



February 2015

# RECOVERY ACT

## GSA's Courthouse Projects Illustrate Opportunities to Improve Management Practices and Analyze Environmental Outcomes

Accessible Version

# GAO Highlights

Highlights of [GAO-15-307](#), a report to congressional requesters

## Why GAO Did This Study

The Recovery Act provided GSA with \$5.55 billion—over three times the agency's 2009 funding for new construction and renovations—to invest in federal buildings and U.S. courthouses. This amount included \$4.5 billion to convert federal buildings and U.S. courthouses into green buildings that would reduce energy and water use, among other goals.

GAO was asked to review GSA's use of Recovery Act funds as they related to courthouses. This report examines (1) how GSA determined which courthouse projects to fund under the Recovery Act, (2) how GSA's management of selected Recovery Act projects aligned with successful practices and whether these projects disrupted judiciary operations, and (3) how GSA set environmental goals for courthouses and whether selected projects met those goals. GAO reviewed relevant laws and agency documents, collected cost and schedule data on courthouse projects, and analyzed environmental outcomes for 10 projects. GAO selected these 10 Recovery Act courthouse projects, based on project size, type, and location, and interviewed GSA officials and judiciary tenants about GSA's management and coordination.

## What GAO Recommends

GAO recommends that GSA (1) examine incorporating successful management practices into its capital investment process and (2) analyze and apply environmental outcomes for green Recovery Act projects. GSA agreed with GAO's recommendations.

View [GAO-15-307](#). For more information, contact Mark Goldstein at (202) 512-2834 or [goldsteinm@gao.gov](mailto:goldsteinm@gao.gov).

February 2015

## RECOVERY ACT

### GSA's Courthouse Projects Illustrate Opportunities to Improve Management Practices and Analyze Environmental Outcomes

## What GAO Found

The General Services Administration (GSA) developed eight selection criteria for utilizing its \$4.5 billion in high-performing green (green) building funds—or more than 80 percent of its total \$5.5-billion budget—under the American Recovery and Reinvestment Act of 2009 (Recovery Act). GSA used almost \$800 million of its \$4.5-billion green building funds on 15 full or partial modernization projects and the remaining funds were used on federal buildings or limited scope projects. For example, at the Hipolito F. Garcia Federal Building and U.S. Courthouse in San Antonio, Texas, GSA installed solar panels and a solar water heater on the roof, installed a green roof on the interior courtyard, and replaced the building's lighting. In addition, as of May 2014, GSA used \$257 million of the \$750 million in Recovery Act funds dedicated to federal buildings and U.S. courthouses to construct or acquire seven courthouses.

GSA management of selected Recovery Act courthouse projects did not always align with seven successful practices that GAO developed for managing large-scale investments. GAO's more in-depth review of 10 courthouses showed that while GSA generally provided top leadership support and sufficient funding, its management of these Recovery Act projects did not always align with the remaining five practices. For example, judiciary tenants at 3 of the 10 courthouses said that GSA management did not actively engage with judiciary stakeholders during construction. In one case, judiciary officials at the Federico Degetau Federal Building and Clemente Ruiz Nazario Courthouse in Puerto Rico said they were not consulted on the project's phased schedule approach that required the closure of all public restrooms in the operating courthouse for a year, except for one restroom on the seventh floor of the adjoining federal building. For the projects GAO reviewed, when GSA did not incorporate the successful practices, GAO found that projects were more likely to experience schedule delays, cost increases, or lack of tenant support. GAO found that most judiciary tenants were satisfied with the completed projects, although tenants at 4 courthouses said the projects disrupted court operations.

GSA set environmental goals by establishing minimum performance criteria (MPC) to guide how it designed green courthouse Recovery Act projects; however, environmental outcomes are not yet known. The MPC included dozens of environmental requirements for projects in areas such as energy, water, and material use. While some Recovery Act projects have been completed for several years and GSA has the necessary data to evaluate projects, GSA officials have not developed a schedule for analyzing building performance against the MPC. GAO evaluated the extent to which the selected courthouses with a year or more of operational data contributed toward the energy and water-reduction goals that GSA used to develop the MPC. GAO found that as of fiscal year 2014, 2 of the 5 courthouses with available data are contributing toward energy reduction goals, and all 4 courthouses with available data are contributing toward water reduction goals. Without evaluating the performance of courthouse projects against the MPC, GSA lacks important information that could guide the agency's future investments in green infrastructure.

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## Abbreviations

AOUSC	Administrative Office of the U.S. Courts
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
EISA	Energy Independence and Security Act
EPA	Environmental Protection Agency
EUAS	Energy Usage and Analysis System
FEMP	Federal Energy Management Program
gBUILD	Green Building Upgrade Information Lifecycle Database
green	high performance green building
GSA	General Services Administration
HVAC	heating, ventilation and air conditioning
IPC	International Plumbing Code
IT	information technology
LEED	Leadership in Energy and Environmental Design
MPC	minimum performance criteria
OIG	Office of Inspector General
PMO	program management office
PV	photovoltaic
Recovery Act	American Recovery and Reinvestment Act of 2009
UPC	Uniform Plumbing Code
USDA	U.S. Department of Agriculture

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February 12, 2015

The Honorable Bob Goodlatte  
Chairman  
Committee on the Judiciary  
House of Representatives

The Honorable Bill Shuster  
Chairman  
Committee on Transportation and Infrastructure  
House of Representatives

The American Recovery and Reinvestment Act of 2009 (Recovery Act)<sup>1</sup> provided the General Services Administration (GSA) with \$5.55 billion for the Federal Buildings Fund—over three times the agency’s 2009 funding for new construction and renovations—to invest in federal buildings and U.S. courthouses, create and preserve jobs, and promote economic recovery. GSA was directed to use at least \$4.5 billion, or 80 percent of its total \$5.5 billion budget, to convert its buildings and courthouses to high-performance green (green) buildings by improving energy and water efficiency, among other environmental goals.<sup>2</sup> Of the remaining Recovery Act funds, not less than \$750 million was to be used by GSA for federal buildings and U.S. courthouses, and not less than \$300 million for border stations and land ports of entry. The Recovery Act required GSA to obligate not less than \$5 billion of the funds by September 30, 2010, and the remainder of the funds by September 30, 2011.

Given GSA’s significant increase in funding from the Recovery Act, you asked us to review GSA’s use of Recovery Act funds at U.S. courthouses. This report examines (1) how GSA determined which courthouse projects to fund under the Recovery Act, (2) how GSA’s management of selected Recovery Act projects aligns with successful management practices and whether these projects disrupted judiciary operations, and (3) how GSA

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<sup>1</sup>Pub. L. No. 111-5, 123 Stat. 115, 149-150 (2009).

<sup>2</sup>Green buildings are designed to achieve a number of environmental goals, including reducing energy, water, and material resource use and the buildings’ negative impact on the environment and on building occupants, by means such as using recycled or nontoxic products in the buildings. See section 401 (13) of the Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 121 Stat. 1492, 1598-99 (2007).

established environmental performance goals for courthouses funded by the Recovery Act and whether selected projects met those goals.

This report examines Recovery Act projects in GSA buildings with a judicial presence. We use the term courthouse throughout the report to refer to these buildings. To identify how GSA determined which U.S. courthouse projects would receive Recovery Act funds, we reviewed GSA's Recovery Act planning documents, project selection criteria, and relevant legislation and guidance—including the Energy Independence and Security Act of 2007 (EISA) and related federal statutes and executive orders—related to its \$4.5 billion in green building Recovery Act funds and its \$750 million in Recovery Act funds for federal buildings and U.S. courthouses. We also worked with GSA and the Administrative Office of the U.S. Courts (AOUSC) to identify which Recovery Act projects had any judicial presence. We excluded border stations and land ports of entry from our analysis because none of these buildings has a judicial presence. GSA categorized green buildings as full or partial modernizations, limited scope projects, or small projects.

To assess how GSA's management of selected Recovery Act projects aligned with successful management practices and whether these projects disrupted judicial operations, we applied seven successful management practices for large scale investments that we identified in prior GAO work.<sup>3</sup> While the successful practices were originally developed for information technology (IT) investments, IT stakeholders agreed that these practices have broader applicability. We also shared these successful practices with GSA officials who oversaw the Recovery Act program and asked how GSA addressed each practice; GSA officials did not identify any concerns with applying these successful practices to Recovery Act projects. These practices are also consistent with the leading practices we set forth in our capital decision-making guide.<sup>4</sup> We selected 10 courthouses, from GSA's 22 new construction or full or partial courthouse modernization projects, for examination with regard to how GSA implemented the management practices. We selected projects that ranged in size, Recovery Act-funding amount, geographic location, and

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<sup>3</sup>See GAO, *Information Technology: Critical Factors Underlying Successful Major Acquisitions*, [GAO-12-7](#) (Washington, D.C.: Oct. 21, 2011).

<sup>4</sup>See GAO, *Executive Guide: Leading Practices in Capital Decision-Making*, [GAO/AIMD-99-32](#) (Washington, D.C.: December 1998).

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project type.<sup>5</sup> In general, we selected projects that had the largest scope and funding because larger projects increased the likelihood that tenants were aware of the Recovery Act-funded work and would be able to describe how, if at all, GSA coordinated with them. We interviewed the judicial tenants that resided in the selected courthouse buildings during construction or would reside in them once construction was completed to obtain their views about how their experiences aligned with the successful practices mentioned above and whether projects disrupted court operations. In addition to interviewing judicial tenants, after interviews, we sent a structured questionnaire to tenants at each courthouse to verify responses captured during initial interviews and to collect additional information specific to the seven successful practices. Our findings from our review of the 10 selected courthouse projects cannot be used to make generalizations about all of GSA's Recovery Act projects. We also examined GSA's cost and schedule data for all 22 courthouses that were either full or partial modernization projects or new construction to identify how, if at all, project costs or schedules changed from 2009 through 2014. We discussed with GSA staff how these data were collected and maintained and determined the data to be sufficiently reliable for our purposes.

To determine how GSA established environmental performance goals for the courthouse projects it funded and the extent to which selected projects met those goals, we reviewed agency and regulatory documents describing GSA's performance goals for Recovery Act projects and examined GSA's data on energy and water usage. Specifically, we compared GSA's energy and water usage data for the selected buildings from fiscal years 2003 and 2007, respectively, to fiscal year 2014 to determine whether expected reductions in energy and water consumption were achieved. We used 2003 energy data and 2007 water data because those were the baseline years for federally required energy and water reductions. We did not complete this analysis for courthouses that were still under construction for any part of fiscal year 2014. We reviewed documentation related to these data and interviewed knowledgeable GSA staff about the quality of the data and determined the data to be

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<sup>5</sup>The 10 courthouse projects we selected included 2 new courthouse construction projects, 6 full modernization projects, and 2 partial modernization projects. We limited our selection of case study projects to new construction or full and partial modernization projects because these were, on average, the largest and most complex projects, and as a result, we expected judiciary tenants to be more familiar with them.



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sufficiently reliable for our purposes. See appendix I for more information about our scope and methodology.

We conducted this performance audit from February 2014 to February 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

As the federal government's landlord, GSA is responsible for, among other things, designing, building, and maintaining its portfolio of approximately 9,000 federally owned or leased buildings and courthouses. According to the AOUSC, 424 of these buildings have a judicial presence ranging from small court spaces that provide judicial services on a part-time basis to large courthouse buildings in major urban areas.

To address the Recovery Act's obligation deadlines, environmental requirements, and large influx of funding, GSA adapted its capital investment process to include a newly created national program management office (PMO) in April 2009 to oversee its Recovery Act program. GSA established the PMO, which included construction and acquisition subject-matter experts, to help regional teams deliver Recovery Act projects on time and in accordance with GSA's policies and Recovery Act requirements. The PMO provided additional support and oversight to GSA's capital investment process. The PMO grouped GSA's 11 regions into three Recovery Act zones. GSA officials stated that the objectives of the zone structure were to create and foster the sharing of ideas and resources and to provide project oversight. GSA zone and regional recovery executive officials were responsible for, among other things, monitoring and reviewing the performance of Recovery Act projects and managing risks at the regional level.

GSA selected 259 federal buildings and U.S. courthouses for its Recovery Act program, in addition to a number of small projects.<sup>6</sup> As shown in table 1, these Recovery Act projects fall into two main categories: (1) conversions to green buildings, and (2) new construction or renovations.<sup>7</sup>

**Table 1: General Services Administration’s (GSA) American Recovery and Reinvestment Act of 2009 (Recovery Act) Program for Federal Buildings and Courthouses, as of August 2014**

Project category	Total number of projects	Recovery Act funding (\$ in millions)
<b>Conversion to high-performance green buildings</b>	<b>248</b>	<b>\$4,500</b>
<i>Full and partial building modernizations:</i> projects associated with a replacement or upgrade of nearly all building systems (such as windows, roofs, plumbing, electrical, and mechanical systems)	45	\$3,209
<i>Limited scope projects:</i> projects associated with a single building system (such as lighting or plumbing) or a few such systems	203	\$883
<i>Small projects:</i> Limited scope projects below the prospectus level (i.e., below \$2.66 million) <sup>a</sup>	140	\$197
Other <sup>b</sup>	—	\$211
<b>New construction of federal buildings and U.S. courthouses</b>	<b>11</b>	<b>\$750</b>

Source: GAO analysis of GSA’s project spend plan, version 11 (submitted to Congress), published August 5, 2014. | GAO-15-307

<sup>a</sup>Before Congress makes an appropriation, GSA submits to the Senate Committee on Environment and Public Works and the House Committee on Transportation and Infrastructure detailed project descriptions, called prospectuses, for authorization by these committees when the proposed construction, alteration, or acquisition of a building to be used as a public building exceeds a specified threshold (see 40 U.S.C. § 3307). For fiscal year 2009, the GSA established threshold for construction, alteration, and lease projects was \$2.66 million.

<sup>b</sup>GSA allocated \$91 million for rental of temporary space during construction, \$113 million for building operations and administrative costs; \$4 million for the Office of High Performing Green Buildings; and another \$3 million for on-the-job apprenticeship programs registered with the Department of Labor.

The Recovery Act directed GSA to use the majority of its funding—\$4.5 billion—to convert its federal buildings and courthouses to green

<sup>6</sup> We excluded small projects from our analysis; these are limited scope projects whose costs are below prospectus level. GSA is not required to transmit a prospectus to Congress with specified types of project data for these projects (see 40 U.S.C. § 3307). For fiscal year 2009, the GSA established threshold for construction, alteration, and lease projects was \$2.66 million.

<sup>7</sup>As discussed above, we have excluded border stations and land ports of entry from further analysis because none of these funds was used for courthouses.

buildings, as defined in section 401 of EISA.<sup>8</sup> Among other things, a green building must, throughout the life cycle of the building, as compared with similar buildings, accomplish the following:

- reduce energy, water, and material resource use;
- improve indoor environmental quality, including reducing indoor pollution, improving heating and cooling, and improving lighting and acoustic environments that affect occupant health and productivity;
- reduce negative impacts on the environment, including air and water pollution and waste generation; and
- consider indoor and outdoor effects of the building on human health and the environment, including improvements in worker productivity, and other factors, considered appropriate by specified green-building officials.

GSA's portfolio of buildings is also subject to federal energy and water conservation requirements and goals established in federal statutes and executive orders. For example, the National Energy Conservation Policy Act,<sup>9</sup> as amended by EISA and the Energy Policy Act of 2005,<sup>10</sup> established energy-efficiency performance standards. EISA amendments require, for example, that agencies—including GSA—apply conservation measures that annually reduce energy consumption resulting in a 30 percent reduction by fiscal year 2015 compared to a fiscal year 2003 baseline to applicable facilities across an agency's entire portfolio.<sup>11</sup> Similarly, Executive Order 13423 requires federal agencies to reduce

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<sup>8</sup>Under EISA, the term high-performance building means a building that integrates and optimizes on a life cycle basis all major high-performance attributes, including energy conservation, environment, safety, security, durability, accessibility, cost-benefit, productivity, sustainability, functionality, and operational considerations. See Pub. L. No. 110-140, 121 Stat. 1492, 1598-99 (2007).

<sup>9</sup>Pub. L. No. 95-619, § 543, 92 Stat. 3206 (1978).

<sup>10</sup>Pub. L. No. 109-58, § 102, 119 Stat. 594 (2005).

<sup>11</sup>Pub. L. No. 110-140, § 431, 121 Stat. 1492, 1607 (2007), codified as amended at 42 U.S.C. § 8253.

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their water consumption by 16 percent by the end of fiscal year 2015 compared to a fiscal year 2007 baseline.<sup>12</sup>

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## GSA Worked to Select Green Projects and New Courthouses That Reflected Recovery Act Priorities

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### GSA Selected Green Projects to Achieve Environmental Goals and Obligate Funds Quickly

According to GSA officials, the agency obligated its \$4.5 billion in Recovery Act funds to green projects that would help convert federal buildings and courthouses into green buildings and that could be obligated quickly. To reflect these priorities, GSA developed selection criteria for full and partial modernization projects (for both federal buildings and courthouses) presented in table 2.<sup>13</sup> The first three criteria were unique to Recovery Act projects and given the highest priority. The remaining five criteria are those GSA typically uses to select capital investment projects.

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<sup>12</sup>Executive Order No. 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, 72 Fed. Reg. 3919 (Jan. 26, 2007). Energy and water conservation measures are evaluated as a reduction in energy or water use intensity, calculated as reductions in British Thermal Units of energy or gallons of water per gross square foot of the agency's federal buildings.

<sup>13</sup>Our report's scope is limited to full and partial modernization projects because they were the most comprehensive projects. Generally speaking, though, limited scope projects had similar selection criteria to Recovery Act projects. However, these projects' goals were tied to reducing GSA's overall energy usage within its portfolio and to improve tenants' working conditions.

**Table 2: General Services Administration's (GSA) Selection Criteria for Full and Partial Modernization Projects Funded under the American Recovery and Reinvestment Act of 2009 (Recovery Act)**

Criterion	Description
Helping transform buildings into high-performing green buildings	A project's ability to implement building systems and technologies that achieve energy or water conservation, or renewable energy generation, among other goals.
Execution timing	The speed at which a contract for the project could be awarded.
Minimizing execution risk	A project that has a lower risk of experiencing schedule delays due to, for example, unforeseen conditions.
Improving facility condition	Extent to which a project would address identified repair needs.
Improving asset utilization	Extent to which a project would reduce vacant space or increase asset use.
Return on investment	Expected time it would take GSA to recover the cost of the project through benefits, such as savings on energy or water bills.
Lease cost avoidance	Degree to which the cost of a private sector lease would be avoided by completing the project.
Historical significance	Extent to which a building has been recognized by the National Register of Historic Places as having historical significance.

Source: GAO analysis of GSA information. | GAO-15-307

Note: The top three criteria were unique to the Recovery Act and given the highest priority when selecting projects.

GSA convened an interdisciplinary team of approximately 20 GSA subject matter experts, including some who would eventually sit on the newly created PMO, to select Recovery Act projects according to the criteria. According to agency officials, GSA's criteria served as a reference for initial project rankings, and the PMO made some modifications to those rankings to arrive at a final project list, to ensure, for example, that each of GSA's 11 regions received funding. Once the PMO and initial list of selected projects were created, officials from the PMO would recommend new projects as funds became available due to, for example, cost savings on other projects. In total, GSA used about \$800 million of its \$4.5 billion green building funds toward 15 full or partial courthouse modernization projects (an average of about \$53 million each).<sup>14</sup>

EISA's broad definition of green building attributes provided GSA flexibility in carrying out its first selection criteria, targeting projects that would help transform buildings into green buildings. For example, each of the full or partial modernization courthouse projects we reviewed contained green infrastructure components aimed at reducing energy and

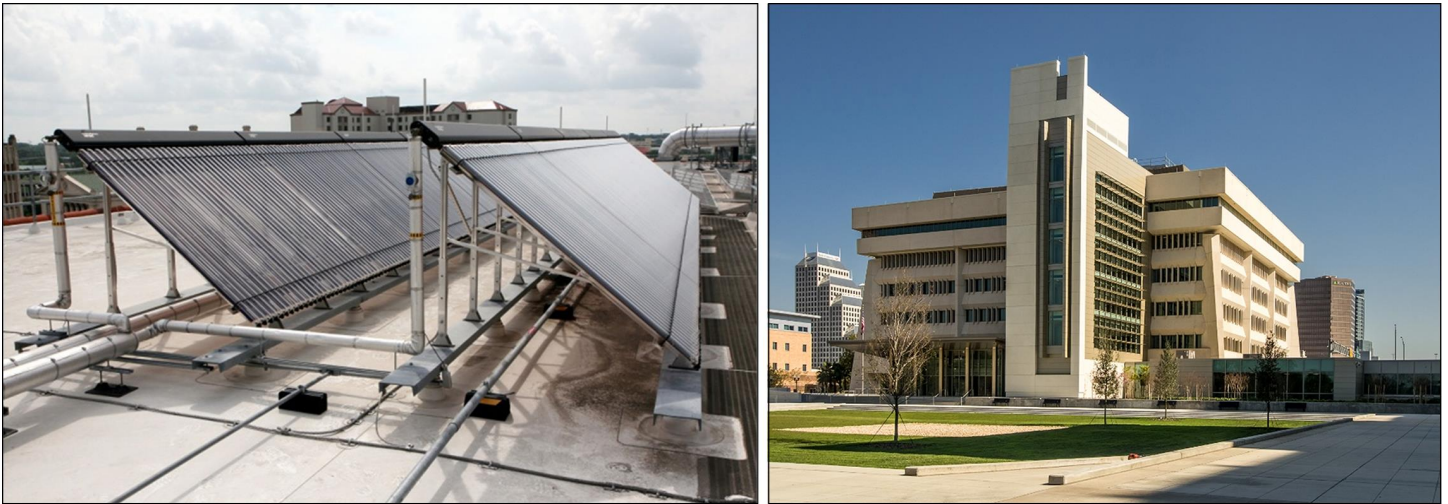
<sup>14</sup>Based on our analysis, GSA used almost \$462 million to fund 125 limited scope courthouse projects (an average of about \$3.7-million each).

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water use, such as energy-efficient lighting and upgraded mechanical systems or water-efficient bathroom fixtures. In our review of eight full or partial modernization courthouses, we also found instances at each courthouse where GSA utilized EISA's broad definition of a green building to incorporate other goals, such as improving indoor environmental quality, fire protection and life safety systems, or building layout. According to GSA officials, each of these projects—which were designed under the supervision of GSA regional officials—were reviewed by GSA's PMO and legal department to make sure projects supported the goals of EISA. The following examples illustrate how GSA used a portion of its green Recovery Act funds for green infrastructure and other broader uses:

- At the Hipolito F. Garcia Federal Building and U.S. Courthouse in San Antonio, Texas, GSA installed solar panels and a solar water heater on the roof (fig. 1), a green roof on the interior courtyard, energy-efficient lighting, water-efficient plumbing throughout the building, and a new heating, ventilation, and air conditioning system, among other upgrades.
- At the Thurgood Marshall U.S. Courthouse in New York City, New York, GSA used \$64 million to pay for construction cost increases of the full modernization project. According to GSA officials, costs increased due to unforeseen building conditions that required additional work, funding to remediate asbestos from the historic building, and the higher-than-expected cost of construction in Manhattan at the time.
- At the Birch Bayh Federal Building and U.S. Courthouse in Indianapolis, Indiana, GSA used a portion of its green funds to complete structural renovations in bathrooms to increase accessibility for people with disabilities. The project also included lead paint and asbestos removal, new carbon monoxide sensors, and fire alarm sprinkler systems.
- At the George C. Young Federal Building and U.S. Courthouse in Orlando, Florida, GSA regional officials told us they requested and received \$12.5 million in additional Recovery Act green project funds to move an elevator pavilion to the building's exterior and improve the building's layout (fig. 1).

**Figure 1: Example of Solar Water Heater at the Hipolito F. Garcia Federal Building and U.S. Courthouse in San Antonio, Texas, and the New Exterior Elevator Pavilion at the George C. Young Federal Building and U.S. Courthouse in Orlando, Florida**



Source: GAO. | GAO-15-307

To minimize the execution risk and expedite the execution timing of Recovery Act projects, GSA generally selected projects that had already completed design work. GSA officials said that they used Recovery Act funding to quickly begin or expand construction on these projects, while also identifying ways to incorporate energy savings or environmental improvements into their design. To guide the design process and ensure that these projects contained green elements, GSA established minimum performance criteria (MPC), which we will discuss in greater detail later. Additionally, GSA funded cost escalation for some ongoing modernization projects—that is, projects that needed additional funding to start or complete construction.

GSA estimated the return on investment or cost effectiveness of its Recovery Act investments based on a calculation of each investment's simple payback period. Pursuant to Department of Energy regulations, as a rough measure of cost effectiveness, federal agencies may calculate a simple payback period for projects that demonstrate payback periods significantly shorter than the useful life of such projects. The simple payback period estimates the amount of time it takes to recover the cost of an initial investment, through future energy and water cost savings. An energy or water conservation technology is likely to be cost-effective if its estimated payback period is less than the useful life of that system. In accordance with the National Institute of Building Sciences' Whole Building Design Guide, GSA can calculate cost effectiveness for all

project components within a building as a whole, rather than individually. This process allows the benefits of some technologies to exceed the cost recovery time frames if they are offset by technologies with shorter cost-recovery time frames, up to an average of 40 years. Table 3 shows simple payback period estimates for selected energy- and water-saving technologies installed at the Hipolito F. Garcia Federal Building and U.S. Courthouse in San Antonio. According to GSA's analysis shown below, project components that recover costs quickly, such as high-efficiency chillers and low-flow plumbing fixtures have been combined with components that take longer to recover costs, such as solar water heaters, for a simple payback period below 40 years.<sup>15</sup>

**Table 3: Example of the General Services Administration's (GSA) Simple Payback Period for Selected Technologies Funded under the American Recovery and Reinvestment Act of 2009 (Recovery Act) at the Hipolito F. Garcia Federal Building and U.S. Courthouse (San Antonio, Texas)**

Technology	Installation cost (in nominal dollars)	Simple payback period in years
Outdoor potable water use reduction (to capture water condensate from the building's heating, ventilation, and air conditioning system)	\$25,000	78
Solar hot water system	\$32,987	27
Photovoltaic system (e.g., solar panels)	\$425,000	20
High efficiency boilers	\$104,000	16
Advanced lighting system	\$219,000	9
Energy recovery units that temper incoming air and reduce energy usage	\$197,500	8
Indoor potable water use reduction (low-flow bathroom features)	\$14,123	7
High efficiency water chillers	\$125,000	4
	<b>Total installation cost (nominal dollars): \$1,142,610</b>	<b>Average simple payback period (in years): 10</b>

Source: GSA. I GAO-15-307

Note: The simple payback period estimates the amount of time it takes to recover the cost of an initial investment, through future energy and water cost savings. When considering the total cost (in nominal dollars) and the expected annual energy- and water-cost savings from technologies installed at the Hipolito F. Garcia Federal Building and U.S. Courthouse, the simple payback period for the collection of installed infrastructure is about 10 years, as shown in the last row of the table.

<sup>15</sup>Historically, GSA used a 25-year period to calculate cost effectiveness; however, beginning in 2007 EISA increased the life-cycle cost calculation period for high-performance green buildings to 40 years. Increasing the payback period by 15 years expanded the scope of viable green infrastructure projects.



## GSA Generally Selected New Construction Projects That Helped It Build or Acquire New Courthouses

In addition to \$4.5 billion in green funds, the Recovery Act provided GSA with \$750 million for federal buildings and U.S. courthouses. While GSA generally selected projects that helped it build or acquire new courthouses, other eligible uses included repairs and alternations to existing buildings, building security enhancements, and building operations and maintenance.

As of May 2014, GSA had used \$257 million of its \$750 million-general-purpose funds for seven courthouses and the remainder on federal buildings that did not have a judiciary presence. As shown in table 4, this included construction of a new courthouse, escalation funds for three new courthouses, and the acquisition of three new courthouses GSA originally planned to lease. GSA funded the new courthouse in Austin because it was a high-priority project for the judiciary; funded the escalation costs for three projects that needed additional funding to start or complete construction; and purchased three new courthouses that it had intended to lease because it considered ownership more cost efficient in the long term.

**Table 4: U.S. Courthouses the General Services Administration (GSA) Funded with \$750 Million in American Recovery and Reinvestment Act of 2009 (Recovery Act) Funds, May 2014**

Project name	Location	Outlays	Project description
Austin Courthouse	Austin, Texas	\$114,245,315	GSA obligated Recovery Act funds to cover cost increases on existing construction projects.
Jackson Courthouse	Jackson, Mississippi	\$2,962,143	
El Paso Courthouse	El Paso, Texas	\$2,594,906	
Richard S. Arnold Courthouse	Little Rock, Arkansas	\$7,170,316	GSA obligated Recovery Act funds to purchase courthouses that GSA previously planned to lease from private developers.
Bakersfield Courthouse	Bakersfield, California	\$27,393,898	
James F. Battin U.S. Courthouse	Billings, Montana	\$77,996,278	
Yuma Courthouse	Yuma, Arizona	\$24,970,346	

Source: GAO analysis of GSA data. | GAO-15-307

GSA’s Project Management Has Not Always Aligned with Successful Practices and Had Mixed Effects on Judicial Operations

GSA’s Project Management Did Not Always Align with Successful Practices	We found that GSA management incorporated the seven successful practices for managing large-scale investments to varying degrees at 10 courthouse projects that we reviewed in greater detail. These seven practices, which we identified in our prior work, are listed in table 5. We found that GSA adhered to two practices by demonstrating support from top leadership and generally providing sufficient funding, but GSA experienced mixed results implementing the remaining five practices.
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Table 5: Successful Management Practices for Large-Scale Investments

Successful practice	Examples of successful practice if applied to the General Services Administration’s (GSA) management of the American Recovery and Reinvestment Act of 2009 (Recovery Act) projects
Project staff involve stakeholders in the development of requirements.	Included judicial stakeholders (tenants) in scoping and design decisions for Recovery Act projects prior to construction.
Project staff actively engage with stakeholders.	Developed mechanisms to actively engage judicial tenants on Recovery Act projects throughout the construction process.
Project staff have the necessary knowledge and skills.	Took actions to ensure that Recovery Act project managers had the necessary knowledge and skills.
Project staff prioritize requirements.	Empowered project managers to prioritize building, scoping, or funding decisions for Recovery Act projects.
Project staff are consistent and stable.	Developed mechanisms to ensure stable leadership for Recovery Act projects.
Senior department and agency executives support the projects.	Demonstrated support from top leadership for Recovery Act projects.
Projects receive sufficient funding.	Secured sufficient funding for Recovery Act projects.

Source: GAO. | GAO-15-307

Note: Successful practices were identified in GAO, Information Technology: Critical Factors Underlying Successful Major Acquisitions, [GAO-12-7](#).

Of the 10 courthouses we reviewed, we found that, in general, Recovery Act projects were more likely to be completed on time, on budget, or receive support from judicial tenants when GSA effectively incorporated the management practices. By contrast, when these practices were not fully incorporated, projects were more likely to experience problems and did not always meet tenants' needs. For example, in a few instances, GSA had to modify projects or replace technologies—actions that can increase costs, delay projects, or increase tenant disruptions. By not incorporating these seven successful practices at each of the 10 courthouses we reviewed, GSA increased the risks that Recovery Act projects were not planned and constructed in the most efficient manner and that impacts to tenants were not minimized. Since GSA's process for other construction projects is similar to how the agency managed the Recovery Act process, these successful practices may have application beyond managing Recovery Act projects.

Practice: Project Staff  
Involve Stakeholders in  
the Development of  
Requirements

We found that GSA management did not consistently involve the judiciary in the planning stages of Recovery Act projects and, consequently, found instances where projects did not meet judicial tenants' needs. Judicial tenants at 2 of the 8 courthouses that responded to our structured questionnaire on this issue said they were involved in scoping Recovery Act projects.<sup>16</sup> Alternatively, 5 respondents that provided a definitive response to our question told us GSA did not involve them in scoping projects or identifying how new building technologies or modifications funded under the Recovery Act would affect them. GSA officials noted that they established protocols to ensure that tenants were included as active members of the project team, however, according to GSA officials, they did not always solicit input when developing the scope of projects—which happened prior to construction—because these were building upgrades that were expected to minimally affect tenants. We found, however, instances where projects did affect judiciary tenants. For example, judicial tenants at the Richard H. Poff Federal Building in Roanoke, Virginia, told us they were not asked about upgrades to lighting and the installation of glass for the windows that later presented safety and operational concerns. Judicial tenants at the building said that the new energy efficient lighting—which automatically turned off when occupancy sensors could not detect movement—turned off in the

<sup>16</sup> Judiciary stakeholders at 2 of the 10 courthouses we selected did not respond to this question on our structured questionnaire, and 1 reported that it neither agreed nor disagreed that GSA involved them.

probation area of the operating courthouse that was accessible to the public, causing safety concerns for those who entered the area. However, according to GSA officials, there was an onsite example of the window treatment for more than a year that tenants were encouraged to review. At the Federal Building and U.S. Custom House in Denver, Colorado, judiciary tenants told us they were not included in scoping the project and identifying new building technologies, and as a result, they told us that the contractors installed energy efficient lights bulbs in historical fixtures that were above the allotted wattage and that the bulbs had to be replaced.

**Practice: Project Staff Actively Engage with Stakeholders**

GSA management developed mechanisms to actively engage judiciary tenants on Recovery Act projects throughout the construction process, but judiciary tenants at some of the selected buildings reported significant challenges. According to GSA officials, GSA developed a communication template for Recovery Act projects—outlining each project’s scope, schedule, budget, and point of contact—that it shared with judiciary tenants. GSA and Judiciary tenants at all of the 10 courthouses we reviewed also said that GSA held regular meetings with the tenants or provided them with project updates. However, judiciary tenants at 3 of the 10 courthouses told us that GSA did not solicit their input. For example, at the Federico Degetau Federal Building and Clemente Ruiz Nazario U.S. Courthouse in San Juan, Puerto Rico, judiciary tenants said that GSA limited their involvement during construction, and as a result, their input was not obtained on the project’s phased schedule approach that required the closure of all public restrooms in the operating courthouse for a year, except for one restroom on the seventh floor of the adjoining federal building. According to a district judge who sits at the courthouse, trials were delayed from resuming after recesses because it took attendees so long to return.

**Practice: Project Staff Have the Necessary Knowledge and Skills**

GSA provided training to help ensure that Recovery Act staff had the necessary knowledge and skills, but some projects still encountered legal or operational challenges. GSA also created the PMO—which included additional regional oversight, subject matter experts, and advisors—to reinforce the knowledge and skills of project staff. Judiciary tenants at 4 of the 9 courthouses that responded reported that GSA staff was knowledgeable on Recovery Act projects, but 5 expressed concerns about the knowledge and skills of GSA project staff. In addition, the GSA Office of Inspector General (OIG) reported that GSA project management violated a number of contracting requirements applicable to Recovery Act projects. For example, the GSA OIG reported in 2010 that GSA project staff incorrectly executed a procurement approach, referred to as the construction manager as contractor, for a federal courthouse in Austin,

Texas. The GSA OIG concluded that the Recovery Act award was not competitive, as required under the Federal Acquisition Regulation.<sup>17</sup> In addition, in April 2011, the GSA OIG testified before the House Committee on Transportation and Infrastructure that as a result of GSA's oversight, a construction contract for the Richard H. Poff Federal Building lacked adequate price competition and cost benefit analysis prior to awarding the construction contract.<sup>18</sup> According to GSA officials, the agency used a new contracting method that staff were unfamiliar with, and as a result, project staff did not always follow federal protocols. Since the OIG reported its Recovery Act findings, GSA has increased training for staff on these methods and project managers cannot use contracting methods for which they have not received training, according to GSA officials.

Judiciary officials also reported instances where GSA's project managers lacked the knowledge and skills, including the knowledge to effectively operate the newly installed building systems, inconveniencing judiciary tenants at 3 of the 10 courthouse projects we reviewed. For example, judiciary officials at 2 courthouses reported that GSA had difficulty with new automation systems and, as a result, temperatures varied drastically across rooms. GSA officials told us that building managers receive training on systems; however, the officials acknowledged that it may take building managers about a year to become proficient on new systems.

Practice: Project Staff  
Prioritize Requirements

We found that GSA's project managers were not consistently able to prioritize requirements on Recovery Act projects due, in part, to GSA management's effort to ensure compliance with relevant laws and overlapping responsibility for Recovery Act projects. As a result, project managers might have had limited opportunities to set priorities, and

<sup>17</sup>The GSA OIG found that the contracting approach was incorrectly executed and resulted in the construction portion of the contract being awarded as an unpriced option for \$102 million without justification for using other than full and open competition. According to GSA officials, the construction phase was not an unpriced option and proper evaluation and competition occurred. See General Services Administration, Office of Inspector General, *Recovery Act Report—Austin Courthouse Project Review of PBS's Major Construction and Modernization Projects Funded by the American Reinvestment and Recovery Act of 2009*, A090172/P/R/R10001 (Washington, D.C.: March 2010).

<sup>18</sup>See GSA OIG, Statement of Honorable Brian D. Miller, Inspector General, General Services Administration, Before the House Committee on Transportation and Infrastructure, Subcommittee on Economic Development, Public Buildings, and Emergency Development, April 14, 2011.

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projects could have been delayed due to additional review. Prior to the Recovery Act, changes to projects were typically performed by project staff in conjunction with regional managers and GSA's legal department. However, in 2012, during the Recovery Act, the GSA OIG reported that project managers had, in some cases, approved invalid change orders.<sup>19</sup> As a result, GSA subsequently required project managers to submit change orders to the PMO and regional executives for approval and review, in addition to the legal department. When asked, four project managers said they did not find the additional oversight burdensome. However, two project managers told us the additional review had led to some project delays and restricted a project manager's autonomy and expertise. GSA officials told us that this change was a necessary safeguard against invalid change orders.

Practice: Project Staff are  
Consistent and Stable

For some Recovery Act projects, GSA management encountered challenges ensuring that project staff were stable and consistent throughout Recovery Act projects leading to instances of tenant confusion and project delays. Judiciary tenants we interviewed at 5 of the 10 courthouses reported that they consistently dealt with the same GSA staff during the project. At these projects, judiciary tenants generally stated that they were more satisfied with GSA's project management. These projects were also more likely than other selected projects to be completed on time or early. In anticipation that staff turnover may occur, GSA created a guide for project managers that outlined, among other things, project managers responsibilities in the event that they moved from one project to another. In practice, GSA PMO officials told us that the regions were responsible for managing attrition within their projects. Five of the 10 Recovery Act projects we reviewed experienced turnover with the project manager; judiciary tenants at four of these courthouses told us that the turnover either delayed the project or resulted in additional coordination challenges. In some cases, staff turnover occurred multiple times throughout the project. For example, at the Richard H. Poff Federal Building, judiciary officials reported having three project managers over the course of a 3-year project, and judiciary tenants reported being dissatisfied with GSA's management. GSA officials told us that they have since developed continuity and succession plans to reduce the impact of staff turnover on construction projects.

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<sup>19</sup>See GSA OIG, Alert Report: Limited Scope Audit of Invalid Obligations and Contingency Funding for Recovery Act Projects. A120174/P/R/W13001 (Washington, D.C.: October, 2012).

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Practice: Senior Department  
and Agency Executives  
Support the Projects

GSA consistently demonstrated support from top leadership for Recovery Act projects. In the early stages of the Recovery Act program, GSA hired a consulting firm to identify the best governance structure for GSA to manage Recovery Act projects. According to GSA officials, they sought out a system that would identify and elevate problems early. Based on the consulting firm's recommendation, GSA created the PMO, which included the zone structure and oversight. According to GSA officials, given the success of the PMO (including the zone structure), GSA has retained its Recovery Act management structure since 2010 and has applied it to other capital investment projects, which are currently managed, with the exception of the PMO and zone structure, similar to Recovery Act projects. GSA officials said that keeping the three zones with additional oversight improves the agency's efficiency managing all capital investment projects.

Practice: Projects Receive  
Sufficient Funding

In the spend plan submitted to Congress, GSA generally allocated enough Recovery Act funding to complete 9 of the 10 Recovery Act projects we reviewed, though 5 required some additional funds beyond the Recovery Act. We could not assess the sufficiency of funding at the Federico Degetau Federal Building and Clemente Ruiz Nazario U.S. Courthouse in Puerto Rico because the project has not been completed. However, GSA officials said that it is unlikely that the project's original scope can be completed with the project's remaining Recovery Act funds. Of the 5 projects that required additional funds, GSA supplemented its Recovery Act funding with a total of \$11 million from its repair and alteration funds; this accounted for less than 2 percent of the these project's total costs. For example, according to GSA data, the full modernization project at the Prince Jonah Kuhio Kalaniana'ole Federal Building and U.S. Courthouse in Honolulu, Hawaii cost more than \$123 million including about \$5 million in non-Recovery Act funds.

We also found instances where Recovery Act funds were reallocated among projects to ensure adequate funding. For example, GSA officials told us they requested and received an additional \$12.5 million to fund a new entry pavilion tower at the George C. Federal Building and U.S. Courthouse in Orlando, a plan that included moving the entrance of the Courthouse to the back of the building and adding a stairwell compliant with today's fire safety code. However, we also found that GSA reduced the scope of 3 projects we reviewed. Specifically, GSA project managers at 3 projects told us that they were required to remove items from the project's scope to address unforeseen building conditions while keeping project costs within budget. In each case, judicial tenants expressed frustration about the elements GSA chose to remove. For example,

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judiciary officials at Federico Degetau Federal Building and Clemente Ruiz Nazario U.S. Courthouse in Puerto Rico said that unforeseen building conditions forced GSA to cut improvements to the building's entryway, which was one of the few elements of the almost \$85 million project that the public would see. GSA officials said that they hope to complete the entry improvements in the future as part of a separate project.

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**Costs or Schedules  
Changed for a  
Majority of Courthouse  
Construction and  
Modernizations**

According to GSA cost and schedule data for new construction and full or partial modernization courthouse projects, GSA completed 8 of the 22 Recovery Act projects on time and on budget. One of the on-time, on-budget projects was the Birch Bayh Federal Building and U.S. Courthouse in Indianapolis. GSA project managers and judiciary tenants attributed the timely completion to, among other things, good working relationships between GSA and the judiciary. However, 14 of the 22 projects experienced schedule delays or cost overruns. For example, according to GSA officials, the Prince Jonah Kuhio Kalaniana'ole Federal Building and U.S. Courthouse's full modernization in Honolulu was completed more than 6 months after originally planned. GSA officials attributed the delay to unforeseen conditions in a federally owned building that had been held by GSA since it was built, including the need for asbestos removal, new electrical wiring, and plumbing issues.<sup>20</sup> GSA also requested an additional \$10 million in Recovery Act funds for the Federal Building and U.S. Custom House in Denver to, among other things, increase the project's scope and address unforeseen building conditions (e.g., asbestos removal). As a result, the project was delayed about 6 months. For one project in San Juan, Puerto Rico, GSA has encountered substantial ongoing management challenges leading to both cost overruns and schedule delays from the original planned completion date of December 25, 2014. According to GSA officials, the project will likely require

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<sup>20</sup>GSA officials said that it is not unusual for owners to not know building conditions, especially for older buildings or those that have had substantial alterations over time.



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additional funding beyond its Recovery Act funds, and GSA has yet to determine a new completion date.<sup>21</sup>

However, GSA's data on costs and schedules do not always provide a complete picture about improvements that were or were not made. In at least one instance, advantageous economic conditions allowed GSA to increase a project's scope while staying within budget. According to GSA officials, in these instances GSA project managers could request to use extra funds for additional green upgrades or GSA could obligate the funds to other projects. For example, GSA officials expected the Hipolito F. Garcia Federal Building and U.S. Courthouse in San Antonio to cost about \$50 million. When the awarded bid came in at \$31 million, GSA officials commissioned a green-performance study to identify additional environmental improvements that could be made. As a result of the study, the project included \$16 million in green upgrades and was GSA's first LEED (Leadership in Energy and Environmental Design) Platinum project.<sup>22</sup> Nonetheless, 3 of our 10 selected projects removed items from the project to stay within costs. As previously discussed, GSA reduced the scope at three projects we reviewed because of unexpected courthouse conditions. For example, solar panels were removed from the original project plans for the Richard H. Poff Federal Building in Roanoke. According to GSA officials, they excluded the solar panels in the final project to use the funds instead for asbestos abatement and electrical work. Similarly, at the Prince Jonah Kuhio Kalaniana'ole Federal Building and U.S. Courthouse in Hawaii, GSA eliminated outdoor building improvements, including landscaping and exterior façade work, among

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<sup>21</sup>While the funds for a large construction project are typically obligated throughout the life of the project, the Recovery Act required GSA to obligate \$5 billion of the funds by September 30, 2010, and the remainder of the funds by September 30, 2011. In addition, while Federal Buildings Fund construction and acquisition funds are typically no-year funds that may remain available until expended, the GSA Recovery Act funds are for a fixed period and thus are subject to a general account closing statute (31 U.S.C. § 1552), which provides that funds available for a fixed period remain available for expenditure for 5 years after the end of the fiscal year in which the funds are required to be obligated. A provision in the Recovery Act, however, authorizes GSA to deobligate and reobligate funds for a project for certain specific reasons. GSA—in consultation with stakeholders—has interpreted this authority to provide up to 5 additional fiscal years to expend the deobligated funds. Therefore, the Recovery Act's establishment of deadlines for obligating and spending funds differs from the typical time frames for GSA's construction projects.

<sup>22</sup>LEED is a third-party certification program and the nationally accepted benchmark for the design, construction, and operation of high-performance green buildings, according to the U.S. Green Building Council.

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other building upgrades to keep projects within budget. According to GSA officials, over the course of the Recovery Act, savings and project needs fluctuated and GSA needed to account for that in its spend plan. As a result, if there were savings, GSA would look for additional opportunities to fund projects, and if there were a shortage of funds, project's scope would have to be cut.

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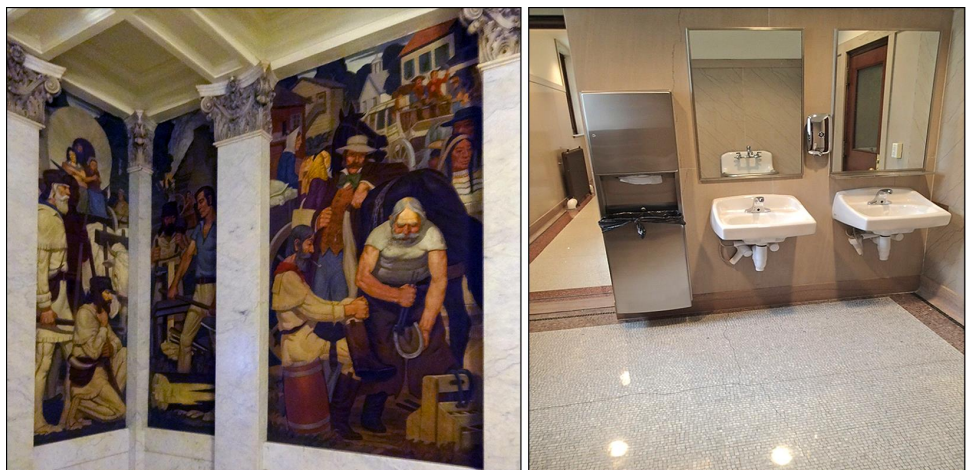
### Most Judiciary Tenants Were Satisfied with Completed Recovery Act Projects, but Some Reported Disruptions and Coordination Challenges

Judiciary tenants at 6 of 10 of the courthouses we studied said that Recovery Act projects did not disrupt court operations. The judiciary tenants attributed this, in part, to good working relationships between GSA and the judiciary. For example, judiciary tenants at 2 courthouses, where tenants remained in the building, told us that although scheduling could be challenging, judicial staff and GSA coordinated in a manner that did not negatively affect operations throughout the entire project. Conversely, judiciary tenants at 4 courthouses reported disruptions and told us that the impacts ranged from moderate to significant. Judiciary tenants described moderate disruptions to include such things as requiring judges to move offices and modify schedules; significant disruptions were said to be such things as unexpected trial delays resulting from the Recovery Act projects. For example, the Richard H. Poff Federal Building was closed for about a week when contractors had to unexpectedly remove the brick façade on the west side of the building for structural and safety reasons. The need to remove the façade—which may have been caused by construction on the building—happened suddenly and, as a result, operations were shut down before employees had time to make alternative work arrangements.

While few Recovery Act projects we reviewed affected court operations, judiciary officials at 8 of 10 courthouses cited challenges coordinating with GSA to complete Recovery Act projects and judicial tenants at 4 of these courthouses described working with GSA as very or extremely challenging. Judicial tenants attributed difficult working relationships to factors mentioned previously including GSA's project management turnover and judiciary tenants' not having provided input on the scope of projects, as well as remote management, tenants remaining in the building during construction, or changes to contractor schedules, among other things. For example, judicial tenants at the Federal Building and U.S. Custom House in Denver told us that while GSA originally planned to complete work in the evening and on weekends, once project delays occurred, work was performed during the day contrary to the judiciary's understanding of how the construction would occur and, according to judicial stakeholders, was more disruptive.

While coordination challenges existed at selected projects, judiciary tenants at 7 of the 9 courthouses we reviewed where the Recovery Act projects were completed told us they were pleased with GSA's new construction or modernizations. Judicial tenants highlighted improvements to, among other things, the look and operation of bathrooms, attractiveness of green roofs, temperature regulation, lighting, security, and overall aesthetic appearances. For example, as shown in figure 2, GSA performed a full modernization at the Birch Bayh Federal Building and U.S. Courthouse in Indianapolis including a new heating, ventilation, and air conditioning system; a green roof on the interior courtyard; an improved lobby appearance; lighting and plumbing upgrades; window replacements; and updated juror bathrooms that were accessible to people with disabilities. According to one of the judges, since the renovations, two disabled jurors have served who would have been dismissed from jury duty because of the non-accessible bathrooms prior to the Recovery Act project. Similarly, judicial tenants in Orlando highlighted the improvements to the George C. Young Federal Building and U.S. Courthouse stating that the project, among other things, improved security and air quality. Conversely, judicial tenants at 2 of the 9 completed courthouses were dissatisfied with the completed projects, attributing part of their dissatisfaction to additional safety or security needs, project delays, and the overall inconvenience of the projects compared to the benefits achieved.

**Figure 2: Artwork in Public Areas and Accessible Juror Bathrooms at the Birch Bayh Federal Building and U.S. Courthouse and Federal Office Building in Indianapolis, Indiana, Funded by the American Recovery and Reinvestment Act of 2009**



Source: GAO. | GAO-15-307

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## GSA Established Performance Criteria for Green Projects but Has Not Evaluated Outcomes against the Criteria

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### GSA Established Performance Criteria for Green Projects

As previously mentioned, GSA established minimum performance criteria (MPC) to guide Recovery Act investments in green buildings and to measure outcomes.<sup>23</sup> While the MPC are specific to projects funded by the Recovery Act, GSA designed them to address federal environmental requirements that GSA must achieve collectively across its portfolio of buildings.<sup>24</sup> Further, according to GSA officials, the MPC are now applied to all new capital projects. We previously reported that the MPC generally support key federal energy and water conservation requirements and goals, and align with most of the elements of a green building, as established by EISA.<sup>25</sup> The following are examples of the MPC that GSA established for its Recovery Act projects (app. II provides a complete listing of the MPC):

- Install advanced meters to more accurately measure a building's real-time electricity, natural gas, steam, and water use.
- Install on-site renewable energy systems (e.g., solar panels, wind, geothermal, and solar thermal/hot water systems to meet at least 30 percent of the hot water demand).
- Use occupancy sensors on lighting to conserve energy in areas of the building that are unoccupied.

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<sup>23</sup>GSA established one set of MPC for new construction and full building modernizations and a second, less stringent set for partial building modernizations and limited scope projects.

<sup>24</sup>For example, by fiscal year 2015, federal agencies are required to reduce their energy use by 30 percent and their water use by 16 percent, compared to the amount of energy they used in 2003 and the amount of water they used in 2007.

<sup>25</sup>See [GAO-10-630](#).

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- Reduce energy usage by 30 percent based on GSA's modeled results of expected performance.<sup>26</sup>
  - Reduce indoor potable water use by at least 20 percent based on GSA's model results for expected performance.<sup>27</sup>
  - Recycle or reuse at least 50 percent of construction and demolition waste generated on a project.

While the MPC guided the scoping decisions for Recovery Act projects, GSA did not require all projects to meet all the MPC. Specifically, GSA regional officials were required to consider the MPC relevant to each project's scope. For example, meeting the MPC for reducing water consumption by 20 percent would only apply to projects with significant plumbing upgrades.

At each of the 10 courthouses we reviewed, we found instances where GSA incorporated technologies that aligned with relevant MPC. For example, per the MPC, GSA installed energy efficient lighting at each of the 10 courthouses we reviewed. Similarly, GSA installed advanced meters in 9 of the 10 courthouses we reviewed. These technologies allowed GSA to remotely monitor and adjust building systems—such as heating, ventilation, and air conditioning or lighting systems—to reduce overall energy and fuel consumption. In some cases, GSA installed technologies that would address two or more MPC. For example, a more efficient heating, ventilation, and air conditioning system installed at the Prince Jonah Kuhio Kalanianaʻole Federal Building and U.S. Courthouse in Honolulu is expected to reduce the building's energy use while also addressing concerns about indoor air quality and mold through improved ventilation. Similarly, GSA installed storm-water collection tanks and a green roof—a roof that has plants on it designed to absorb heat, insulate buildings, and reduce carbon emissions, among other environmental benefits—at the Birch Bayh Federal Building and U.S. Courthouse in Indianapolis (fig. 3). The green roof helps manage storm water runoff and reduces water consumption by absorbing some rainfall,

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<sup>26</sup>Design standards identified in 2007 for an American Society of Heating, Refrigerating and Air-Conditioning Engineers Standard 90.1 baseline building.

<sup>27</sup>Design standards identified in the Energy Policy Act of 1992 (Pub. L. No. 102-486, 106 Stat. 2776, Uniform Plumbing Code (2006), and International Plumbing Code (2006).

and the storm-water collection tanks capture up to 10,000 gallons of excess rainwater to be used later for flushing toilets.

**Figure 3: Storm Water Collection Tanks and Green Roof Installed at the Birch Bayh Federal Building and U.S. Courthouse in Indianapolis, Indiana**



Source: GAO. | GAO-15-307

GSA officials said that not all the MPC could be addressed in some projects. For example, although the MPC directed GSA project managers to include on-site renewable energy systems—including solar panels, solar water heaters, or both—when scoping projects, project managers did not incorporate this MPC at 4 of the 10 courthouses in our review.<sup>28</sup> According to GSA officials, renewable energy systems were not installed because they were not cost-effective, were not feasible, or were not within the scope of the original project. For example, GSA determined that solar renewable-energy systems would not be cost-effective at the Thurgood Marshall U.S. Courthouse because the building's orientation provided insufficient exposure to sunlight. Although solar panels might have been cost-effective at the George C. Young Federal Building and

<sup>28</sup>Two of the projects we reviewed (The Federal Building and U.S. Custom House in Denver and the Richard H. Poff Federal Building) were partial modernization projects. As a result, in some instances, they had less strict criteria compared to new construction or full modernizations. Specifically, partial modernizations were not required to include solar hot water heaters.

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U.S. Courthouse, GSA provided a waiver for structural reasons, including minimal surface area on the roof for solar panels and insufficient ability of the roof to support the additional weight in hurricane wind conditions.

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**GSA Has Gathered Data and Reported Some Environmental Outcomes but Not against the MPC**

GSA has reported the environmental performance of some technologies and buildings that received funding under the Recovery Act. For example, GSA created the Green Proving Ground program to evaluate how specific technologies, including some installed at Recovery Act projects, have contributed to energy savings. As of the end of fiscal year 2014, GSA had completed and reported results for 15 technologies and plans to report results for 9 more technologies in fiscal year 2016. GSA also analyzed energy usage data for 59 federal buildings—all of which received Recovery Act funds—and reported that collectively the buildings, on average, were using 5.5 percent less energy during the winter of fiscal year 2014 compared to the winter of fiscal year 2008 (the year prior to the Recovery Act). According to GSA, the results were particularly notable because GSA performed this analysis for buildings located in states that had harsh winters in fiscal year 2014.<sup>29</sup> GSA also created the Green Building Upgrade Information Life-cycle Database (gBUILD) to capture Recovery Act project information, including each building's baseline performance, expected performance, and actual performance achieved from some green building conversions. GSA plans to use the database to analyze and report building performance results.<sup>30</sup> Since the Recovery Act, gBUILD has been expanded to include all of GSA's buildings with large green infrastructure projects.

GSA has not yet evaluated the environmental performance of its Recovery Act projects against the MPC. According to GSA officials, while the agency is currently considering how it might measure building performance against the MPC, the agency has not developed a schedule

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<sup>29</sup>According to GSA, cities that had an average monthly temperature of at least 3 degrees below the normal monthly average, or had a month with at least 5 heating degree days more than average during the fiscal year 2014 winter (November 2013 – March 2014) met the definition of “harsh winter”. The definition applied to the District of Columbia, and cities in the following seven states: Georgia, Illinois, Maryland, Massachusetts, Missouri, New York, and Pennsylvania.

<sup>30</sup>gBUILD replaced GSA's Recovery Act High Performance Green Building Database in May 2013. gBUILD also tracks information on energy usage efficiency, water conservation measures, and renewable energy systems, among other relevant information, some of which are imported from other GSA systems.



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or plan to analyze results. GSA officials told us they continually monitor building performance, but need at least one year of operational data to accurately compare completed projects against the MPC. However, according to our analysis of GSA's cost and schedule data, 18 of GSA's 22 new construction or modernization courthouses have been operational for at least a year and 5 projects have been operational for more than 3 years. GSA officials cited further limitations to their ability to report outcomes of Recovery Act projects. For example, GSA officials said that establishing a representative baseline year against which to measure the MPC is challenging because a number of factors outside of the Recovery Act project—including, for example, building occupancy rates and variability in weather patterns—can influence energy and water consumption. In 2013, a GSA OIG report said that the agency also faces challenges collecting accurate and relevant data to report building performance outcomes—including energy and water use, among other variables.<sup>31</sup>

Without evaluating building performance against the MPC, GSA is limited in its knowledge of whether projects have achieved expected outcomes. We have previously reported that agencies need to understand outcomes of their investments to determine which investments provide the greatest value.<sup>32</sup> In GSA's Recovery Act Program Plan, the agency reported that investing in government facilities would improve a buildings' environmental performance and provide a significant return on investment. Understanding projects' outcomes should help inform GSA's efforts to prioritize future infrastructure investments and could help educate building tenants about improved building performance and demonstrate to the taxpayers that GSA's investments have provided value.

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<sup>31</sup>GSA OIG. *GSA's Management Challenges, Fiscal Year 2014*. (Washington, D.C.: Nov. 7, 2013). P. 16.

<sup>32</sup>For example, see GAO, *RESULTS-ORIENTED GOVERNMENT: GPRA Has Established a Solid Foundation for Achieving Greater Results*, [GAO-04-38](#) (Washington, D.C.: Mar. 10, 2004).



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## Some Projects Are Contributing to Federal Environmental Goals but It Remains Unclear If They Meet the MPC

Since GSA has not measured the progress of its Recovery Act projects toward meeting the MPC, we analyzed GSA's energy and water usage data for the full or partial courthouse- modernization projects we reviewed against federal portfolio-wide goals upon which some of the MPC were based.<sup>33</sup> We limited our analysis to the 5 full or partial courthouse modernization projects that had completed construction and were operational for at least 1 year. We excluded 2 new courthouses from our analysis because there is no baseline or historical data against which we could compare their performance. We also did not include 3 courthouses that were still under construction during fiscal year 2014, the most recent year for which we have utilities' data. In its Recovery Act-program plan, GSA stated that its full and partial building- modernization and new-construction Recovery Act projects would be designed to achieve select federal goals. Although the federal goals apply to agency-wide energy and water reductions, GSA tracks individual buildings against the federally mandated baseline.

While energy use has declined at 4 of the 5 full or partial modernization courthouses projects we reviewed, only two projects reduced energy enough to meet federal targets. In addition, it is unclear whether these projects meet GSA's energy reduction goals as outlined in the MPC. Federal agencies were required to reduce their energy use per gross square foot of their building portfolio space by at least 27 percent by fiscal year 2014 and 30 percent by fiscal year 2015, compared with a fiscal year 2003 baseline. We evaluated whether the five courthouses were contributing toward the federal goal by either meeting or exceeding the 27 percent reduction that was expected by fiscal year 2014. Energy usage at the Thurgood Marshall U.S. Courthouse, however, increased in fiscal year 2014 as compared to fiscal year 2003. According to GSA officials, the increased energy usage at the Thurgood Marshall U.S. Courthouse may be attributed to newly installed systems—including air conditioning and ventilation, lighting, elevator systems, and fire alarm and sprinkler systems—that were previously either dormant, non-existent, or partially functioning. Officials also said that changes in occupancy rates and

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<sup>33</sup>To assess this, we examined the total energy use, in average monthly British Thermal Units per gross square foot and water use, in average monthly gallons per gross square foot, for fiscal year 2014, compared to baseline comparison years of 2003 for energy and 2007 for water. The GSA OIG performed a similar analysis. See *Reduction in Energy Consumption from Recovery Act Projects at the Goodfellow Federal Center Complex in St. Louis, Missouri, is Not Apparent* (Great Lakes Region: Mar. 18, 2014).

weather from year to year could explain some variability in each building's energy use. See Table 6 for a comparison of results from fiscal year 2003 to fiscal year 2014.

**Table 6: Average Monthly Energy Use (British Thermal Units/Gross Square Foot of Building), Comparing Fiscal Years 2014 to 2003**

Fiscal year	Thurgood Marshall U.S. Courthouse	George C. Young Federal Building and U.S. Courthouse	Federal Building and U.S. Custom House	Birch Bayh Federal Building and U.S. Courthouse	Hipolito F. Garcia Federal Building and U.S. Courthouse
2003	7,817	4,076	5,573	5,090	5,632
2014	9,825	3,249	4,092	2,737	2,618
Percentage change	+25.7%	-20.3%	-26.6%	-46.2%	-53.3%

Source: GAO analysis of GSA data. | GAO-15-307

For water usage, we reviewed four full or partial modernization projects and found that, in 2014, all of them contributed toward federal water conservation goals, as shown in table 7.<sup>34</sup> Across their building portfolio, federal agencies were required to achieve at least a 14 percent reduction in water use by fiscal year 2014 and a 16 percent reduction by fiscal year 2015 compared with a fiscal year 2007 baseline.<sup>35</sup> All four courthouses exceeded the fiscal year 2014 and 2015 goals.

<sup>34</sup>We removed the Hipolito F. Garcia Federal Building and U.S. Courthouse from our analysis of water use because, in consultation with a GSA official, we determined that the water use values logged for the courthouse were inaccurate.

<sup>35</sup>Executive Order No. 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 Fed. Reg. 52117 (Oct. 8, 2009), strengthened this water intensity consumption goal by extending the fiscal year-end date to 2020. For example, the executive order requires "reducing potable water consumption intensity by 2 percent annually through fiscal year 2020 or 26 percent by the end of fiscal year 2020."

**Table 7: Average Monthly Water Use (Gallons/Gross Square Foot of Building), Comparing Fiscal Years 2014 to 2007**

<b>Fiscal year</b>	<b>Birch Bayh Federal Building and U.S. Courthouse</b>	<b>George C. Young Federal Building and U.S. Courthouse</b>	<b>Thurgood Marshall U.S. Courthouse</b>	<b>Federal Building and U.S. Custom House</b>
2007	1.049	6.850	1.977	0.848
2014	0.613	3.382	0.890	0.344
Percentage change	-41.6%	-50.6%	-55.0%	-59.5%

Source: GAO analysis of GSA data. | GAO-15-307

While our analysis allowed us to examine whether selected projects were contributing toward federal energy and water reduction goals, the extent to which GSA is meeting its energy and water goals for these or other projects as outlined in the MPC remain unclear. Further, GSA's requirements for Recovery Act green projects were broader than energy and water reductions, including goals related to indoor environmental quality, building design, and material use, which we have not reviewed. Without analyzing and applying building performance against the MPC, GSA will be limited in ability to understand and maximize the benefits of its environmental efforts, particularly as they relate to future projects.

## Conclusions

The Recovery Act provided GSA with an unprecedented opportunity to enhance the energy and environmental performance of aging federal buildings. With this opportunity comes a responsibility to manage projects effectively and demonstrate positive outcomes from these targeted infrastructure investments. GSA's management of the 10 Recovery Act courthouse projects we reviewed generally aligned with two successful practices for large-scale investments, but did not always align with five other practices. As a result of lessons learned from the Recovery Act projects, GSA reformed some aspects of its project management that did not fully align with those practices but has not addressed other areas. By not fully aligning management of federal buildings with successful practices, GSA may have missed opportunities to more effectively manage projects and develop successful working relationships with building tenants—including better meeting cost and schedule estimates and minimizing inconveniences to tenants. Furthermore, since GSA's management of other construction projects is similar to how the agency managed Recovery Act projects, going forward, GSA would be better positioned to manage those projects more efficiently and with minimal

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disruption to tenants if it ensured that the successful practices for large-scale investments were incorporated to the fullest extent appropriate.

While GSA used the vast majority of its \$4.5 billion in Recovery Act funds to modernize buildings and install green technologies, building performance and outcomes remain unclear. GSA's limited understanding of building performance and outcomes is particularly a concern regarding its full and partial modernization projects, which have each received an investment of more than \$70 million dollars, on average. As GSA continues to invest in large-scale projects to convert federal facilities to high-performance green buildings and improve the overall condition of its portfolio, it is important that the agency improve how it manages future construction projects and make investment decisions based on a strategy that is informed by observed and measurable outcomes from its Recovery Act projects.

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## Recommendations

We recommend that the GSA Administrator take the following two actions:

1. GSA should examine incorporating successful management practices—such as consistently involving tenants at various stages of the project—into its capital investment process to ensure that projects are managed efficiently and that tenant disruptions are minimized.
2. To ensure that GSA's green Recovery Act projects meet relevant requirements, GSA should analyze environmental outcomes against relevant requirements for each of its full and partial-modernization Recovery Act projects and apply any lessons to future projects.

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## Agency Comments and Our Evaluation

We provided a draft of this report to the General Services Administration (GSA) and the Administrative Office of the U.S. Courts (AOUSC) for review and comment. GSA agreed with our recommendations and said that it has policies and procedures in place to address them. GSA also provided technical comments that were incorporated as appropriate. GSA's comments are reprinted in appendix III. Judiciary officials from the Prince Jonah Kuhio Kalaniana'ole Federal Building and U.S. Courthouse in Hawaii reiterated the importance of GSA's actively engaging stakeholders and having an on-site project manager throughout large construction projects. The judiciary also provided technical comments that were incorporated, as appropriate.

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As agreed with our offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days. At that time, we will send copies to the Administrator of GSA and the Director of the AOUSC. In addition, the report will be 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 [goldsteinm@gao.gov](mailto:goldsteinm@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.

A handwritten signature in black ink, appearing to read 'Mark Goldstein', with a long horizontal flourish extending to the right.

Mark Goldstein  
Director Physical Infrastructure

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# Appendix I: Objectives, Scope, and Methodology

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This report examines how the General Services Administration (GSA) used funds from the American Recovery and Reinvestment Act of 2009 (Recovery Act) in buildings that included a judicial presence.<sup>1</sup> We used the term courthouses throughout the report to refer to GSA-operated buildings with a federal judicial presence.<sup>2</sup> This report examines (1) how GSA determined which courthouse projects to fund under the Recovery Act; (2) how GSA's management of selected Recovery Act courthouse projects aligned with successful practices and whether these projects disrupted judiciary operations, and (3) how, if at all, GSA established environmental performance goals for courthouses funded by the Recovery Act and whether the selected projects met those goals.

To identify how GSA determined which courthouses would receive Recovery Act funds, we reviewed GSA's Recovery Act-planning documents; project selection criteria; prior GAO reports; and relevant legislation and guidance, including the Energy Independence and Security Act of 2007 (EISA), related federal statutes, and executive orders related to GSA's \$4.5 billion in high-performance green (green) Recovery Act funds and its \$750 million in funds for federal buildings and U.S. courthouses. We excluded border stations and land ports of entry from our analysis, for which GSA was appropriated \$300 million, because none of these facilities have a court presence. To understand how GSA identified allowable technologies within green Recovery Act projects, we summarized portions of EISA that provided information on how to determine if environmental technologies are cost-effective and include environmental characteristics of a green building, respectively. GSA categorized green buildings as full or partial modernizations, limited scope projects, or small projects. We worked with GSA and the Administrative Office of the U.S. Courts (AOUSC) to identify and summarize which Recovery Act projects had any judicial presence and how much funding each project received. We provided examples of specific Recovery Act projects from the ten courthouses we reviewed (see below for more information).

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<sup>1</sup>Pub. L. No. 111-5, 123 Stat. 115, 149-150 (2009).

<sup>2</sup>These buildings can range from small court spaces that provide judicial services on a part-time basis to large courthouse buildings in major urban areas. In 2011 we reported that according to the Administrative Office of the U.S. Courts (AOUSC), this included 424 buildings.

To understand how GSA's management of Recovery Act projects aligned with successful practices and whether projects disrupted judiciary operations, we identified seven successful management practices for large scale investments developed in prior GAO work.<sup>3</sup> While the successful practices were developed for Information Technology (IT) investments, IT stakeholders agreed that these practices have broader applicability, including construction management. We also shared these leading practices with GSA officials who oversaw the Recovery Act program to ask how GSA addressed each practice and incorporated any comments as appropriate; GSA officials did not identify any concerns with applying these successful practices to Recovery Act projects. These practices are also consistent with the leading practices we set forth in our capital decision-making guide.<sup>4</sup> Of the nine practices we identified, we omitted two practices from our analysis. Specifically, we omitted two practices: (1) end users participated in testing of system functionality prior to formal end user acceptance testing and (2) program officials maintained regular communication with the prime contractor. We excluded testing system functionality because, for the majority of Recovery Act work, judiciary tenants would not have expertise to test building systems such as mechanical or plumbing upgrades. We eliminated the practice that calls on officials to maintain regular communication with the prime contractor because this practice was outside the scope of our audit. The GSA OIG has performed a vast body of work looking at contracting issues for Recovery Act projects and, to avoid duplication, we omitted contracting issues from the scope of our audit.

We interviewed GSA project staff and judicial tenants—who resided in buildings during construction or would reside once construction was completed—at 10 selected courthouses that received Recovery Act funds to see how their experiences aligned with the successful practices mentioned above and whether projects affected court operations. In addition to interviewing judicial tenants, after interviews, we sent a structured questionnaire to tenants at each courthouse to verify responses captured during initial interviews and collect additional

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<sup>3</sup>See GAO, *Information Technology: Critical Factors Underlying Successful Major Acquisitions*, [GAO-12-7](#) (Washington, D.C.: Oct. 21, 2011).

<sup>4</sup>See GAO, *Executive Guide: Leading Practices in Capital Decision-Making*, [GAO/AIMD-99-32](#) (Washington, D.C.: December 1998).

information specific to the seven successful practices. For example, while we asked interviewees in meetings whether projects affected judiciary operations, in the follow-up questionnaire, we ask tenants to rate the impact on 4-point scale—response options included no impact, minimal impact, moderate impact, and severe impact. All judiciary tenants returned the questionnaire, although not every tenant responded to every question.

We selected 10 courthouses from among GSA's 22 large courthouse projects (including 7 new construction projects and 15 full or partial modernization projects).<sup>5</sup> We selected these 10 courthouses—listed in table 1 below—based on the following criteria: (1) project type (new construction or full or partial modernization); (2) project cost (generally selecting among the most expensive projects); (3) project substantial completion date (selecting both completed and ongoing projects); (4) geographic location (selecting projects across GSA's regions and zones); (5) percentage occupancy by judicial tenants (selecting projects where the judiciary ranged from minor to major tenant); (6) Leadership in Energy and Environmental Design (LEED) certification level<sup>6</sup> (selecting projects that ranged with respect to the number of factors incorporated into the project); and (7) relevant GSA Office of Inspector General (OIG) findings (selecting both projects that had and had not been reviewed by the OIG). We limited our selection from among the large courthouse projects because there was greater risk in spending large amounts of funds under the tight timeframes of the Recovery Act (compared to smaller projects) and because the larger projects would likely be more visible to the tenants and under construction for a longer period of time, resulting in potential obvious benefits or inconveniences to courthouse tenants. Of

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<sup>5</sup>New Construction and Full and Partial Building Modernizations were categories used by GSA to describe its Recovery Act projects. New construction projects are those associated with building entirely new structures or significant extensions to existing structures, including the construction of new federal buildings and courthouses. Full and partial building modernizations are projects associated with the replacement or upgrade of multiple building systems and components (such as windows, roofs, and plumbing, electrical, and mechanical systems), which are intended to significantly increase the usable life of the buildings. Full modernizations are comprehensive renovations that replace or restore nearly all the major systems in a building. Partial modernizations are more limited and address one or a few systems in the building.

<sup>6</sup>LEED is a third-party certification program and the nationally accepted benchmark for the design, construction, and operation of high-performance green buildings, according to the U.S. Green Building Council. Projects are awarded points and scored (in ascending order) as LEED certified, silver, gold, or platinum.



the 10 courthouse projects we selected, 2 were new construction projects, 6 were full modernization projects, and 2 were partial modernization projects.

We conducted semi-structured interviews with GSA and judiciary tenants at 6 courthouses in-person. We interviewed stakeholders from the remaining 4 courthouses over the phone. During the interviews we asked about experiences working together (i.e., GSA and judiciary tenants), whether projects affected court operations, and projects' goals. We followed-up with judiciary tenants to make sure we had accurately captured their assessments of GSA's management. Observations with GSA and judiciary tenants at these selected courthouses cannot be used to make generalizations about the views of all GSA project managers or tenants of Recovery Act projects.

**Table 8: List of U.S. Courthouses where GAO Conducted Interviews**

Location	Project (building name)	Type of project
San Juan, Puerto Rico	Federico Degetau Federal Building and Clemente Ruiz Nazario U.S. Courthouse	Full modernization
New York, New York	Thurgood Marshall U.S. Courthouse (escalation)	Full modernization
Roanoke, Virginia	Richard H. Poff Federal Building	Partial Modernization
Orlando, Florida	George C. Young Federal Building and U.S. Courthouse	Full modernization
Indianapolis, Indiana	Birch Bayh Federal Building and U.S. Courthouse	Full modernization
Austin, Texas	Austin U.S. Courthouse	New construction
San Antonio, Texas	Hipolito F. Garcia Federal Building and U.S. Courthouse	Full modernization
Billings, Montana	James F. Battin U.S. Courthouse	New construction
Denver, Colorado	Federal Building and U.S. Custom House	Partial Modernization
Honolulu, Hawaii	Prince Jonah Kuhio Kalaniana'ole Federal Building and U.S. Courthouse	Full modernization

Source: GAO summary of information provided by GSA. Source: GSA. | GAO-15-307

To identify how, if at all, costs and schedules changed for selected Recovery Act projects, we collected GSA's data on costs and schedules for all 22 courthouses that were either new construction or full and partial modernizations for years 2009 through 2014. To assess changes in project costs, we compared GSA's original request to Congress against the final project cost. To assess changes in project schedules, we compared GSA's planned completion date with the contractor when the project was awarded to GSA's substantial completion date. We also interviewed GSA project managers to identify how costs or schedules changed and any mitigating factors. We did not evaluate GSA's cost-

estimating process for this report. GSA provided us data as of May 2014. To assess the reliability of GSA's data we reviewed documentation related to this data source from our prior reports, and agencies' websites, and asked knowledgeable government officials to provide written responses to our questions about the quality of the data. We determined that the data were sufficiently reliable to provide general trends on GSA's costs and schedules for Recovery Act projects. Since we only evaluated 22 Recovery Act projects, generalizations should not be made to all projects. Rather, we provide illustrative examples for why costs and scheduled may have changed.

To determine how GSA set environmental performance goals for the projects it funded and the extent to which selected projects met their goals, we reviewed agency and regulatory documents and summarized GSA's minimum performance criteria (MPC) for Recovery Act projects and identified outcomes for select projects. We described how GSA developed building-specific MPC that would also help the agency achieve broader federal environmental goals and requirements, including energy and water reduction requirements, as outlined in various statutes. While GSA is required to meet federal-energy and water-reduction requirements across its entire portfolio of buildings, it also tracks individual buildings against this baseline. To evaluate whether the selection of buildings we reviewed are contributing toward meeting federal energy and water reduction goals, we analyzed GSA's data on energy usage for 5 of the 10 courthouses we reviewed, and we analyzed GSA's data on water usage for 4 of the 10 courthouses we reviewed. We did not assess results for the 2 new courthouses because the buildings were not yet constructed in the federally-required baseline comparison years. We also did not assess results for 3 courthouse modernizations that were under construction for part of fiscal year 2014 because we wanted to compare a full year of operational utilities data. We omitted the Hipolito F. Garcia Federal Building and U.S. Courthouse from our analysis of water reductions because of concerns we had regarding the reliability of its water use data. GSA's MPC for energy and water reductions are developed with a performance-based approach requiring, for example, that buildings achieve a percentage reduction compared to a baseline. We compared building-specific energy and water-use data from fiscal year 2014 to each building's energy and water use data during the baseline comparison years specified in the agency-wide federal energy and water reduction goals GSA must achieve. Specifically, with respect to energy and water usage, EISA amendments to the National Energy Conservation Policy Act of 2007 require GSA to reduce energy consumption per gross square foot of the buildings it manages by 30 percent by fiscal year 2015 compared

with fiscal year 2003, and must reduce water consumption per gross square foot of the buildings it manages by 16 percent by fiscal year 2015 compared with fiscal year 2007, pursuant to Executive Order 13423.

To evaluate project outcomes, we calculated energy and water use reductions based on historic utility use data for electric, steam, gas, and oil (none of the courthouses in our selection used coal), and water utilities, provided by GSA. We converted all energy utilities to British Thermal Units and calculated the energy use intensity—British Thermal Units per gross square foot—to compare across our selection of courthouses. Similarly, we calculated the water use intensity—gallons per gross square foot—to compare across our selection of courthouses that had been in operation for the full fiscal year 2014. Our analysis has some limitations, however. Comparing energy or water reductions based on two endpoints can produce misleading results if the baseline or final years do not represent a typical year of the assessed building. For example, many variables can affect the results, making it difficult to attribute results to installed building systems or technologies. Some of the reductions can be attributed to the many green infrastructure enhancements made on the building; other reductions could be explained by a change in building occupancy rates or abnormal seasonal effects in the baseline or final years of measurement that would influence demand for energy. We assessed the reliability of the program data we used by reviewing GSA documentation on GSA's Energy Usage Analysis System (EUAS), and questioning knowledgeable GSA officials about the quality of the data and controls in place to ensure data accuracy. We determined the data were sufficiently reliable for our purposes.

We conducted this performance audit from February 2014 to February 2015, 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.

# Appendix II: GSA’s Minimum Performance Criteria for Recovery Act Projects

**Table 9: General Services Administration’s (GSA) Minimum Performance Criteria for New Construction and Full Modernization Projects**

Criteria	Elements
Integrated Design	<ul style="list-style-type: none"> <li>Use an integrated design process to establish performance goals for sustainable design principles and develop a plan to ensure implementation of high-performance green (green) building goals throughout the project.</li> <li>Hire a qualified, independent commissioning agent working for GSA at the beginning of design.</li> <li>Include commissioning tailored to the size and complexity of the project, including an experienced commissioning provider from the project initiation through project closeout.</li> </ul>
Energy	<ul style="list-style-type: none"> <li>Use Energy Star Target Finder to set an energy goal that achieves a fossil-fuel reduction of 55 percent for 2010 design starts.</li> <li>Achieve at least 30 percent reduction in energy usage compared to an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2007 baseline building.</li> <li>Install advanced meters. Include meters for electricity, natural gas, steam, and water.</li> <li>Use Energy Star or Federal Energy Management Program (FEMP)-designated Energy Efficient Products.</li> <li>Install solar thermal systems to meet at least 30 percent of the hot water demand. If not life cycle cost-effective, provide an engineering study and letter of explanation signed by the Regional Recovery Executive.</li> <li>Plan for on-site renewable energy systems (photovoltaic, wind, geothermal, solar thermal/hot water). If no on site renewable energy systems are included, provide a letter of explanation signed by the Regional Recovery Executive.</li> <li>Assess the effects of solar heat gain based on site’s conditions and building orientation.</li> <li>Provide a complete envelope design to include thermal breaks, insulation, continuous air barriers, external sun-control devices, and green roof potential.</li> <li>Choose glazing systems, including frames, glass, films and gasses, based on visual needs, elevation, orientation, heat loss and solar load.</li> <li>Cooling and heating plants will use an LCC methodology (e.g., National Institute of Standards and Technology Handbook 135) for equipment selection to include lifetime operating costs based on efficiency, reliability, and maintainability of equipment.</li> <li>Evaluate the use of: <ul style="list-style-type: none"> <li>variable frequency drives, high efficiency chillers and boilers with modular design for part load efficient operations in heating, ventilation, and air conditioning (HVAC) design;</li> <li>radiant space conditioning and thermal storage systems;</li> <li>natural ventilation;</li> <li>energy recovery ventilators to recover heat from exhaust to preheat outdoor air;</li> <li>separate HVAC for 24x7 spaces; and</li> <li>evaporative cooling (direct or indirect) strategies, in suitable climates.</li> </ul> </li> </ul>

**Appendix II: GSA's Minimum Performance  
Criteria for Recovery Act Projects**

<b>Criteria</b>	<b>Elements</b>
Water	<ul style="list-style-type: none"> <li>• Reduce indoor potable water use by at least 20 percent compared to EPA 1992, Uniform Plumbing Code (UPC) 2006, and International Plumbing Code (IPC) 2006.</li> <li>• Reduce outdoor potable water use for irrigation by at least 50 percent compared to conventional baseline for the building. Smart controllers using evapotranspiration and weather data are required for irrigation systems.</li> <li>• Evaluate strategies to capture rainwater for non-potable uses including flushing fixtures, cooling tower and irrigation. Consider harvesting condensation from all cooling coils for non-potable use. (See GSA Recovery Act Program Management Office Design Build Guidance Criteria—Water Efficiency Requirements issued 5/29/2009)</li> <li>• Evaluate alternative strategies to reduce cooling tower use of potable water. Strategies include use of captured rainwater and HVAC condensate recovery.</li> <li>• Manage the 95th percentile rain event onsite through infiltration, reuse or evapotranspiration. Strategies include permeable paving, vegetated roofs, or other low impact development techniques. Environmental Protection Agency (EPA) guidance is under development.</li> <li>• Where available, use EPA's WaterSense labeled products - faucets, toilets, urinals, showerheads, and irrigation controls.</li> <li>• Use high efficiency fixtures in accordance with new GSA water guidance.</li> <li>• Meter cooling tower water makeup.</li> </ul>
Indoor Environmental Quality	<ul style="list-style-type: none"> <li>• Provide occupant lighting controls in accordance with new GSA lighting specifications.</li> <li>• Provide occupancy sensors.</li> <li>• Provide daylight sensors for fixtures within 15' of windows.</li> <li>• At a minimum, comply with ASHRAE Standard 55-2004 and ASHRAE Standard 62.1-2007.</li> <li>• Consider moisture control strategies to reduce risk for mold and damaging moisture.</li> <li>• Use demand control ventilation to control indoor air quality.</li> <li>• Use low-emitting building materials.</li> <li>• Follow Sheet Metal and Air Conditioning Contractors' National Association Indoor Air Quality Guidelines for Occupied Buildings under Construction.</li> <li>• Flush out space for a minimum of 72 hours.</li> </ul>
Materials	<ul style="list-style-type: none"> <li>• Select products with lesser or reduced effect on human health and the environment. <a href="http://www.epa.gov/epp">http://www.epa.gov/epp</a></li> <li>• Use products with recycled content according to the Comprehensive Procurement Guidelines. <a href="http://www.epa.gov/cpg/products">http://www.epa.gov/cpg/products</a></li> <li>• Use products with bio-based content according to U.S. Department of Agriculture's (USDA) BioPreferred program. <a href="http://www.biopreferred.gov/DesignationItemList.aspx">http://www.biopreferred.gov/DesignationItemList.aspx</a></li> <li>• Salvage, recycle, or reuse at least 50 percent of construction and demolition waste generated on a project. Develop a construction waste management plan to quantify material diversion goals and maximize the materials to be salvaged, recycled, or reused.</li> <li>• Eliminate the use of ozone depleting compounds where alternative environmentally preferable products are available.</li> </ul>

Source: GSA. | GAO-15-307

**Table 10: General Services Administration's (GSA) Minimum Performance Criteria for New Construction and Full Modernization Projects**

Criteria	Elements
Integrated Design	<ul style="list-style-type: none"> <li>• Use an integrated team to assess conditions, identify areas for improvement, establish performance goals for sustainable design principles, and develop a plan to ensure implementation of green building objectives.</li> <li>• Hire a qualified, independent commissioning agent working for GSA at the beginning of design.</li> <li>• Include commissioning tailored to the size and complexity of the project, including an experienced commissioning provider from the project initiation through 1 year after occupancy.</li> <li>• -or-</li> <li>• Re-commission the building to determine performance improvement goals.</li> </ul>
Energy	<ul style="list-style-type: none"> <li>• Target an Energy Star score of 80 or higher.</li> <li>• -and-</li> <li>• Achieve at least 20 percent reduction in energy usage from the 2003 baseline for the building.</li> <li>• -or-</li> <li>• Achieve at least 20 percent reduction in energy usage compared to an ASHRAE Standard 90.1-2007 baseline building.</li> <li>• Use Energy Star or FEMP-designated Energy Efficient Products.</li> <li>• Consider renewable energy generation through photovoltaic (PV), building integrated PV, solar thermal, and building integrated wind power, when life-cycle cost effective.</li> <li>• Evaluate lighting in office areas, stairwells, parking garages, exterior parking lots and mechanical spaces for redesign in accordance with new GSA lighting specifications.</li> <li>• HVAC retrofits must consider the use of: <ul style="list-style-type: none"> <li>• an LCC methodology (e.g. National Institute of Standards and Technology Handbook 135) for cooling and heating plant equipment selection to include lifetime operating costs based on efficiency, reliability and maintainability of equipment;</li> <li>• variable frequency drives, high efficiency chillers and boilers with modular design for part load efficient operations,</li> <li>• radiant space conditioning and thermal storage systems;</li> <li>• natural ventilation;</li> <li>• energy recovery ventilators to recover heat from exhaust to preheat outdoor air;</li> <li>• separate HVAC systems for 24x7 spaces; and</li> <li>• evaporative cooling (direct or indirect) strategies, in suitable climates.</li> </ul> </li> </ul>

**Appendix II: GSA's Minimum Performance  
Criteria for Recovery Act Projects**

<b>Criteria</b>	<b>Elements</b>
Water	<ul style="list-style-type: none"> <li>• Reduce indoor potable water use by at least 20 percent from the 2003 baseline for the building.</li> <li>-or-</li> <li>• Reduce water use by 20 percent compared to 120 percent of UPC 2006 or IPC 2006 for fixtures installed after 1994 or 160 percent for fixtures installed before 1994.</li> <li>• Reduce outdoor potable water use for irrigation by at least 50 percent compared to conventional baseline or compared to 2003 measured baseline for the building. Smart controllers using evapotranspiration and weather data are required for irrigation systems.</li> <li>• Consider harvesting condensation from cooling coils for non-potable use.</li> <li>• Evaluate alternative strategies to reduce cooling tower use of potable water. Strategies include increased cycles of concentration, use of captured rainwater, and systems that treat the water for a longer use without chemicals.</li> <li>• Manage the 95th percentile rain event onsite through infiltration, reuse or evapotranspiration.</li> <li>• Strategies include permeable paving, vegetated roofs or other low impact development techniques. EPA guidance is under development.</li> <li>• Where available, use EPA's WaterSense labeled products - faucets, toilets, urinals, showerheads and irrigation controls.</li> <li>• Consider fixture retrofits in accordance with new GSA water guidance, including high efficiency single or dual flush handles or the installation of automatic flush valves.</li> <li>• Meter cooling tower water makeup.</li> </ul>
Indoor Environmental Quality	<ul style="list-style-type: none"> <li>• Provide occupant lighting controls in accordance with new GSA lighting specifications.</li> <li>-and-</li> <li>• Provide occupancy sensors.</li> <li>-and-</li> <li>• Provide daylight sensors for fixtures within 15' of windows.</li> <li>• At a minimum, comply with ASHRAE Standard 55-2004 and ASHRAE Standard 62.1-2007.</li> <li>• Use demand control ventilation to enhance indoor air quality.</li> <li>• Consider moisture control strategies to reduce risk for mold and damaging moisture.</li> <li>• Use low-emitting building materials.</li> </ul>
Materials	<ul style="list-style-type: none"> <li>• Select products with lesser or reduced effect on human health and the environment. <a href="http://www.epa.gov/epp">http://www.epa.gov/epp</a></li> <li>• Use products with recycled content according to the Comprehensive Procurement Guidelines. <a href="http://www.epa.gov/cpg/products">http://www.epa.gov/cpg/products</a></li> <li>• Use products with bio-based content according to USDA's BioPreferred program. <a href="http://www.biopreferred.gov/DesignationItemList.aspx">http://www.biopreferred.gov/DesignationItemList.aspx</a></li> <li>• Salvage, recycle or reuse at least 50 percent of construction and demolition waste generated on the project. Develop a construction waste management plan to quantify material diversion goals and maximize the materials to be salvaged, recycled or reused.</li> <li>• Eliminate the use of ozone depleting compounds where alternative environmentally preferable products are available.</li> </ul>

Source: GSA. | GAO-15-307

# Appendix III: Comments from the U.S. General Services Administration



The Administrator

February 3, 2015

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 draft report entitled, *GSA's Courthouse Projects Illustrate Opportunities to Improve Management Practices and Analyze Environmental Outcomes* (GAO-15-307). The Government Accountability Office (GAO) recommends that:

1. GSA should examine incorporating successful management practices--such as consistently involving tenants at various stages of the project--into its capital investment process to ensure that projects are managed efficiently and that tenant disruptions are minimized.
2. To ensure that GSA's green Recovery Act projects met relevant requirements, GSA should analyze environmental outcomes against relevant requirements for each of its full and partial modernization Recovery Act projects and apply any lessons to future projects.

GSA agrees with the recommendations and has policies and procedures in place to address these recommendations. In response to the first recommendation, GSA is committed to improving its project management practices throughout the agency. For example, GSA established the Recovery Program Management Office (Recovery PMO) in March 2009 to:

- Foster effective project management practices on every American Recovery and Reinvestment Act project team;
- Monitor and measure the quality of each project's performance;
- Address funding needs as projects moved through execution; and,
- Ensure all project teams were fully resourced.

U.S. General Services Administration  
1800 F Street, NW  
Washington, DC 20405  
Telephone: (202) 501-0800  
Fax: (202) 219-1243



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In September 2010, GSA consolidated the Recovery PMO within the agency's Office of Project Delivery. The project oversight structure developed by the Recovery PMO continues for all GSA high risk capital projects.

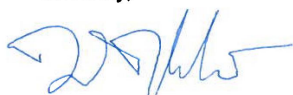
In addition to the Recovery PMO, GSA established a National Global Project Management Office (gPMO) in 2009, to develop effective project management practices across all Public Buildings Service projects and to build on the success of the Recovery PMO. The gPMO established requirements that ensure tenants are included as active members of the project team. Requirements are also in place to guarantee that the project team communicates with tenants regularly. In addition, GSA established protocols to address any differences between GSA and tenant agencies as early as possible to avoid delays and cost risks.

In response to the second recommendation, GSA actively analyzes environmental outcomes and performance data against relevant requirements, capturing lessons learned and best practices for future projects. For example, the following two processes are currently helping GSA meet its environmental objectives:

- During the design and construction phases, reported Minimum Performance Criteria (MPC) statuses are repeatedly monitored and validated. The MPCs are a checklist of sustainable design best practices which influence project features.
- Once the project is complete, GSA's Light-Touch Measurement and Verification process systematically compares a project's actual energy results against design targets from energy models. GSA conducts an investigation into any anomalies and documents the findings.

In addition to this letter, technical comments that update and clarify statements in the draft report are enclosed. If you have any additional questions or concerns, please do not hesitate to contact me at (202) 501-0800, or Ms. Lisa Austin, Associate Administrator, Office of Congressional and Intergovernmental Affairs, at (202) 501-0563.

Sincerely,



Dan Tangherlini  
Administrator

Enclosure

cc: Mr. Mark Goldstein, Director, Physical Infrastructure, GAO

**U.S. General Services Administration  
Technical Comments  
GAO Draft Report Entitled, *GSA's Courthouse Projects Illustrate Opportunities to  
Improve Management Practices and Analyze Environmental Outcomes*  
(GAO-15-307)**

GAO Language: Page 11, regarding the assertion that project management did not align with successful practices.

GSA Comments: GSA has policies and procedures in place to ensure that tenants are informed at every level of a project. This requirement is part of the gPMO directive which includes:

Project Management Protocols

- Established requirements to ensure the stakeholders (tenants) are included as active members of the project team.
- Established communication requirements to ensure the project team communicates with the stakeholders on a regular basis during the project.
- Established issue escalation protocols to ensure conflicts can be addressed by the project sponsor and stakeholders as early as possible to avoid delays and cost risks.

GAO Language: Page 13, regarding the statement that tenants were not briefed about lighting upgrades and glass installation.

GSA Comments: The project team had monthly meetings with tenant representatives where they discussed what the building would look like and the scope of the project. This is documented in tenant presentations and meeting notes. In addition, there was a curtain wall mock up outside the loading dock for over a year that agencies were encouraged to review. The feedback on the lighting was positive and there were a few issues that were raised by tenants that were corrected.

GAO Language: Page 17, "However, after September 30, 2011, GSA's obligation deadline under the Recovery Act had passed. As a result, GSA project managers could no longer request additional Recovery Act funds for these projects..."

GSA Comments: This is incorrect. ARRA Spend Plans 9 through 11 all occurred after September 30, 2011, and all moved funds between projects. The distinction is that after September 30, 2011, GSA could no longer add new scope to Recovery Act projects, as the funds had expired. Additionally, spend plans became difficult to execute as there were less funds available to allocate, and several legal issues regarding use of expired funds had to be resolved prior to finalizing each new spend plan.

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GAO Language: Page 32, regarding the project costs and substantial completion dates in the table

GSA Comments: More up-to-date information on project costs can be found in ARRA Spend Plan 11, which was approved by the Office of Management and Budget in August 2014, and two of the substantial completion dates are significantly different than the actual dates: Puerto Rico was September 30, 2015; and New York was December 31, 2012. An updated version of this chart was forwarded to GAO on December 29, 2014.

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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

Mark Goldstein, (202) 512-2834, or [goldsteinm@gao.gov](mailto:goldsteinm@gao.gov).

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## Staff Acknowledgments

In addition to the contact named above, Keith Cunningham, Assistant Director; Allie Cleaver, Geoffrey Hamilton; John Healey; Delwen Jones; Terence Lam; Joshua Ormond; Melissa Swearingen; and Elizabeth Wood made key contributions to this report.

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