Report of the Vermont State Auditor

DOUGLAS R. HOFFER
Vermont State Auditor

Department of Buildings and General Services Capital Projects

Projects Consistently Exceeded Cost and Schedule Estimates; BGS' Process Weaknesses Hinder Its Ability to Improve Capital Project Management

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Mission Statement

The mission of the Auditor's Office is to hold state government accountable.

This means ensuring that taxpayer funds are used effectively and efficiently, and that we foster the prevention of waste, fraud, and abuse.

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Dear Colleagues,

Between 2012 and 2016, the Legislature appropriated over $278 million for BGS-managed capital projects, such as the Vermont Psychiatric Care Hospital in Berlin, the Public Health Lab in Colchester, the District Heat Plant in Montpelier, and the Public Safety Facility in Westminster.

Our review of ten BGS capital projects found that costs for nine completed projects were $24.6 million above the total estimated costs of $92 million. The median cost overrun for these projects was 31 percent, with a range of 11 to 73 percent.[1] Expected completion dates were missed for all ten projects and ranged from two months to almost four years late. One project was not completed as of June 30, 2016, and costs were under the estimate at that time. The project scope changed for some projects, which increased costs in some instances. For example, the State originally planned to renovate a purchased building for the Public Health Lab. However, the State later determined that the building was not suitable for a laboratory and demolished the building to construct a new lab at the site.

Based on our analysis of project documents and interviews with project managers, BGS attributes these differences to many factors, including changes to code requirements, unforeseen conditions, and tenant or building owner requests. Project managers cited delays in funding or site acquisition and design changes as other explanations.

SAO believes that these explanations do not identify the underlying causes of cost increases, schedule delays, and scope changes. However, BGS' process weaknesses hinder the identification of underlying causes.

First, BGS has not evaluated its management of capital projects by comparing actual results to defined baseline estimates and assessing why they miss the mark. Another shortcoming is that BGS lacks assurance that the mechanisms it uses to track project costs identify all costs associated with capital construction projects. In addition, BGS has very limited policies and procedures related to capital projects.

Without a comparison of actual results to estimates, complete data, and thoroughly documented policies and procedures, BGS does not have the means to address the risk of continued cost and schedule overruns and significant changes to project scope.

During the audit, we also observed instances of noncompliance with the State's procurement and contracting policies. These observations are reported in a section entitled Procurement and Contracting Issues.

[1] Based on comparing actual costs for projects completed as of June 30, 2016 to the cost estimate provided to the Legislature when funding for site acquisition or construction was requested or to the regulatory body when approval was sought for a healthcare facility.

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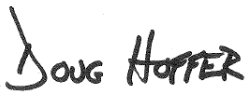
This report also includes an appendix that offers an overview of each project, including project description. Cost overage information is presented to the extent it was available in project documentation or from a project manager's estimate of cost impact.

We made a variety of recommendations to BGS, such as developing a system to evaluate capital construction project performance and developing policies and procedures to assist project managers with planning and managing capital construction projects.

The report is available on the state auditor's website: http://auditor.vermont.gov/.

I would like to thank the management and staff at the Department of Buildings and General Services for their cooperation and professionalism throughout the course of this audit.

Sincerely,



DOUGLAS R. HOFFER
State Auditor

ADDRESSEES

The Honorable Mitzi Johnson
Speaker of the House of Representatives

The Honorable Tim Ashe
President Pro Tempore of the Senate

The Honorable Phil Scott
Governor

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Commissioner, Department of
Finance and Management

Christopher Cole
Commissioner, Department of
Buildings and General Services

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Introduction

The Department of Buildings and General Services (BGS) constructs facilities that enable state agencies to perform their functions. These facilities range from correctional facilities to office buildings to laboratories and represent long-term public investment.

Capital construction projects are complex endeavors with a variety of challenges, such as time and cost constraints and program and quality goals. These projects involve many different individuals and organizations and many separate steps.

Over $278 million was appropriated by the Legislature from 2012 to 2016 for BGS-managed capital projects such as new construction, renovation, repairs, and improvements to leased space. During this period, cost overruns and schedule delays were reported by various news outlets for some projects, including the construction of the Westminster Public Safety Barracks, renovation of leased office space at National Life in Montpelier, and construction of the District Heat plant in the state capital complex.

A 2012 organization and management assessment concluded that BGS lacked metrics for measuring outcomes for most divisions, including the results of its building projects. In its fiscal year (FY) 2018 budget request, BGS highlighted a slow economic recovery and a lack of growth in revenues for funding government services and acknowledged that it is imperative that remaining resources be allocated and spent wisely. BGS' fiscal year 2016, 2017, and 2018 budget request documents list performance measures such as the number of projects completed on schedule and coming in on budget, but no results were reported.

Because of reported cost overruns and schedule delays and BGS' failure to report results for its capital projects, the State Auditor's Office (SAO) determined to assess the extent to which cost, schedule, and scope changed for 10 BGS capital projects active during 2012 to 2016 and to determine the reasons for these changes.

Appendix I contains detail on our scope and methodology. Appendix II contains a list of abbreviations used in this report.

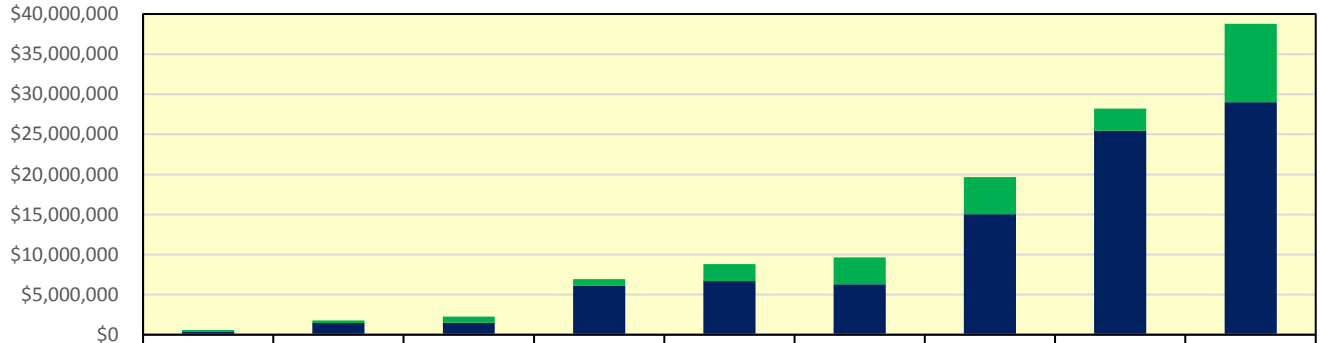
Highlights

Capital construction projects managed by BGS are complex endeavors. Reports of cost overruns and schedule delays combined with a lack of performance reporting by BGS led the SAO to assess the extent to which cost, schedule, and scope changed for capital projects active during 2012 to 2016 and to determine the reasons for these changes. For purposes of this audit, SAO reviewed 10 capital construction projects active during this period.

Objective 1 Finding

Per SAO analysis, as of June 30, 2016, costs[2] for nine completed capital projects exceeded the estimated cost by a median of 31 percent, with a total cost increase of $24.6 million.[3] Cost overruns ranged from 11 to 73 percent. Expected completion dates were missed by two to forty-five months for the nine completed projects. A tenth project was still in progress. Significant changes to scope occurred for some projects according to available project data and project managers' recollections. For example, rather than renovate and add to a purchased building as planned, the existing building was demolished and a new one constructed, adding $2 to $4 million to the project according to the project manager.

Figure 1: Cost Overrun vs Estimate by Project



	St. Albans Maintenance Shop	Vermont Veterans' Home, Bennington	Middlesex Therapeutic Community Residence	Westminster Public Safety Facility	Lamoille County Courthouse	National Life, Montpelier	Montpelier District Heat Plant	Vermont Psychiatric Hospital, Berlin	Public Health Lab, Colchester[a]
Total Cost	$606,000	$1,768,000	$2,246,000	$6,917,000	$8,790,000	$9,649,000	$19,650,000	$28,215,000	$38,766,000
% Over Estimate	73%	22%	48%	12%	31%	53%	31%	11%	34%
Excess Over Estimate	$256,000	$318,000	$732,000	$767,000	$2,090,000	$3,338,000	$4,600,000	$2,759,000	$9,766,000
Initial Estimated Cost	$350,000	$1,450,000	$1,514,000	$6,150,000	$6,700,000	$6,311,000	$15,050,000	$25,456,000	$29,000,000

[a] The State had planned to co-locate the health lab with the Department of Public Safety's forensic lab at Building 617, a former IBM facility in Essex. Net costs of $7.6 million for Building 617 were separately accounted for by BGS. None of these costs were attributed to the project to construct the Public Health Lab in Colchester. See Table 2 for additional information.

[2] SAO identified limitations and weaknesses in BGS' project cost tracking so SAO calculated actual project costs for the 10 projects.

[3] An overview of each project is presented in Appendix III.

Project documents cite changes to code requirements, unforeseen conditions, and tenant or building owner[4] requests as reasons for changes. Project managers recollected design changes that impacted some projects. Project managers also explained that delays in capital bill appropriations and site acquisition can lead to increases in pricing due to inflation. For the two projects with schedule delays greater than forty months, two years of the delay occurred because of the need to reallocate resources to remedy the destruction to state buildings from Tropical Storm Irene in 2011.

With the exception of Tropical Storm Irene-related delays, SAO believes these reasons are not the underlying cause of the differences between estimated and actual results for capital projects. Specifically, explaining cost increases from change orders as the result of unforeseen site conditions does not identify why unforeseen site conditions occurred on capital projects. Further, BGS has not compared capital project outcomes to expected results and has not identified the cause of changes to cost, schedule, and scope. Without identifying underlying cause, it's not possible to know what, if any, corrective action is needed. According to the General Accountability Office's (GAO) guide "Leading Practices in Capital Decision-Making,"[5] results should be evaluated, including an evaluation and comparison of results to goals, and lessons learned should be incorporated into the decision-making process.

Data limitations and limited documented procedures are shortcomings in BGS' management of capital construction projects. For example, the department tracks use of funds appropriated for capital projects, but this tool is organized by appropriation, not by project, and appropriations may occur across multiple years so information about costs for a project are in multiple spreadsheets. Project managers may use spreadsheets to track project costs, but there is no uniform approach. Lastly, queries of the Vermont Integrated Solution for Information and Organization Needs (VISION) system, the State's accounting system, by project identification number (project ID) may be used to identify costs, but there is no documented policy for using project IDs and they have been used inconsistently. For example, of the projects SAO reviewed, many had multiple project IDs, including one that had nine.

Underscoring the lack of documented procedures for the use of project IDs, BGS has very limited policies and procedures for managing its capital projects. Federal agencies such as the General Services Administration (GSA), the GAO, and states have handbooks or guides for use in managing construction projects. These guides address site selection, cost estimating, and other topics relevant to managing capital construction projects.

The department, along with other state entities, is part of a planning effort to implement a project management information system which, if implemented, may provide the data needed to assess performance. However, the timeline for implementation is not clear. In the interim, BGS should improve the tools it

[4] For purposes of the audit, tenant means the state organization(s) that occupies a state-owned building under the jurisdiction of BGS. The National Life building is privately-owned and a portion is leased to BGS. The Lamoille County Courthouse is owned by the county and the Vermont Veterans' Home is owned by the trustees of the Vermont Veterans' Home.

[5] GAO/AIMD-99-32 Leading Practices in Capital Decision-Making.

currently has for identifying total project cost and the reasons that results differ from original estimates.

During the audit, we observed instances of noncompliance with the State's procurement and contracting policies. These observations are reported in a section entitled Procurement and Contracting Issues.

Recommendations

We made a variety of recommendations to BGS, such as developing a system to evaluate capital construction project performance and developing policies and procedures to assist project managers with planning and managing capital construction projects.

Background

BGS Capital Construction

Jurisdiction and Portfolio

BGS had jurisdiction over 249 state-owned buildings and 141 leases in fiscal year 2016, according to department data.[6] The makeup of the State's facilities reflects the diversity of agencies' missions and includes psychiatric care facilities, office buildings, correctional facilities, courthouses, laboratories, and public safety barracks.

Per 3 V.S.A. 2283a, BGS is responsible for all matters relating to the development, design, construction, management, and disposal of state-owned and leased buildings under its jurisdiction. Certain buildings and structures are under the jurisdiction and control of other departments, such as Forests, Parks, and Recreation, Fish and Wildlife, Military, and the Agency of Transportation. However, the majority of state-owned buildings and improvements, valued at $432,275,000 as of June 30, 2016, were under the jurisdiction of BGS.

Between fiscal years 2012 and 2016, over $278 million was appropriated via the annual capital bill[7] to BGS for various projects. Of this amount, approximately $17.8 million was reallocated from other state organizations and BGS projects from years prior to 2012. BGS was not able to provide a portfolio of projects worked on each year because the department does not have an information system that captures the number of projects and the dollar value of those projects. SAO calculated that of the $278 million appropriated, $14.9 million was appropriated for staff costs of the Engineering and Construction section, $39 million for major maintenance, and $171 million for nine significant projects.[8]

The Facilities Operations Division is responsible for planning, designing, constructing or renovating, and maintaining new and existing state-owned space. The Engineering and Construction personnel within this division are responsible for managing capital projects. Some of these positions are classified as buildings project managers while others are classified as buildings engineers. Throughout our report, we use the term project manager to refer to these positions collectively.

6 BGS Space Book 2016.

7 The capital bill is based on a capital budget request submitted to the General Assembly by the Governor and provides spending authority for specific projects outlined in that act.

8 For purposes of this calculation, a significant project is one which received capital bill appropriations of $2 million or more in a single fiscal year.

Project managers oversee a range of capital projects that may include the following:

- New construction and renovation - any addition of new space to the State;
- Major Maintenance includes three subsets: 1) planned capital renewal, 2) deferred maintenance, and 3) routine maintenance;[9]

Leasehold improvements are improvements to space the State leases from another entity, and are generally managed by the landlord. The National Life project was an exception as it was managed by BGS project managers.

The project managers may manage multiple capital projects simultaneously and are responsible for all phases of these projects. Their duties may include developing the project scope and determining the maximum cost effectiveness among feasible alternatives. They also plan, maintain, and adjust the project schedule and provide oversight of project funding. Furthermore, they are responsible for the project designs to ensure that all necessary technical reviews, permit applications, surveys, right-of-way assessments, and other requirements are carried out in a timely manner. According to BGS, these professionals are indispensable to accomplishing the goals set forth in the capital bill.

Change Orders

Change orders are a change to the essential terms of a contract which includes changes to cost, schedule, and scope of work. Change orders can occur for a variety of reasons, including omissions in the project's design, unforeseen conditions at the project site, or because the tenant agency or building owner requests changes.

Per BGS' General Conditions for Construction Contracts, project managers are the State's representatives who have the authority to bind the State for all matters requiring the State's approval or authorization. The project managers authorize contractors to perform work using a document known as a proposed change order. Periodically, proposed change orders are compiled into a single change order that is then sent to the Office of Purchasing and Contracting (OPC).

[9] Planned capital renewal refers to major repairs or replacement/rebuilding of major facility components that have reached the end of their useful life. Deferred maintenance refers to repairs that were not accomplished as part of normal maintenance or capital renewal that has accumulated to the point that facility deterioration is evident and could impair the proper function of the facility. Routine maintenance refers to periodic scheduled work and minor repairs made on an as-needed basis.

These changes orders, detailing changes to contract end date, value, or scope of work, are processed as contract amendments by OPC and routed for the appropriate reviews and approvals.

Starting in 2014, project managers are required to submit a brief memorandum with the change order that provides an overall explanation of the changes.

Significant Changes Occurred, but BGS Process Weaknesses Hinder Identification of Cause

SAO analysis[10] shows that costs for nine capital projects completed as of June 30, 2016, exceeded BGS' estimated cost by 11 to 73 percent, with a total increase of $24.6 million. Another project was not completed as of June 30, 2016, and costs were under the estimate at that time. Expected completion dates were missed for all ten projects. According to project data and project managers' recollections, there were significant changes to scope for some projects.

Based on SAO analysis of project documents and interviews with project managers, many factors account for actual results differing from estimates, including changes to code requirements, unforeseen conditions, and tenant or building owner requests. Project managers cited delays in funding or site acquisition and design changes as other explanations, and they indicated that project delays can lead to price increases of three to ten percent annually due to inflation.

BGS has not evaluated its management of capital projects by comparing actual results to pre-defined baseline estimates. As a result, the department lacks the necessary information to determine what causes results to differ from expectations and what improvements could be made to the management of capital projects.

Another shortcoming is that BGS has limited data or weaknesses in its data. For example, BGS lacks assurance that its mechanisms for tracking project costs capture all project costs. BGS also lacks information about the reasons for some contract change orders, and the dollar impact was not documented for each reason cited. In addition, BGS has very limited policies and procedures related to capital projects. Of particular note is the absence of policies or procedures that address capital project planning issues, such as preparation of project cost estimates and site selection. Federal agencies such

[10] For purposes of this analysis, SAO established a consistent methodology for selection of baselines for estimated cost and expected completion date and for actual completion date. See Scope and Methodology in Appendix I for more information.

as the GSA have handbooks or guides for use in managing construction projects, which address these areas and others, as do many states.

Without a comparison of actual results to estimates, complete data, and thoroughly documented policies and procedures, BGS does not have the means to address the risks of continued cost and schedule overruns and significant changes to project scope.

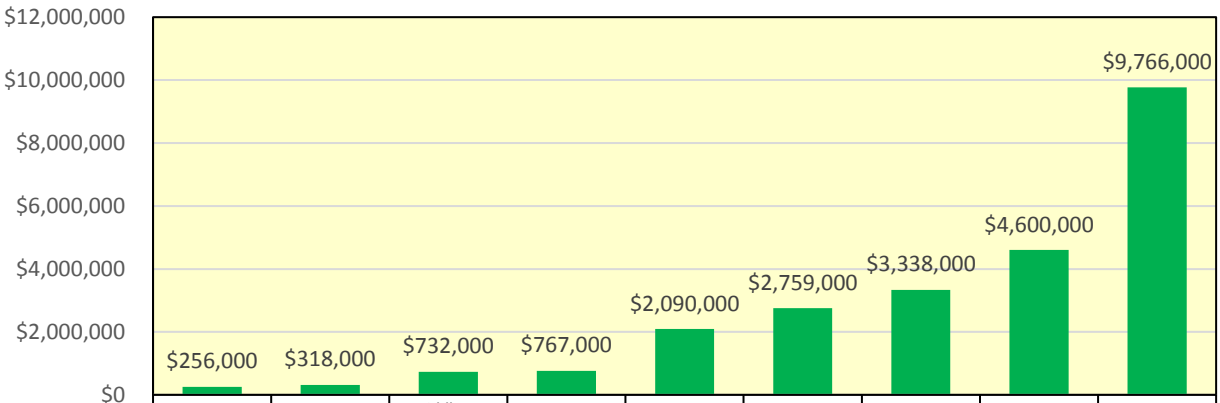
Costs Exceeded Estimates, Projects Were Completed After Expected Date, and Scope Changed for Some Projects

SAO reviewed ten capital projects that were active in the period 2012 to 2016.

Our analysis showed that nine capital projects completed by June 30, 2016 cost more than BGS estimated when significant capital funding was sought from the Legislature or when project approval was sought from a regulatory body. The nine projects had a median cost increase of 31 percent and a total increase of $24.6 million. One project (108 Cherry Street) was ongoing at the time of the audit and as of June 30, 2016, costs were less than the estimate.

Figures 2 and 3 summarize data by cost overrun and by percentage cost overrun for the 9 completed projects reviewed by SAO.

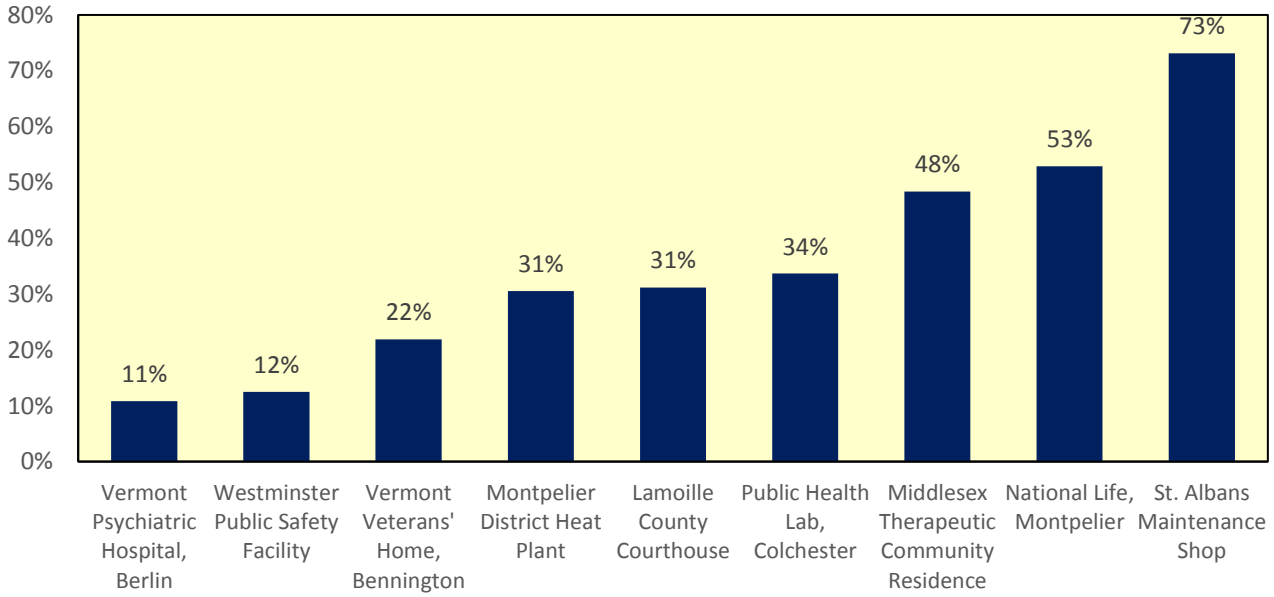
Figure 2: Cost Overrun for Nine BGS Capital Projects (rounded to thousands)[a]



	St. Albans Maintenance Shop	Vermont Veterans' Home, Bennington	Middlesex Therapeutic Community Residence	Westminster Public Safety Facility[b]	Lamoille County Courthouse[b]	Vermont Psychiatric Hospital, Berlin	National Life, Montpelier	Montpelier District Heat Plant	Public Health Lab, Colchester[c]
Initial Estimated Cost	$350,000	$1,450,000	$1,514,000	$6,150,000	$6,700,000	$25,456,000	$6,311,000	$15,050,000	$29,000,000
Excess Over Estimate	$256,000	$318,000	$732,000	$767,000	$2,090,000	$2,759,000	$3,338,000	$4,600,000	$9,766,000

[a] Commencing in 2014, BGS staff costs were allocated to capital projects. These costs were excluded for purposes of this analysis because some of the projects were completed prior to 2014 and did not have staff costs allocated to them.
[b] Over $200,000 in payments were made after June 30, 2016 and were added to actual cost for this analysis.
[c] The State had planned to co-locate the health lab with the Department of Public Safety's forensic lab at Building 617, a former IBM facility in Essex. Net costs of $7.6 million for Building 617 were separately accounted for by BGS. None of these costs were attributed to the project to construct the Public Health Lab in Colchester. See Table 2 for additional information.

Figure 3: Percent Cost Overrun for Nine BGS Capital Projects[a]



[a] See Figure 2 for relevant footnotes.

Since at least fiscal year 2013, BGS' statutorily-required performance report has stated that its Engineering and Construction section is assessed on the number of projects coming in on budget. BGS has failed to report these results and none of the capital projects that we reviewed met this performance standard.

BGS' budget request also stated that performance would be assessed based on the number of projects completed on-time. Expected completion dates were missed for all ten projects and BGS has not reported the number of projects completed on-time.

Completion dates for nine projects ranged from two to forty-five months after the date originally estimated. The project that was not complete as of June 30, 2016, was already 24 months past the forecast completion date.

Table 1 compares forecast to actual completion for the 10 projects reviewed by SAO, arranged in descending order by the number of months past the forecast completion date.

Table 1: Number of Months Past Expected Completion Date

Project	Forecast Completion Date	Actual Completion Date	Months Past Forecast Completion Date[a]
Completed Projects			
Public Health Lab, Colchester	5/31/2011	3/13/2015 [b]	45
Westminster Public Safety Facility	12/31/2012	5/18/2016	41
Lamoille County Courthouse	5/13/2013	5/11/2016	36
Montpelier District Heat Plant	6/30/2013	6/2/2014	11
Vermont Veterans' Home, Bennington	5/30/2014	4/07/2015	10
Middlesex Therapeutic Community Residence	1/21/2013	6/14/2013	5
Vermont Psychiatric Care Hospital, Berlin	2/28/2014	6/27/2014	4
National Life, Montpelier	3/15/2013	5/17/2013	2
St. Albans Maintenance Shop	1/18/2013	3/20/2013	2
Not Completed as of June 30, 2016			
108 Cherry Street, Burlington	6/30/2014	Not Applicable	24

[a] Months cited in the table are calendar months with no allowance for holidays, weekends, etc.

[b] The tenant move-in date was August 2015, five months after the completion date, because of concerns associated with the airflow in the building.

Project managers recollected that some of the projects had changes in scope, and they estimated the cost impact for some of these changes for purposes of our audit. See Table 2 for the changes described by project managers.

Table 2: Project Scope Changes Per BGS Project Managers

Project	Description of Change to Scope	Cost Impact
Montpelier District Heat Plant	Planned to demolish the existing heat plant structure. Instead, portions of the existing building were reused and portion of the remaining structure had to be anchored to the ground.	Per the project manager, this increased project costs $866,000.
National Life, Montpelier	Original scope of improvements to the leased space at National Life did not include extensive renovations to the Records Center building.	The design and renovation of this facility increased project costs $1.1 million.
Westminster Public Safety Facility	The Legislature approved the Department of Public Safety's request that Public Safety Answering Points (PSAP) consoles (for answering 911 calls) be paid for by capital funds allocated to the project.	Per the project manager, this increased project costs by $143,000.
Public Health Lab, Colchester	Planned to renovate the building purchased by the State and construct an addition. It was later determined that the existing building should be demolished because it was not suitable for use as a laboratory and a new facility was constructed.	The project manager estimated that demolishing the existing building and constructing a new facility added $2 to $4 million to the project cost.
Public Health Lab, Colchester	From 2001 to mid-2008, the State had planned to co-locate the health lab and the Department of Public Safety's forensic lab. A former IBM facility located in Essex, known as "Building 617," was purchased for the project. Ultimately, the forensic lab was constructed in Waterbury and the health lab in Colchester. The costs discussed at right are not included in the $38.8 million spent for the health lab in Colchester.	Per a VISION report for Building 617, total cost was $10.9 million. This included $6.5 million to purchase Building 617 in 2006, $2.4 million for architectural design services, and $2 million for building operating costs, such as utilities, and for maintenance. Costs were offset by proceeds from the 2013 sale of Building 617 for a little over $2 million and a $1.3 million reimbursement by the federal government. The net cost to the State was $7.6 million.

Although significant changes to cost, schedule, and scope occur on BGS capital projects, the department has not implemented a system to evaluate capital project performance from planning to completion. Without this evaluation, BGS does not know where improvements could be made to reduce the changes.

Project Documents and Project Manager Recollections Explain Some Changes, but Don't Identify Root Cause

SAO analysis of contract change orders for the nine completed capital projects determined that about twenty-two percent of the increase in costs, or $5.3 million, was due to change orders. Since March 2014, project managers have been required to document the reasons for a change order in a memo to the file. Documented reasons included code compliance, unforeseen conditions, and tenant or building owner request, but the impact on cost was not always clear.

Factors other than change orders resulted in cost increases and schedule delays. Project managers indicated that unanticipated events and delays in funding and site acquisition were among the reasons that increased costs or resulted in schedule delays.

Change Orders Related to Compliance with Code, Unforeseen Conditions, and Tenant or Building Owner Requests

Change order and other project documents for the Westminster facility and the Middlesex Therapeutic Community Residence indicated that changes occurred to comply with code requirements.

- Costs for the Westminster facility increased by $350,000 to meet fire safety requirements which, according to BGS, were adopted subsequent to the design of the facility, and were identified during the permitting process.

- The investment of about $200,000 in energy efficiency improvements was a requirement of state energy code at the Middlesex Therapeutic Community Residence.

Unforeseen site conditions were cited as a reason in change orders for many projects.

- At Westminster, the discovery of buried stumps, wood debris, and four fuel tanks (a 10,000 gallon, 3,000 gallon, and two smaller fuel tank bodies) during construction added $168,000 to cost. In addition, plans for management of storm water runoff had to be changed for the Westminster project because soils were not suitable for the system that was originally planned. Site analysis, including a property history search and soil tests, was conducted for the Westminster facility, but did not uncover these issues.

- At the Public Health Lab, site analysis was conducted to determine the depth needed for structural beams, but site conditions discovered during construction required that structural beams be driven further into the ground than originally planned, which increased the cost $366,000.

- In the District Heat project, additional costs were incurred due to the need to remove and replace five feet of unsuitable soil. The impact on cost was not quantified.

Requests for the Lamoille County Courthouse, Vermont Veterans' Home, and the Vermont Psychiatric Care Hospital were reasons cited by project managers for increased project costs.

- A security manager was hired by the Judiciary after initial planning for the Lamoille County Courthouse was completed, which resulted in a heightened focus on security. This increased cost by approximately $372,000 for holding-cell improvements, security cameras, and bulletproof glass.

- For the Vermont Veterans' Home, a request for removal of plumbing and electrical wire, rather than leaving existing pipes and wires in place as is general industry practice, increased costs. The impact on cost was not quantified.

- Tenant requests for changes after the project was substantially completed at the Vermont Psychiatric Care Hospital increased costs by $162,000, as recorded in the change order documentation.

Other Reasons for Changes to Cost, Schedule and Scope

Projects were delayed or costs increased due to circumstances such as Tropical Storm Irene and funding appropriations over multiple years. The following are examples of these and other reasons.

- Construction for some projects was delayed because of the need to reconstruct/replace facilities damaged during Tropical Storm Irene in August 2011. Specifically, the project manager for the Public Health Lab was re-assigned to Irene-related projects, which delayed the lab project for two years. In addition, funds that had been appropriated for Westminster were reallocated to Irene-related projects, delaying construction for two years. This project also experienced delays related to site acquisition.

- The Legislature did not always appropriate funds to projects according to the timing requested by BGS. For example, appropriations to the Lamoille County Courthouse project were authorized over a two-year period, rather than the single year that was requested. According to the project manager, costs for Lamoille County Courthouse increased $330,000 due to inflation over the time period of the delay. Some BGS project managers indicated that delays increase costs because of inflation, which they estimated ranges from three to ten percent annually.

- Extensive changes to heating, ventilation, and air conditioning (HVAC) and for power and telecommunications cabling increased costs $1.1 million for the National Life project because of the type of flooring system in one of the buildings and changes to the space design. In addition, modular furniture and walls had not been selected at the time the original estimate was prepared, and the cost exceeded the amount budgeted for furniture by $298,000.

- For the Public Health Lab, difficulty commissioning[11] a BSL-3[12] lab resulted in increased costs of over $116,000 and delayed the tenant move-in date to August 2015, five months after completion of the building.

- The project manager for the Public Health Lab was not sure why plans to co-locate the Public Health Lab and the DPS forensic lab at Building 617 changed in mid-2008, but he indicated that the design for renovating Building 617 was 90 percent complete when he was told of the change. According to a current and former member of the House Committee on Corrections and Institutions,[13] timing for accreditation of the forensic lab, DPS' decision to not locate other public safety functions at Building 617, and higher than expected costs to renovate Building 617 are some reasons that plans changed. The costs to purchase and maintain Building 617 and the cost of architectural engineering firm services ($10.9 million per a VISION report) are not reflected in the total project cost of $38.8 million for the Public Health Lab.

[11] Commissioning is the process of assuring, from design phase to a minimum of one year after construction, that all facility systems perform interactively in accordance with design documentation and intent, and in accordance with the owner's operational needs, including training of operating personnel.

[12] BSL3 is a biosafety level defined by the Centers for Disease Control & Prevention and is appropriate for agents with a known potential for aerosol transmission, for agents that may cause serious and potentially lethal infections, and that are indigenous or exotic in origin.

[13] The House Committee on Corrections and Institutions oversees the capital bill.

- The construction Request for Proposal (RFP) for the Maintenance Shop did not include requirements to obtain permits and design connections to utilities (gas, water, electric) because BGS' did not intend to have the general contractor perform this work. Subsequently, the general contractor's contract was amended to include an additional $92,000 for the permitting, design, and construction of these connections.

- Site work was much more involved than BGS anticipated at the Middlesex Therapeutic Community Residence. Considerable effort was needed to ensure proper drainage and to repair sod damaged from construction activities. Further unanticipated costs included the installation of a sanitary system and the underground extension of electrical service to the new building. According to project documentation, this project lacked the necessary planning due to the urgency of the project.

- An additional investment of $218,000 was required for purchase and installation of telecommunications equipment for the Psychiatric Care Hospital because an external vendor was hired to provide these services, rather than the State's Department of Information and Innovation as the project manager had planned.

BGS acted to reduce costs on some projects using value engineering.[14] For example, costs on the Public Health lab were reduced $92,000 by changing the type of insulation, finishes, and electrical components. Costs for Lamoille County Courthouse were reduced by $216,000 by changing insulation, deleting wainscoting and chair rails, changing from a slate roof to a copper roof, and making other deletions. However, all the projects where value engineering was used still had significant cost overruns from the original estimated cost.

SAO believes the reasons cited for changes to cost, schedule, and scope are not the root cause[15] of the differences between estimated and actual results for capital projects. For example, unforeseen site conditions were cited as a reason for cost increases in some change orders, but this does not identify why unforeseen site conditions occurred on capital projects. Therefore, it's not clear whether there are corrective actions that could reduce the number

[14] According to the GSA, value engineering is an organized effort directed at analyzing the functions of systems, equipment, facilities, services and supplies for the purpose of achieving the essential functions at the lowest life cycle cost consistent with the required performance, reliability, quality and safety.

[15] Root cause is the cause, that if corrected, would prevent recurrence of the occurrence. It is the most basic cause that explains why the event happened, that can reasonably be identified, that senior management has the control to fix, and for which effective recommendations for corrective actions to remedy the problem, prevent specific recurrence of the problem, and preclude occurrence of similar problems can be generated. (Source: United States Department of Energy in their Occurrence Reporting Causal Analysis Manual (DOE-STD-1197-2011)).

of unexpected cost increases from unforeseen site conditions. More extensive evaluation of site conditions or increasing cost and schedule contingencies in project estimates might address the risk of cost increases and schedule delays related to unforeseen site conditions, but without identification of the root cause BGS may not identify corrective actions to reduce these risks on future capital projects.

Weaknesses Exist in BGS' Processes for Managing Capital Projects

Capital construction projects are complicated with a variety of challenges, such as time and cost constraints, and involve many different individuals and organizations and many separate steps. Adding to these challenges, BGS is responsible for the construction and maintenance of many different types of facilities such as public safety barracks, heat plants, laboratories, and office buildings. In the face of those challenges, the absence of project performance assessments, data limitations, and limited documented procedures are fundamental shortcomings in BGS' management of capital asset construction projects, which increase the risk of continued cost and schedule overruns and changes to scope.

Assessing Actual Performance of Capital Construction Projects

Since at least fiscal year 2013, BGS' annual budget requests have stated that the department assesses the performance of the Engineering and Construction section based on the number of construction projects completed within budget, on time, and with appropriate quality and adequacy and safety records. However, BGS has not regularly reported results for these measures and acknowledged that it has not determined what baselines (e.g., estimates) would be used to measure performance. A BGS official also indicated that the department has not assessed project performance by comparing final project cost and completion date to pre-defined baseline estimates and evaluating why these differences have occurred.

In addition, BGS has not defined which of multiple project milestones represents project completion for purposes of performance measurement. For example, projects using the services of an architectural engineering firm generally have a substantial completion certificate issued when a project is sufficiently complete that the tenant could occupy and use the building for its intended purpose. Alternatively, tenant move-in date could be used to represent the project completion date. Without a defined completion date, it's not clear which date should be used 1) to determine total project costs for comparison to estimated costs and 2) to measure the extent to which a project is on-time.

Updates regarding specific projects are provided to the Legislature during testimony and upon legislative request, according to a BGS official. These updates address the status of projects, including revised budgets and project schedules. Prior to 2016, BGS used a red light/green light report to track the status of capital construction projects. The December 2015 report showed project cost and appropriated funds, but did not compare final project cost to project cost estimates. It included start and estimated completion date, but did not have an actual completion date to compare to the estimated completion date.

Other states assess and report capital projects' actual outcomes against baselines. For example, Washington State requires government agencies to submit a final project report for all capital projects over $5 million that includes comparison of the actual cost and completion date to the estimates produced in the predesign stage[16] and at the time of funding. Texas calculates whether projects were completed on schedule and within budget, with specific definitions for the data points used for schedule, cost, and budget.

According to GAO's guide "Leading Practices in Capital Decision-Making," results should be evaluated, including an evaluation and comparison of results to goals, and lessons learned should be incorporated into the decision-making process. Successful implementation of a capital investment project is determined primarily by whether the project was completed on schedule, came in within budget, and provided the benefits intended.

In addition, a 2015 newsletter from Vermont state government's performance accountability website stated that performance measures allow decision-makers to delve into programs and services and look for ways to improve the effectiveness of the service, make changes to address new conditions, or evaluate why different results are seen in different programs and/or regions. Without an evaluation of results, BGS lacks information to determine what improvements could be made to its management of capital projects.

Data Limitations Associated with Project Cost Tracking and Change Order Information

BGS has three mechanisms that it uses to track capital construction project costs, but all have limitations or weaknesses that mean BGS lacks assurance that any of its tools identify all costs associated with capital construction projects.

[16] Washington's decision makers in the Governor's Office, Office of Financial Management, and the Legislature use the information from the predesign stage to determine whether a project should proceed to design and construction.

Capital Construction (CAPCON) Spreadsheets

One mechanism is a spreadsheet known as CAPCON, which BGS uses to track expenditures against capital bill appropriations for each fiscal year. This tool is not designed to track total project costs, and when a project is funded by multiple appropriations or appropriation lines, the use of the individual appropriations is tracked in separate workbooks. The spreadsheet does not accumulate the costs tracked by appropriation into a project total. For example, the District Heat project's costs were recorded in four separate CAPCON spreadsheets relating to capital bill appropriations for four different fiscal years. Within those four CAPCON spreadsheets, District Heat project expenses were recorded against nine different capital bill appropriations, tracked in separate workbooks. Expenses were funded by appropriations for contingency and major maintenance as well as by appropriations specific to the project, and each appropriation was tracked on a separate CAPCON worksheet. Nowhere in the CAPCONs was a project total for District Heat shown.

In addition, the CAPCON report primarily contains information about project costs funded by capital bill appropriations and may exclude costs funded by other sources. For example, the National Life project used capital bill appropriations and Fee for Space funds.[17] About $1 million was covered by the Fee for Space fund and these costs were not included in the CAPCON.

Cost Tracking Spreadsheet

Project managers use different project cost tracking tools. Some project managers track project costs using an Excel spreadsheet that was developed by one of the project managers, the "Cost Tracking Spreadsheet." For the projects we reviewed, we found that it was used for three projects.

The Cost Tracking Spreadsheet could be the mechanism used to track total project costs, but there is some risk that the spreadsheets may be inaccurate or incomplete. The project managers do not routinely reconcile the spreadsheet to VISION and it does not appear to be reviewed by anyone independent of the preparer of the spreadsheet.

VISION Project ID Queries

Project expenses are recorded in VISION, which has a chart field that may be used to categorize costs by project. BGS utilizes this chart field and maintains a list of project IDs in an Excel spreadsheet. Two administrative staff are responsible for assigning the project IDs.

[17] Per statute, Fee for Space is a facilities operations internal service fund. BGS can use it to pay for operating and maintenance expenses for buildings, support facilities, and grounds; major maintenance and renovation projects; state agency relocation expenses; purchase options for real estate acquisitions; construction expenses; and debt service payments on general obligation bonds authorized to build or acquire buildings and support facilities.

However, the department does not have documented policies or procedures that ensure project managers utilize project IDs in a uniform manner. Specifically, BGS has no written policy on the assignment and use of project IDs. According to one project manager, the list of project IDs has been used for multiple years and the information included in the spreadsheet and how project IDs are assigned has changed over time. He acknowledged that no rules were established for how project IDs should be used, including which projects require an ID.

We noted differences in how project IDs were assigned to the capital projects we reviewed and found that seven of the projects had multiple IDs. Further, BGS provided an incomplete list of project IDs to SAO as SAO identified an additional 11 project IDs that had been used for the projects.

- The 108 Cherry Street project had nine project IDs; the project manager said that new project IDs were requested for each appropriation and each contract. However, he did not maintain a list of project IDs for the project, and SAO identified IDs that he was not aware of.

- The second BGS project manager assigned to District Heat requested a project ID, not knowing that one had been established by the previous project manager.

- The Therapeutic Community Residence and Psychiatric Care Hospital each had more than one project ID. For both projects, IDs were established to track use of Fee for Space funds to reimburse these funds once the State received Federal Emergency Management Agency (FEMA) or insurance money related to damage caused to state buildings by Tropical Storm Irene. BGS also established project IDs to track costs against capital bill appropriations.

- Costs for the National Life project were tracked under three project IDs. One was used for project costs paid by capital bill funds. Two different project IDs were used to monitor the State's use of Fee for Space so that these funds could be reimbursed once other funding mechanisms were established for the project. The State used these same project IDs to track costs for other projects, and it was not possible to use VISION to identify which costs related to National Life. In addition, the project manager was not aware that two additional project IDs had been used to track the use of the Fee for Space funds and used to categorize costs for National Life in VISION.

The different approaches to assigning project IDs complicate reporting total project costs using VISION data. There is increased risk that total project

costs can't be identified using VISION, because project managers may not be aware of all project IDs assigned to a project or the same project ID may have been used for multiple projects.

BGS has identified a need for a project management information technology system, and the State's December 2016 Million Dollar Technology Project Report[18] included the Enterprise Resource Planning Expansion project. A component of this project is to add project costing and project management functionality, which would support the tracking and monitoring of project scope, budget, and schedule and provide more accurate financial estimating according to the technology project report.

The 2015 technology project report listed November 2017 as the target date for project costing and project management, but the December 2016 report did not include a target date. This effort has started and stopped in the past. A BGS official indicated that the department is in the process of acquiring project scheduling software and a final evaluation of the two possible solutions is underway. However, scheduling software does not address cost tracking and BGS needs a reliable mechanism to track total project costs now.

Similar to cost tracking, BGS has some processes in place to identify information about contract change orders, but the information has limitations.

A March 2014 email notified project managers of the requirement to prepare a memo documenting the overall reason for each change order. Prior to the requirement for the memo, reasons for change orders were not consistently documented. For example, we found that 13 of the 23 change orders we reviewed that occurred prior to March 2014 did not document reasons for the changes.

We also found that explanatory memos for change orders did not necessarily capture the full reasons for changes. For example, a change order executed in January 2015 incorporated ten "contractor change orders", most of which consisted of multiple itemized "requests for change orders". The explanatory memo states that the reason for the time extension is to permit completion of extra work listed in the change order, but does not state what caused the need for this extra work or why the State should pay for it.

Contract change orders can contain multiple changes with various reasons for the changes, and the required memos prepared by project managers did not specify a dollar amount for each reason cited. Therefore, it was not possible to calculate the effect of various reasons cited by project managers.

[18] Annual report produced by the Department of Information and Innovation's project management office as required by 32 V.S.A. § 315.

For example, in a memo for a $77,000 change order to the construction contract for the Health Lab, BGS cited tenant requested changes, field condition variations and unforeseen conditions among other reasons for the changes needed. However, the memo does not explain what the cost is in each of these reason categories that contributed to the overall $77,000 increase in costs.

In addition, the department has not established and defined reason categories to be used to classify change orders. Lacking this guidance, project managers might use the same reason to describe dissimilar circumstances. For example, unforeseen condition could be used to describe a change that is the result of an omission in construction documents or a circumstance that was not identified during planning.

The Office of Purchasing and Contracting (OPC) maintains a contracting database where information is collected and recorded about the number of change orders and the cumulative increase in contract value by changes orders. However, reasons for change orders and the associated dollar impact are not recorded in the database. SAO believes that collecting and summarizing this information in a centralized manner may assist BGS with identifying the underlying causes of change orders.

Limited Documented Guidance for Capital Construction Projects

Vermont's internal control standards[19] state that documentation of policies and procedures is critical to the daily operations of a department and serve to provide specific direction to and help form the basis for decisions made every day by employees. Without this framework of understanding by employees, conflict can occur and poor decisions can be made. Further, the efficiency and effectiveness of operations can be adversely affected.

Although Vermont's standards indicate that documentation of policies and procedures is critical, BGS' documented guidance for managing capital construction projects is very limited.

For example, BGS has design guidelines, but this guidance primarily relates to technical specifications for materials and building construction and the achievement of energy efficient and sustainable facilities. The design guidelines indicate that cost estimates should be prepared, but do not address the method to use and the level of documentation needed for the cost estimate.

[19] *Internal Control Standards, A Guide for Managers* published by the Department of Finance and Management.

Other states and the federal government have documented guidance on the work that needs to be performed before major funding decisions are made about a project, including development of cost estimates. According to the GSA, contingencies are an integral part of the total estimated costs of a project and cover costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties concerning project scope.

The cost estimates BGS provided to the Legislature when significant funding was requested or when seeking regulatory approval for a project were generally produced at the earliest stages of the projects and were produced by BGS or architectural engineering firms for some projects; in one case the landlord provided an estimate.

According to project managers, estimates were developed in various ways, including:

- Based on costs of previous similar projects with an inflation factor;
- Square footage multiplied by a cost factor based on building type (e.g., warehouse, commercial office space, etc.); and
- Cost estimates prepared by contracted architects (the basis of those estimates is unknown).

For seven projects, BGS provided project cost estimate documentation with individual cost categories, such as land purchase, architectural fees, construction costs and contingencies. For seven projects the method used to derive the cost estimate was documented (e.g., cost per square foot or unit cost). However, none of the project estimates had documented sources. For example, the Health Lab cost estimate was based on number of square feet and estimated cost per square foot for various components, but the source of the cost per square foot was not documented. Six of the projects included contingencies in the cost estimates, but there was no documentation that showed why these were chosen. Documentation for the other four projects did not show any contingencies.

An AACE® International[20] study[21] indicates that imprecise project estimates produced during early project planning phases can account for cost overruns up to 50 percent. The federal government and other states have developed cost estimation guidance and procedures to document cost estimates to reduce this risk. For example:

[20] AACE International previously referred to the Association for the Advancement of Cost Engineering International.

[21] AACE International Recommended Practice No. 56R-08, *COST ESTIMATE CLASSIFICATION SYSTEM- AS APPLIED FOR THE BUILDING AND GENERAL CONSTRUCTION INDUSTRIES, TCM Framework: 7.3 – Cost Estimating and Budgeting*.

- The GAO cost estimating and assessment guide[22] provides twelve steps to a high-quality cost estimating process. The guide also contains four characteristics of a high-quality cost estimate: 1) well documented, 2) comprehensive, 3) accurate, and 4) credible.

- The GSA[23] Project Estimating Requirements for the Public Buildings Service contains standards and practices, such as a format for preparation of the estimate, guidelines for site and design contingency percentages, and how to develop escalation rates to account for inflation during the project.

- Other states such as Washington, Minnesota, and Georgia have documented guidance addressing the preparation and documentation of cost estimates. For example, Georgia's Construction Manual discusses several common approaches to cost estimates and provides guidance to account for escalation factors. Georgia also uses a standard cost estimate form and requires users to submit detailed documentation that supports all analyses and calculations used to develop and compile the cost estimate that was submitted.

According to GAO, a reliable cost estimate is critical to the success of any program. Without the ability to generate reliable cost estimates for the capital programming process, agencies are at risk of experiencing cost overruns, missed deadlines, and performance shortfalls. Furthermore, estimates that lack documentation are not useful for updates or information sharing and can hinder understanding and proper use. Finally, an unreliable cost estimate does not provide the basis for informed decision making, realistic budget formulation, and program resourcing, and accountability for results.

In another example, BGS' protocol for buying property describes procedures for acquisition of real estate, including advertising in the project area, conducting a site visit, and completing a property appraisal. However, this protocol does not identify criteria for evaluating potential sites or provide guidance about the extent of site investigation that should be conducted.

Cost increases resulting from unforeseen site conditions and altered conclusions about the viability of acquired sites occurred in four of the ten projects we reviewed. Without documented procedures to guide the site

[22] GAO COST ESTIMATING AND ASSESSMENT GUIDE, *Best Practices for Developing and Managing Capital Program Costs,* GAO-09-3SP, March 2009.

[23] GSA provides federal workplaces by constructing, managing, and preserving government buildings and by leasing and managing commercial real estate. GSA also promotes management best practices and efficient government operations through the development of government-wide policies.

selection process, BGS' lacks a framework to form the basis for these decisions and increases the risk of poor decisions.

According to the GSA, the site selection decision has a dramatic impact on almost every facet of the design and construction process. GSA has a site selection guide that includes a list of criteria categories for use in evaluating potential building sites and recommends that relevant criteria from the list be used to evaluate potential sites. This guide also addresses site investigation procedures, including environment reports and other studies, and requires preparation of a site investigation report. GSA cites benefits of using the site selection guide, including ensuring that the selected site is viable for the intended facility and reducing the risk of unanticipated difficulties and their impact in terms of schedule and expense.

Procurement and Contracting Issues

According to Bulletin 3.5,[24] state policy is to use open competitive procurement practices both to afford all businesses equal opportunity to bid for state contracts and to ensure the State obtains optimal solutions at reasonable prices. Further, the State's procedures are designed to achieve additional goals, including oversight of agency procurement activities and protecting the interests of the State.

In the course of this audit, we identified several instances where requirements related to competitive bidding were not met. We also found that BGS' processes related to contract change orders provide a level of authority to project managers to obligate the State that is inconsistent with state policies and conflict with a statutory requirement for the Secretary of the Agency of Administration's (the "Secretary") approval. Finally, we noted an instance where a significant contract was entered into by BGS, but there was limited evidence of review of the arrangement outside of BGS' organization. Oversight by the Secretary does not appear to be required by state policy and the BGS Commissioner had statutory authority to approve the contract, but the interests of the State may be best protected by having the Secretary and the Attorney General's Office (AGO) review and approve similar transactions in the future.

Failure to Competitively Bid

Exemptions to the requirement to competitively bid are permitted by state policy in certain extraordinary circumstances such as in an emergency or where only one vendor can meet the need, subject to seeking the approval of the Secretary. We noted nine instances where the request for sole source

[24] Bulletin 3.5, Procurement and Contracting Procedures.

procurement failed to describe an extraordinary circumstance, but the BGS Commissioner and the Secretary approved the sole source procurement. The following are examples of the reasons provided for sole source procurements that fail to describe extraordinary circumstances:

- Using the standard procurement process would delay the project and the contractor has done similar work in the past.

- Hiring this contractor, who is familiar with the site, would eliminate the bid process.

- Hiring a different firm [from the one awarded the contract and - originally hired as a subcontractor to the consultant performing the project feasibility study] to take the project through the next phase of design and construction administration would end up costing the State time and money with no apparent benefit to the State.

The State has revised its guidance related to sole source procurement since these contracts were awarded, providing additional examples of circumstances that justify sole source and decreasing the dollar threshold for which sole source procurements require the Secretary's approval. These changes may reduce the incidence of inappropriate use of sole source procurement.

State policy discourages contract amendments because they may diminish the advantages of the competitive bidding process and forbids use of contract amendments to circumvent the State's requirements regarding competitive procurement. However, the policy does not explain what constitutes a significant scope or dollar amount change and what would require competitive bidding rather than a contract amendment. We noted three instances where an existing contract was amended to procure services that were qualitatively distinct from the contract's original scope, and the dollar increases ranged from 40 to 305 percent.

- The State hired an architectural engineering firm for a feasibility[25] study for re-housing state employees displaced by Tropical Storm Irene. The contract was amended to add architectural engineering services for program and space planning and detail design, documentation for construction, and construction support services for the project at National Life. The addition of these services increased the original $248,000 contract value by $262,000, a 106 percent increase.

[25] A feasibility study is used to determine whether to proceed with a project before the legislature approves additional funds for design.

- An architect was hired in 2009 to work on the final phase of a project to install a geothermal system at the Vermont Veterans' Home. According to the project manager, this project was completed in December 2011. Mold was discovered in August 2012, and a separate project was initiated to remediate this. An amendment was made to the architect's existing contract to add work related to the mold remediation project, extending the contract term by a year. In total, the contract value was increased by $186,000, or 40 percent.

- An architectural firm was contracted from 2008 to 2012 to conduct planning for replacement of the Vermont State Hospital in Waterbury, including drawings to illustrate concepts of design for various options. After the destruction of the state hospital by Tropical Storm Irene, the State significantly changed the architectural firm's contract. The State increased the contract by more than $2 million, a 305 percent increase, and stipulated an entirely new scope of service, which included detailed designs for construction, evaluating construction bids, and providing construction administration services for the construction of a 25-bed inpatient facility in Berlin.

The recent revision to Bulletin 3.5 added some emphasis to this prohibition, but there are no examples to demonstrate under what circumstances amending a contract would be considered a circumvention of competitive bidding.

Required Authorization Not Obtained

BGS' processes for approval of contract change orders is not consistent with a requirement in statute, and the department's processes for modifications to construction contracts provides a level of authority to project managers that contradicts state policy.

Statute[26] indicates that any change orders relative to BGS capital projects shall not be allowed unless they have the approval of the Secretary. However, Bulletin 3.5 and BGS' contracting plan[27] defer the Secretary's approval until certain thresholds are met. For example, for contracts with original values greater than $250,000, the Secretary's approval is required once the cumulative effect of the changes increases the contract price by 15 percent or more,[28] but not before this point. The SAO consulted with the AGO on this issue and the AGO stated that generally, a statute will control over a bulletin if

[26] 29 V.S.A. 152(a)(3)(A)

[27] According to Bulletin 3.5, the Secretary of the Agency of Administration may approve a written contracting plan that provides an acceptable alternative to requirements of the bulletin.

[28] This was the policy in effective for the period covered by our audit. The current Bulletin 3.5 requires the Secretary's approval for amendments to competitively procured services once the cumulative increase in the contract prices is 25 percent or more.

they are not consistent. Further, the AGO suggested it would be a good idea for the responsible parties (e.g., Commissioner of BGS and the Secretary) to consider how best to address in Bulletin 3.5 approval of change orders in accordance with 29 V.S.A. §152(a)(3)(A).

BGS relies on its project managers and contracted architects to review and approve proposed change orders[29] for construction contracts. Periodically, multiple proposed change orders approved by the project manager are accumulated into a single change order, which is processed as an amendment to the construction contract and is subject to the review and approval requirements of Bulletin 3.5, including signature by the Commissioner.

According to BGS' General Conditions for Construction Contracts,[30] approval of proposed change orders by the BGS project manager constitutes authorization for contractors to complete the proposed work. We noted many instances of proposed change orders that exceeded $10,000 and five that exceeded $125,000. However, this delegation of authority is inconsistent with the State's Bulletin 3.3 which requires approval by an organization head for contracts greater than $10,000 and all changes to those contracts.[31] The original Bulletin 3.3 indicated that a waiver from the Secretary may be sought for repetitious handling of routine matters or where appropriate delegation is believed to have been made. An addendum dated April 20, 2015 states that non-exempt directors and managers may be assigned as designees only in emergency situations. According to the AGO, the inconsistency between BGS' General Conditions for Construction Contracts and Bulletin 3.3 was brought to the attention of BGS officials during a recent review of the terms and conditions for construction contracts. The Director of OPC indicated that BGS has not completed its review of the AGO's comments.

BGS' approved contracting plan permitted the initiation or continuation of work prior to the execution of a contract amendment. However, it also required that the Secretary be notified when BGS intended to allow work to be performed in advance of the execution of a contract amendment. BGS did not follow the notification requirements for work performed in advance of the approval of contract amendments by the Secretary and the Director of OPC acknowledged that BGS did not inform the Secretary.

Boilers for the District Heat Plant were purchased for $4.9 million without going through the established process for securing and recording prior

[29] A proposed change order is a written request submitted to the architect by either the contractor or the State requesting a change to the contract price and/or schedule.

[30] The general conditions are used with all construction contracts administered through BGS. The general conditions are attached to, and become part of the contract documents.

[31] Per Bulletin 3.3, Delegation of Authority for Signing Documents, "organization head" includes elective officers and their deputy, agency secretaries or department commissioners and their exempt deputies.

approvals for the terms and conditions of the purchase agreement. A state-issued purchase order was utilized rather than the standard state contract, but the purchase order included many terms required by Bulletin 3.5, such as product specifications, payment terms, warranty, and reference to the State's standard terms and conditions.

It's not clear why this purchase wasn't subject to the formal approval requirements of Bulletin 3.5. According to Bulletin 3.5, a purchase order is a contract, and the Bulletin requires approval by the Secretary prior to execution of contracts over $250,000 and approval by the Attorney General for the form of contracts not using the State's standard contract for services. BGS' contracting plan required approval by the Secretary for commodities purchases greater than $500,000.

Personnel for the boiler vendor were on-site for installation and provided additional services during the first year of operation. According to OPC's current buyer's guidebook,[32] and the Bulletin 3.5 in effect at the time of the purchase, this type of arrangement meets the definition of a commodity contract.[33] Both state that commodity contracts are subject to development under Bulletin 3.5.

The Director of OPC recalled that the Secretary of Administration's Office was kept informed of the project and that the BGS General Counsel and an Assistant Attorney General reviewed the terms and conditions of the purchase order. However, OPC was unable to provide documentary evidence of prior approval of the purchase order by the Secretary or by the Attorney General's Office. In addition, neither BGS nor OPC could provide a copy of the boiler purchase order executed by the BGS Commissioner and the vendor.

Additional Oversight for Significant Lease Obligations May be Warranted

The National Life lease obligates the State to pay $37.4 million over a 10-year lease term and required the State to pay the cost of tenant improvements above a $3.5 million landlord allowance.[34] The terms did not establish a cap on spending for the improvements and the State was required to use National Life's vendors for the project, which negated competitive bidding. An Agency of Administration official confirmed that the procurement and contracting requirements of Bulletin 3.5 do not apply to real estate leases since "lease" is not incorporated in the Bulletin's definition of a contract.

32 BGS Financial Operations Division Office of Purchasing and Contracting, *Buyer's Resource Guide,* January 1, 2016.

33 A commodity contract is any contract for the purchase of a product, commodity, equipment, or software that also involves the contractor's personnel coming onto state property to install or service the purchased item or train state personnel in the use of the item purchased.

34 Per the lease terms, National Life paid for $3.5 million of the costs of tenant improvements.

Statute[35] assigns sole authority to the Commissioner of BGS for the approval of real estate leases, but BGS' protocol for leasing real estate from outside vendors requires the approval of the Secretary for lease terms that exceed seven years. According to BGS' Director of Property Management, the Secretary was involved in the lease and the fit-up effort (e.g., tenant improvements), but the lease was signed by the BGS Commissioner and there is no documentary evidence of the Secretary's review and approval of the National Life lease terms.

Bulletin 3.5 procedures are designed to achieve several goals related to procuring and contracting for goods and services, including providing for checks and balances, oversight of agency procurement activities, and protecting the interest of the State. Given these policy goals and the magnitude of the State's obligation for this transaction, it may be desirable to require approval of the Secretary for significant real estate lease obligations.

Conclusions

The Department of Buildings and General Services manages a diverse portfolio of capital construction projects, and the attendant challenges of time and cost constraints add to the complexity of these projects. BGS' budget report indicates that measures of success for capital projects include the number of construction projects completed on time and on budget, but the department has not established baselines against which to measure actual results and has not reported the number of projects completed on time and on budget.

Per SAO analysis, most of the 10 projects reviewed exceeded the original estimated costs by 30 percent or greater. Some projects also experienced delays that exceeded a year. According to BGS, delays increase costs, but the department has not systematically analyzed why projects may exceed cost estimates or schedule timeframes. Furthermore, contract change orders accounted for 22 percent of the cost overrun for the nine completed projects, but BGS has not consistently documented the reasons for the change orders and does not quantify the dollar amount for the various reasons cited in change orders. Without an evaluation of project results and documentation of the effect of various reasons for change orders, BGS lacks information to determine what improvements could be made to its management of capital projects.

BGS has very little documented guidance pertaining to the many steps involved in managing a capital construction project. For example, BGS does not have guidance for the preparation of cost estimates. Documentation of

[35] 29 V.S.A. § 165(d)

policies and procedures is critical to the daily operations of a department because they set forth the fundamental framework and the underlying methods and processes all employees rely on to do their jobs. They provide specific direction to and help form the basis for decisions made every day by employees. Without this framework of understanding by employees, the efficiency and effectiveness of operations can be adversely affected and the department's reputation is at risk.

Recommendations

We make the recommendations in Table 3 to the Commissioner of the Department of Buildings and General Services.

Table 3: Recommendations and Related Issues

Recommendation	Report Pages	Issue
1. Develop a system to evaluate capital construction project performance, to include a comparison of actual to expected cost, schedule, and scope and identification of root cause of differences.	12-16, 21-22	Significant changes to cost, schedule, and scope occurred on BGS capital projects. However, BGS has not assessed capital project performance by comparing expected and actual results and evaluating why differences have occurred. Without an evaluation of results, BGS lacks information to determine what improvements could be made to its management of capital projects.
2. Define the data points, such as estimated project cost, expected completion date, and actual completion date, needed to evaluate capital project performance.	21	For many years BGS has identified performance measures for the Engineering and Construction section in its budget request, including the number of projects completed on schedule and the number of construction projects coming in on budget. However, BGS has not defined which cost estimate, expected completion date, and actual completion date should be used to calculate the measures.
3. Calculate the performance measures listed in BGS' budget request for the Construction and Engineering section and report the results to the Legislature.	21-22	GAO's practices for capital project decision-making state that successful implementation of a capital project is determined by whether the project was completed on schedule, came in within budget, and provided the benefits intended. BGS has identified performance measures for the Engineering and Construction Section in its budget requests since 2013, including the number of projects on schedule and the number of construction projects coming in on budget, but has not calculated results and reported to the Legislature on these measures.

Recommendation	Report Pages	Issue
4. Require that project managers track total actual project cost using either the Cost Tracking Spreadsheet or VISION queries based on project ID. If BGS elects to use the Cost Tracking Spreadsheet, implement internal controls such as a reconciliation to VISION and review by BGS staff independent of the preparer of the spreadsheet.	22-23, 25	BGS has three mechanisms that it uses to track capital construction project costs, but all have limitations or weaknesses that mean BGS lacks assurance that any of its tools identify all costs associated with capital construction projects. BGS has identified a need for a project management information technology system, a component of which is to add project costing, but the timeline for implementing a project management information system is not certain.
5. Develop written policies regarding how project IDs should be used, including when use of project ID is required.	23-24	The inconsistent use of project IDs complicates tracking project costs in VISION. BGS could not readily provide the SAO with all project IDs for selected projects because they often used more than one ID and project managers were not always aware of all the project IDs that were created for a capital construction project.
6. Amend the requirement to prepare a change order memo to require that project managers include significant reasons in the change order memo and quantify the dollar amount attributable to each reason.	25-26	Project managers are required to record only an overall explanation for a change order. Contract change orders can contain multiple changes with various reasons for the changes, and the required memos prepared by project managers did not include all reasons and did not specify a dollar amount for each reason cited. Therefore, it was not possible to calculate the effect of various reasons cited by project managers and BGS may not be able to assess the significance of various reasons.
7. Document and define the categories to be used to describe the reason for change orders.	25-26	BGS requires preparation of a memo documenting the overall reason for each change order. The department has not established and defined reason categories to be used to classify change orders. Lacking this guidance, project managers might use the same reason to describe dissimilar circumstances. For example, unforeseen condition could be used to describe a change that is the result of an omission in construction documents or a circumstance that was not identified during planning
8. Develop a mechanism to collect and summarize reasons for change orders and the dollar impact of those reasons.	25-26	BGS documents reasons for change orders in a memo prepared by project managers. However, there is no mechanism to collect and summarize this data for comparison and review across multiple capital projects. OPC's contracting database contains some information related to change orders, but it does not contain data about the reasons for change orders and the associated dollar impact.

Recommendation	Report Pages	Issue
9. Develop and implement policies and procedures to assist project managers with planning and managing capital construction projects, including guidance for preparation of cost estimates and site selection.	26-29	Although Vermont's standards indicate that documentation of policies and procedures is critical, BGS' documented guidance for managing capital construction projects is very limited. BGS' guidelines indicate that cost estimates should be prepared, but do not address the method to use or the amount of contingency that is appropriate. In another example, BGS' protocol for buying property describes procedures for conducting a site visit, but does not identify criteria for evaluating potential sites or provide guidance about the extent of site investigation that should be conducted.
10. Document cost estimates and maintain documentation that shows the basis for the estimate, including the method and sources used to develop the estimate.	27-28	Project cost estimate documentation did not include sources. Some of the documentation showed the method used (e.g., cost per square foot or unit cost). Six projects included contingency, but the reason for including a particular contingency was not documented. Undocumented estimates are not useful for updates or information sharing and can hinder understanding and proper use.
11. Approve sole source procurement only when extraordinary circumstances exist or the vendor/contractor is the only one capable of providing the service, consistent with the requirements of Bulletin 3.5.	29-30	We noted nine instances where the request for sole source procurement failed to describe an extraordinary circumstance or that the vendor/contractor was the only one capable of providing the service. Both the BGS Commissioner and Secretary of the Agency of Administration (the "Secretary) approved these sole source procurements.
12. Request that the Agency of Administration clarify when a change to the scope of work is so significant that competitive bidding is required and a contract amendment prohibited.	30-31	We noted three instances where an existing contract was amended to procure services that were qualitatively distinct from the contract's original scope, and the dollar increases ranged from 30 to 296 percent. State policy forbids the use of contract amendments to avoid competitive procurement, but does not give examples or other guidance to facilitate identifying when scope change is so significant as to warrant a new procurement process.
13. Consult with the Secretary on how to address the inconsistency between the statutory requirement for all BGS change orders to be approved by the Secretary and Bulletin 3.5's requirement for contract changes that exceed 25 percent to be approved.	31-32	Statute requires all change orders for BGS capital projects to be authorized by the Secretary. Bulletin 3.5 requires Administration approval only for contract changes more than 25 percent of the original contract value.

Recommendation	Report Pages	Issue
14. Amend the approval process for proposed change orders so that BGS staff with the requisite level of authority approve proposed change orders.	32	BGS' processes for modifications to construction contracts provides a level of authority to project managers that contradicts state policy. Bulletin 3.3 reserves the authority to approve changes to contracts over $10,000 to organization heads. However, BGS' current practice is for project managers to bind the state by approving proposed change orders, with the Commissioner signing change orders that compile multiple proposed change orders after the project manager has authorized the work to be done.
15. Develop a process to ensure that the Secretary is notified whenever work is authorized in a proposed change order before a contract change order is executed.	32	BGS did not notify the Secretary as required by BGS' Contracting Plan when BGS intended to allow work to be performed in advance of the execution of a contract amendment.
16. Ensure that requisite authorizations for purchases are obtained and documented in accordance with Bulletin 3.5.	32-33	Boilers for the District Heat Plant were purchased for $4.9 million without going through the process established in Bulletin 3.5 for securing and documenting authorization of the Secretary of the Agency of Administration and the AGO. In addition, neither BGS nor OPC could provide a copy of the boiler purchase order executed by the BGS Commissioner and the vendor.
17. Collaborate with the Agency of Administration to determine whether certain lease arrangements should be subject to the guidance and approval requirements in Bulletin 3.5.	33-34	Statute assigns sole authority to the Commissioner of BGS for the approval of real estate leases, but BGS' protocol for leasing real estate from outside vendors requires the approval of the Secretary for lease terms that exceed seven years. According to an Agency of Administration official, Bulletin 3.5 does not apply to real estate leases since "lease" is not incorporated in the Bulletin's definition of a contract. The National Life lease obligates the State to pay $37.4 million over a 10-year lease term and required the State to pay the cost of tenant improvements above a $3.5 million landlord allowance.

Management's Comments and Our Evaluation

On June 6, 2017, the Commissioner of BGS provided comments on a draft of this report. These comments are reprinted in Appendix IV. In general, the Commissioner had no objection to our recommendations related to improving documentation of processes and indicated that BGS will work with the Secretary of Administration to create better alignment between the BGS contracting plan, state statute and BGS' regulatory framework. The Commissioner did not explicitly address our recommendations related to evaluating capital construction project performance and certain recommendations related to compliance with procurement policies. The

Commissioner agreed with some of our findings but asked that we consider certain conclusions within the report. Appendix IV contains our considerations of those conclusions.

Appendix I
Scope and Methodology

To address our audit objective, we obtained an understanding of BGS' process for managing capital construction projects by reviewing their operating policies and procedures, including those related to design guidelines, property management, and major maintenance. We reviewed process flow charts that BGS created as part of planning for the State's Enterprise Resource Planning project. We interviewed BGS personnel to gain an overview of the actual systems and procedures used in capital construction project management and to understand the details of the process, including pre-planning, design, construction, and commissioning. We inquired of BGS management about any plans to acquire an information technology system for managing capital projects and reviewed the 2015 and 2016 annual Million Dollar Technology Project reports.

To gain a broader understanding of BGS, we reviewed budget documents for information on staffing and performance measurement for the Construction and Engineering section. We also reviewed a report from an external consultant on BGS' management and organization.

We reviewed Vermont state statutes regarding BGS' jurisdiction and the authority of the Commissioner regarding capital assets and the funding for those assets. We also reviewed Vermont state administrative bulletins regarding procurement and contracting procedures and delegation of authority and BGS' contracting plan.

We interviewed Agency of Administration personnel for details on procurement and contracting and on financial administration of capital construction projects. We interviewed the State Treasurer and bond counsel for information about allowable uses for the general obligation bonds issued to finance projects in the capital bill.

To gain insight into best practices for managing capital construction projects, we reviewed audit reports from the GAO, GSA's Office of Inspector General, and the State of Washington's Joint Legislative Audit and Review Committee. We reviewed construction project manuals, including guidelines for cost estimates, from the states of Washington, Georgia, Minnesota; and the GSA. We reviewed GAO guidelines for cost estimates and an AACE International report about cost estimating for construction. We reviewed National Research Council reports on capital construction. We reviewed information on construction performance measures from the Texas Facilities Commission, GSA, and the Department of Energy.

SAO utilized a combination of capital bills from FY2012 to FY2017 and BGS Red Light/Green Light reports from December 2015 and 2014 to determine which capital projects to include in a data request for purposes of risk assessment and ultimately inclusion in the audit scope.

From the projects in the data request, SAO selected 10 projects that were active during the period 2012 to 2016. Projects were selected to represent the variety of projects managed by BGS. The following characteristics were considered: type of facility (public safety barracks, courthouse, laboratory, etc.), appropriation amounts, project manager assignment, and geographic location.

To gain an understanding of the selected projects, we interviewed the project manager or BGS staff most familiar with the project. We reviewed documentation about the projects, such as contracts, change orders, memos, proposed change orders, Certificates of Need, and contract summary and certification forms. We reviewed testimony presented to the Legislature regarding some of the projects. For National Life, we reviewed lease documents, contracts, invoices, and move schedules. We inquired of BGS management whether previous audits had been done on any of these projects.

BGS has not determined what baselines (e.g., estimates) would be used to measure capital construction performance and has not defined which of multiple project milestones represents project completion for purposes of performance measurement. To identify appropriate data points to use to determine changes to cost and schedule, SAO reviewed GAO and federal Inspector General audit reports to understand the approach used to compare actual results to forecasts. We also reviewed the approach used by the states of Washington and Texas. These federal and state entities compared actual results to estimated costs and forecast completion dates that were established when project approval/funding was initially sought.

As the baseline for cost comparison, SAO utilized the cost estimate in the 1) capital bill request when funds were requested for site acquisition or construction or 2) Certificate of Need (CON) application for healthcare facilities when approval was sought for the project from the regulatory body. To the extent estimates were not provided to decisionmakers, SAO utilized estimates available in various project-related documentation at the time significant funding was requested. In one instance, SAO utilized the cost estimate that was provided to the project manager upon assignment to the project because an estimate was not provided to the Legislature when significant funding was first sought.

To determine the extent of cost changes, we compared the SAO calculated actual project cost to the established baseline cost estimate and calculated the dollar overage and percent over estimate. We discussed the results of the analysis with the project managers.

SAO used the contract end date in the original architecture/engineering firm contract to represent the baseline forecast completion date. If an architecture/engineering firm was not used for a capital project, SAO utilized the expected completion date published in the RFP for construction services or the end date of the original construction contract. For one project, architect/engineering and construction services were not used, so SAO utilized a forecast move-in date as the baseline. For the project that was not completed as of June 30, 2016, the project manager asserted that June 30, 2014 was a reasonable date to use for estimated completion.

To represent actual project completion, SAO used the date of substantial completion[36] documented in a certificate signed by the architecture/engineering firm where available. For two projects, other certifications were used that showed the date occupancy was granted. For one project, neither of these data points was pertinent and the actual tenant move-in date was used.

To determine whether a capital project was completed on time or after the forecast completion date, SAO compared the baseline forecast completion date to the date of the certificate of substantial completion, other certificate showing date of occupancy, or the tenant move-in date. SAO calculated the number of months that a project was delayed. We discussed the results of the analysis with project managers.

To assess changes in scope, we identified the original scope of the project by reviewing architect/engineer contracts, design proposals, and Certificates of Need. To determine how the scope changed over the course of the project, we:

- reviewed each individual change order for impact on scope and reviewed supporting documentation;
- discussed change orders with project managers to get additional details on changes;
- and inquired of project managers about other changes that they recollected.

To determine the reasons for cost, schedule, and scope changes we reviewed change order packages for the details of changes and interviewed project managers. We interviewed a current and a former member of the House Committee on Corrections and Institutions about scope changes related to

[36] Substantial completion is a construction industry term indicating that work is sufficiently complete that the owner can occupy or utilize the building for its intended use. The date of substantial completion, if there is one, is clearly documented.

the health lab project. SAO discussed value engineering changes with project managers to determine how they affected the project cost.

We requested supporting documentation for BGS' cost estimates. For those projects where documentation was available, we reviewed the cost estimate as to source, methodology for creating the estimate, and contingencies included in the estimate.

SAO identified limitations and weaknesses in BGS' project cost tracking so SAO calculated actual project costs for the 10 projects. SAO calculated actual project costs as of June 30, 2016 because the nine finished projects ended before this date. For two projects, greater than $200,000 was paid after this date and SAO included these costs in the total actual project cost.

For the actual project cost, we extracted data from the State's accounting system, VISION, using the field "project ID" as the variable that would identify costs associated with a particular project. We consulted with the project managers to determine if they were aware of any additional project IDs used on their projects. We obtained appropriation tracking spreadsheets (CAPCONs) from the Agency of Administration, which show project expenditures along with project IDs, and we reviewed them for evidence of alternative project IDs being used. Additionally, we reviewed contract documents, which contain project IDs, for any IDs that had not been discovered in the previous procedures.

To determine if this information was reliable and complete, we compared the calculated actual cost from VISION to the project costs as recorded in the CAPCONs.

We noted that some staff costs were included in the VISION data. We discussed with project managers and BGS management how staff costs were accounted for. We excluded staff costs from our calculation of total project cost because BGS staff did not start recording staff costs in VISION until 2014 and because BGS staff costs are not included in project cost estimates.

As an additional check on actual cost, we reviewed the capital bill appropriation acts to determine what funding was requested for each project and how much was actually appropriated to each project by the Legislature. Because the CAPCONs track expenditures by appropriation, we reviewed them to determine if the appropriated funding was used specifically for the project or if other appropriations were used for project costs.

We also requested information on how project managers tracked actual costs and obtained the project managers' cost tracking spreadsheets, if applicable.

For the National Life project, SAO obtained confirmation from National Life of the total tenant improvement costs billed to the State by National Life and the costs paid by National Life. SAO verified the costs of architectural/engineering firm by vouching costs recorded in VISION to invoices. SAO also corroborated the costs recorded by the project manager in a cost tracking spreadsheet to CAPCON reports and VISION reports.

During the audit, we performed procedures to review BGS' compliance with the State's procurement and contracting policies. These procedures included:

- Review of sole source procurements and contract amendments to determine if BGS complied with state procurement requirements.
- Review of change orders to determine if approval from the Secretary of the Agency of Administration was obtained, as required by the State's administrative bulletins and BGS' contracting plan.
- Comparison of construction contract language to an administrative bulletin regarding the delegation of authority.
- Consultation with the Attorney General's Office regarding interpretation of statute, contract terms, and administrative bulletins.

Our audit field work was performed between August 2016 and May 2017, and included visits to the Department of Buildings and General Services headquarters in Montpelier, Vermont.

We conducted this performance audit in accordance with generally accepted government auditing standards, which 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 the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

Appendix II
Abbreviations

AGO	Attorney General's Office
BGS	Department of Buildings and General Services
CAPCON	Capital Construction
CON	Certificate of Need
FEMA	Federal Emergency Management Agency
FY	Fiscal Year, starting July 1 and ending June 30
GAO	Government Accountability Office
GSA	General Services Administration
HVAC	Heating, Ventilation, and Air Conditioning
OPC	Office of Purchasing and Contracting
PSAP	Public Safety Answering Points
RFP	Request for Proposal
SAO	State Auditor's Office
V.S.A.	Vermont Statutes Annotated
VISION	Vermont Integrated Solution for Information and Organizational Needs

Appendix III offers an overview of each project, including project description. Cost overage information is presented to the extent it was available in project documentation or a project manager estimated a cost impact.

Figure 4: Lamoille County Courthouse

Table 4: Lamoille County Courthouse Project Summary

Project Description	The purpose of this project was to build additional space and to renovate the existing Courthouse to improve security and ADA access.
Site	County-owned site in Hyde Park
Occupant	Judiciary
Cost estimate	$6.7 million estimate prepared by BGS based on external architect estimate and provided to the legislature at the time construction funding was requested.
SAO calculation of actual cost as of 6/30/2016[a]	$8,790,000
Cost overage	$2.1 million overage (31 percent). Change orders requested by building owner for increased security added $372,000; inflation added $330,000.
Funding sources	Capital appropriations
Completion Date	Substantial completion on May 11, 2016

[a] Additional invoices totaling over $200,000 were paid after 6/30/2016 and were included in the actual cost calculation.

Figure 5: Middlesex Therapeutic Community Residence

Table 5: Middlesex Therapeutic Community Residence Project Summary

Project description	The purpose of this project was to construct a temporary seven-bed Secure Residential Recovery Facility in Middlesex in order to provide a safe, secure, and therapeutic recovery place for persons in the custody of the Commissioner of Mental Health.
Site	State-owned site in Middlesex
Occupant	Department of Mental Health
Cost estimate	$1.5 million estimate prepared by BGS and presented in the Certificate of Need Application
SAO calculation of actual cost as of 6/30/2016	$2,246,000
Cost overage	$732,000 overage (48 percent), including $200,000 to improve the energy efficiency of the modular buildings.
Funding sources	$1.16 million FEMA reimbursement $1.01 million Capital appropriations $48,000 Other funds
Completion date	Certificate of Occupancy was granted on June 14, 2013.

Figure 6: Montpelier District Heat Plant

Table 6: Montpelier District Heat Plant Project Summary

Project Description	The purpose of this project was to flood-proof and increase the efficiency and capacity of the existing district heat plant, enabling the State to sell heat to the City of Montpelier. The boilers were replaced and the building enlarged from 5,276 to 17,104 square feet.
Site	Existing state-owned building in Montpelier
Occupant	BGS
Cost Estimate	$15.05 million, estimate calculated by the economic consultants and provided to the legislature at the time construction funding was requested.
SAO calculation of actual cost as of 6/30/2016	$19,650,000
Cost overage	$4.6 million overage (31 percent). $2.3 million due to selective demolition, flood proofing, unexpected conditions and complexity of project.
Funding sources	$12.8 million in capital appropriations $6.9 million in grants from the federal Department of Energy.
Completion Date	Substantial completion June 2, 2014

Figure 7: National Life North Lobby Entrance

Table 7: National Life, Montpelier Project Summary

Project description	To renovate and install modular furniture and wall panels in 187,243 square feet of leased space for 1,063 state employees. Renovations included HVAC, plumbing, sprinklers, electrical, data and communications cabling, floor coverings, windows, and an entrance vestibule.
Site	Owned by National Life, located in Montpelier, Vermont
Occupant	Multiple state agencies, including Agency of Transportation, Agency of Natural Resources, and Agency of Commerce and Community Development
Cost estimate	$6.3 million estimate developed by landlord and provided to project manager upon assignment to the project.
SAO calculation of actual cost as of 6/30/2016	$9,649,000
Cost overage	$3.3 million overage (53 percent). $1.1 million to design and renovate the Records Center building and $1.1 million for HVAC, electrical, and data and communications cabling.
Funding sources	$5.1 million capital appropriations $3.5 million National Life Tenant Improvements Allowance [Per the lease, National Life paid for $3.5 million of the tenant improvements. National Life expects to recoup this from the State over the term of the lease] $1.1 million Fee for Space Fund
Completion date	Final move-in date was May 17, 2013

Figure 8: Public Health Laboratory, Colchester

Table 8: Public Health Laboratory, Colchester Project Summary

Project Description	The purpose of this project was to construct the Vermont Public Health Laboratory. The laboratory performs testing to monitor Vermont's population and environment for threats to public health.
Site	Site in Colchester purchased for $3.1 million
Occupant	Department of Health
Cost estimate	$29 million estimate developed by external architect firm and provided to Legislature when funding for site acquisition was requested.
SAO calculation of actual cost as of 6/30/2016	$38,766,000
Cost overage	$9.8 million (overage 34 percent). Change orders added $2.2 million to the project.
Funding sources	Capital appropriations
Completion Date	Substantial completion March 13, 2015

Figure 9: St. Albans Maintenance Shop

Table 9: St. Albans Maintenance Shop Project Summary

Project Description	The purpose of this project was to build a maintenance shop outside the security perimeter at the Northwest State Correctional Facility in St. Albans. This facilitates BGS staff working on buildings in the area without having to go into and out of the security perimeter.
Site	State-owned site at the Northwest State Correctional Facility in St. Albans
Occupant	BGS
Cost estimate	$350,000, estimate developed by BGS and provided to the legislature at the time construction funding was requested.
SAO calculation of actual cost as of 6/30/2016	$606,000
Cost Overage	$256,000 overage (73 percent). An additional contract was needed for permitting and designing utilities ($17,000), and a change order was needed for building the utilities, ($75,000).
Funding sources	Capital appropriations
Completion Date	Division of Fire Safety Inspection 3/20/2013

Figure 10: Vermont Psychiatric Care Hospital, Berlin

Table 10: Vermont Psychiatric Care Hospital, Berlin Project Summary

Project Description	The purpose of this project was to build a 25-bed state owned and operated psychiatric hospital. This hospital was needed because the Vermont State Hospital in Waterbury was destroyed during Tropical Storm Irene.
Site	Site in Berlin purchased for $2,315,000
Occupant	Department of Mental Health
Cost estimate	$25.5 million developed by external architect firm and BGS. Presented in the Certificate of Need Application
SAO calculation of actual cost as of 6/30/2016	$28,215,000
Cost overage	$2.8 million overage (11 percent) including: $218,000 for a change in telecommunications system, $162,000 in tenant requests after substantial completion.
Funding sources	$13.7 million FEMA and insurance reimbursement $8.1 million capital appropriations $5.9 million Fee for Space $500,000 general fund
Completion Date	Substantial completion was June 27,2014.

Figure 11: Vermont Veterans' Home, Bennington Mold Growth

Table 11: Vermont Veterans' Home, Bennington Project Summary

Project Description	The purpose of this project was to address mold growth, including mold remediation, asbestos removal, and HVAC improvements.
Site	Vermont Veterans' Home building in Bennington. Owned by Board of Trustees.
Occupant	Vermont Veterans' Home
Cost Estimate	$1.5 million calculated by BGS, Provided to Legislature at the time construction funding was requested.
SAO calculation of actual cost as of 6/30/2016	$1,768,000
Cost overage	$317,000 overage (22 percent). Included the discovery of additional mold and unforeseen site conditions, and the contractors' bids being higher than expected.
Funding sources	$1.7 million capital appropriations $102,000 other
Completion Date	Substantial completion April 7, 2015

Figure 12: Westminster Public Safety Facility

Table 12: Westminster Public Safety Facility Project Summary

Project description	The purpose of this project was to construct a Public Safety Field Station located in Westminster. This facility also houses PSAP, Emergency Operations Center, offices for Fish and Wildlife and Fire Safety, and provide storage for large emergency response vehicles and equipment.
Site	Site in Westminster purchased for $287,000
Occupant	Department of Public Safety
Cost estimate	$6.2 million estimate developed by BGS and provided to Legislature when funding for construction was requested.
SAO calculation of actual cost as of 6/30/2016[a]	$6,917,000
Cost overage	$767,000 overage (12 percent) including: $350,000 requirements for fire code compliance, $168,000 mitigate unsuitable soils, and $143,000 PSAP consoles.
Funding sources	Capital appropriations
Completion date	Substantial completion was May 18, 2016.

[a] Additional invoices totaling over $200,000 were paid after 6/30/2016 and were included in the actual cost calculation.

Figure 13: 108 Cherry Street, Burlington

Table 13: 108 Cherry Street, Burlington Project Summary

Project Description	The purpose of this project was to replace over 150 heat pumps that had reached the "end of their useful life" and the old chiller and chilled water system; some associated lined duct removals and replacements; and some necessary carpet and ceiling tile replacements in affected areas.
Site	Existing state-owned building in Burlington
Occupant	Department of Health, with small areas occupied by other state departments.
Cost Estimate	$3.5 million calculated by BGS. Provided to Legislature when construction funding was requested.
SAO calculation of actual cost as of 6/30/2016	$1,592,000
Cost overage	The project is not complete.
Funding sources	Capital appropriations
Completion Date	Not yet complete

VERMONT

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June 6, 2017

Douglas R. Hoffer
Vermont State Auditor
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Montpelier, VT 05633-5101

Dear Auditor Hoffer,

Thank you for the opportunity to respond to the audit findings in your review of the Department of Buildings and General Services (BGS) Capital Construction Program. BGS management has reviewed your 17 recommended process changes, especially those that seek better documentation of schedules and project estimating to improve our project development performance. In general, we have no objection to these recommendations to improve documentation of our processes with the goals of improved project estimating and scheduled adherence. In fact, we are currently implementing project scheduling software to improve project schedules and we have instituted your recommendation to require a change order memo for the contract files. Additionally, we are in the final stages of implementing a new scoping process that will require a completed scope for each major capital project including an estimated spending profile and project delivery schedule. This process will also contain management approval to reduce scope creep and change orders.

We also agree with the findings that BGS lacks basic tools typically found in other states that manage facilities to better document the capital construction process. These tools include project scheduling and project tracking software. While the State of Vermont is pursuing these tools in an integrated fashion with other enterprise level administrative programs tied to our financial system, BGS needs to implement a project tracking system in the interim.

With respect to certain conclusions that were made in your audit, I offer the following points for your consideration:

Two Year Capital Bill

See our comment 1 on page 59

The change by the State to a two-year Capital Bill, while increasing flexibility to adjust capital funds to better meet project needs over that two-year period, it has also made project estimating for some projects that begin construction in the second year more challenging. Typically, that cohort of projects hasn't even finished the scoping process and we must provide a budget estimate for construction. The State either needs to slow down building projects to complete scoping thereby delaying a project one to two years or understand that the project estimate and scope is going to change as the project constraints are identified and design is advanced.

Project Schedules

See our comment 2 on page 59

Many things can impact a project schedule including a lack of funding. Two of the projects reviewed, the Public Health Lab and the Westminster Public Safety Facility, had funding pulled from the projects by the Legislature to accommodate other needs due to the impacts from Tropical Storm Irene (TSI). Both projects exceeded a 40-month delay in large part due to a lack of funding and skewed the average delays for the projects reviewed in the aggregate. These issues of funding are outside the control of BGS and while the report acknowledges this fact, we believe the overall aggregated project delay numbers should have been adjusted without inclusion of these outliers.

Project Estimating

There are many factors that can cause a project estimate to differ from the actual costs to construct the project. The time of year a project goes out to bid has an impact on project costs. If the project is bid during the summer construction season, the price generally exceeds the estimate as contractors already have their work lined up for the year. Even if the project is put out to bid during an optimal time of year, the prices provided by contractors also vary greatly, indicating BGS is not the only organization that has struggles with developing a construction estimate in capital construction.

In many cases, the discrepancy of expected to actual costs pertains to ever changing market and development trends nationally and in Vermont. A typical scoping process takes 6 to 9 months to gather and assess data including, but not limited to, client and building needs, site selection, site/building survey, existing utilities, right-of-way (ROW), environmental resource identification, and subsurface conditions. Absent this information, it is virtually impossible to develop a reliable scope, cost estimate, and delivery schedule. In addition, client needs may change unexpectedly during project development and delivery at no fault of BGS. This is usually due to unanticipated organizational changes such as consolidation, increases or decreases in staff, and changes to existing programs.

Unforeseen Site Conditions

See our comment 3 on page 59

On page 19 of the audit report is the following sentence, "SAO believes the reasons cited for changes to cost, schedule, and scope are not the root cause of the differences between estimated and actual results for capital projects." But the SAO does not provide the reason, the "root cause" of these differences in the report and seems to dismiss the reasons articulated by BGS project managers as to the actual reasons between estimated and actual causes. We do not dispute that BGS could do a better job of documenting those reasons in our contract and project files but to say we don't understand the root causes of the delays or why a project goes over budget is misleading. If the SAO found alternative reasons other than those stated by BGS project managers, we are sure they would have been included in the report.

See our comment 4 on page 59

With respect to unforeseen site conditions, the Westminster Public Safety Facility was used an example where project costs increased by $168,000 due to the discovery of four fuel tanks and woody debris. This project received extensive borings which did not detect the four deeply buried tanks nor the woody debris. BGS could take additional borings beyond what is customary best practice in the buildings industry but these additional scoping expenses would have to be justified over time in the best interest of the State. We are comfortable with the balance we are striking with the level of borings we conduct on our projects. It should be noted that the $168,000 in additional expenses would have had to have been paid on the project regardless of whether the fuel tanks and woody debris were identified in scoping. We do agree that finding those items in the scoping phase

would have produced a better project estimate but again it's a balance in determining what's in the best interest of the State.

Contract Amendments

See our comment 5 on page 60

Contract amendments are common in the delivery of construction projects. These amendments allow the owner to respond rapidly to urgent needs and provide consistency from one phase of project delivery to another. Openly bidding each phase of project delivery such as scoping, design, and construction oversight adds considerable time to the schedule for the procurement of services ultimately increasing administrative costs and reducing our ability to deliver projects on-time. It's also in the best interest of the State to retain the same firm for all phases of design to ensure consistency in the development of project plans and specifications as well as providing oversight of the project during construction. When different firms are hired for distinct phases of design or construction, it creates inconsistencies and often results in inefficiencies, errors, and project delays as the new firm needs to come up to speed and often request additional information to conform to their own practices and comfort.

Your report also highlighted that BGS has some work to do to better align our change order process and the project manager's ability to bind the State with the approval process outlined in state statute and the requirements of Bulletin 3.5. We are going to work with the Secretary of Administration to create better alignment between the BGS contracting plan, state statute and our regulatory framework with the assistance of the Attorney General's Office.

In closing, we appreciate the recommendations for improving our documentation of our processes, the need to create additional policies and procedures that guide the development of projects, the need for scheduling and tracking systems for projects and the benefits that completed scoping projects will bring to project estimates and scheduling. We look forward to implementing many of these recommended changes and going over our work with your audit team in a year.

Best regards,

Christopher Cole
Commissioner

SAO Evaluation of Management Comments

The following presents our evaluation of specific comments made by the Commissioner of the Department of Buildings and General Services.

Comment 1	The uncertainty associated with estimating project cost cited by BGS in its comment regarding the Capital Bill process reinforces our recommendation that the department develop documented policies and procedures for cost estimate preparation.
Comment 2	SAO did not report an average schedule delay for the projects reviewed, so BGS' suggestion that two projects are outliers that skewed reported results is not accurate. Rather, we reported that project schedule delays ranged from two to forty-five months past the forecast completion date for nine completed projects. In our draft report, we acknowledged in our findings that Tropical Storm Irene caused a two-year delay for the Public Health Lab and the Westminster Public Safety Facility (both of which were completed over forty months later than anticipated). In our final report, we added this information to our highlights section, which summarizes our audit findings.
Comment 3	We do not dismiss the reasons for cost overruns and schedule delays identified by project managers. Rather, we point out that an explanation such as unforeseen condition is not the root cause as it does not provide sufficient detail to identify corrective measures and lessons learned to apply to other construction projects. For clarity, we have added the definition of root cause as a footnote on page 20 of the report. Since BGS had not compared capital project outcomes to expected results and as a result had not identified the underlying causes of changes to cost, schedule, and scope, we were not able to report actual root cause for most of the changes. The sentence that BGS referred to is now on the bottom of page 20 of this report because the report page numbering has changed.
Comment 4	We provided three examples of projects with unforeseen site conditions cited as a reason for cost overruns. We theorized that additional site investigation or increasing contingencies in cost estimates may be appropriate to address this risk. We did not recommend that additional site testing be conducted to identify unforeseen conditions, rather we recommended that BGS develop a system to evaluate capital construction project performance, including identification of root cause of differences.

Comment 5	BGS has misinterpreted our finding. We did not conclude that each phase of a project should be competitively bid. Rather, we pointed out three instances where BGS added services to existing architectural engineering contracts, significantly changing the scope of work and dollar value of the original contract without competitively bidding the added services. Because state policy forbids the use of contract amendments to circumvent the State's requirements regarding competitive procurement, but does not explain what constitutes a significant scope or dollar amount change requiring competitive bidding rather than a contract amendment, we recommended that BGS seek clarification of the policy from the Agency of Administration.