



March 2017

VA CONSTRUCTION

Improved Processes Needed to Monitor Contract Modifications, Develop Schedules, and Estimate Costs

Accessible Version

GAO Highlights

Highlights of [GAO-17-70](#), a report to congressional addressees

Why GAO Did This Study

VA has 26 ongoing medical-facility construction projects intended, for example, to provide improved care to veterans returning from Afghanistan and Iraq. GAO has previously reported on VA's weaknesses in managing major projects. Congress continues to have questions about VA's project management practices and mandated that VA outsource to other federal entities the design and construction of certain ongoing projects and future projects costing \$100 million or more.

In response to a 2016 defense authorization, this report assesses 1) VA's actions since 2013 to address challenges managing projects costing \$100 million or more and 2) opportunities for improvements in managing these projects, particularly VA's medical facility in Denver, CO, the only project outsourced to USACE that is under construction. GAO reviewed reports on VA management of projects, interviewed VA and USACE officials, and visited five projects to compare their management to VA policies and procedures. Selected projects include the most costly, those in various stages of construction and projects managed by VA and USACE. GAO also analyzed the estimated cost and schedule of the Denver project for adherence to best practices.

What GAO Recommends

VA should (1) establish a mechanism to monitor change orders, (2) develop a reliable activation cost estimate for the Denver project, and (3) clarify policies on integrating schedules. VA concurred with our recommendations. VA and USACE provided technical comments which we incorporated as appropriate.

View [GAO-17-70](#). For more information, contact Dave Wise at (202) 512-5731 or wised@gao.gov

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What GAO Found

The Department of Veterans Affairs (VA) has taken steps to address challenges in managing projects to build medical facilities. In response to statutory requirements and additional congressional direction, VA is outsourcing management of certain such projects to the U.S. Army Corps of Engineers (USACE). As of October 2016, VA had 23 ongoing projects costing \$100 million or more. VA and USACE have entered into interagency agreements for 12 of these 23 projects. The agreements entail USACE's managing the projects while VA retains responsibility for their overall completion, including activation (making the facility ready for full operation after construction, such as adding medical equipment). VA has also revised policies and procedures for managing projects not outsourced to USACE, such as streamlining the change order process, or approving changes to a facility's design.

VA still has opportunities to improve tracking change orders for major projects and estimating cost and schedules for the \$1.675-billion Denver construction project—the only USACE-managed project under construction thus far:

- Specifically, while VA has issued guidelines to streamline the change order process and plans to collect data on time frames, it lacks a mechanism to systematically collect or monitor data on time frames to process change orders. Although VA's contract management software collects information on dates change orders were initiated and approved, VA does not use the software to determine if changes are approved within the required time. Further, it does not currently track reasons for change orders, such as whether VA medical staff requested them. VA plans to replace this software with a system that records this information. Although procurement of this system has been delayed, VA intends to implement a system to monitor time frames by March 2017. However, it is not yet clear how VA plans to use new information it collects to oversee change orders because VA lacks a mechanism to oversee and monitor changes to a facility's design as a project progresses. Without such a mechanism, VA cannot determine how processing timeframes and design changes affect costs and schedules and thus is at risk for unexpected cost increases and schedule delays.
- In assessing VA's medical facility project in Denver, GAO found opportunities to improve cost estimates and schedules. VA's activation cost increased from \$272 million in 2012 to \$341 million currently. However, the current estimate is not reliable; VA officials could not provide information on how they developed it and GAO could not determine if it meets criteria in the *GAO Cost Estimating and Assessment Guide*. Further, GAO's analysis showed that the construction and activation schedules are not integrated, so that the construction schedule's milestones do not align with the activation schedule. Leading practices and VA policies both call for integrating such schedules to help ensure projects' successful and timely completion. However, VA's policies to integrate such schedules are inconsistent and unclear. The combined problems with the activation cost estimate and schedule integration put Denver's VA medical facility at risk of further cost increases and delays. Without reliable information on activation costs and schedules for the Denver project, VA has no assurance that the schedules are realistic and that current funding will suffice to complete construction and activation.

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Abbreviations

ACBM	Activation Cost Budget Model
CFM	Office of Construction and Facilities Management
eCMS	Electronic Contract Management System
IMS	integrated master schedule
OMB	Office of Management and Budget
PMP	project management plans
USACE	U.S. Army Corps of Engineers
VA	Department of Veterans Affairs
VHA	Veterans Health Administration

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March 7, 2017

Congressional Addressees

The Department of Veterans Affairs (VA) operates one of the largest health care systems in the country with over 1,700 sites serving almost 9-million veterans in 2015. VA has been building new medical facilities to replace facilities that were built decades ago and to provide veterans returning from Afghanistan and Iraq with specialized care. VA is required to submit a prospectus to the House and Senate Committees on Veterans' Affairs when it proposes to build, renovate, or acquire any medical facilities estimated to cost more than \$10 million,¹ known as "major medical facility projects." We have previously reported on significant cost overruns on VA's projects to build major medical facilities as well as weaknesses in managing these projects.² Specifically, in 2013, we reported on cost overruns totaling \$1.5 billion on four major medical-facility construction projects in Denver, CO; Las Vegas, NV; New Orleans, LA; and Orlando, FL.³ Congress has raised questions about VA's administration and oversight of these projects and passed several laws related to VA's construction of major medical facilities: (1) in 2015, Congress passed and the president signed the Department of Veterans Affairs Expiring Authorities Act of 2015, (2) the National Defense Authorization Act for Fiscal Year 2016, and (3) the Consolidated Appropriations Act, 2016.⁴ Collectively, these three laws require VA to contract with other federal entities to provide full project-management services for the design and construction of certain ongoing construction projects with a total estimated cost of \$100 million or more.⁵ Furthermore,

¹38 U.S.C. § 8104.

²GAO, *VA Construction: Additional Actions Needed to Decrease Delays and Lower Costs of Major Medical-Facility Projects*, [GAO-13-302](#) (Washington, D.C.: April 2013).

³[GAO-13-302](#).

⁴Pub. L. No. 114-58, § 502, 129 Stat. 530, 537-38; Pub. L. No. 114-92, 129 Stat. 726, 1020 (2015); Pub. L. No. 114-113, 129 Stat. 2242, 2691-92 (2015), respectively.

⁵In addition, the explanatory statement accompanying the Consolidated Appropriations Act, 2016 specified seven ongoing projects for which VA was directed to outsource design and construction management. These seven projects are in Alameda, CA; American Lake, WA; Livermore, CA; Long Beach, CA; Louisville, KY; San Francisco, CA; and West Los Angeles, CA.

the three laws collectively require that VA contract out management of any new projects costing \$100 million or more.⁶ All of these projects that are contracted out are known as “super construction projects.” VA has chosen the U.S. Army Corps of Engineers (USACE) to manage these projects. VA will continue to manage other ongoing construction projects costing \$100 million or more not specified by the three 2015 laws.

Regardless of whether a VA medical facility project is managed by USACE or VA, all such projects are funded through VA appropriations. Additionally, VA will still be responsible for “activating” all construction projects—a process by which VA identifies, plans, and manages the steps to bring a newly built medical facility into operation, such as purchasing medical equipment and hiring new staff.

The National Defense Authorization Act for Fiscal Year 2016 included a provision requiring us to report on VA’s oversight and administration of the design and construction of major medical-facility projects. Separately in 2015, House Veterans Affairs Committee requesters asked us to review the same issues. In November 2016 we provided an interim briefing to Senate and House Veterans Affairs Committees as well as the Senate and House Appropriations Subcommittees on Military Construction, Veterans Affairs, and Related Agencies to meet our mandated reporting date. This report assesses VA’s administration and oversight of the medical facility construction projects outsourced to USACE and those that VA still manages.⁷ Specifically, we reviewed

- actions VA has taken since 2013 to address challenges in its administration and oversight of the highest cost medical-facility construction projects (those costing \$100 million or more), and

⁶More specifically, the construction management requirements in Department of Veterans Affairs Expiring Authorities Act of 2015 explicitly apply to the VA medical facility construction project in Denver, CO, as well as any super construction project authorized on or after September 30, 2015. Pub. L. No. 114-58, § 502, 129 Stat. 530, 537-38. The construction management requirements in the National Defense Authorization Act for Fiscal Year 2016 apply to VA medical facility projects of more than \$100 million authorized after November 25, 2015. Pub. L. No. 114-92, 129 Stat. 726, 1020 (2015). In addition, the Consolidated Appropriation Act, 2016 provided that \$649 million of VA’s Fiscal Year 2016 appropriation would remain unavailable until VA enters into an agreement with an appropriate non-VA federal entity for projects with a total estimated cost of \$100 million or more. Pub. L. No. 114-113, 129 Stat. 2242, 2691-92 (2015).

⁷All of the projects that we focus on in this report cost \$100 million or more.

- what opportunities, if any, exist for VA to make additional improvements to its administration and oversight of these projects, particularly at the VA medical facility in Denver, CO, the only USACE-managed project that is currently under construction.

To determine the actions VA has taken since 2013 to address challenges in the administration and oversight of medical-facility construction projects costing \$100 million or more, we reviewed the following: (1) prior GAO, VA Office of Inspector General and USACE reports on VA's management of these projects and (2) VA's policies and guidance on project administration and oversight, particularly those policies and guidances implemented or revised since we last reviewed VA's construction of medical facilities.⁸ We also interviewed VA headquarters and USACE officials and selected 5 of 26 construction projects for in-depth case study reviews in Denver, CO; Louisville, KY; New Orleans, LA; Palo Alto, CA; and St. Louis, MO.⁹ These projects were among the most costly and at a variety of stages in the construction process (see fig. 1 on pg. 5). In our sample, we also included projects VA was managing as well as those USACE was managing. For each project, we reviewed construction documents and examined cost and schedule data. We also interviewed VA and, where applicable, USACE staff responsible for managing design and construction and design and construction contractors, and VA medical center staff, and liaison with representatives of local veterans services organizations. The information from our selected projects is illustrative and cannot be generalized to sites agency-wide. To determine how VA could improve its administration and oversight of medical facility construction projects costing \$100 million or more, we also compared management of the projects we reviewed to VA's policies and procedures to determine the extent to which they were followed. In addition, we analyzed cost and schedule data for the Denver, CO, project; this is the only project that USACE is managing that is currently under

⁸GAO-13-302.

⁹Of these 26 projects, 23 are estimated to cost \$100 million or more. The remaining 3 are estimated to cost less than \$100 million. The selected projects are new medical facilities being built in Denver, CO; Louisville, KY; and New Orleans, LA; ambulatory care and polytrauma-blind rehabilitation facilities being built in Palo Alto, CA; and a facility improvement project in St. Louis, MO. The Denver project is actually located in Aurora, CO, but because it is replacing the facility in Denver and is frequently referred to as the Denver project; we will refer to it as the Denver project for purposes of this report. VA is managing the New Orleans, Palo Alto, and St. Louis projects, while USACE is managing the Denver project and has agreed to manage the Louisville project.

construction.¹⁰ We discussed Denver’s activation cost and schedule with VA’s local and headquarters staff, as these two activation factors were not integrated within the construction estimate and schedule. We assessed the reliability of the Denver construction estimate and schedule data through interviews with knowledgeable VA staff and a review for completeness and any unexpected values and determined that the data were sufficiently reliable for the purpose of our reporting objectives. We compared VA’s and USACE’s process for estimating the cost and schedule of the Denver project with GAO best practices. Specifically, we compared the process used to estimate the Denver project’s construction cost estimate to best practices identified in the *GAO Cost Estimating and Assessment Guide*.¹¹ Similarly, we compared the process used to develop the Denver project’s schedule estimate with GAO’s *Schedule Assessment Guide*, which defines best practices related to four characteristics—comprehensive, well-constructed, credible, and controlled—of high-quality, reliable schedule estimates).¹² Appendix I contains a more detailed description of our scope and methodology.

We conducted this performance audit from January 2016 to March 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

¹⁰The Denver project is the largest of all of VA’s projects in terms of cost and thus the only one for which we assessed cost and schedule estimates.

¹¹GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (Supersedes [GAO-07-1134SP](#)), [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009). This guide identifies best practices across the federal government that are the basis for a high-quality, reliable cost estimate.

¹²GAO, *Schedule Assessment Guide: Best Practices for Project Schedules*, [GAO-16-89G](#) (Washington, D.C.: Dec. 22, 2015). The GAO’s *Schedule Assessment Guide* presents the scheduling concepts introduced in the *Cost Estimating and Assessment Guide* as 10 leading practices associated with developing and maintaining a reliable, high-quality schedule. The leading practices were developed in conjunction with government and industry experts in the schedule-estimating community. GAO’s *Schedule Assessment Guide* serves also to present guiding principles for our auditors in evaluating the economy, efficiency, and effectiveness of government programs.

Background

VA has pressing infrastructure needs and has struggled to make progress in addressing them. Many of VA's facilities were built decades ago and were designed for an inpatient-driven health care system and do not align with VA's current wellness approach to provide health care through an integrated system emphasizing a full continuum of care, in particular outpatient care. Additionally, as we reported in 2013,¹³ new or expanded facilities are needed to accommodate veterans returning from Iraq and Afghanistan who need specialized treatment. To meet the health care needs of veterans, VA has 23 construction projects under way, costing \$100 million or more. As noted previously, VA is required to submit a prospectus to the House and Senate Committees on Veterans' Affairs that contains information about each planned medical-facility project expected to cost \$10 million or more.¹⁴ This information includes an initial estimate of the overall cost and, in some cases, a completion date for the project.

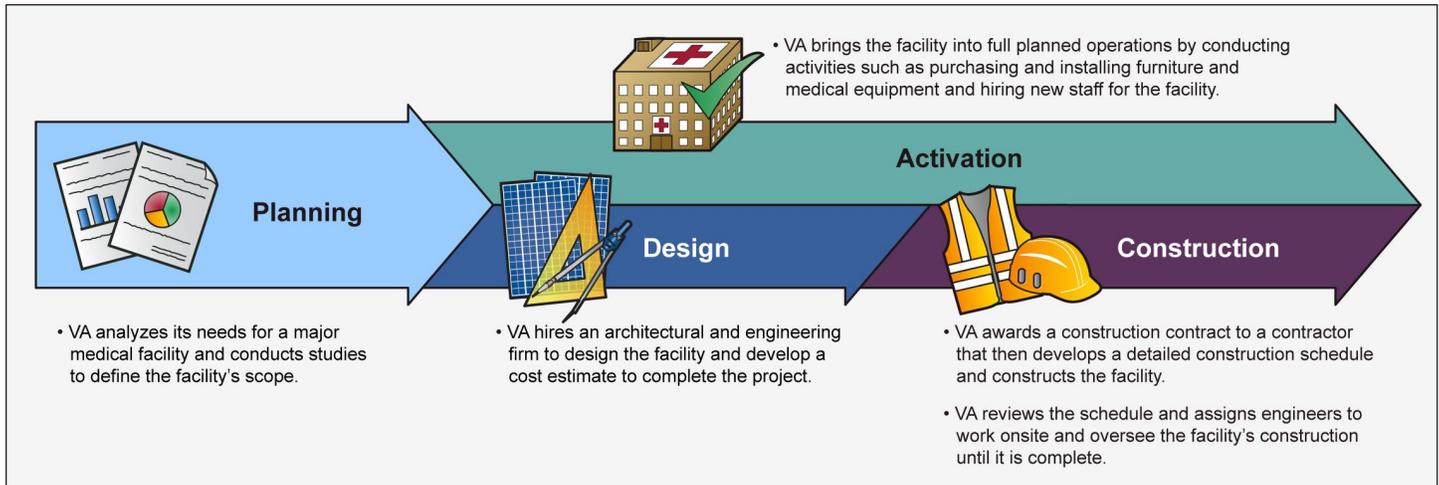
VA classifies the phases of construction projects it manages in the following terms: (1) initial planning; (2) design of the facility; (3) construction; and (4) activation. (See fig. 1 for more details.) VA's Office of Construction and Facilities Management (CFM) in conjunction with VA's Veterans Health Administration (VHA) is responsible for planning, designing, and constructing new medical facilities, including medical facility projects costing more than \$100 million that are not managed by USACE.¹⁵ VHA is responsible for activating new medical facilities. As figure 1 indicates, activation activities, such as purchasing equipment and hiring staff, begin during design, continue through construction, and end when the facility is fully operational. VA's Activations Office supports activation efforts by issuing guidance and offering some services, including cost-estimating services.

¹³[GAO-13-302](#).

¹⁴38 U.S.C. § 8104.

¹⁵CFM executes these projects under the oversight of the Office of Acquisition, Logistics, and Construction.

Figure 1: Phases of a Department of Veterans Affairs' (VA) Project for Medical Facility Construction.



Source: GAO analysis of VA information. | GAO-17-70

VA staff at various organizational levels are responsible for managing the construction of medical-facility projects. Contracting officers, occasionally located on-site to support the senior resident engineer in executing the construction contract, are ultimately responsible for managing the execution of construction contracts; other onsite staff—such as the project executive and resident engineers—oversee the actual construction. In some instances, staff from CFM's regional offices and VA's headquarters, including attorneys in the Office of General Counsel, provide assistance to the project team. According to VA officials, the VA's medical center staff, such as the medical center director, are involved in facility design and are responsible for monitoring construction to ensure that the facility will meet veterans' needs.

According to USACE officials, USACE acts as the design and construction agent on projects it manages and its construction process includes four phases that are similar to VA's process:

- *Planning and Programming:* The agency that USACE supports—in this case, VA—identifies the need for the project and its scope. USACE provides technical support and advice as needed.
- *Design:* USACE develops criteria for the project and engineering and architectural details as well as major contract procurement and other legal documents and schedules. USACE takes the lead in this phase; VA is directly integrated into the project team.

- *Construction*: USACE awards and administers the construction contract and is involved in activities such as project management, engineering, contracting, and legal counsel. USACE takes the lead in this phase; VA is directly involved in the project team.
- *Operation and Maintenance*: VA is responsible for operations and maintenance once construction is complete, although USACE may provide technical assistance as needed.

As we previously noted in our 2013 report, most construction projects require some degree of change to the facility design as the project progresses. Typically, organizations have a process to initiate and implement these changes through “change orders.”¹⁶ Changes can occur for a variety of reasons, including design errors, unforeseen site conditions, and changes in medical practice and safety requirements, as well as changes to improve equipment. In general, government contracts contain a changes clause that permits the contracting officer to make changes, in designated areas, within the general scope of the contract.¹⁷ Contractors can also request changes to the contract. Agency guidance specifies milestones for change orders, depending on their dollar value.¹⁸

In our 2013 report, we found significant cost increases and delays for the four projects we reviewed.¹⁹ We attributed those cost increases and delays to various factors, including changes to veterans’ health care needs, site acquisition issues, and problems in VA’s management of medical facility projects. We made recommendations intended to improve VA’s management of its major construction projects (specifically, problems with managing change orders and defining VA officials’ roles and responsibilities). These recommendations and VA’s responses are

¹⁶[GAO-13-302](#). These changes are also called contract modifications. For purposes of this report we will refer to them as “change orders.”

¹⁷48 C.F.R. § 43.201.

¹⁸VA, *Contract Modification Handbook for Resident Engineers in Field Offices: Appendix III: Modification Milestones (Version 1.0, Aug. 29, 2013)*.

¹⁹[GAO-13-302](#).

discussed later in this report. In 2015, USACE also reviewed the same four VA medical center projects, with findings similar to ours.²⁰

VA Has Taken Steps Intended to Address Administration and Oversight Challenges of Medical-Facility Construction Projects

Since 2013, VA Has Taken Steps toward Jointly Managing the Projects It Has Outsourced to USACE in Response to a Statutory Mandate

In response to requirements in several federal statutes, VA is in the process of outsourcing the acquisition, design and construction of certain medical facility projects costing \$100 million or more to USACE.

According to VA staff, VA selected USACE because of its engineering and construction experience. Although the Denver project currently is the only project under construction that jointly involves both VA and USACE, the agencies have established an interagency agreement that provides general terms and conditions for future projects.²¹

Further, as of October, 2016, VA and USACE had developed interagency agreements for 11 projects in addition to the Denver project that delegate contract administration authority to USACE.²² These agreements include the value of the services USACE will provide and define USACE's and VA's respective roles and responsibilities. According to USACE officials,

²⁰U.S. Army Corps of Engineers, *Major Medical Construction, United States Department of Veterans Affairs, A Diagnostic Assessment by the United States Army Corps of Engineers, North Las Vegas Medical Center* (July 15, 2015); U.S. Army Corps of Engineers, *Major Medical Construction, United States Department of Veterans Affairs, A Diagnostic Assessment by the United States Army Corps of Engineers, New Orleans Medical Center* (July 15, 2015); U.S. Army Corps of Engineers, *Major Medical Construction, United States Department of Veterans Affairs, A Diagnostic Assessment by the United States Army Corps of Engineers, Orlando Medical Center* (Aug. 17, 2015); and U.S. Army Corps of Engineers, *Major Medical Construction, United States Department of Veterans Affairs, A Diagnostic Assessment by the United States Army Corps of Engineers, Denver-Aurora Medical Center* (June 8, 2015).

²¹VA and USACE plan to develop more specific agreements for each medical facility project USACE agrees to manage.

²²For a list of VA outsourced and managed projects and status see appendix II.

for each medical facility construction project USACE manages, it will provide planning, site acquisition, facility design, construction management, and contract administration services. VA will maintain responsibility for informing Congress and other agencies on the status of projects' cost and schedule, although USACE may provide information regarding the project upon request. In October 2015, USACE began actively managing one of the projects, the Denver VA Medical Center project (see fig. 2), which was about 78 percent complete as of October, 2016, according to VA. As part of managing this project, USACE awarded a new contract to the construction contractor to complete the remaining work on the project. The other projects that USACE is responsible for managing have not yet reached the construction phase. According to USACE officials, because the other projects USACE is taking over are at varying stages of completion, the extent of USACE's involvement in each project may vary.²³

Figure 2: Denver Department of Veterans Affairs Medical Center Project (November 2016)



Source: U.S. Army Corps of Engineers. | GAO-17-70

VA and USACE have also taken the following additional steps to coordinate their efforts on construction projects USACE will manage:

- VA and USACE developed an Enterprise Program Management Plan to provide a framework and consistent approach for USACE to support VA's design and construction program in the future. The plan

²³In addition to taking over management of the Denver, CO, project, USACE has agreed to take over management of the Louisville, KY, project.

formalizes USACE's role and aligns with the underlying goal of the agencies' interagency agreement to deliver medical facility projects within cost and on schedule. In comments on a draft of this report, VA reported that it and USACE executed the plan in December of 2016.

- VA officials stated that, in the future, VA's CFM workforce will be integrated with the USACE team during construction to (1) enable workers to pass along institutional knowledge VA staff gained while managing the Denver project and (2) collaborate and gain familiarity with USACE methods. For example, at the Denver site, eight VA CFM staff—most of whom are resident engineers—are collaborating with USACE's team to learn USACE's processes and share knowledge of VA's standards, while USACE staff are responsible for overseeing the contractors. In the future, VA officials expect to have four to five CFM staff on-site on each project USACE manages.
- VA and USACE officials told us they established "building teams" to help the two agencies' staff work together toward project completion. Building teams are comprised of VA, USACE, and contractor staff and meet regularly to chart and track progress, build and maintain trust, and resolve issues in a timely manner. For example, if the building team discusses and reaches agreement on a change order, all parties are aware of the change at the same time, thus expediting resolution.
- VA is also collaborating with USACE staff in Denver to facilitate integrated project coordination and the execution of contract administration, according to VA officials. VA officials said that integrating CFM staff with USACE in Denver and on future projects will help to incorporate USACE practices and lessons learned on projects that VA will continue to manage. USACE also provided Denver CFM senior resident engineers and resident engineers a 3-day training workshop on USACE construction-quality management processes. According to VA, these participants will form a cadre of CFM staff to work on all future projects.
- VA has also made arrangements to reimburse USACE for managing projects. According to the interagency agreement that specifies general terms and conditions, VA will reimburse USACE for costs to manage these projects. These reimbursements include costs related to overseeing the design and construction of the projects, and when applicable, cost for activities related to the initial assessment and acceptance of VA's previous work in design or construction, or both. VA officials told us that each project will continue to have four to five VA staff who will perform such tasks as interacting with medical center staff to ensure that VA design requirements are met and to coordinate changes during construction. They added that, therefore, this process

will entail additional personnel and layers of review and noted that previously, VA had four staff on-site during medical-facility construction projects, a number that was too few when compared with USACE's staffing model. The VA officials further noted that VA does expect to increase staff on-site at projects to improve safety and control project cost and delivery time.

VA Has Taken Some Steps to Address Challenges Managing Medical Facility Projects

VA implemented the recommendations we made in our 2013 report regarding the management of the four largest medical facilities projects at the time—all costing well over \$100 million—and other identified challenges, by revising the following policies and procedures:

- *Medical Equipment Planners:* Our 2013 report recommended that VA develop and implement guidance to assign medical equipment planners to medical-construction projects costing more than \$10 million.²⁴ This assignment would help VA better respond to changes in technology and equipment. In August 2013, VA issued a policy memorandum providing such guidance. The memorandum also requires the hiring of a medical equipment specialist through the architectural and engineering firm responsible for designing the project when construction projects need medical equipment installed during construction when VA manages construction.²⁵ VA officials at our selected projects indicated that VA has improved its capabilities for medical facilities' planning, including equipment planning, to better ensure coordination with healthcare staff. For example, the Palo Alto medical facility has a permanent staff of equipment planners and architects, which CFM staff said will reduce the number of design changes and change orders during construction; however, as discussed later in this report, VA does not have a mechanism in place to determine if these steps have reduced design changes.
- *Project Roles and Responsibilities:* VA also responded to our recommendation to improve VA staff communication with construction contractors and architectural and engineering firms, particularly to clarify roles and responsibilities related to change orders. We found in

²⁴GAO-13-302.

²⁵Department of Veterans Affairs, Office of Construction & Facilities Management, *Architectural Design Manual* (Aug. 1, 2014).

2013 that a lack of clear communication with contractors contributed to schedule delays and cost increases for medical-facility projects. Contractors were sometimes confused about which CFM staff were responsible for various aspects of project oversight. In September 2013, VA implemented procedures to communicate to contractors the roles and responsibilities of VA officials who manage medical facility construction projects, including the change order process. These procedures include requirements to develop a communications plan and matrix to assure clear and consistent communications with all parties. The communications plan must address, among other issues, regular project communication, such as meetings and in-progress reviews; frequency and method of communication (e.g., e-mail, phone); and stakeholder roles and responsibilities. On the three selected projects we reviewed that VA managed, contractors said they had established good working agreements with CFM to communicate and resolve issues. For example, VA and contractor officials said they conduct frequent walk-throughs and weekly meetings on all projects.

- *Streamlining change order approvals:* VA took several steps to respond to our 2013 recommendation that VA streamline its change order approval process.²⁶ First, in August 2013, VA issued the *Contract Modification Handbook* that established processing time frames for change orders on construction contracts.²⁷ For example, the *Handbook* states that change orders under \$100,000 in value should be processed in 60 days. Furthermore, VA raised the threshold for change orders needing legal review to those with a cost of \$700,000 or more. Previously, all change orders over \$100,000 needed legal review, resulting in delays caused by the length of the legal review process and the large number of changes needing review. Additionally, in March 2015, VA authorized certain regional officials to approve change orders of up to \$2 million; VA's Central Office previously handled these approvals.²⁸ Although VA officials told us these changes have helped streamline the process, as discussed

²⁶GAO-13-302.

²⁷Department of Veterans Affairs, *Contract Modification Handbook for Resident Engineers in Field Offices* (Aug. 29, 2013). In commenting on a draft of this report, VA noted that it has since updated this handbook and expects to finalize and distribute the new version by the end of the second quarter of fiscal year 2017.

²⁸In commenting on a draft of this report, VA stated that it has since raised these limits. Currently, the contracting officer's authority to approve contract actions, including change orders, has increased to \$5 million.

later, VA does not monitor the extent that change orders are processed according to established timelines. As a result, VA does not know if the time frames for processing change orders have actually improved.

As part of VA's overall efforts to improve management of medical facility projects, VA also made other changes to its guidance that apply to all medical-facilities projects costing \$10 million or more that are managed by VA). These changes are summarized in table 1.

Table 1: Other Department of Veterans Affairs' (VA) Actions to Improve Management of Medical Facility Projects

Action	Description of action
Issued guidance on Framework Principles for the Delivery of Major Construction Projects	In September 2013, VA published its guidance to assist medical staff with activating new medical facilities.
Issued guidance on Major Construction Projects—Roles and Responsibilities	In September 2015, VA issued guidance that describes the roles and responsibilities of medical and CFM staff to enhance the delivery of projects.
Issued guidance on Foundation of Project Design Principles	In November 2015, VA published principles for architectural form and style specifying that designs should avoid costly and unwarranted architectural and engineering embellishments and unnecessary construction and maintenance expenses.
Issued guidance on Changes requested by VA medical staff	In May 2016, VA clarified CFM responsibilities and authorities for evaluating and approving changes requested by medical centers after construction has begun.

Source: GAO Analysis of VA information. | GAO-17-70

Improvements Managing Change Orders and Estimating Project Costs and Schedules Could Help VA Address Continuing Cost Increases and Schedule Delays

Cost Increases and Schedule Delays Persist at Major Medical-Facility Projects

Some VA major medical-facility projects continue to experience cost increases and schedule delays similar to those that we found in our previous review of VA's major construction projects.²⁹ Of the 26 ongoing

²⁹[GAO-13-302](#).

construction projects,³⁰ 10 projects had no cost increases between November 2012 and October 2016, and 4 had cost decreases ranging from 2.3 percent to 16.4 percent.³¹ However, 10 projects did experience cost increases. For example, the Denver, CO, project has experienced a cost increase of over 100 percent since November 2012, and the San Francisco project has experienced a cost increase of about 54 percent. These 10 projects have a combined cost increase of \$1.3 billion.³² Similarly, 13 projects experienced schedule delays between November 2012 and October 2016.³³ For example, the New Orleans project has been delayed by almost 2 years. Table 2 shows changes in estimated costs and schedules between November 2012 and October 2016 for the five projects we selected for this review. See appendix III for changes in cost and schedule for all 26 ongoing major medical-facilities projects. Below, we describe issues related to managing change orders and estimating costs and scheduling that could be contributing to the persistence of cost increases and schedule delays.

Table 2: Changes in Costs and Completion Time Frames between November 2012 and October 2016 for Selected Department of Veterans Affairs' (VA) Medical-Facility Construction Projects

Project location	Estimated cost, Nov. 2012 (dollars in thousands)	Estimated cost, Oct. 2016 (dollars in thousands)	Percentage (%) change	Estimated completion timeframe, Nov. 2012	Estimated completion timeframe, Oct. 2016	Number of months difference
Denver	\$800,000	\$1,675,000	109.4%	April 2015	Jan. 2018	33

³⁰As mentioned previously “major construction projects” are those estimated to cost more than \$10 million. Of VA’s 26 major construction projects, 23 are estimated to cost \$100 million or more.

³¹To assess the extent to which cost increases and schedule delays have continued at VA’s major construction projects, we analyzed how estimated costs and completion dates for ongoing projects have changed since the time of our 2013 report. For that report, VA provided us with data on estimated costs and completion dates for its 50 ongoing major medical-facility projects that were current as of November 2012. For our current review, we analyzed how estimated costs and completion dates for projects that are still ongoing have changed since November 2012. See [GAO-13-302](#).

³²We did not calculate changes in costs for two projects—the Manhattan flood recovery and American Lake projects—for this report. The Manhattan project had no cost estimate available in November 2012. The American Lake project’s scope was expanded in fiscal year 2015 to include additional work, an expansion that increased the total estimated cost and made the cost in November 2012 inapplicable.

³³We did not calculate changes in schedules for 13 projects. Ten projects are pending acceptance by USACE and do not have current estimated completion dates, and three projects did not have schedule data published in November 2012.

Project location	Estimated cost, Nov. 2012 (dollars in thousands)	Estimated cost, Oct. 2016 (dollars in thousands)	Percentage (%) change	Estimated completion timeframe, Nov. 2012	Estimated completion timeframe, Oct. 2016	Number of months difference
Louisville ^a	900,000	925,000	2.8	NA	NA	NA
New Orleans	995,000	1,084,500	9.0	Feb. 2016	Dec. 2017	22
Palo Alto ^b	716,600	716,600	0	Dec. 2017	June 2019	18
St. Louis ^c	366,500	366,500	0	NA	Aug. 2020	NA

Legend:

NA=Not available

Source: GAO analysis of VA data. | GAO-17-70

^aThe Louisville project did not have estimated completion dates available in November 2012 or October 2016.

^bAccording to VA, it expects the cost estimate for the Palo Alto project to increase and is evaluating options to offset these increases. Additionally, the June 2019 completion date depends on VA's receiving construction funding in 2018.

^cThe St. Louis project did not have an estimated completion date available in November 2012. Additionally, according to VA, the August 2020 completion date depends on VA's receiving Congressional funding for construction in 2018.

VA Lacks Sufficient Data to Analyze the Processing Time Frames and Reasons for Change Orders

VA has taken steps to improve its process for managing change orders. As discussed, we found in 2013 that delays in VA's change-order approval process affected costs and schedules of VA projects.³⁴ VA has taken several actions since then to streamline its change-order approval process, including establishing processing timeframes and increasing the dollar value of change orders that need VA headquarters approval.

As described earlier, VA issued its *Contract Modification Handbook* (the *Handbook*) in August 2013 to establish milestones for processing change orders. These milestones include both interim milestones throughout the change order process and milestones for the total amount of time a change order should take to be processed. The Handbook specifies time frames for change orders based on their cost (i.e., more costly change orders have longer time frames) and also requires VA staff to enter the prescribed milestones into VA's Electronic Contract Management System (eCMS). While VA officials said they believe that processing time frames have improved, contractor officials at one site we visited said they had not

³⁴[GAO-13-302](#).

seen significant improvements in the process and cited time frames as a continuing challenge for VA.

However, VA currently does not collect the necessary information to determine whether efforts to streamline the change order process have in fact been successful. More specifically, eCMS does not track whether many of the milestone dates are met as required by the *Handbook*. VA provided us with data from eCMS on change orders for 2014, 2015, and 2016. We found that this data contains the dates when change orders were created in the system, and the dates when they finished being processed. However, the data do not contain information on all of the milestones required by the *Handbook*, and because of this omission, VA cannot determine if its guidelines are being met. Although VA officials said they do periodically review eCMS data, because they contain limited information on milestones in the change order process, this data cannot be compared to the *Handbook's* milestones. CFM officials at VA headquarters said that eCMS is meant to generate contract actions and was not designed to help manage construction projects. It is thus not configured to collect data on the milestones required by the *Handbook*.³⁵

While spreadsheets containing data on change orders are prepared at some of the VA sites we visited, the information they contain on processing time frames is insufficient to assess the timeliness of change orders against requirements in the *Handbook*. Three sites we visited kept spreadsheets on change orders that contained information on processing time frames, including some of the time frames required by the *Handbook*.³⁶ VA headquarters officials told us that regional CFM offices monitor change-order-processing time frames for projects in their regions using these spreadsheets. However, VA officials said that the monitoring process is manual and not done for all change orders. Additionally, the information in these spreadsheets was incomplete and inconsistent. For example, these spreadsheets contained incomplete information for many change orders, and none of the spreadsheets contained information sufficient to determine whether processing time frames established in the

³⁵We recently reported on problems with eCMS's reporting. See GAO, *Veterans Affairs Contracting: Improvements in Policies and Processes Could Yield Cost Savings and Efficiency*, [GAO-16-810](#) (Washington, D.C., September, 2016).

³⁶These three projects were New Orleans, LA; Palo Alto, CA; and St. Louis, MO. We did not review change order data at the Denver, CO, project because USACE manages change orders for that project. The Louisville, KY, project currently has no change orders because construction on that facility has not yet started.

Handbook were met. Additionally, each site we visited collected different types of data on change orders.

Because VA lacks the data on the change order processing timeframes required by the *Handbook* or similar data indicating how long change orders take to process, it is unable to clearly measure the impact, if any, of its actions to improve the change order process. Using complete and consistent information to monitor its adherence to required time frames is important for VA to achieve its goals of processing change orders in a timelier manner, especially given our previous findings that change-order-processing time frames caused delays at some projects. However, because VA is not collecting the information necessary to know if its guidelines are being followed, it cannot currently measure its performance to determine if its improvement actions and guidelines have succeeded in improving the timeliness of processing change orders or whether additional actions are needed.

Similarly, VA does not collect sufficient information to monitor the reasons change orders occur. Change orders can occur for a variety of reasons, including errors in the project's design, unknown conditions at the project site (such as buried fuel storage tanks), or because medical center staff request a change to the project. Although VA collects some information on change orders—such as the dates change orders were approved and their amounts, as discussed earlier—it does not collect sufficient data to categorize and monitor the reasons for change orders. While a description of each change order is entered into eCMS, this information cannot be easily categorized. Additionally, only two of the five sites we visited collect information in any systemic manner related to the reasons for change orders.³⁷ However, these sites do not do so consistently or for all change orders.

VA is taking steps to procure a new system to more consistently collect information on change orders. As of December 2016, VA was in the process of procuring a new system that could better collect and track information on change orders for all projects and provide reports to management. According to VA's plans, this system is intended:

- to track dates associated with each change order and its status,
- generate change order alerts based on timeframes,

³⁷These two projects were New Orleans, LA, and Palo Alto, CA.

- notify VA staff when they are expected to take action on a change order,
- track the reason for each change order, and
- provide reports to management, among other things.

According to the Request for Proposal for the new system, VA was targeting March of 2017 to have the new system in place. However, in comments on a draft of this report, VA stated that, while this procurement has been delayed, VA has developed a plan to monitor compliance with time frames for approving change orders established in the *Handbook*, using existing reporting structures. VA expects to have this system in place by March of 2017.

Although VA's new system is expected to collect the necessary information on change orders, it is not clear how VA plans to use this information. More specifically, VA has not established a mechanism to monitor whether change orders are approved within the guidelines VA established or the reasons why change orders occur. In September 2015, VA issued a memo identifying timely change orders as a goal. Likewise, VA issued guidance in May 2016 directing CFM staff to minimize changes the VA medical centers requested during construction to the extent possible because they can be disruptive and costly.³⁸ An effective internal-monitoring mechanism requires VA management not only to collect data from reliable sources, as it plans to do, but also to establish and operate monitoring activities that include using collected information on change-order and design change controls to measure performance toward achieving objectives. According to the *Standards for Internal Control in the Federal Government*, ongoing monitoring should be built into the entity's operations, performed continually, and be responsive to change. Further, separate evaluations should be used to periodically provide feedback on the effectiveness of this monitoring. Without a fully functioning monitoring system, VA cannot determine the extent to which processing time frames and design changes affect project costs and schedules and thus is at risk of unexpected cost increases and schedule delays occurring at VA-managed projects.

³⁸Department of Veterans Affairs, Office of Construction and Facilities Management, Memorandum: Management of User Requested Changes in Major Construction Projects (May 5, 2016).

The Cost Estimate for the Denver Project's Construction Is Reliable, but Other Estimates Are Not

As part of our review, we assessed the Denver project's cost and schedule estimates against best practices for estimating costs and schedules. This project is the only USACE-managed project that is currently under construction and has cost and schedule data available. It involves constructing a new, 1.2-million square foot facility that includes 148 patient beds, inpatient tertiary care and ambulatory care, a 30-bed spinal cord injury center, a research building, parking structures, and many supporting facilities. As of August 2015, when USACE took over management of the project, USACE estimated that completing the construction of the facility would cost an additional \$585 million. This estimate, along with various contract oversight and USACE management fees of \$40 million, \$150 million in reallocated VA funding, and the \$900 million VA has already spent on the project, brings the total estimated cost to complete construction to about \$1.675 billion—an increase of \$1.054 billion over the initial estimate. Additionally, as of May 2016, USACE estimates that the project will be completed in January 2018—about 40 months behind VA's originally scheduled completion date. Our analysis focused on the estimated cost of \$585 million to complete construction and its estimated completion date of January 2018. These two were the most recent estimates available at the time of our review.³⁹ VA is responsible for activating the Denver facility and has estimated that this process will cost an additional \$341 million and will be completed by June 2019.

The August 2015 Cost Estimate for Construction of the Denver Project Substantially Meets the Four Characteristics of Reliable Cost Estimates

The August 2015 cost estimate for completing construction of the Denver project substantially meets the characteristics of reliable cost estimates

³⁹This analysis focused only on the cost and schedule estimates for the contractor to complete construction of the facility. We discuss costs and schedules related to activation of the facility later in this report.

identified in the *GAO Cost Estimating and Assessment Guide*.⁴⁰ This guide defines best practices related to the four characteristics—comprehensive, well documented, accurate, and credible—of high-quality, reliable cost estimates. We compared the Denver construction cost estimate to these four characteristics and used five categories—fully meets, substantially meets, partially meets, minimally meets, or does not meet—to rate how the cost estimate met each characteristic. We consider cost estimates to be reliable if we determine that the overall assessment ratings for each of the four characteristics are substantially or fully met. Conversely, if our analysis showed that any of the characteristics were not met, minimally met, or partially met, then the estimate cannot be considered reliable. We found that the construction cost estimate for the Denver project substantially meets each of the four characteristics of a high-quality, reliable cost estimate (see table 3). Appendix IV provides greater detail of our comparison of the estimate with the specific best practices that constitute these characteristics.

Table 3: GAO’s Assessment of the Cost Estimate to Complete Construction of the Department of Veterans Affairs Denver Medical Center Compared to the Four Characteristics of High-Quality, Reliable Cost Estimates

Characteristic	Description of characteristic	GAO assessment
Comprehensive	<ul style="list-style-type: none"> The estimate accounts for all possible costs associated with a project. Estimate is structured in sufficient detail to ensure that costs are neither omitted nor double counted. Estimate documents all cost-influencing assumptions. 	Substantially meets
Well-documented	<ul style="list-style-type: none"> Supporting documentation explains the process, sources, and methods used to create the estimate. Estimate contains the underlying data used to develop the estimate. Estimate has been adequately reviewed and approved by management. 	Substantially meets
Accurate	<ul style="list-style-type: none"> The estimate is not overly conservative or optimistic. Estimate is based on an assessment of the costs most likely to be incurred. Estimate is regularly updated so that it always reflects the project’s current status. 	Substantially meets

⁴⁰GAO-09-3SP. We determined that most of the leading practices were applicable to the assessment of the cost estimate for completing construction of the Denver project. However, we determined that the best practice of having a group outside the agency conduct an independent cost estimate was not applicable to the construction cost estimate because the estimate itself served as an independent cost estimate. The purpose of the estimating effort was to develop an independent cost estimate that would enable the USACE to establish a firm target price with the construction contractor for the remaining construction. USACE’s cost estimate served as an independent cost estimate for comparison with the construction contractor’s estimate, so the criteria for an independent cost estimate is inapplicable.

Characteristic	Description of characteristic	GAO assessment
Credible	<ul style="list-style-type: none"> Any limitations of the analysis because of uncertainty or sensitivity surrounding data or assumptions are discussed. The estimate's results are cross-checked. 	Substantially meets

Legend:

Substantially meets—the Department of Veterans Affairs and the U.S. Army Corps of Engineers provided evidence that satisfies a large portion of the criteria

Source: GAO, | GAO-17-70

Notes: For the purposes of this analysis, we assessed only the estimated cost for the contractor to complete construction of the facility.

Comprehensive

A cost estimate is considered comprehensive if it accounts for all possible costs associated with a project, is structured in sufficient detail to ensure that costs are neither omitted nor double counted, and documents all cost-influencing assumptions. We found the estimate substantially meets this characteristic. USACE's construction cost estimate includes all project costs of the remaining construction. USACE's description of remaining construction work was based on an extensive review of the project's progress through April 2015 and comprises the technical baseline of the remaining construction work. The project's work breakdown structure—which is intended to define in detail the work necessary to accomplish a project's objectives—is based on end products and deliverables, such as buildings, and has an appropriate level of detail for all elements. The cost estimate's documentation also addresses the ground rules and assumptions on which the estimate was based and identifies major risks to the project, such as schedule slippage. However, the estimate does not link these risks to specific work breakdown structure elements.

Well documented

A cost estimate is considered well documented: (1) when supporting documentation explains the process, sources, and methods used to create the estimate, (2) when the estimate contains the underlying data used to develop the estimate, and (3) when it is adequately reviewed and approved by management. We found the estimate substantially meets this characteristic. USACE's cost estimate data were collected from primary sources, such as the construction plans and contractor price quotes. USACE's documentation describes the methodology and includes detailed costs for each cost element. This documentation also includes detailed information about the work breakdown's structure, assumptions, and exclusions, but does not demonstrate the step-by-step calculations or

the source data used to develop each element of the estimate. While officials said that there were many formal briefings to upper management, they did not provide documentation of these briefings.

Accurate

A cost estimate is considered accurate when the estimate is not overly conservative or optimistic, is based on an assessment of the costs most likely to be incurred, and is regularly updated so that it always reflects the project's current status. We found the estimate substantially meets this characteristic. USACE officials said that all of the cost estimates were double checked for errors—we used spot checks and found no errors. Additionally, when changes had to be made to the estimate, the variations were explained in detail in the estimate's documentation. Estimate updates occurred in order to reflect changes due to continuing construction and better understanding of project costs. Officials said that they had adjusted the estimate for inflation and provided the inflation indexes used, although we could not independently verify the application of those indexes because the estimate calculations were not provided. The estimate also lacks a documented comparison of the current estimate (updated with actual costs) and previous estimate. However, the estimate is based on historical and relevant data taken from the existing contract, remaining construction work, and cost information from other hospitals.

Credible

A cost estimate is considered credible when any limitations of the analysis are discussed and the estimate's results are cross-checked. We found USACE's estimate substantially meets this characteristic. A formal cost risk and uncertainty analysis was performed, and it was used to set the amount needed for cost contingency for the program.⁴¹ While the estimate does not include a sensitivity analysis, it does identify key factors affecting cost and risk and examines the sensitivity of major risks based on the results of the risk and uncertainty analysis.⁴²

⁴¹Contingency represents funds held for "unknown unknowns" that are outside a construction contractor's control.

⁴²A sensitivity analysis can help estimators identify the cost elements that represent the most risk.

The Cost Estimate for Activating the Denver Facility Is Unreliable

VA is required to include activation costs in the estimated cost of a new medical facility. Specifically, the prospectus that VA is required to submit to the House and Senate Committees on Veterans' Affairs for a major-medical facility project must include, among other things, a detailed estimate including the facility's estimated activation cost.⁴³ Similarly, Office of Management and Budget Circular A-11 states that the cost of a capital asset such as a new hospital is its full life-cycle cost, which consists of all direct and indirect costs for planning through disposal, including activation.⁴⁴ Finally, the GAO Cost Estimating and Assessment Guide states that a project's cost estimate should include both the government's and contractor's costs of the project over its full life cycle, which includes everything from the project's inception to its disposal.⁴⁵

VA currently estimates that activating the Denver facility will cost \$341 million, but the estimate lacks documentation supporting this figure.⁴⁶ VHA officials told us that the original activation estimate of \$272 million was developed in 2012 using a predecessor to VA's current model for estimating activation costs, called the Activation Cost Budget Model (ACBM), when construction of the facility was in the early stages. According to VA officials, the ACBM is being revised to help the VA medical center's staff develop more accurate activation cost estimates that align with projects. The officials said that since 2012, the estimate has increased to \$341 million due to updated information such as more

⁴³38 U.S.C. § 8104(b)(1)(B).

⁴⁴Office of Management and Budget (OMB), *Capital Programming Guide, Supplement to OMB Circular No. A-11*, "Appendix I" (2015).

⁴⁵[GAO-09-3SP](#).

⁴⁶According to VA officials, this activation estimate also includes the cost of continuing to operate a Community Living Center at the current Denver facility after the new facility opens. Although this center had been a part of the Denver project's plan, it was cut from the project to reduce costs. As a result, VA officials said that the current facility will in part need to remain open to operate this center.

precise equipment requirements.⁴⁷ However, VA's \$341-million cost estimate for activating the Denver facility is not well supported. Specifically, VA officials provided minimal supporting documentation associated with developing the 2012 cost estimate, on which the current estimate is based. Additionally, VA officials said that the VHA staff responsible for it are no longer with VA. Current Denver VHA officials we interviewed regarding the estimate said that they were not familiar with or involved in its development. These officials said that they do not know why documentation on developing the estimate did not exist.

Without documentary evidence on the cost-estimating process for the activation estimate, we cannot determine the extent to which it conforms to the characteristics of a high-quality cost estimate described in the *GAO Cost Estimating and Assessment Guide*.⁴⁸ As a result, we consider the estimate unreliable. A reliable cost estimate is critical to the success of any program. Such an estimate provides the basis for informed decision making, realistic budget formulation and program resourcing, and accountability for results. For example, VA relies on these estimates to make annual funding decisions for activating various facilities. Additionally, because these estimates inform VA's annual budget requests, Congress relies on them to make annual appropriations decisions. According to VA officials, VA's Activations Office will assist sites with estimating activation costs. However, VA officials said that the Activations Office had not provided assistance for the Denver project. Without a reliable cost estimate for activating this project, VA and congressional decision makers cannot make informed decisions such as budgeting the funds needed to fully equip the Denver VA medical center so that it is fully operational.

⁴⁷VA headquarters officials said that this estimate consists of one-time costs, although these officials said that they provided Congress with an activation estimate in 2016 that also included recurring costs of about \$55 million, which brings the total operating cost of the project to \$396 million. These officials told us that they did not consider recurring costs to be activation costs. However, VA's guidance on activations describes recurring activation costs as the incremental workload resulting from a project. In addition to this estimate, VA officials at the Denver project told us that the current activation estimate is \$386 million, and these officials did not distinguish between one-time costs and recurring costs.

⁴⁸[GAO-09-3SP](#).

The Denver Construction Schedule Only Partially Meets Most Characteristics of Reliable Schedules, Making the Schedule Unreliable

The most recent schedule estimate—prepared in May 2016 by USACE—for completing construction of the Denver project is also not reliable, based on our criteria. Specifically, the estimate partially meets most characteristics of reliable schedule estimates identified in the *GAO Schedule Assessment Guide*.⁴⁹ This guide defines best practices related to the four characteristics—comprehensive, well-constructed, credible, and controlled—of high-quality, reliable schedule estimates. A project’s success depends in part on having a reliable schedule describing the project’s work activities, the resources required to complete them, and how they relate to one another. Thus, the schedule not only provides a road map for the systematic execution of a program, but also provides a means by which to gauge progress, identify and address potential problems, and promote accountability. We compared the construction schedule estimate with these four characteristics and used five categories—fully meets, substantially meets, partially meets, minimally meets, or does not meet—to rate how the schedule estimate met each characteristic. We consider schedule estimates to be reliable if the overall assessment ratings for each of the four characteristics are substantially or fully met. Conversely, if our analysis showed that any of the characteristics were not met, minimally met, or partially met, then the estimate cannot be considered reliable.

We found that the construction schedule estimate for the Denver project substantially meets one characteristic of high-quality, reliable schedule estimates but only partially meets the other three (see table 4). Specifically, the schedule substantially meets the characteristic of a controlled schedule. By only partially conforming to three of these characteristics, VA and USACE cannot be sure that the schedule’s estimated dates are reliable. Appendix V provides greater detail of our comparison of the estimate with the specific best practices that constitute these characteristics.

⁴⁹[GAO-16-89G](#).

Table 4: GAO Assessment of Schedule Estimate to Complete Construction of the Department of Veterans Affairs' (VA) Denver Medical Center Compared to the Four Characteristics of High-Quality, Reliable Schedule Estimates

Characteristic	Description	GAO assessment
Comprehensive	<ul style="list-style-type: none"> The schedule estimate includes all activities for both the government and its contractors necessary to accomplish a project's objectives as defined in the project's work breakdown structure.^a Schedule estimate includes the labor, materials, travel, facilities, and equipment needed to do the work and depicts when those resources are needed and when they will be available. Schedule estimate realistically reflects how long each activity will take and allows for discrete progress measurement. 	Partially meets
Well-constructed	<ul style="list-style-type: none"> Activities in the schedule estimate are logically sequenced with the most straightforward logic possible. Unusual or complicated logic techniques are used judiciously and justified in the schedule documentation. The schedule's <i>critical path</i>^b represents a true model of the activities that drive the project's earliest completion date, and total float^c accurately depicts schedule flexibility. 	Partially meets
Credible	<ul style="list-style-type: none"> The schedule estimate is horizontally traceable—that is, it reflects the order of events necessary to achieve aggregated products or outcomes. It is also vertically traceable—that is, activities in varying levels of the schedule map to one another and key dates presented to management in periodic briefings are in sync with the schedule. Data about risks and opportunities are used to predict a level of confidence in meeting the project's completion date. The level of necessary schedule <i>contingency</i>^d and high-priority risks and opportunities are identified by conducting a robust schedule risk analysis. 	Partially meets
Controlled	<ul style="list-style-type: none"> The schedule estimate is updated periodically by trained schedulers using actual progress and logic to realistically forecast dates for program activities. It is compared against a designated baseline schedule to measure, monitor, and report the project's progress. The baseline schedule is accompanied by a basis document that explains the overall approach to the project, defines ground rules and assumptions, and describes the unique features of the schedule. The baseline schedule and current schedule are subject to a process that governs when and how technical and programmatic changes are applied. 	Substantially meets

Legend:

Substantially met=VA and the U.S. Army Corps of Engineers (USACE) provided evidence that satisfies a large portion of the criteria

Partially met=VA/USACE provided evidence that satisfies about half of the criterion

Source: GAO. | GAO-17-70

Note: For the purposes of this analysis, we assessed only the schedule estimated for the contractor to complete construction of the facility.

^aA work breakdown structure defines in detail the work necessary to accomplish a project's objectives.

^bA critical path is the sequence of activities that represents the longest path from the project's start and finish dates.

^cFloat is the amount of time by which an activity can be delayed before the delay affects the project's estimated finish date.

^dContingency is a reserve of extra time to account for known and quantified risks and uncertainty.

Comprehensive

A schedule estimate is comprehensive if it: (1) includes all activities, (2) depicts what resources are needed and when they will be available, and (3) realistically reflects how long activities will take. We found that the estimate partially meets this characteristic. The estimate includes all work necessary to complete construction, and activity durations were reasonably short, meaningful, and allowed for discrete progress measurement. However, activities in USACE's Denver construction schedule are not consistently mapped to a well-defined work breakdown structure. Additionally, activities in the schedule do not have resources, such as labor and equipment, assigned to them. Doing so could help ensure that resources are adequate and allow for their effective management. If the schedule does not allow for insight into the current or projected allocation of resources, the risk of delay is significantly increased.

Well-constructed

A schedule estimate is well-constructed if:

- its activities are logically sequenced with the most straightforward logic possible;
- unusual or complicated logic techniques are used judiciously;
- the schedule's critical or longest path represents a true model of the activities that drive the project's earliest completion date; and
- total float accurately depicts schedule flexibility.⁵⁰

We found that USACE's construction schedule estimate for Denver partially meets this characteristic. Activities in the schedule are logically sequenced and the longest path to completion is valid and not driven by lags or constraints. However, many activities in the schedule appear to have an unreasonable amount of total float. Unreasonable total float estimates indicate logic weaknesses in a schedule and may result in inaccurate calculations of project completion dates.

⁵⁰Total float is the amount of time by which an activity can be delayed before the delay affects the project's estimated finish date.

Credible

A schedule estimate is credible if: (1) it is horizontally and vertically traceable, (2) data about risks and opportunities are used to predict a level of confidence in the project's completion date, and (3) the level of necessary schedule contingency and high-priority risks and opportunities are identified by conducting a robust analysis of schedule and risk. We found that the estimate partially meets this characteristic. Lower level activities in USACE's construction schedule for Denver are consistent with higher level activities in the work breakdown structure. However, the schedule logic has gaps that indicate the schedule may not depict relationships between different project elements. Also, key milestone dates at varying levels of the schedule do not map to one another or to dates presented to management, meaning that the schedule may present different information to different audiences. Furthermore, documentation does not contain key details of the schedule risk analysis USACE conducted or describe how activity durations were simulated for that analysis. If a schedule risk analysis is not properly conducted, determining the likelihood of the program's completion date, how much contingency is needed, or the activities that are most likely to delay the project is more difficult.

Controlled

A schedule is controlled if it is: (1) updated periodically by trained schedulers using actual progress and logic to realistically forecast dates for program activities, (2) is compared against a designated baseline schedule, (3) defines ground rules and assumptions, and (4) describes the unique features of the schedule. We found that the estimate substantially meets this characteristic. The Denver construction schedule is updated regularly and was current at the time of our review. Additionally, officials provided us with a valid baseline schedule from October 2015. The baseline schedule and current schedule are subject to a process that governs when and how technical and programmatic changes are applied. USACE also examines the schedule after each update. However, we found no evidence of a schedule narrative that includes important information about updates.

USACE officials explained they would follow best practices if they initiated a project. However, they stated that this project presented a unique situation because USACE began managing the project when it was about 50 percent complete. Consequently, many normal requirements were not included in the schedule. For example, the construction contract between

USACE and the construction contractor did not require all of the features of reliable schedules, including that the schedule have resources, such as labor and materials, assigned to activities or be mapped to a work breakdown structure. However, USACE normally requires, for example, that schedules be mapped to a work breakdown structure. USACE officials further explained that incorporating all best practices into the Denver construction schedule now would be costly and disruptive. VA officials also noted that as of November 2016, the project was ahead of schedule. In commenting on a draft of this report, VA noted that it is confident the construction contractor is currently meeting or exceeding scheduled dates to turn buildings over to VA so that VA can begin the activation process.

VA's Policies on Linking Construction and Activation Activities Are Not Clear or Consistent

Various VA policies require that CFM link construction and activation schedules to form an integrated master schedule (IMS)—an important element to ensuring the successful and timely completion of those projects.⁵¹ According to the *Schedule Assessment Guide*,⁵² an IMS helps ensure that all activities needed to complete a project are accounted for and ordered correctly. An IMS ideally takes the form of a single schedule file that includes all activities. However, it may also be a set of separate schedules representing the work of separate contractors and government offices networked together. Best practices for developing schedules in the *GAO Schedule Assessment Guide* state that projects should have an IMS. Furthermore, these best practices state that all activities in the IMS be logically sequenced, with steps clearly showing how related portions of work depend on one another. Finally, *Standards for Internal Control in the Federal Government* emphasize the importance of control activities—including issuing policies and procedures—and internal communication—

⁵¹Department of Veterans Affairs, *Requirement for Integrated Master Schedules and Cost Risk Analysis* (Mar. 30, 2012); Department of Veterans Affairs, *Office of Construction and Facilities Management (CFM) Policy Memorandum 003C-2014-9: Integrated Master Schedule for Major Construction Projects and Real Property Leases* (VAIQ 7486874) (Oct. 3, 2014); and Department of Veterans Affairs, *Integrated Master Schedule for Major Construction Projects, Schedule Development* (Feb. 23, 2016).

⁵²[GAO-16-89G](#).

including providing quality information to key staff—to achieving agencies' objectives and addressing related risks.⁵³

Although VA and USACE officials at the Denver project provided a construction schedule, an activation schedule, and an IMS, we found that certain activation activities and milestones in these schedules were not aligned with each other across the three schedules. This lack of alignment could increase the risk of VA's experiencing delays in activating major medical facilities.

- Our analysis showed that not all of the milestone dates in the IMS were aligned with dates in the activation and construction schedules. For example, the date on which VA is scheduled to accept the Diagnostic and Treatment building from the construction contractor is different in the three schedules. The IMS shows this date as January 24, 2018; the construction schedule shows it as October 20, 2017, and the activation schedule shows it as October 31, 2017.
- VHA officials told us that they last updated the activation schedule in January 2016. This is in contrast to the construction schedule, which had been updated in May 2016, and the IMS, which had been updated in April 2016. Although the dates these schedules were last updated were not aligned, we were able to compare the acceptance milestones for the different buildings at the Denver site in each of the three schedules. While the IMS and activation milestones were aligned on four dates on which VA would accept buildings, none of the construction acceptance milestones were aligned with those in either the IMS or activation schedule.
- While 11 activation activities were in the construction schedule for initial outfitting and transitioning to completed buildings, these were not aligned well with the activation schedule: our analysis of these activities in the construction schedule indicated that they were untraceable to dates in the activation schedule. In fact, the activation activities in the construction schedule all ended on the construction contract's end date in January 2018. Because of this lack of alignment, activation milestones in the construction schedule appeared to only represent construction contractor activation efforts and not those of VA medical center staff, who are responsible for overall activation of the facility.

⁵³[GAO-14-704G](#).

In addition, because the activation schedule was developed several months earlier than the construction schedule and the IMS, dates for activation activities in the construction schedule and IMS may not be accurate. VHA officials explained that they had let their contract with the vendor that produced the original activation schedule expire after the schedule was updated in January 2016. As of August 2016, VA had hired another scheduling contractor that developed a new activation schedule. At that time, VHA officials stated that they were in the process of incorporating major construction milestones into this schedule. USACE officials noted that they had provided construction dates to the activation contractor as a part of this effort. According to USACE officials at the site, VHA's new activation contractor is now responsible for the IMS. VHA officials said that the new activation schedule includes all activation activities and will also incorporate major construction milestones. However, USACE officials said that they have no plans to fully integrate the new activation schedule with the construction schedule. VA noted in its comments on a draft of this report that it is working to synchronize its current activation schedule with USACE's construction schedule.

Although VA requires an IMS, many of its policies on developing an IMS that links construction and activation activities are not clear or consistent. Various policies that CFM issued from 2012 through 2016 require the CFM project manager to develop an IMS for all projects,⁵⁴ gathering project schedule data from various sources, including medical centers. However, these policies use conflicting and undefined terms to describe the activities an IMS should cover. In particular, while some policies specify an IMS should cover activities through project "closeout," they also note that the IMS should cover all significant activities throughout the project's "life cycle." These two terms are undefined and can be interpreted to encompass different activities: "life cycle," which encompasses activities through disposal of the facility at the end of its useful life, includes activation, but "closeout" may not. Although CFM's policies are unclear, guidance from VA's Activations Office specifically requires that a project's activation schedule be linked to the CFM construction schedule. Moreover, neither CFM's nor the Activations Office's guidance on IMS are aligned with individual projects' key plans—specifically, the individual project management plans (PMP)—the

⁵⁴Department of Veterans Affairs, *Requirement for Integrated Master Schedules and Cost Risk Analysis*; Department of Veterans Affairs, *Integrated Master Schedule for Major Construction Projects and Real Property Leases*; and Department of Veterans Affairs, *Integrated Master Schedule for Major Construction Projects, Schedule Development*.

framework plans for the successful execution of individual projects such as the one in Denver. For example, the Denver PMP says that the IMS and activation schedules are two different schedules and has no requirement to link the two schedules, an approach that conflicts with some VA policies that say that the IMS should include both construction and activation activities.

The fact that VA does not have a fully integrated IMS could result in additional delays for the Denver project. For example, VHA officials at the project said that some completed buildings will only be accessible through areas still under construction, meaning they will be unavailable to occupy. Similarly, these officials said that the Diagnostic and Treatment Center, which is critical to hospital operations, will be completed last. According to these officials, this building will be required to support other buildings, such as the inpatient clinic, that will be completed earlier. These issues could delay opening the new facility. Veterans Service Organizations we spoke with told us that veterans in the local area are affected the most when a hospital does not open on time. Veterans in the Denver area told us that they must continue to receive treatment at an outdated and deteriorating facility while they wait for the new hospital to open.

Conclusions

In response to GAO's 2013 report and statutory mandates, VA has taken a number of actions in recent years to improve its management of medical-facility projects, particularly projects costing over \$100 million. These actions have resulted in benefits, including fostering a more collaborative environment among contractors and VA's construction and medical staff. However, as our review shows, VA needs to take further actions. We found that VA does not collect sufficient information to determine if its new guidelines, intended to ensure the timely processing of change orders and better control costly design changes during construction, are being followed, due primarily to limitations in VA's electronic system for tracking changes to construction contracts. VA intends to implement a system by March 2017 that better tracks change orders. However, VA does not have a mechanism in place to evaluate the new data it will collect to periodically provide feedback on the effectiveness of the VA's strengthened guidelines for change orders.

In response to statutory mandates, VA's enlistment of USACE to manage certain projects costing \$100 million or more represents a significant action. USACE is now managing the Denver project, which experienced

large cost increases and significant delays when it was managed by VA. Awarding a new contract with the contractor to continue construction under USACE management was a positive step. However, additional steps are required to manage the project and avoid further cost increases and delays. Specifically, the current estimate of activation costs developed by VA is unreliable. Without a reliable activation cost estimate, VA has no assurance that current funding will be sufficient to complete activation and Congress, veterans and the American public do not have a complete and accurate picture of the total cost of the Denver project. Further, our analysis of the new construction schedule for the project indicates that USACE and VA need to more fully follow the key components of a reliable schedule, such as integrating and aligning construction and activation activities into a master schedule. Otherwise, VA and USACE risk delays in completing construction on and activating the Denver facility. Any such delays could result in additional cost increases and further postponing the time when veterans will be able to receive services at the new facility. Moreover, the confusing and inconsistent language in VA's policies on developing an IMS will make it difficult for VA to move forward and create integrated and accurate schedules in the future.

Recommendations for Executive Action

To improve VA's management of medical-facility construction projects and its accountability and to allow for more informed decision making by Congress and VA, we recommend that the Secretary of Veterans Affairs take the following three actions:

- establish a mechanism to monitor the extent that major facilities projects are following guidelines on change orders' time frames and design changes;
- develop an activation cost estimate for the Denver project that is reliable and conforms with best practices as described in the *GAO Cost Estimating and Assessment Guide*; and
- clarify CFM policies to require that: (1) all projects have an integrated master schedule to ensure that the integrated master schedules include and link all construction and activation activities, and (2) the policies on integrated master schedule for projects managed by CFM and USACE are consistent.

Agency Comments

We provided a draft of this report to VA and USACE for their review and comment. VA concurred with our recommendations and provided updated information, which we incorporated as appropriate. Both VA and USACE provided technical comments, which we also incorporated as appropriate. VA's comments are reprinted in appendix VI.

We are sending copies of this report to appropriate congressional committees, the Secretary of Veterans Affairs, the Secretary of Defense, and the Commanding General and Chief Engineer of the U.S. Army Corps of Engineers. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

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



David J. Wise Director, Physical Infrastructure

List of Addressees

The Honorable Johnny Isakson Chairman The Honorable Jon Tester
Ranking Member Committee on Veterans' Affairs United States Senate

The Honorable Jerry Moran Chairman The Honorable Brian Schatz
Ranking Member Subcommittee on Military Construction, Veterans
Affairs, and Related Agencies Committee on Appropriations United
States Senate

The Honorable Phil Roe Chairman The Honorable Tim Walz Ranking
Member Committee on Veterans' Affairs House of Representatives

The Honorable Charlie Dent Chairman The Honorable Debbie
Wasserman Schultz Ranking Member Subcommittee on Military
Construction, Veterans Affairs, and Related Agencies Committee on
Appropriations House of Representatives

The Honorable Mike Coffman House of Representatives

Appendix I: Scope and Methodology

To determine the actions the Department of Veterans Affairs (VA) has taken to address challenges in the administration and oversight of medical-facility construction projects since 2013, we reviewed VA's policies and guidance on project administration and oversight. We obtained and analyzed data that VA provided on the status of VA's 26 active major medical facility projects that had received funding as of March 2016, including the total estimated cost, scheduled completion date and the project's current status.¹ We determined there were 23 projects estimated to cost over \$100 million within the list of 26 active major-medical facility projects. Of these 23 projects, 10 have agreements in place between VA and the United States Army Corps of Engineers (USACE) for USACE to manage various phases of the projects as of November 2016. There are also agreements in place for two additional projects not included in VA's data—Reno, Nevada and Portland, Oregon.² We selected 5 of these 23 construction projects for in-depth case study review in order to select from projects with the highest cost, projects in different phases of the construction process, as well as a mix of projects managed by VA's Office of Construction and Facility Management (CFM) or USACE.³ For the selected projects, we visited the Denver CO, New Orleans LA, and Palo Alto CA sites and conducted teleconferences for

¹The term "major medical facility project" is defined to mean a project for the construction, alteration, or acquisition of a medical facility involving a total expenditure of more than \$10,000,000. See 38 U.S.C. § 8104(a)(3)(A).

²As the 23 active construction projects costing \$100 million or more are in various stages of design, acquisition and construction, VA and USACE are negotiating what project stage will be completed by VA or assigned to USACE.

VA and USACE have agreements for American Lake, WA; Canandaigua, NY; Denver, CO; Livermore, CA; Long Beach CA; Louisville, KY; Portland OR; Reno, NV; San Diego, CA; San Francisco, CA; Tampa, FL; and West Los Angeles, CA. VA and USACE have not yet reached an agreement for the Alameda, CA project.

³The projects we selected are located in Denver, CO; Louisville, KY; New Orleans, LA; Palo Alto, CA; and St. Louis, MO. Of these, Denver and Louisville have agreements for USACE to manage construction. The site that we refer to throughout this report as the Denver VA Medical Center, or Denver, is actually located in Aurora, Colorado, near Denver.

the Louisville KY and St. Louis MO projects. The information from our selected projects is illustrative and cannot be generalized to sites agency-wide. For each project, we reviewed construction documents; examined cost, schedule, and change-order data; interviewed CFM and, where applicable, USACE officials responsible for managing design and construction, design and construction contractors, VA's Veterans Health Administration (VHA) medical center staff, and representatives of local veterans services organizations.

To determine whether VA could make any additional improvements to its administration and oversight of those projects costing \$100 million or more, we compared the management of our selected projects to VA's policies and procedures, particularly those put in place since our 2013 report, to determine the extent to which they are followed. We interviewed VA headquarters and USACE officials on project administration and oversight and changes intended to improve these processes. We reviewed prior GAO, VA Office of Inspector General and USACE reports on VA's management of these projects.

We also collected CFM information on cost increases and schedule changes for the five construction projects. Because of its dramatic project cost increase and status as the only project that USACE manages that is currently under construction, we selected the Denver cost estimate and schedule for an analysis of compliance with best practices. We discussed the Denver activation cost and schedule with VHA local and headquarters staff, as these items were not integrated within the construction estimate and schedule. We assessed the reliability of the Denver construction cost and schedule data through interviews with knowledgeable VA staff and a review for completeness and any unexpected values. We determined that the data were sufficiently reliable for the purpose of our reporting objectives.

To determine the extent to which VA and USACE have estimated the cost and schedule of the Denver project in a manner consistent with best practices, we interviewed VA and USACE staff and compared the project cost and schedule estimates with GAO best practices. Specifically, the *GAO Cost Estimating and Assessment Guide* identifies best practices that represent work across the federal government and are the basis for a

high-quality, reliable cost estimate.⁴ A cost estimate created using best practices exhibits four broad characteristics: it is accurate, well documented, credible, and comprehensive. That is, each characteristic is associated with a specific set of best practices. In turn, each best practice is made up of a number of specific tasks (see app. IV). Similarly, we compared the schedule estimate with the *GAO Schedule Assessment Guide*, which defines best practices related to four characteristics—comprehensive, well-constructed, credible, and controlled—that are important to developing high-quality, reliable schedule estimates (see app. V).⁵ For our evaluations of the cost and schedule estimates, when the tasks associated with the best practices that define a characteristic were mostly or completely satisfied, we considered the characteristic to be substantially or fully met. When all four characteristics were at least substantially met, we considered a cost or schedule estimate to be reliable.⁶

We conducted this performance audit from January 2016 to March 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our

⁴GAO *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (Supersedes [GAO-07-1134SP](#)), [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009).

⁵GAO *Schedule Assessment Guide: Best Practices for Project Schedules*, [GAO-16-89G](#) (Washington, D.C.: Dec. 22, 2015). The *GAO Schedule Assessment Guide* presents the scheduling concepts introduced in the *Cost Estimating and Assessment Guide* as 10 leading practices associated with developing and maintaining a reliable, high-quality schedule. The leading practices were developed in conjunction with government and industry experts in the schedule-estimating community. The *GAO Schedule Assessment Guide* serves also to present guiding principles for our auditors in evaluating the economy, efficiency, and effectiveness of government programs.

⁶We established five descriptions for our assessments of leading practices and cost estimate characteristics: fully meets, substantially meets, partially meets, minimally meets, and does not meet. We consider a leading practice to be fully met when the associated tasks are completely satisfied, substantially met when a large portion of the associated tasks are satisfied, partially met when about half of the associated tasks are satisfied, minimally met when a small portion of the associated tasks are satisfied, and not met when none of the associated tasks are satisfied. Our assessment method weights each leading practice equally and bases the assessment of each characteristic on the average score of underlying leading practices. We assign each description a numerical value (5 for fully meets to 1 for does not meet) and round scores to the higher numerical value (i.e., a score of 4.5 would round up to 5 and a score of 4.4 would round down to 4). Assessments were conducted by an individual analyst, and then the results were independently traced and verified by a second analyst.

findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Additional Information on Medical Center Projects Outsourced to U.S. Army Corps of Engineers

Table 5: List of Department of Veterans Affairs Medical Center Projects Outsourced to the U.S. Army Corps of Engineers (USACE) for Construction

Project	State	Description	Status
American Lake	WA	New Building 201 and Seismic Corrections to Buildings 81 and 18	Construction Documents
Canandaigua	NY	New Construction and Renovation	Construction Documents
Denver	CO	New Medical Facility	Construction
Long Beach	CA	Seismic Corrections to Mental Health and Community Living Center	Design Development, Construction Documents, and Construction
Louisville	KY	New Medical Facility	Design Development
Palo Alto	CA	Livermore Realignment	Design Development
Portland	OR	Seismic Retrofit and Renovation of Buildings 100 and 101 and Add Specialty Clinic and parking for 600	Planning
Reno	NV	Upgrade Building 1 Seismic, Life Safety, Utility Corrections, and Expand Clinical Services	Design Development
San Diego	CA	Seismic Corrections	Construction Documents
San Francisco	CA	Seismic Corrections to Buildings 1, 6, 8 and 12	Construction Documents
Tampa	FL	Polytrauma Expansion/Bed Tower	Design Development
West Los Angeles	CA	Seismic Corrections of Various Buildings	Construction Development and Construction

Source: GAO analysis of VA data. | GAO-17-70

Note: VA and USACE have agreements in place for USACE to complete for these projects as of October 2016.

Appendix III: Changes in Costs and Schedules for Major Medical-Facility Projects

To assess the extent to which cost increases and schedule delays have continued at Department of Veterans Affairs (VA) major construction projects, we analyzed how estimated costs and completion dates for ongoing projects have changed since the time of our 2013 report (see table 6).¹ For that report, VA provided us with data on estimated costs and completion dates for its 50 ongoing major medical-facility projects that were current as of November 2012. For our current review, we analyzed how estimated costs and completion timeframes for projects that are still ongoing have changed between November 2012 and October 2016.

Table 6: Changes in Costs and Completion Time Frames for Department of Veterans Affairs' (VA) Major Medical-Facility Projects between November 2012 and October 2016

Project	Project Description	Estimated cost, Nov. 2012	Estimated cost, Oct 2016	Percent (%) change ^a	Estimated completion timeframe, Nov. 2012 ^b	Estimated completion timeframe, Oct. 2016 ^c	Number of months difference ^d
Bay Pines VA-managed project	Inpatient/Outpatient Improvements	\$158,200,000	\$158,200,000	0.0	February-2015	February-2020	60
Biloxi VA-managed project	Restoration Of Hospital/Consolidation of Gulfport	304,000,000	297,000,000	-2.3	June-2016	August-2018	26
Dallas VA-managed project	Spinal Cord Injury	155,200,000	155,200,000	0.0	December-2014	January-2017 ^e	25
Las Vegas VA-managed project	New Medical Facility	584,655,000	584,655,000	0.0	June-2014	February-2016	20

¹Major projects are those that VA estimates will cost more than \$10 million.

**Appendix III: Changes in Costs and Schedules
for Major Medical-Facility Projects**

Project	Project Description	Estimated cost, Nov. 2012	Estimated cost, Oct 2016	Percent change^a	Estimated completion timeframe, Nov. 2012^b	Estimated completion timeframe, Oct. 2016^c	Number of months difference^d
Long Beach VA-managed project	Seismic Corrections to Buildings 7 and 126	129,545,000	129,545,000	0.0	August-2014	February-2022 ⁱ	90
New Orleans VA-managed project	New Medical Facility	995,000,000	1,084,500,000	9.0	February-2016	December-2017	22
New York VA-managed project	Manhattan Flood Recovery	NA ^g	207,000,000	NA	NA	February-2019	NA
Orlando VA-managed project	New Medical Facility	616,158,000	616,158,000	0.0	July-2013	October-2016	39
Palo Alto VA-managed project	Centers for Ambulatory Care/Polytrauma-Blind Rehabilitation	716,600,000	716,600,000	0.0	December-2017	June-2019 ^h	18
Perry Point VA-managed project	Replacement Community Living Center	90,100,000	92,700,000	2.9	TBD	June-2020	NA
San Juan VA-managed project	Seismic Corrections to Building 1	277,000,000	277,000,000	0.0	October-2016	June-2021	56
Seattle VA-managed project	Building 101 Mental Health	222,000,000	192,424,000	-13.3	June-2015	September-2018	39
Seattle VA-managed project	Correct Seismic Deficiencies in Various Buildings	51,800,000	43,880,000	-15.3	September-2015	May-2016	8
St. Louis VA-managed project	Medical Facility Improvement and Cemetery Expansion	366,500,000	366,500,000	0.0	TBD	August-2020	NA
Walla Walla VA-managed project	Multi Specialty Care	71,400,000	71,400,000	0.0	January-2016	March-2019	38
American Lake ^f U.S. Army Corps of Engineers (USACE)-managed project	New Building 201, Building 81 Seismic Corrections and Building 18 and 81AC Renovation	NA	161,700,000	NA	NA	TBD	NA

**Appendix III: Changes in Costs and Schedules
for Major Medical-Facility Projects**

Project	Project Description	Estimated cost, Nov. 2012	Estimated cost, Oct 2016	Percent (%) change^a	Estimated completion timeframe, Nov. 2012^b	Estimated completion timeframe, Oct. 2016^c	Number of months difference^d
Canandaigua U.S. Army Corps of Engineers (USACE)- managed project	New Construction and Renovation	370,100,000	309,500,000	-16.4	TBD	TBD	NA
Denver U.S. Army Corps of Engineers (USACE)- managed project	New Medical Facility	800,000,000	1,675,000,000	109.4	April-2015	January-2018	33
Long Beach U.S. Army Corps of Engineers (USACE)- managed project	Seismic Corrections to Mental Health and Community Living Center	258,400,000	317,300,000	22.8	TBD	TBD	NA
Louisville	New Medical Facility	900,000,000	925,000,000	2.8	TBD	TBD	NA
Palo Alto U.S. Army Corps of Engineers (USACE)- managed project	Livermore Realignment	354,300,000	415,600,000	17.3	TBD	TBD	NA
Sacramento U.S. Army Corps of Engineers (USACE)- managed project	Alameda Outpatient Clinic	208,600,000	240,200,000	15.1	TBD	TBD	NA
San Diego U.S. Army Corps of Engineers (USACE)- managed project	Spinal Cord Injury, Seismic Corrections	195,000,000	227,100,000	16.5	TBD	TBD	NA

**Appendix III: Changes in Costs and Schedules
for Major Medical-Facility Projects**

Project	Project Description	Estimated cost, Nov. 2012	Estimated cost, Oct 2016	Percent change^a	Estimated completion timeframe, Nov. 2012^b	Estimated completion timeframe, Oct. 2016^c	Number of months difference^d
San Francisco U.S. Army Corps of Engineers (USACE)-managed project	Correct Seismic Deficiencies, Buildings 1, 6, 8, and 12	224,800,000	346,700,000	54.2	TBD	TBD	NA
Tampa U.S. Army Corps of Engineers (USACE)-managed project	Polytrauma Expansion and Bed Tower	231,500,000	231,500,000	0.0	October-2011	TBD	NA
West Los Angeles U.S. Army Corps of Engineers (USACE)-managed project	Seismic Corrections to Various buildings	346,900,000	370,800,000	6.9	December-2013	TBD	NA

Legend:

TBD=to be determined

NA=not applicable

Source: GAO Analysis of VA data. | GAO-17-70

^aProjects listed as NA in this column are projects whose estimated costs, either in November 2012 or March 2016, were unknown.

^bProjects with TBD listed in this column were projects whose completion dates as of November 2012 were to-be-determined.

^cThe 10 projects whose completion dates are listed as TBD in this column are projects whose management VA is outsourcing to the U.S Army Corps of Engineers (USACE). USACE does not yet have completion dates for these projects. The Denver project has also been outsourced to USACE, but USACE was able to provide a completion date for this project.

^dProjects listed as NA in this column are projects whose completion dates, either currently or in November 2012, were to-be-determined or not applicable.

^eThis project includes phases to build a parking garage and a spinal cord injury facility. This estimate is for the parking garage phase only. The spinal cord injury phase has not received funding so there is no date estimate for that phase.

^fOfficials said a demolition phase was added to this project after Nov 2012, which extended its completion timeframe.

^gThere was no original cost estimate published for this project at the time construction began.

^hOfficials said that the estimated completion date does not include Ambulatory Care Center phase of this project because it has not received funding.

ⁱThis project's scope was expanded in fiscal year 2015 to include additional work. The estimated cost and completion timeframe in November 2012 is therefore no longer applicable.

Appendix IV: Comparison of the Denver Construction's Cost Estimate with Best Practices for Cost Estimating

We assessed the estimated cost to complete construction of the Department of Veterans Affairs' new Denver medical center using the GAO Cost Estimating and Assessment Guide's framework of the four characteristics—comprehensive, well-documented, accurate, and credible—associated with high-quality, reliable cost estimates.¹ Specifically, we assessed the Denver project's construction cost estimate against the best practices associated with these four characteristics. The U.S. Army Corps of Engineers developed the current cost estimate to complete construction of this project. Table 7 provides greater detail of our comparison of the estimate with the leading practices that are aligned with the four cost estimating characteristics.

¹GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (Supersedes [GAO-07-1134SP](#)), [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009). The methodology outlined in this guide is a compilation of 20 best practices that federal cost-estimating organizations and industry use to develop and maintain reliable cost estimates throughout the life of a government acquisition program. The leading practices were developed in conjunction with government and industry experts in the cost-estimating community and have been applied in past work involving federal construction projects. By default, the guide also serves as a guiding principle for our auditors to evaluate the economy, efficiency, and effectiveness of government programs. We determined that most of the leading practices were applicable to the assessment of the cost estimate for completing construction of the Denver project. However, we determined that the best practice of having a group outside the agency conduct an independent cost estimate to not be applicable to the construction cost estimate because the estimate itself served as an independent cost estimate. The purpose of the estimating effort was to develop an independent cost estimate that would enable the VA/USACE to establish a firm target price with the construction contractor for the remaining construction. VA/USACE's cost estimate served as an independent cost estimate for comparison with the construction contractor's estimate, so the criteria for an independent cost estimate is inapplicable.

Appendix IV: Comparison of the Denver Construction's Cost Estimate with Best Practices for Cost Estimating

Table 7: GAO Assessment of the Cost Estimate to Complete Construction of the Department of Veterans Affairs (VA) Denver Medical Center Compared to the Four Characteristics of High-Quality, Reliable Cost Estimates

Characteristic	Characteristic assessment	Best practice	Individual assessment and key examples of rationale
Comprehensive	Substantially meets	The cost estimate includes all costs	Fully meets: All applicable costs for the construction contract appear to be included in the cost estimate.
		Completely define program, reflect current schedule, and be technically reasonable	Substantially meets: The cost estimate is based on an assessment of all remaining construction work on the project to be completed. However, the technical baseline documentation does not discuss cost and technical risk
		The cost estimate's work breakdown structure is product-oriented, traceable to the statement of work/objective, and at an appropriate level of detail to ensure that cost elements are neither omitted nor double-counted ^a	Fully meets: The work breakdown structure outlines all major work for the project.
		Document all cost-influencing ground rules and assumptions	Partially meets: The estimate details all ground rules and assumptions, but does not trace risks to specific work breakdown structure elements. Additionally, while inflation was incorporated into the estimate, it did not identify the source of inflation indexes.
Well-documented	Substantially meets	Documents capture source data, their reliability, and how they were normalized	Partially meets: While some cost estimating parameters are included in the estimate's supporting documentation, not all of the data or data sources are included.
		The documentation describes in sufficient detail the calculations performed and the estimating methodology used to derive each element's cost	Substantially meets: Cost-estimating methods used include bottom-up and parametric approaches, but the estimate's documentation does not contain historical data as bases of the parametric methodologies.
		The documentation describes step by step how the estimate was developed so that a cost analyst unfamiliar with the program could understand what was done and replicate it	Substantially meets: The documentation provides detailed information about the WBS structure, the cost-estimating methodologies, and assumptions and exclusions, but does not provide step-by-step calculations for each cost element.
		Documents discuss technical baseline description and that the data in the baseline are consistent with the estimate	Fully meets: The estimate was based on an assessment of the scope of work remaining at the time it was produced and represented the technical baseline.
		Provides evidence that management reviewed and accepted the estimate	Partially meets: USACE officials said that they provided many formal briefings to management, but they did not provide us with any examples of these briefings.

Appendix IV: Comparison of the Denver Construction's Cost Estimate with Best Practices for Cost Estimating

Characteristic	Characteristic assessment	Best practice	Individual assessment and key examples of rationale
Accurate	Substantially meets	The cost estimate results are unbiased, not overly conservative or optimistic and based on an assessment of most likely costs.	Substantially meets: The confidence level for the base estimate is calculated as less than 10 percent. A revised version of the cost estimate, completed in August 2015, did not have an associated updated confidence level.
		Adjusted properly for inflation.	Partially meets: We could not verify that the estimate was properly adjusted for inflation because documentation does not include calculations involving inflation factors.
		The estimate contains few, if any, minor mistakes.	Partially meets: USACE officials said that all of the cost estimates were double checked. However, the base estimate reported in the risk analysis could not be found in other reports on the estimate.
		The cost estimate is regularly updated to reflect significant changes in the program so that it is always reflecting current status.	Substantially meets: USACE officials said that when changes have to be made to the estimate, the variations are explained in detail in various reports. Several changes that were made to the estimate, as well as why the changes were made, were documented.
		Variances between planned and actual costs are documented, explained, and reviewed.	Minimally meets: Officials did not provide a sufficient explanation of how they track variances between actual and planned costs.
		The estimate is based on a historical record of cost estimating and actual experiences from other comparable programs.	Fully meets: The data used for the estimate were from primary sources, including construction plans and specifications, a detailed inspection of the remaining work, interviews with VA, USACE, and contractor officials, and national and local vendors.
		Estimating technique for each cost element was used appropriately.	Fully meets: Officials said that they used a bottom-up estimating technique. For this technique, work breakdown structure cost elements were defined in detail by a work breakdown structure dictionary using current and relevant data that was adequate for estimating element costs.
Credible	Substantially meets	Include sensitivity analysis that identifies a range of possible costs based on varying major assumptions, parameters, and data inputs.	Partially meets: While a risk analysis identifies all key cost and risk drivers, USACE did not conduct a formal sensitivity analysis.
		A risk and uncertainty analysis was conducted that quantified the imperfectly understood risks and identified the effects of changing key cost driver assumptions and factors.	Substantially meets: USACE performed a formal risk and uncertainty analysis and developed the most likely cost of each of the risk drivers along with a minimum to maximum range for variables. However, an updated risk and uncertainty analysis was not conducted for an updated version of the cost estimate.

Appendix IV: Comparison of the Denver Construction's Cost Estimate with Best Practices for Cost Estimating

Characteristic	Characteristic assessment	Best practice	Individual assessment and key examples of rationale
		Major cost elements were cross-checked to see whether results were similar.	Substantially meets: USACE developed a statistical relationship to compare costs at a high level, but did not perform cross-checks of major cost elements.
		Independent estimate was conducted by an outside group to determine whether other estimating methods produced similar results.	Not applicable: We excluded this best practice because the purpose of the USACE's estimating effort was to establish a firm target price for the contractor to complete the remaining construction. USACE's estimate served as an independent cost estimate for comparison with the contractor's estimate. Therefore, the requirement for the independent cost estimate is not applicable.

Legend:

- Fully met=VA/USACE provided complete evidence that satisfies the entire criterion
- Substantially met=VA/USACE provided evidence that satisfies a large portion of the criterion
- Partially met=VA/USACE provided evidence that satisfies about half of the criterion
- Minimally met=VA/USACE provided evidence that satisfies a small portion of the criterion
- Not met=VA/USACE provided no evidence that satisfies any of the criterion

Source: GAO analysis of VA and USACE data. | GAO-17-70

Notes: This analysis focused only on the cost estimate for the contractor to complete construction of the facility. The estimate does not include all costs from the inception of the program through design, development, construction, and operation and maintenance because the scope was defined as developing an estimate to enable the government to establish a firm target price for the remainder of the construction contract work.

³A work breakdown structure is supposed to define in detail the work necessary to accomplish a project's objectives.

Appendix V: Comparison of the Denver Construction's Schedule Estimate with Best Practices

We assessed the schedule estimate to complete construction of the Department of Veterans Affairs' new Denver medical center using the GAO Schedule Assessment Guide's framework of the four characteristics—comprehensive, well-constructed, credible, and controlled—of high-quality, reliable schedule estimates.¹ Specifically, we assessed the Denver project's schedule estimate against the best practices associated with these four characteristics. The U.S. Army Corps of Engineers monitors the schedule estimate to complete construction of this project. Table 8 provides greater detail of our comparison of the estimate with the leading practices that are aligned with the four schedule-estimating characteristics.

Table 8: GAO's Assessment of the Schedule Estimate to Complete Construction of the Department of Veterans Affairs' (VA) Denver Medical Center, Compared to the Four Characteristics of High-Quality, Reliable Cost Estimates

Characteristic	Characteristic assessment	Best practice	Individual assessment and key examples of rationale
Comprehensive	Partially Meets	The schedule captures all activities	Partially meets: The construction schedule appears to include all work necessary to complete construction. However, activities in the schedule are not consistently mapped to a well-defined work breakdown structure. ^a
Comprehensive	Partially Meets	The schedule has resources assigned to all activities	Not meets: There are no resources assigned to activities.

¹GAO, *GAO Schedule Assessment Guide: Best Practices for Project Schedules*, GAO-16-89G (Washington, D.C.: Dec. 22, 2015). The *GAO Schedule Assessment Guide* presents the scheduling concepts introduced in the *Cost Estimating and Assessment Guide* as 10 leading practices associated with developing and maintaining a reliable, high-quality schedule. The leading practices were developed in conjunction with government and industry experts in the schedule-estimating community. The *GAO Schedule Assessment Guide* serves also to present guiding principles for our auditors in evaluating the economy, efficiency, and effectiveness of government programs.

**Appendix V: Comparison of the Denver
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Practices**

Characteristic	Characteristic assessment	Best practice	Individual assessment and key examples of rationale
Comprehensive	Partially Meets	The schedule establishes the durations of all activities	Fully meets: The information provided by USACE indicates their confidence that activity durations were developed carefully and have been vetted and monitored by USACE and the construction contractor.
Well-constructed	Partially Meets	The schedule sequences all activities	Substantially meets: The majority of activities have appropriate logic and the use of constraints is reasonable. However, the schedule includes lag on 296 activities that are not justified in documentation. Lags denote the passage of time and should only represent a real need to delay time between activities.
Well-constructed	Partially Meets	The schedule has a valid critical path ^b	Substantially meets: The longest path, which USACE uses in place of the critical path, is valid and not driven by lags or constraints. However, the activities that are included on the longest path do not appear to include major works such as utilities, systems, electrical, mechanical, and the like.
Well-constructed	Partially Meets	The schedule has reasonable total float ^c	Minimally meets: The schedule appears to have an excessive amount of total float. For example, 80 percent of remaining activities are able to slip more than 2 working months before affecting the key milestone date.
Credible	Partially Meets	The schedule can be traced horizontally and vertically	Partially meets: Lower levels of the schedule roll up to higher work breakdown structure levels. However, the schedule logic has gaps that indicate the schedule may not depict relationships between different project elements.
Credible	Partially Meets	A schedule risk analysis was conducted	Partially meets: A schedule risk analysis was conducted, but key details of the analysis are not available in the provided documentation.
Controlled	Substantially meets	The schedule is updated using actual progress and logic	Substantially meets: The schedule is updated periodically and delivered to the project management team monthly. Additionally, our analysis found no date anomalies in the schedule. However, there is no accompanying schedule narrative that documents changes.
Controlled	Substantially meets	A baseline schedule is maintained	Substantially meets: USACE officials provided us with a baseline schedule that we confirmed is valid and produces baseline dates and variances when compared to the current construction schedule. While there is no accompanying schedule basis document, officials did provide some documentation of acronyms, work breakdown structure elements, and schedule ground rules and assumptions.

Legend:

- Fully met=VA/USACE provided complete evidence that satisfies the entire criterion
- Substantially met=VA/USACE provided evidence that satisfies a large portion of the criterion
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^aA work breakdown structure is supposed to define in detail the work necessary to accomplish a project's objectives.

**Appendix V: Comparison of the Denver
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Practices**

^bA critical path is the sequence of activities that represents the longest path from the project's start and finish dates.

^cFloat is the amount of time by which an activity can be delayed before the delay affects the project's estimated finish date.

Appendix VI: Comments from the Department of Veterans Affairs



DEPARTMENT OF VETERANS AFFAIRS
Washington DC 20420

February 14, 2017

Mr. Dave Wise
Director, Physical Infrastructure
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Wise:

The Department of Veterans Affairs (VA) has reviewed the Government Accountability Office's (GAO) draft report, ***“VA CONSTRUCTION: Better Processes for Monitoring Contract Modifications, Developing Schedules, and Estimating Costs Needed”*** (GAO-17-70).

The enclosure provides our general and technical comments and sets forth the actions to be taken to address the GAO draft report recommendations.

VA appreciates the opportunity to comment on your draft report.

Sincerely,

A handwritten signature in black ink, appearing to read "Gina S. Farrissee".

Gina S. Farrissee
Acting Chief of Staff

Enclosure

Enclosure

Department of Veterans Affairs (VA) Comments to
Government Accountability Office (GAO) Draft Report
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Since the report has been drafted, several updates have taken place:

- a. At the time of the GAO study, VA and USACE were in the process of finalizing the Enterprise Program Management Plan. This plan was signed December 2016.
- b. As stated in the report, the most current Contract Modification Handbook was issued in August 2013. The handbook has since been updated as a result of a recommendation by VA's OIG. The updated Contract Modification Handbook is now expected to be finalized and distributed by the end of the second quarter of fiscal year 2017.
- c. The report noted the CFM policy stated that Regional Acquisition Directors could approve contract actions up to \$2 million without further administrative review. This limit has been revised. Now, the contracting officer's authority to approve contract actions (to include change orders) has increased to \$5 million, and Regional Acquisition Directors can approve contract actions up to \$15 million.
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e. Referencing page 14, Table 2, the Palo Alto estimate shown was not updated in 2016 and is the original estimate. VA does anticipate this estimate to increase as a result of escalation, as full construction funding has not been received. VA is evaluating the ability to offset the increases through scope reductions or value engineering efforts.

f. Referencing page 14, table 2, construction completion timeframes for Palo Alto and St. Louis will change once the final construction funds are received. The June 2019 date for Palo Alto and the August 2020 for St. Louis are dependent upon construction funding being received in 2018.

g. VA intended to procure new construction management software by March of 2017. This procurement has been delayed. VA currently plans to have a system in place to improve tracking and managing modifications by the March 2017 timeframe.

h. The report states that the USACE contractor developed construction schedule only partially meets characteristics of a reliable schedule. We agree with GAO on the need to have a reliable schedule, and that the Denver construction schedule does not fully meet those characteristics. However, VA has confidence in the current Denver schedule, and is synchronizing the current activation schedule with the USACE schedule. VA confidence in the USACE schedule is evidenced by the contractor currently meeting or beating scheduled building turnover dates and VA receiving access to buildings to begin activation.. USACE has responded that they normally produce schedules that meet the characteristics of a reliable schedule, and Denver is an anomaly to USACE normal process, based on the state of the construction when they issued the new construction contract.

VA has taken steps to improve the construction process which were highlighted in the report. GAO’s acknowledgements of improvements noted in the report are:

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- b. VA's integration of full time Medical Planners on the project team is occurring to assist in coordination of design with medical equipment and reduce time and cost . While the evidence may be slow to show, the reality is we are able to take time and cost-savings action if a delay is detected.
- c. VA's efforts to streamline the change order approvals have reduced time for processing, and we are seeing the results in comments from our contractors. Our ability to keep the contract current (modifications approved in a timely manner) demonstrates a level of commitment to our contractors that shows in improved relationships.
- d. VA issued guidance on Framework Principles for the Delivery of Major Construction Projects. This guidance establishes clean lines of authority for execution of design and construction and established the Executive Director, CFM as the responsible authority for changes to the design of projects. This provides clear governance of the construction process.
- e. VA issued guidance on Foundation of Project Design Principles. This guidance lays the framework to assure construction projects are functional and that aesthetics do not govern the design.
- f. VA issued guidance on changes requested by VA medical staff to improve coordination and control. This guidance establishes the Executive Director, CFM, as the responsible authority for incorporation of medical center requested changes.

These and many other improvements are targeted to improve design and construction management, which promotes cost control and limits schedule growth. Design and construction is a lengthy process, and the results of these efforts may not show their full benefits for several more years, particularly as improvements in planning will not show until well into construction, often 4 to 10 years later VA recognizes that improvement of the design and construction process is iterative and is committed to continuous process improvements.

VA acknowledges the recommendations made by GAO and is working to implement the recommendations. Our plan to implement the recommendations follows.

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VA is strongly committed to developing a reliable activation cost estimate that conforms to best practices to allow Congress and VA for informed decision-making. The content in this draft report applies to high risk area 2 (inadequate oversight and accountability). VA will use GAO's findings to continue to make improvements and fulfill VA's mission of honoring America's Veterans by providing exceptional health care that improves their health and well-being.

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GAO Recommendation: To improve VA’s management of medical facility construction projects and its accountability and to allow for more informed decision making by Congress and VA, GAO recommends that the Secretary of Veterans Affairs take the following three actions:

Recommendation 1: Establish a mechanism to monitor the extent that major facilities projects are following guidelines on change order timeframes and design changes.

VA Comment: Concur. The Department of Veterans Affairs (VA) has developed a plan to establish procedures and processes for monitoring Construction Facilities Management compliance with the timeframes established in the updated Contract Modification Handbook. The process will standardize the reporting and will use existing reporting structures such as VA’s Project Review Board to assure there is management oversight of the compliance to the time standards for processing. VA will have the process in place by the end of March 2017.

Recommendation 2: Develop an activation cost estimate for the Denver project that is reliable and conforms with best practices as described in the *GAO Cost Estimating and Assessment Guide*.

VA Comment: Concur. This recommendation is related to high risk area 2 (inadequate oversight and accountability). Developing a reliable activation cost estimate that confirms with best practices will improve VA’s management of medical facility construction projects and will allow for more informed decision making by Congress and VA.

VA concurs with having a reliable cost estimate for construction projects. To provide rigor and improve accuracy of activation cost estimates, the Veterans Health Administration (VHA) developed the Activation Cost Budget Model (ACBM) to estimate Major Construction and Major Lease activation project requirement costs; i.e., recurring and non-recurring activation costs.

The development of activation project estimates is a coordinated effort between VA Medical Centers (VAMCs), and VHA’s Office of Capital Asset Management Engineering and Support (OCAMES). Information is gathered to develop preliminary recurring and non-recurring activation cost estimates for new space. As the project progresses through the acquisition process, estimates continue to be refined through the use of “progress elaboration.” Due to the number of years between when a preliminary budgetary estimate is prepared and when a project nears its actual activation date, some variation is expected as project requirements are refined.

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In fiscal year (FY) 2012, VHA started to utilize the ACBM to provide project specific cost estimates to bring the new space into full operational status. Since the development of the ACBM, OCAMES has facilitated field data calls to gather all needed project data to run the model; for example, Budget Year, Project Type, Space Gap Data, Utilization Gap Data, Net New Full Time Equivalents resulting from project, Project Duration, Expected year of groundbreaking, Square Footage included in project, Additional Workload Resulting from Project - Amount of workload that is expected to be transferred to VA from a fee care provider as a result of the project, etc. Additionally, the ACBM contains assumptions regarding the timing of costs based on historical VA experience, and calculates recurring costs based on the total incremental workload and non-recurring linear cost per square foot, by department. Activation costs are phased across the multiple years of each project, and phasing varies depending on the number of years of construction.

To further improve the accuracy of activation costs, in FY 2015, OCAMES-Activations developed the Activating Funding Process (see Figure 1). This process utilizes top-down and bottom-up cost development methods. Integral to this process is the analysis of the two cost estimates, analyzing the variation, validation of the requirement and expected year of execution. During this assessment, the ACBM cost estimates are compared to the project requirements developed by the local project team; which results in a three year outlook and total estimated activation cost. As needed, adjustments are made to the original estimates due to variations as a result of unknown design impacts on operations, variation in the cost of furniture, fixtures and equipment, scope refinement, specification omissions or changes, operation cost increases, etc.

Since FY 2015, Denver's \$341 million estimated activation cost has been reassessed as part of this yearly process, and determined reasonable to bring this facility into operational status. The assessment included a review of the requirements, justification and comparison to multiple ACBM runs.

As part of FY 2015 improvements, OCAMES – Activations took a portfolio management approach to support field operations, by offering VHA wide services and tools. This support includes access to activation subject matter experts to assist in cost estimating, activation specific contract support, assessment tools, and contract vehicles to assist VAMC leadership with planning and managing Major Construction and Major Lease Activation Projects. In addition, Clinical and Administrative Activation Checklists have and continue to be developed to assist the field operations in determining requirements, and ensuring key operational components are addressed. Activation projects teams have access to the Attainia Database System to plan furniture, fixtures and equipment, and improve the accuracy of the project cost estimates.

Enclosure

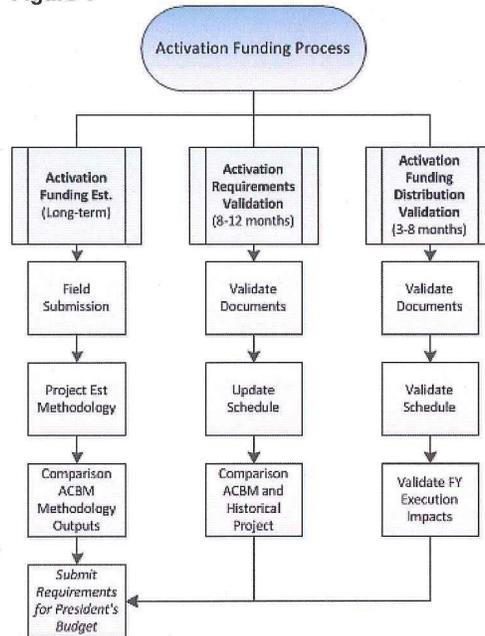
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In FY 2016, an analysis was conducted on the ACBM tool and activation funding process, to improve cost forecasting and management of the activations process. The ACBM has been modified to better support short and long-term funding estimates and to assist VHA with the portfolio management for all Major Construction and Major Lease activations across the system. New features include project tracking, requirements validation, data versioning, monthly updating capabilities, and robust reporting capabilities. The new tool is currently scheduled to be deployed by the end of February 2017. The status is complete.

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Figure 1



Enclosure

Department of Veterans Affairs (VA) Comments to
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Recommendation 3: Clarify CFM policies to require that:

- **all projects have an integrated master schedule to ensure that the integrated master schedules include and link all construction and activation activities; and**
- **the policies on integrated master schedule for CFM and U.S. Army Corps of Engineers managed projects are consistent.**

VA Comment: Concur. VA will clarify the Policy Memorandum and Standard Operation Procedure (SOP) to reinforce the policy that all projects develop and maintain an Integrated Master Schedule (IMS). VA is developing reports for the organization that demonstrate the IMS is linked to construction and activation, and also provides management with meaningful data on which to act or guide the project team. These reports will be documented in SOPs and reviewed by leadership to ensure the project team is working to maintain schedule.

Denver project is the only project that is integrating construction and activation schedules into the IMS. As we identify the lessons learned, IMS SOPs will be developed. The SOPs will address the process for VA/United States Army Corps of Engineers projects as well as improved integration of the activation activities. VA anticipates completion of this recommendation by July 2017.

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Technical Comments:

Page 9, under Figure 2, first bullet: Bullet reads:

“VA and USACE are in the process of finalizing an Enterprise Program Management Plan to provide a framework and consistent approach for USACE to support VA’s design and construction program in the future. The plan will formalize USACE’s role and align with the underlying goal of the agencies’ interagency agreement to deliver medical facility projects with cost and on schedule.”

VA Recommended Edit: Revise bullet to read:

“On December 21, VA and USACE executed an Enterprise Program Management Plan to provide a framework and consistent approach for USACE to support VA’s design and construction program in the future. The plan formalizes USACE’s role and align with the underlying goal of the agencies’ interagency agreement to deliver medical facility projects within cost and on schedule.”

Appendix VII: GAO Contact and Staff Acknowledgments

GAO Contact

David J. Wise, (202) 512-2834 or wised@gao.gov

Staff Acknowledgments

In addition to the contact named above, Ed Laughlin (Assistant Director), Lynn Filla-Clark (Analyst in Charge), Brian Bothwell, Steven Campbell, George Depaoli, Geoffrey Hamilton, Jason Lee, Malika Rice, Amy Rosewarne, and Larry Thomas made key contributions to this report.

Appendix VIII: Accessible Data

Data Tables

Data Table for Figure 1: Phases of a Department of Veterans Affairs' (VA) Project for Medical Facility Construction.

Planning

VA analyzes its needs for a major medical facility and conducts studies to define the facility's scope.

Activation

VA brings the facility into full planned operations by conducting activities such as purchasing and installing furniture and medical equipment and hiring new staff for the facility.

Design

VA hires an architectural and engineering firm to design the facility and develop a cost estimate to complete the project.

Construction

VA awards a construction contract to a contractor that then develops a detailed construction schedule and constructs the facility.

VA reviews the schedule and assigns engineers to work onsite and oversee the facility's construction until it is complete.

Agency Comment Letters

Text of Appendix VI: Comments from the Department of Veterans Affairs

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DEPARTMENT OF VETERANS AFFAIRS

Washington DC 20420

February 14, 2017

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Director, Physical Infrastructure

U.S. Government Accountability Office 441 G Street, NW

Washington, DC 20548

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VA Comment: Concur. The Department of Veterans Affairs (VA) has developed a plan to establish procedures and processes for monitoring Construction Facilities Management compliance with the timeframes established in the updated Contract Modification Handbook. The process will standardize the reporting and will use existing reporting structures such as VA's Project Review Board to assure there is management oversight of the compliance to the time standards for processing. VA will have the process in place by the end of March 2017.

Recommendation 2: Develop an activation cost estimate for the Denver project that is reliable and conforms with best practices as described in the GAO Cost Estimating and Assessment Guide.

VA Comment: Concur. This recommendation is related to high risk area 2 (inadequate oversight and accountability). Developing a reliable activation cost estimate that confirms with best practices will improve VA's management of medical facility construction projects and will allow for more informed decision making by Congress and VA

VA concurs with having a reliable cost estimate for construction projects. To provide rigor and improve accuracy of activation cost estimates, the Veterans Health Administration (VHA) developed the Activation Cost Budget Model (ACBM) to estimate Major Construction and Major Lease activation project requirement costs; i.e., recurring and non-recurring activation costs.

The development of activation project estimates is a coordinated effort between VA Medical Centers (VAMCs), and VHA's Office of Capital Asset Management Engineering and Support (OCAMES). Information is gathered to develop preliminary recurring and non-recurring activation cost estimates for new space. As the project progresses through the acquisition process, estimates continue to be refined through the use of "progress elaboration." Due to the number of years between when a preliminary budgetary estimate is prepared and when a project nears its actual activation date, some variation is expected as project requirements are refined.

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In fiscal year (FY) 2012, VHA started to utilize the ACBM to provide project specific cost estimates to bring the new space into full operational status. Since the development of the ACBM, OCAMES has facilitated field data calls to gather all needed project data to run the model; for example, Budget Year, Project Type, Space Gap Data, Utilization Gap Data, Net New Full Time Equivalent resulting from project, Project Duration', Expected year of groundbreaking, Square Footage included in project, Additional Workload Resulting from Project - Amount of workload that is expected to be transferred to VA from a fee care provider as a result of the project, etc. Additionally, the ACBM contains assumptions regarding the timing of costs based on historical VA experience, and calculates recurring costs based on the total incremental workload and non- recurring linear cost per square foot, by department. Activation costs are phased across the multiple years of each project, and phasing varies depending on the number of years of construction.

To further improve the accuracy of activation costs, in FY 2015, OCAMES-Activations developed the Activating Funding Process (see Figure 1). This process utilizes top- down and bottom-up cost development methods. Integral to this process is the analysis of the two cost estimates, analyzing the variation, validation of the requirement and expected year of execution. During this assessment, the ACBM cost estimates are compared to the project requirements developed by the local project team; which results in a three year outlook and total estimated activation cost. As needed, adjustments are made to the original estimates due to variations as a result of unknown design impacts on operations, variation in the cost of furniture, fixtures and equipment, scope refinement, specification omissions or changes, operation cost increases, etc.

Since FY 2015, Denver's \$341 million estimated activation cost has been reassessed as part of this yearly process, and determined reasonable to bring this facility into operational status. The assessment included a review of the requirements, justification and comparison to multiple ACBM runs.

As part of FY 2015 improvements, OCAMES - Activations took a portfolio management approach to support field operations, by offering VHA wide services and tools. This support includes access to activation subject matter experts to assist in cost estimating, activation specific contract support, assessment tools, and contract vehicles to assist VAMC leadership with planning and managing Major Construction and Major Lease Activation Projects. In addition, Clinical and Administrative Activation Checklists have and continue to be developed to assist the field operations in determining requirements, and ensuring key operational components are addressed. Activation projects teams have access to the Attainia Database System to plan furniture, fixtures and equipment, and improve the accuracy of the project cost estimates.

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In FY 2016, an analysis was conducted on the ACBM tool and activation funding process, to improve cost forecasting and management of the activations process. The ACBM has been modified to better support short and long-term funding estimates and to assist VHA with the portfolio management for all Major Construction and Major Lease activations across the system. New features include project tracking, requirements validation, data versioning, monthly updating capabilities, and robust reporting capabilities. The new tool is currently scheduled to be deployed by the end of February 2017. The status is complete.

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Figure 1

Activation Funding Process (Process diagram. Accessible data available upon request.

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Recommendation 3: Clarify CFM policies to require that:

- all projects have an integrated master schedule to ensure that the integrated master schedules include and link all construction and activation activities; and
- the policies on integrated master schedule for CFM and U.S. Army Corps of Engineers managed projects are consistent.

VA Comment: Concur. VA will clarify the Policy Memorandum and Standard

Operation Procedure (SOP) to reinforce the policy that all projects develop and maintain an Integrated Master Schedule (IMS). VA is

developing reports for the organization that demonstrate the IMS is linked to construction and activation, and also provides management with meaningful data on which to act or guide the project team. These reports will be documented in SOPs and reviewed by leadership to ensure the project team is working to maintain schedule.

Denver project is the only project that is integrating construction and activation schedules into the IMS. As we identify the lessons learned, IMS SOPs will be developed. The SOPs will address the process for VA/United States Army Corps of Engineers projects as well as improved integration of the activation activities. VA anticipates completion of this recommendation by July 2017.

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Technical Comments:

Page 9, under Figure 2, first bullet: Bullet reads:

"VA and USAGE are in the process of finalizing an Enterprise Program Management Plan to provide a framework and consistent approach for USACE to support VA's design and construction program in the future. The plan will formalize USACE's role and align with the underlying goal of the agencies' interagency agreement to deliver medical facility projects with cost and on schedule."

VA Recommended Edit: Revise bullet to read:

"On December 21, VA and USACE executed an Enterprise Program Management Plan to provide a framework and consistent approach for USAGE to support VA's design and construction program in the future. The plan formalizes USAGE's role and align with the underlying goal of

the agencies' interagency agreement to deliver medical facility projects within cost and on schedule."

Related GAO products

Veterans Affairs Contracting: Improvements in Policies and Processes Could Yield Cost Savings and Efficiency. [GAO-16-810](#). Washington, D.C.: September 16, 2016.

VA Construction: Actions to Address Cost Increases and Schedule Delays at Denver and Other VA Major Medical-Facility Projects. [GAO-15-564T](#). Washington, D.C.: April 24, 2015.

VA Construction: VA's Actions to Address Cost Increases and Schedule Delays at Denver and Other Major Medical-Facility Projects. [GAO-14-548T](#). Washington, D.C.: April 22, 2014.

VA Construction: Additional Actions Needed to Decrease Delays and Lower Costs of Major Medical-Facility Projects. [GAO-13-556T](#). Washington, D.C.: May 7, 2013.

VA Construction: Additional Actions Needed to Decrease Delays and Lower Costs of Major Medical-Facility Projects. [GAO-13-302](#). Washington, D.C.: April 4, 2013.

VA Real Property: Realignment Progressing, but Greater Transparency about Future Priorities Is Needed. [GAO-11-197](#). Washington, D.C.: January 31, 2011.

VA Construction: VA Is Working to Improve Initial Project Cost Estimates, but Should Analyze Cost and Schedule Risks. [GAO-10-189](#). Washington, D.C.: December 14, 2009.

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