



Report to the Subcommittee on  
Readiness and Management Support,  
Committee on Armed Services, U.S.  
Senate

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January 2022

# DEFENSE INFRASTRUCTURE

## DOD Should Better Manage Risks Posed by Deferred Facility Maintenance

# GAO Highlights

Highlights of [GAO-22-104481](#), a report to the Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate

## Why GAO Did This Study

DOD manages facilities worldwide with an estimated aggregate plant replacement value of about \$1.3 trillion. Sustaining these facilities involves maintenance and repair to keep them in good working order. Deferring maintenance can lead to deterioration, potentially affecting DOD's ability to support missions.

GAO was asked to review DOD facility sustainment. This report examines the extent to which (1) DOD's cost factors for estimating its facility sustainment funding requirements are comparable to those of other federal agencies and fully account for DOD's sustainment costs; (2) DOD's facility sustainment funding aligns with its funding goals; and (3) DOD has a deferred maintenance backlog and a process for managing any such backlog. GAO reviewed documentation and interviewed officials about DOD's process for estimating facility sustainment funding requirements and managing deferred maintenance; analyzed funding and deferred maintenance data for FY2017 through FY2020; and contacted a non-generalizable sample of 12 DOD installations from six DOD components to discuss facility sustainment.

## What GAO Recommends

GAO made four recommendations, including that DOD account for the costs to sustain facilities that exceed their expected lifespans and improve the implementation of SMS. DOD did not concur with the first recommendation but concurred with the other three to improve SMS implementation. GAO maintains all four recommendations are valid, as discussed in this report.

View [GAO-22-104481](#). For more information, contact Elizabeth Field at (202) 512-2775 or [fielde1@gao.gov](mailto:fielde1@gao.gov).

January 2022

## DEFENSE INFRASTRUCTURE

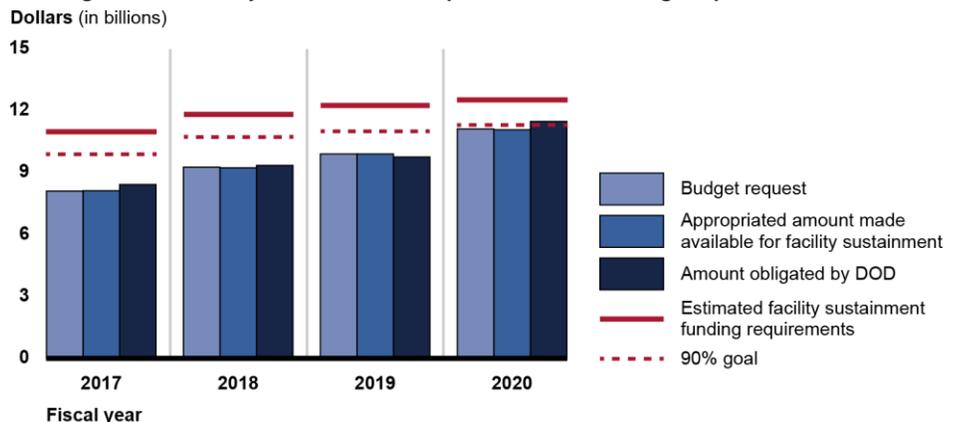
### DOD Should Better Manage Risks Posed by Deferred Facility Maintenance

## What GAO Found

To estimate the funding needed to sustain its roughly 550,000 facilities worldwide, the Department of Defense (DOD) uses cost factors that are comparable to those used by other selected federal agencies, including factors that account for geographic differences and inflation. However, DOD does not fully account for the costs of sustaining facilities that exceed their expected lifespans. Thus, DOD likely underestimates its annual funding requirements, because nearly 30 percent of its facilities have exceeded their expected lifespans.

DOD's facility sustainment funding has not aligned with funding goals, although the gap has been decreasing (see figure). From fiscal year (FY) 2017 through FY2020, the six components reviewed by GAO estimated a total of \$47.5 billion in facility sustainment funding requirements. The budget request for DOD identified \$38.3 billion (80.6 percent of requirements). Appropriated amounts made available for facility sustainment totaled \$38.2 billion (80.5 percent of requirements). And DOD, using appropriated amounts and other allowable amounts, obligated \$38.9 billion (81.9 percent of requirements). DOD's goal is for components to fund facility sustainment at a minimum of 90 percent of annually estimated requirements, but according to DOD officials competing priorities led to budget requests below those goals.

**Funding for DOD Facility Sustainment Compared to DOD Funding Requirements and Goals**



Source: GAO analysis of Department of Defense facility sustainment funding data. | GAO-22-104481

Note: According to DOD, obligations surpassed 90 percent of estimated requirements in FY2020 due to reprogramming.

For fiscal year 2020, DOD reported deferred maintenance backlogs totaling \$137 billion, but DOD has yet to implement the Sustainment Management System (SMS), which it expects will allow it to better manage the risk of these backlogs. Installation officials stated that deferred maintenance leads to the premature failure of facility systems and often leads to more costly repairs, and that maintenance is most often delayed for lower-priority facilities such as living quarters and childcare facilities. SMS implementation is over 3 years behind schedule, does not have dedicated funding, and is being implemented inconsistently by DOD components, particularly as it pertains to facility condition assessments. Without addressing these issues, DOD's efforts to mitigate risks to its management of facility sustainment will be jeopardized.

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## Abbreviations

ASD(S)	Assistant Secretary of Defense (Sustainment)
CAPE	Cost Assessment and Program Evaluation
DHA	Defense Health Agency
DLA	Defense Logistics Agency
DOD	Department of Defense
FCI	Facility Condition Index
FSM	Facilities Sustainment Model
FY	Fiscal Year
GSA	General Services Administration
NASA	National Aeronautics and Space Administration
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
SMS	Sustainment Management System

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January 31, 2022

The Honorable Tim Kaine  
Chairman  
The Honorable Dan Sullivan  
Ranking Member  
Subcommittee on Readiness and Management Support  
Committee on Armed Services  
United States Senate

The Department of Defense (DOD) manages an inventory of more than 550,000 facilities worldwide, with an estimated aggregate plant replacement value of about \$1.3 trillion as of November 2019.<sup>1</sup> These facilities, which include buildings (e.g., housing and childcare centers) and structures (e.g., piers and pipelines), support DOD missions and require ongoing sustainment. Facility sustainment involves maintenance and repair activities necessary to keep facilities in good working order.<sup>2</sup> Inadequate facility sustainment, which results in deferred maintenance, can lead to facilities deteriorating, potentially affecting DOD's ability to support missions.<sup>3</sup>

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<sup>1</sup>DOD's facility inventory includes buildings (e.g., housing and childcare centers), structures (e.g., towers, storage tanks, piers), and linear structures (e.g., runways, roads, pipelines). Plant replacement value represents the cost to replace a current facility and supporting infrastructure using today's construction costs and standards. It is used as a common measure of facility and inventory size, as well as a basis for generating facility condition ratings. For plant replacement value formula, see DOD 7000.14-R, *Financial Management Regulation*, vol. 2B, chap. 8, *Facilities Sustainment and Restoration/Modernization* (December 2016).

<sup>2</sup>Facility sustainment includes regularly scheduled adjustments and inspections, preventive maintenance tasks, and emergency response and service calls for minor repairs. Sustainment also includes major repairs or replacement of facility components that are expected to occur periodically throughout the life cycle of facilities. This includes regular roof replacement, refinishing of wall surfaces, repairing and replacement of heating and cooling systems, replacing tile and carpeting, and similar types of work.

<sup>3</sup>Federal financial accounting standards define deferred maintenance and repairs as maintenance and repairs that were not performed when they should have been or were scheduled to be and which are put off or delayed for a future period. Federal Accounting Standards Advisory Board, *Definitional Changes Related to Deferred Maintenance and Repairs: Amending Statement of Federal Financial Accounts Standards 6, Accounting for Property, Plant and Equipment* (May 11, 2011).

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In recent years, GAO has identified weaknesses in DOD's efforts to manage its support infrastructure, including in facility sustainment. For example, in 2016 we reported that, for fiscal year (FY) 2009 through FY2014, DOD had about \$100 billion of deferred maintenance backlogs for facilities; and that the military services had annually requested and spent about 80 percent of the funding needed to meet their estimated facility sustainment requirements.<sup>4</sup> In 2018 we reported that DOD's process for tracking and reporting real property (including facilities) data resulted in inaccurate and incomplete information about facility condition, and in 2020 we reported on issues in managing the real property data that DOD used to inform its decisions for facility-related budgeting and mission planning.<sup>5</sup>

You requested that we review DOD's facility sustainment investment decisions. This report examines the extent to which (1) DOD's cost factors for estimating its facility sustainment requirements are comparable to those of other federal agencies and fully account for DOD's facility sustainment costs; (2) DOD's facility sustainment funding aligns with its funding goals; and (3) DOD has a deferred maintenance backlog and a process for managing the risks of any such backlog.

For all three objectives, we reviewed FY2017 through FY2020 data for the Army, Air Force, Navy, Marine Corps, Defense Logistics Agency

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<sup>4</sup>GAO, *Defense Facility Condition: Revised Guidance Needed to Improve Oversight of Assessments and Ratings*, [GAO-16-662](#) (Washington, D.C.: June 23, 2016). We also reported that DOD did not have visibility of the military services' progress in implementing a standardized facility condition assessment process, and we recommended that DOD clarify its guidance on reporting facility condition. In September 2018 the military services began reporting on the status of completing facility condition assessments based on the standardized process.

<sup>5</sup>GAO, *Defense Real Property: DOD Needs to Take Additional Actions to Improve Management of Its Inventory Data*, [GAO-19-73](#) (Washington, D.C.: Nov. 13, 2018). We found that DOD's central database for its real property, including tracking facility condition data—the Real Property Assets Database—contained inaccurate data and lacked completeness. In November 2018 we made six recommendations, to include developing and implementing corrective actions for identified data discrepancies, and developing a strategy to address risks associated with data quality and information accessibility. *Defense Real Property: DOD-Wide Strategy Needed to Address Control Issues and Improve Reliability of Records*, [GAO-20-615](#) (Washington, D.C.: Sept. 9, 2020). We also recommended in September 2020 that DOD develop and implement a strategy to remediate real property asset control issues and to develop department-wide instructions for conducting inventories of real property. DOD concurred or partially concurred with our eight recommendations in these reports but had not taken action to fully implement them as of September 2021.

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(DLA), and Defense Health Agency (DHA).<sup>6</sup> Collectively, these six components accounted for 88 percent of DOD’s estimated facility sustainment funding requirements, as of October 2020. We also analyzed documents and interviewed officials from the six DOD components in our scope, as well as officials from several Office of the Secretary of Defense (OSD) offices. To obtain installation-level perspectives on facility sustainment, we met with officials from a non-generalizable sample of 12 installations—two installations for each of the six DOD components.<sup>7</sup>

For our first objective, we reviewed literature about facility management and estimating facility sustainment requirements from academic and professional journals; the Federal Facilities Council; publicly available DOD Office of Inspector General reports; and our own prior reports.<sup>8</sup> We interviewed officials and analyzed the cost factors used by DOD to estimate its annual facility sustainment funding requirements and compared them with those used by other federal agencies, including the Department of Energy, the Coast Guard, and the National Aeronautics and Space Administration (NASA). We selected these federal agencies

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<sup>6</sup>Space Force data are not included in the Air Force data. Although the Space Force was created in FY2020, it did not have designated installations until FY2021. We previously reported on DOD sustainment funding through FY2014; see [GAO-16-662](#). We excluded from our analysis data prior to FY2017 because of DOD changes in the methodology for assembling facility sustainment cost data that would preclude comparisons with recent data. FY2020 was the most recent year for which sustainment funding data were available for our analysis.

<sup>7</sup>A more detailed description of our methodology for selecting the installations can be found in appendix I.

<sup>8</sup>E.g., H. Iijima and S. Takata, “Condition Based Renewal and Integrated Maintenance Planning,” *CIRP Annals – Manufacturing Technology*, vol. 65 (2016): 37-40; H. Kaiser, “Facilities Condition Assessment,” *APPA Body of Knowledge*, (2020): 1; Federal Facilities Council, *Budgeting for Facilities Maintenance and Repair Activities* (1996); Defense Business Board, *Best Practices for Real Property Management* (Apr. 21, 2016); DOD Office of Inspector General, *Audit of the Department of Defense’s Sustainment, Restoration, and Modernization of Military Medical Treatment Facilities* Rep. No. DODIG-2020-103 (July 8, 2020); and GAO, *Coast Guard Shore Infrastructure: Applying Leading Practices Could Help Better Manage Project Backlogs of At Least \$2.6 Billion*, [GAO-19-82](#) (Washington, D.C.: Feb. 21, 2019).

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after consulting with officials from the General Services Administration (GSA) and the Federal Facilities Council.<sup>9</sup>

Similar to DOD, these federal agencies own, operate, and sustain a relatively large number of facilities that include specialized facilities, such as nuclear facilities and wind tunnels. We compared the ages of specific facilities we discussed with installation officials against their expected lifespans under current design standards. We also analyzed data on the ages of buildings owned and sustained by the military services to determine the number of buildings potentially exceeding their expected lifespans. We assessed the reliability of the building age data by manually reviewing their completeness and by interviewing cognizant military service officials. Based on these steps, we determined that the building age data were sufficiently reliable for evaluating building lifespans. We determined that the information and communication component of federal internal control was significant to this objective. Further, we determined that the underlying principle that management should use quality information to achieve agency objectives was significant.<sup>10</sup>

For our second objective, we analyzed available data on DOD's facility sustainment funding requirements and allotments for FY2017 through FY2020 for each of the six components in our scope.<sup>11</sup> To the extent that data were available, for each fiscal year we calculated the dollar amount and percentage differences between the estimated facility sustainment funding requirements, amounts requested to meet those requirements, amounts allotted for sustainment activities from enacted appropriations,

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<sup>9</sup>The GSA oversees the operation and maintenance of federal government buildings, serving about 1 million federal employees across the United States. The GSA Administrator is also a member of the Federal Real Property Council, an interagency council to promote efficient and economical use of federal real property assets. The Federal Real Property Council provides guidance to and is supported by GSA's Real Property Policy Division. The Federal Facilities Council is a cooperative association of federal agencies to advance technologies, processes, and management practices that improve the management, operations, and evaluation of federal facilities.

<sup>10</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

<sup>11</sup>DOD facility sustainment funding is derived from multiple appropriation accounts such as service operations and maintenance (O&M) accounts and military construction accounts. Out of lump sum amounts appropriated into these accounts, DOD and its components internally allot amounts in support of programs, projects, and activities such as facilities sustainment. An allotment is part of an agency's system of administrative control of funds.

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and actual obligations.<sup>12</sup> We compared those calculations with DOD's stated annual goal—90 percent of the estimated facility sustainment funding requirement—to determine whether the goal was met, and if not, at what point the gap between the goal and the allotted funding occurred.<sup>13</sup> To assess the reliability of these data, we reviewed corroborating documentation, assessed the data for inconsistencies, and interviewed DOD component officials about the source, accuracy, and reliability of the data. We determined that the data were sufficiently reliable for our reporting purposes.

For our third objective, we analyzed data on the deferred maintenance backlogs of the six components as published in the components' annual financial reports for FY2017 through FY2020. We met with officials from OSD and each of the six components to discuss their approaches for managing deferred maintenance. We interviewed officials at the six components to determine the extent to which they had met OSD's goal for implementing the Sustainment Management System (SMS) to standardize facility condition assessments across the department. We also reviewed DOD component and OSD documents on SMS implementation. We compared DOD's approach for implementing SMS against a key characteristic—the identification of resources—of effective project schedules.<sup>14</sup>

We also determined that the risk assessment and control environment components of federal internal control were significant to this objective.<sup>15</sup> We requested and obtained facility condition data from the six components, but found that the data were unreliable due to missing and inaccurate entries. We previously reported in 2018 on these unreliable data and made recommendations focused at improving the quality of

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<sup>12</sup>An obligation is a definite commitment that creates a legal liability of the government for the payment of goods and services. An agency incurs an obligation, for example, when it places an order or signs a contract.

<sup>13</sup>In 2014 the Under Secretary of Defense for Acquisition, Technology, and Logistics ((USD (AT&L)) reiterated that it was DOD's goal to fund sustainment programs at 90 percent or higher of the Facility Sustainment Model requirement. (USD (AT&L) Memorandum, *Facility Sustainment and Recapitalization Policy* (Apr. 29, 2014).

<sup>14</sup>GAO, *Schedule Assessment Guide: Best Practices for Project Schedules*, [GAO-16-89G](#) (Washington, D.C.: Dec. 22, 2015), and *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Program Costs*, [GAO-20-195G](#) (Washington, D.C.: Mar. 12, 2020).

<sup>15</sup>[GAO-14-704G](#).

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data; however, as of September 2021 DOD had not yet implemented our recommendations.<sup>16</sup> Therefore, we were unable to analyze the relationship between facility sustainment funding and facility condition. A more detailed description of our objectives, scope, and methodology can be found in appendix I.

We conducted this performance audit from August 2020 to January 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

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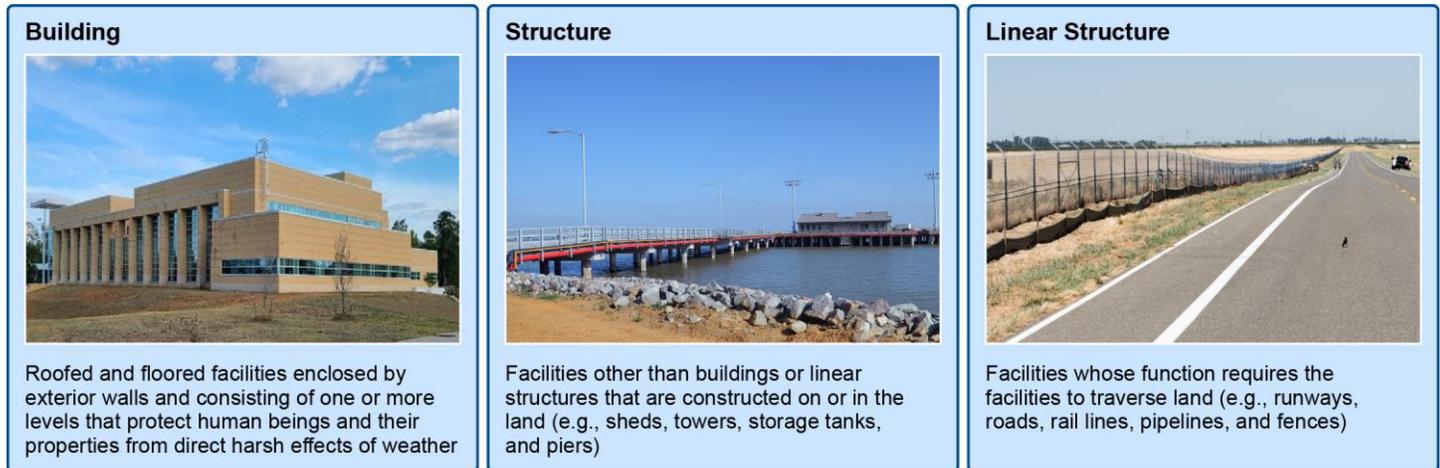
### Types of DOD Facilities

DOD operates and sustains hundreds of installations in the continental United States and overseas. Each of these installations has facilities to support DOD's assigned missions and the personnel who work, live, and recreate on the installations. Facilities on DOD installations include administrative buildings, housing, childcare centers, communication lines, perimeter fencing, parking areas, parade fields, retaining walls, sidewalks, and transformers—all of which require ongoing sustainment. DOD classifies its inventory of more than 550,000 facilities into buildings, structures, and linear structures (see figure 1).

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<sup>16</sup>[GAO-19-73](#).

Figure 1: Department of Defense (DOD) Definitions of Facility Types



Source: DOD (text); Defense Health Agency/G. Watson (building); U.S. Army Corps of Engineers/J. Bruton (structure); U.S. Air Force/H. Couch (linear structure). | GAO-22-104481

## Oversight and Management of Federal and DOD Facilities

Executive Order 13,327, *Federal Real Property Asset Management*, promotes the efficient and economical use of facilities.<sup>17</sup> The executive order established the interagency Federal Real Property Council, chaired by the Deputy Director for Management of the Office of Management and Budget (OMB), with assistance from other council members, including the Administrator of the GSA.<sup>18</sup> Senior real property officers of 23 other federal agencies, including DOD, are members of the Federal Real Property Council. In addition to compiling data on the member agencies' facilities, the council collects property management leading practices to help federal agencies improve their approaches to facility sustainment, among other things. For example, in its 2020 agency reporting guidance, the council highlighted models used by DOD, the Department of Energy, and NASA as mature approaches to estimate facility repair needs based on condition assessments.<sup>19</sup>

The head of each DOD component with facility management responsibilities is required to maintain an accurate and current inventory

<sup>17</sup>69 Fed. Reg. 5897 (Feb. 6, 2004) (Executive Order signed Feb. 4, 2004).

<sup>18</sup>The Federal Real Property Council was established by Executive Order 13,327 and later enacted into law by the Federal Real Property Management Reform Act of 2016, Pub. L. No. 114-318, § 2(3) (2016).

<sup>19</sup>Federal Real Property Council, *2020 Guidance for Real Property Inventory Reporting*, Version 1 (June 12, 2020).

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of real property facilities of which they are the sole user or over which they exercise management responsibility.<sup>20</sup> A number of DOD organizations have responsibilities that relate to oversight and management of DOD facility sustainment activities, as described below:

- The Assistant Secretary of Defense (Sustainment) (ASD(S)) prescribes policies and procedures for the conduct of maintenance and sustainment support in DOD. The office is also responsible for monitoring and reviewing all sustainment programs within DOD, and it participates in the DOD planning, programming, and budgeting process with respect to assigned facility sustainment responsibilities, among others.
- The Under Secretary of Defense (Comptroller) is the advisor to the Secretary of Defense for budgetary and financial matters. The Comptroller focuses on budgetary formulation and execution, directing the formulation and presentation of DOD budgets, and maintaining effective control and accountability over the use of all DOD financial resources.
- The Director of Cost Assessment and Program Evaluation (CAPE) is the principal DOD official for independent cost estimation and cost analysis. CAPE prescribes policies and procedures for the conduct of cost estimation and analyses. CAPE also conducts or approves independent cost estimates and cost analyses covering sustainment reviews and budget requests, among others. According to officials, the office sets the percentage of the estimated facility sustainment requirements that DOD components are to request in their annual budget submissions and provides this information in defense programming guidance.<sup>21</sup>

The Army, Air Force, Navy, and Marine Corps have offices and installation management commands responsible for managing service-specific facility sustainment policy, planning, and investment activities. While DLA and DHA generally lease the facilities they occupy on military installations, these agencies are also responsible for funding and sustaining such facilities.

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<sup>20</sup>DOD Instruction 4165.70, *Real Property Management* (Apr. 6, 2005) (Incorporating Change 1, Aug. 31, 2018).

<sup>21</sup>According to CAPE officials, the programming guidance is not binding; rather, the intent of the defense programming guidance is to enable DOD components to establish their relative funding priorities.

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## DOD Budget Development for Facility Sustainment

Since 2003, DOD has used the Facilities Sustainment Model (FSM)—discussed in more detail later in this report—to estimate its annual, department-wide facility sustainment funding requirements.<sup>22</sup> FSM generates an estimated annual funding requirement for facility sustainment activities necessary to keep facilities in good working order.<sup>23</sup> While the President’s budget request describes funding for high-level purposes, DOD also submits budget justifications to Congress that provide a detailed presentation of the department’s proposed budget—for example, the amount for facilities sustainment under the high-level purpose of Operation and Maintenance. Congress then appropriates lump sum amounts for these high-level broad purposes, and OMB distributes the appropriated amounts into the various department and component accounts through the apportionment process.<sup>24</sup> Finally, DOD internally allocates amounts for its various projects, programs, and activities, including facility sustainment.<sup>25</sup>

DOD’s process for developing its annual facility sustainment budget, using FSM, is summarized in figure 2.

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<sup>22</sup>DOD uses FSM to estimate its annual facility sustainment funding requirements based on the quantities and types of facilities included in DOD’s Real Property Assets Database. We have reported on data reliability issues with the database in prior reviews. See [GAO-19-73](#) and [GAO-20-615](#).

<sup>23</sup>In addition to generating annual facility sustainment requirements, FSM also estimates sustainment requirements to cover the costs of DOD-wide facility sustainment initiatives, such as implementing standardized facility condition assessments.

<sup>24</sup>Apportionment is an OMB action that divides amounts made available for obligation by specific time periods, usually quarters.

<sup>25</sup>Allotments are part of an agency’s system of administrative control of funds whose purpose is to keep obligations and expenditures from exceeding budgetary limits established through appropriation and apportionment.

**Figure 2: Department of Defense (DOD) Budget Process As It Applies to Facility Sustainment**

Budget Development			Fiscal Year
Planning	Programming/Budgeting	Enactment	Execution
<i>about eighteen months prior to budget year</i>		<i>generally during the prior fiscal year</i>	
<p><b>Budget Formulation</b></p> <p>The Office of the Assistant Secretary of Defense for Sustainment uses the Facilities Sustainment Model to develop estimated budget requirements for sustaining DOD facilities.</p>	<p><b>Budget Submission</b></p> <p>DOD submits its budget estimate, including estimated amounts for facility sustainment, to the Office of Management and Budget (OMB). OMB finalizes based on presidential priorities and the President transmits to Congress.</p>	<p><b>Congress Deliberates</b></p> <p>Congress authorizes and appropriates amounts, and enacts funds, including funds for facility sustainment, based on deliberations.</p>	<p><b>Federal Agencies Execute Appropriated Amounts</b></p> <p>OMB apportions appropriated amounts to DOD, which are then allocated and obligated for facility sustainment purposes.</p>

Source: GAO analysis of Department of Defense information and Office of Management and Budget guidance. | GAO-22-104481

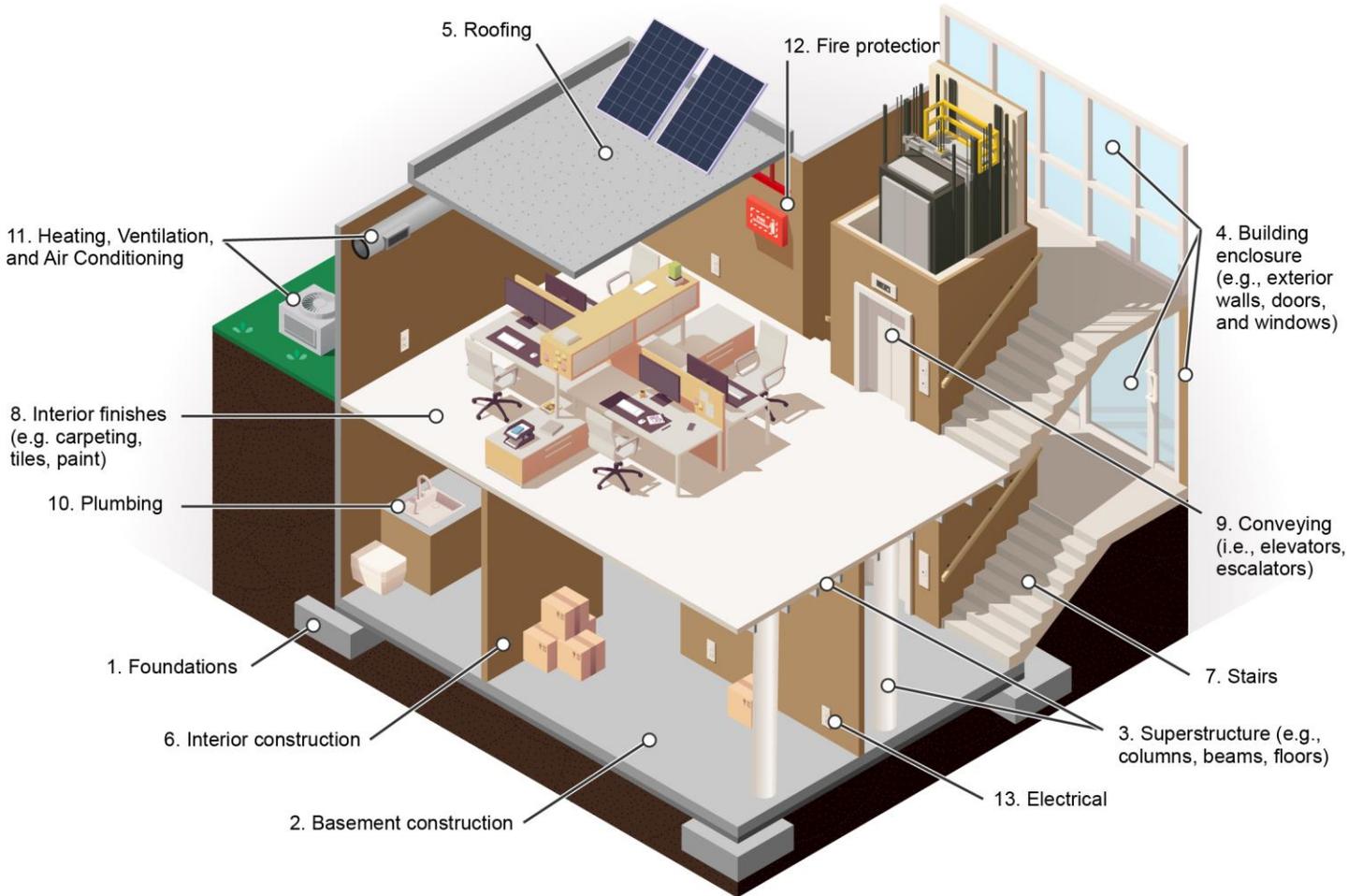
Note: This figure is a summary of the overall budget process as it applies to DOD facility sustainment and does not depict every step.

## DOD’s Sustainment Management System (SMS)

In 2013 DOD began transitioning to SMS, developed by the U.S. Army Corps of Engineers Engineer Research and Development Center, to assess the condition of facilities. SMS is intended to replace and standardize the different methods used across DOD to assess facility condition, but according to DOD officials full replacement is not expected until 2025, at the earliest.

SMS uses the results of on-site visual condition assessments of existing facilities to forecast when systems such as roofs and plumbing will need major repairs or replacement, as well as the effects that delaying those facility repairs or replacements will have on their condition. DOD components can use these SMS projections to plan and prioritize their facility sustainment activities. The SMS module for buildings includes criteria to assess the condition of 13 systems, including roofing, electrical, and plumbing (see figure 3).

**Figure 3: Thirteen Systems Included in the Sustainment Management System Module for Assessing the Condition of Buildings**



Source: GAO presentation of Department of Defense information; Taras Livvy/stock.adobe.com. | GAO-22-104481

To conduct a facility condition assessment, an inspector applies preset criteria to each facility system being inspected. For example, SMS has criteria to assess the extent and severity of rust on metal doors and cracks in a building's foundation. SMS scores the individual facility system assessments and combines these scores on a weighted basis to determine (and score) the building's overall facility condition.

# In Estimating Sustainment Requirements, DOD Does Not Fully Account for Facility Age

## DOD's Cost Factors Are Comparable to Those Used by Other Federal Agencies

DOD currently uses FSM to estimate its annual facility sustainment funding requirements, relying on cost factors similar to those used by other selected federal agencies, as shown in table 1. For example, according to agency documents and officials, all of the agencies use commercial cost data, and like DOD they all adjust their estimates to account for geographic differences in the costs of labor, material, and equipment.<sup>26</sup> Similarly, DOD and the other selected federal agencies adjust for inflation, consistent with OMB guidance or based on local market conditions.

**Table 1: Comparison between Department of Defense (DOD) Facility Sustainment Funding Requirements Cost Factors and Those Used by Other Selected Federal Agencies**

Cost factors	Department of Defense	Department of Energy	National Nuclear Security Administration	National Aeronautics and Space Administration	Coast Guard
Uses commercial cost data, as appropriate	✓	✓	✓	✓	✓
Adjusts for geographic area cost differences	✓	✓	✓	✓	✓
Adjusts for inflation	✓	✓	✓	✓	✓
Adjusts for increased security requirements <sup>a</sup>	✓	✓	✓	—	—

Source: GAO analysis of agency documents and interviews with agency officials. | GAO-22-104481

<sup>a</sup>This cost factor applies when a facility's security requirements add significantly to the costs of sustainment activities, such as restricted access, which can materially delay response or completion times by sustainment personnel.

<sup>26</sup>See, e.g., Department of Energy Order 430.1C, *Real Property Asset Management* (Aug. 19, 2016) (Incorporating Change 2, Sept. 17, 2020); and NASA Procedural Requirement 8831.2F, *Facilities Maintenance and Operations Management* (Incorporating Change 1, Sept. 2, 2016).

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The primary cost factor used by FSM to estimate funding requirements is the sustainment unit cost.<sup>27</sup> This cost represents the annual cost of sustaining an average-sized facility for a particular facility analysis category.<sup>28</sup> For example, the sustainment unit cost for a storage shed is expressed in terms of cost per square foot, and the sustainment unit cost for a chain link fence is expressed in cost per linear foot. Data from commercially available sources or from professional associations and government agencies are the basis of the sustainment unit costs for almost all of DOD's facility analysis categories for buildings, and for 83 percent of DOD's facility analysis categories for all facility types (i.e., buildings, structures, and linear structures). DOD considers these data sources to be accessible, widely applicable, and unbiased.

DOD's FSM Configuration/Support Panel meets three to four times a year to review and update FSM's business rules and cost factors, including sustainment unit costs. The panel is chaired by the Assistant Director for Military Construction in the Office of the Assistant Secretary of Defense (Sustainment), and its membership includes representatives from the Army, Air Force, Navy, Marine Corps, DHA, DLA, DOD Education Activity, and Washington Headquarters Service. Panel members update data on their facilities and are lead proponents for those facility analysis categories that are either used primarily by their component or fall within their mission expertise. For example, DLA is the lead proponent for facility analysis categories related to fuel infrastructure, the Air Force is the lead proponent for categories related to runways, and the Navy is the lead proponent for categories related to wharfs and piers. As lead proponents,

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<sup>27</sup>In 2008 we reported on factors affecting the reliability of the sustainment unit costs used in FSM, including that DOD had not maintained documentation of how these unit costs were derived. We recommended that DOD maintain such documentation, to include the calculations used to determine each factor as well as the reasons for any changes made from year to year. DOD concurred with our recommendation and now maintains cost data, including expected facility lifespan and the cost and frequency of required sustainment activities, for all facility analysis categories. GAO, *Defense Infrastructure: Continued Management Attention Is Needed to Support Installation Facilities and Operations*, [GAO-08-502](#) (Washington, D.C.: Apr. 24, 2008).

<sup>28</sup>DOD Instruction 4165.03, *DOD Real Property Categorization* (Aug. 24, 2012) (Incorporating Change 3, Aug. 31, 2018). DOD estimates sustainment funding requirements by grouping similar facilities into facility analysis categories. Each facility analysis category has a common unit of measure and an equivalent sustainment unit cost based on that unit of measure. For example, small unit headquarters buildings are measured in square footage and have a sustainment unit cost of \$4.17 per square foot.

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panel members add, modify, and delete facility analysis categories to better reflect the department's total facility inventory.

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## DOD Does Not Account for Facilities That Exceed Their Expected Lifespans

While DOD uses cost factors that are comparable to those used by other agencies, it differs from those agencies in the way in which it estimates its facility sustainment funding requirements. Specifically, we found that in determining its annual sustainment funding requirements, DOD does not account for the higher costs of sustaining facilities that have exceeded their expected lifespans.

Federal Real Property Council guidelines allow agencies to report their annual facility sustainment funding requirements based on facility condition assessments or on an estimate.<sup>29</sup> According to agency documents and officials, the other selected federal agencies estimate their annual sustainment costs by incorporating the results of facility condition assessments, a procedure that does not require separate accounting for facility age. For example, the Department of Energy and the National Nuclear Security Administration use condition assessments to estimate their facility sustainment funding requirements. DOD, in contrast, estimates facility sustainment funding requirements, based on the total quantity of each facility analysis category (for example, based on the total square footage of general administrative buildings across the department), regardless of the age or condition of individual facilities within the category.

In developing and applying sustainment unit costs, DOD assumes that facility sustainment activities, including annual tasks and periodic major repairs such as roof replacements, will occur at regular and predictable intervals over the course of that facility's expected lifespan.<sup>30</sup> DOD projects the expected lifespans of facilities according to its facility analysis categories. For example, facilities in the observation tower facility analysis category have an expected lifespan of 36 years, and those in the marine maintenance shop category have an expected lifespan of 50 years.

The sustainment unit costs used in FSM apportion the annualized costs of required sustainment activities across the expected lifespan of the

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<sup>29</sup>2020 *Guidance for Real Property Inventory Reporting*.

<sup>30</sup>DOD assumes that sustainment unit costs will represent an accurate forecast of overall sustainment requirements—but not an accurate forecast for individual facilities—because facilities' ages and conditions vary, and major repairs and replacements do not occur uniformly every year. ASD(S), *DOD Facilities Sustainment Model, V.22 (FY 2022-2027)* (June 9, 2020) (Incorporating Change 1, July 23, 2020).

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facility. For example, FSM uses a sustainment unit cost that assumes the doors of a hardened aircraft shelter will need to be replaced once during the shelter's expected 40-year lifespan and will cost about \$12,400. FSM apportions the \$12,400 door replacement cost over 40 years, thus contributing \$310 to the annual sustainment cost—or 1/40th of the total cost.

Facility sustainment unit costs should be reasonably accurate if DOD completes sustainment activities on schedule and facilities are retired at the end of their expected lifespans. However, if the average age of facilities in a facility analysis category exceeds expected lifespan, or if sustainment activities are deferred, DOD will likely incur greater sustainment costs than those generated by FSM using sustainment unit costs.

We identified multiple instances in which the average age of facilities in a particular facility analysis category exceeded the expected lifespan for that category. For example:

- The **Navy and Marine Corps** had 32 facility analysis categories in which the average age of facilities exceeded their expected lifespans—for one category, by 29 years. The average age for Navy wharfs was about 73 years—23 years beyond their expected lifespans of 50 years.
- **Army** officials reported that the average age of Army facilities in 63 facility analysis categories exceeded their expected lifespans—including barracks, dining facilities, and ammunition storage facilities.

Also, our analysis of **Army, Air Force, Navy, and Marine Corps** FY2020 building age data found that 29 percent of buildings in use or in caretaker status were built more than 60 years ago and had exceeded their expected lifespans.<sup>31</sup>

Officials at all eight of the military service installations we contacted told us about the challenges and higher costs of sustaining older facilities, including facilities that had exceeded their expected lifespans and were still in use. For example:

- An official at Fort Leonard Wood, Missouri, told us that many of the installation's warehouses were built of wood in the early 1940s, and thus had already exceeded their 45-year expected lifespans by more

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<sup>31</sup>We did not include structures or linear structures in our analysis.

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than 30 years. The official said that many of those warehouses had extensive termite damage, lacked heating and air conditioning systems, and were difficult to sustain given current funding (see figure 4). The official cited an example of one warehouse where an undetected roof leak had caused about \$300,000 in damage to mattresses, and appliances had dry rot due to the lack of climate controls.

**Figure 4: World War II-Era Warehouse at Fort Leonard Wood, Missouri**



According to an Army official, this World War II-era warehouse is still in use on Fort Leonard Wood, Missouri, although it is difficult to sustain given current funding. The inlet pipe at the front end is for hooking up an external climate control system.

Source: U.S. Army/B. Nelson. | GAO-22-104481

- Officials at Marine Corps Base Hawaii told us that more than half of the base's facilities date to the World War II period and have exceeded their expected lifespans. Officials said that most of the installation's sustainment funding goes to maintaining these facilities, especially their aged mechanical and utility systems.

When we asked Army, Navy, and Marine Corps officials whether they believed that FSM provides accurate estimates of sustainment requirements in cases in which facilities are used beyond their expected lifespans, they told us that FSM provides a rough estimate. They also stated that FSM would generate higher sustainment funding requirements if it accounted for age, since older facilities cost more per year to sustain.

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According to DOD's definition of sustainment, the main objective of its facility sustainment program is to keep facilities in good working order to meet mission requirements.<sup>32</sup> *Standards for Internal Control in the Federal Government* states that management should use quality information to achieve agency objectives and identify, analyze, and respond to risks.<sup>33</sup>

However, DOD has not collected complete and reliable information on the impact of older facilities on facility sustainment costs, nor has it assessed the effect of older facilities on the sustainment unit costs for all facility categories in which the average age of the facilities exceeds their expected lifespans. When we discussed the possibility of collecting, assessing, and incorporating facility age into FSM's sustainment unit costs for estimating facilities sustainment funding requirements, officials stated that there would be value in doing so. However, an OSD official noted that the department intends to move from FSM to SMS for determining sustainment funding requirements in the future, and that spending time and money to assess and adjust the sustainment unit costs used in FSM to account for facilities exceeding their expected lifespans would not be a wise investment of resources at this time.<sup>34</sup>

As noted above, DOD's FSM Configuration/Support Panel meets three to four times each year, among other reasons so as to review and update FSM's business rules, including its cost factors. It would not necessarily entail additional resources for the panel to assess the extent to which older facilities affect sustainment unit costs as part of those routine reviews. Moreover, adoption of SMS across the department to conduct facility condition assessments has been slower than planned. In October 2021 an OSD official stated that full replacement of FSM with SMS for determining facilities sustainment funding requirements likely would not occur for another 5 years—indicating that DOD would continue using FSM until at least the end of 2026.

Until the department collects and assesses information on the effect of aging facilities on facilities sustainment costs and incorporates that information into its estimates, it will continue to underestimate the likely

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<sup>32</sup>DOD 7000.14-R, *Financial Management Regulation*, vol. 2B, chap 8, *Facilities Sustainment and Restoration/Modernization* (December 2016).

<sup>33</sup>[GAO-14-704G](#).

<sup>34</sup>SMS determines maintenance requirements based on facility condition rather than expected lifespan.

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budgetary resources it needs to meet its objective of keeping facilities mission capable.

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## DOD Has Not Met Its Goals for Annual Sustainment Funding, but the Gap Has Been Decreasing

DOD's facility sustainment funding has not aligned with its annual funding goal of 90 percent or higher of its facility sustainment requirement, as called for by the Under Secretary of Defense (Acquisition and Sustainment) in 2014.<sup>35</sup> We found that, for the fiscal years we examined (FY2017 through FY2020), DOD did not allot funding for facility sustainment at 90 percent or higher of estimated FSM requirements. Our analysis shows that the six components in our review collectively estimated a total of \$47.5 billion in facility sustainment funding requirements for FY2017 through FY2020. However, the budget request for DOD identified \$38.3 billion for facility sustainment funding requirements for those years (80.6 percent of requirements). Appropriated amounts made available for facility sustainment totaled \$38.2 billion (80.5 percent of requirements), and DOD obligated \$38.9 billion (81.9 percent of requirements).<sup>36</sup> These obligations surpassed 90 percent of estimated requirements in FY2020, which some DOD officials told us included funding that was reprogrammed for facility sustainment purposes from other programs before the end of the fiscal year.<sup>37</sup>

Table 2 shows aggregated annual totals for the six components at each step of the funding process.

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<sup>35</sup>Under Secretary of Defense (Acquisition, Technology, and Logistics) Memorandum. *Facility Sustainment and Recapitalization Policy* (Apr. 29, 2014). DOD facility sustainment funding is derived from multiple appropriation accounts, such as service operations and maintenance (O&M) accounts and military construction accounts. Out of lump sum amounts appropriated into these accounts, DOD and its components internally allot amounts in support of programs, projects, and activities such as facilities sustainment. An allotment is part of an agency's system of administrative control of funds.

<sup>36</sup>The amounts obligated exceed amounts allotted because additional funds were made available for facility sustainment projects through reprogramming. Reprogramming occurs when funds are shifted within an appropriation or fund account to be used for purposes other than those contemplated at the time of appropriation, such as shifting restoration funds to sustainment. Generally, agencies may shift funds within an appropriation account as part of their duty to manage their funds, and they may do so without statutory authority.

<sup>37</sup>According to DOD officials, this funding was reprogrammed for facility sustainment purposes because other programs were unable to obligate their appropriated amounts prior to their expiration at the end of the fiscal year.

**Table 2: Department of Defense (DOD) Components' Annual Facilities Sustainment Funding**

	FY2017	FY2018	FY2019	FY2020	Total <sup>a</sup>
<b>Estimated facility sustainment funding requirements<sup>b</sup> (\$billions)</b>	10.9	11.8	12.2	12.5	<b>47.5</b>
<b>Budget request (\$billions)</b>	8.1	9.2	9.9	11.1	<b>38.3</b>
<i>Percentage of estimated requirements</i>	73.8	78.1	80.9	88.6	<b>80.6</b>
<b>Appropriated amount made available for facility sustainment (\$billions)<sup>c</sup></b>	8.1	9.2	9.9	11.0	<b>38.2</b>
<i>Percentage of estimated requirements</i>	74.0	77.8	80.9	88.3	<b>80.5</b>
<b>Amount obligated by DOD (\$billions)</b>	8.4	9.3	9.7	11.4	<b>38.9</b>
<i>Percentage of estimated requirements</i>	76.7	78.8	79.7	91.5	<b>81.9</b>

Source: GAO analysis of DOD facility sustainment funding data. | GAO-22-104481

Notes: Data shown represent the six DOD components in our review: Army, Air Force, Navy, Marine Corps, Defense Logistics Agency, and Defense Health Agency. According to DOD, obligations surpassed 90 percent of estimated requirements in FY2020 due to reprogramming.

<sup>a</sup>Amounts may not sum due to rounding.

<sup>b</sup>DOD estimated its facility sustainment funding requirements using the Facilities Sustainment Model.

<sup>c</sup>DOD allots amounts for facility sustainment from its available appropriations.

The levels of facility sustainment funding included in DOD's annual budget request from FY2017 through FY2020 varied among the components (see table 3).<sup>38</sup> The Defense Health Agency's (DHA) budget request was the highest of the components'—averaging 101.1 percent of its estimated FSM requirements for FY2017 through FY2020—and the Defense Logistics Agency's (DLA) request was the lowest—averaging 70.0 percent of its estimated FSM requirements for those same fiscal years. OSD and DHA officials stated that DHA must request a relatively higher funding amount for the sustainment needs of its medical facilities, or it would risk not meeting national healthcare accreditation standards.<sup>39</sup> During the 4-year period we examined, the budget request nearly met or exceeded 100 percent of DHA's estimated facility sustainment requirements, reaching a high of 106.6 percent in FY2017. DLA officials stated that its budget requests, which reached a low of 64.1 percent in FY2017, reflect an acceptable level of risk and were set at the levels requested in order to fund other, competing priorities, such as audit,

<sup>38</sup>For more detailed information on facility sustainment funding requests by DOD component, see appendix II.

<sup>39</sup>The Joint Commission accredits more than 80 percent of U.S. hospitals by performing assessments of medical facility condition. According to DHA officials, the Joint Commission's facility condition standards require that DOD sustain medical facilities in excellent condition. All of DHA's medical facilities are subject to accreditation standards.

information technology modernization, and 100 percent annual inventory efforts.

**Table 3: Percentages of Estimated Department of Defense (DOD) Components' Facility Sustainment Funding Requirements in Fiscal Year (FY) Budget Requests (in percent)**

DOD component	FY2017	FY2018	FY2019	FY2020	Average
<b>Army</b>	70.9	75.8	80.1	85.4	78.1
<b>Air Force</b>	77.7	80.2	80.5	85.6	81.0
<b>Navy</b>	69.6	78.3	80.0	107.0	83.7
<b>Marine Corps</b>	74.0	74.9	81.0	83.2	78.3
<b>Defense Logistics Agency</b>	64.1	67.9	75.7	72.5	70.0
<b>Defense Health Agency</b>	106.6	100.2	98.0	99.6	101.1

Source: GAO analysis of DOD data. | GAO-22-104481

Note: DOD estimated its facility sustainment funding requirements using the Facilities Sustainment Model.

Officials from the four military services also told us that other programs—such as weapon system acquisitions—are consistently prioritized above facility sustainment. For example, Navy officials stated that aircraft, submarine, and ship acquisition initiatives are consistently prioritized above facility sustainment because of their perceived greater importance in performing the Navy’s assigned missions. Navy officials added that they typically request less than 90 percent of the FSM-generated requirement so as to better align with the Navy’s topline budget, which was based on the Navy’s overall mission needs.

OSD officials stated that competing priorities—such as modernization of the U.S. nuclear weapons stockpile—were the primary reason why DOD’s annual budget requests for facility sustainment were consistently below DOD’s 90 percent funding goal. However, these officials told us that DOD has taken measures to increase prioritization of facility sustainment, such as setting annual “funding floors” for DOD components based on estimated FSM requirements and increasing those funding floors annually.<sup>40</sup> For example, DOD set a funding floor in FY2017 for components’ Operation and Maintenance accounts at 70 percent of the

<sup>40</sup>According to OSD officials, a funding floor is the minimum acceptable level of funding for annual budget submissions. OSD officials told us that DOD components are not precluded from seeking facility sustainment funding above the funding floor, which is considered a minimum threshold.

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FSM requirement.<sup>41</sup> This floor was increased to 75 percent in the FY2018 budget submission, to 80 percent in the FY2019 budget submission, and to 85 percent in the FY2020 budget submission.

Our analysis found that the gap between funding requested and estimated requirements decreased each year in the time period reviewed. It decreased by 14.8 percent for the period—from 73.8 percent of estimated requirements in FY2017 to 88.6 percent in FY2020. Further, the gap between the estimated FSM requirement and the amount DOD obligated narrowed by 14.8 percent, from 76.7 percent in FY2017 to 91.5 percent in FY2020.

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## Implementation of SMS to Help DOD Manage Risks Associated with Its \$137 Billion Maintenance Backlog Faces Challenges

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### DOD Components' Deferred Maintenance Backlogs Are Equivalent to Almost 12 Years of Facility Sustainment Funding at FY2020 Levels

In FY2020 DOD reported \$137 billion in deferred maintenance. Of that amount, \$130 billion, or 95 percent, represents the deferred maintenance backlog for the six components in our review. The \$130 billion in deferred maintenance backlogs is an inflation-adjusted increase of 5 percent over what the components reported in FY2017. Federal financial accounting standards define deferred maintenance and repairs as maintenance and repairs that were not performed when they should have been or were scheduled to be and which are put off or delayed for a future period.<sup>42</sup> Based on our analysis, we determined that the FY2020 deferred

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<sup>41</sup>DOD components fund facility sustainment activities primarily with Operation and Maintenance accounts. In addition to facility sustainment, Operation and Maintenance accounts are used to cover such things as facility modernization and demolition programs, training and education, and depot maintenance activities.

<sup>42</sup>Federal Accounting Standards Advisory Board, *Statement of Federal Financial Accounting Standards 42: Deferred Maintenance and Repairs* (Apr. 25, 2012) (Amending Statements of Federal Financial Accounting Standards 6, 14, 29 and 32). For the purpose of this report, we refer to “deferred maintenance and repairs” as “deferred maintenance,” and we refer to the balance of deferred maintenance as “deferred maintenance backlogs.”

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maintenance total for the six components (\$130 billion) represents more than 1,000 percent of the components' aggregated FY2020 budget request for facility sustainment (\$11.1 billion)—equivalent to almost 12 years of facility sustainment funding at FY2020 levels.

Installation officials we met with from each of the military services told us that deferred maintenance leads to the premature failure of facility systems, such as roofing and plumbing, which often results in more costly facility restoration and replacement projects.<sup>43</sup> Installation officials also said that the size of current deferred maintenance backlogs is unsustainable, and that reducing backlogs will require, among other things, disposing of facilities in poor and failing condition rather than sustaining or repairing them.<sup>44</sup>

OSD and DOD component officials expect the deferred maintenance backlogs to continue to increase, given current facility sustainment funding levels. For example, the Air Force predicts \$90 billion in deferred maintenance for its facilities by FY2050—a 195 percent increase over its FY2020 backlog. DOD component officials attribute the increase in deferred maintenance backlogs to DOD's requesting funding for facility sustainment at levels below estimated FSM requirements and below DOD's 90 percent funding goals. OSD and DOD component officials told us that DOD's deferred maintenance backlogs are a significant and growing risk to the department's ability to support its missions, but they also stated that there are other higher-priority program requirements. Some noted that DOD's deferred maintenance backlogs are more likely to be addressed by disposing of facilities, rather than funding the delayed sustainment activities associated with the backlogs.

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<sup>43</sup>Restoration includes repair or replacement of facilities damaged by inadequate sustainment, excessive age, natural disaster, fire, accidents, or other causes.

<sup>44</sup>According to data reported for FY2020, facilities designated as excess or planned for replacement accounted for 9 percent of the Army deferred maintenance backlog, 12 percent of the Air Force deferred maintenance backlog, 3 percent of the Navy deferred maintenance backlog, and 0 percent of the Marine Corps deferred maintenance backlog.

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## Facilities Deemed Low Priority, Such as Living Quarters, Experienced More Delays Than Others in Facility Sustainment Funding

Officials at 10 of the 12 installations we met with told us that because facility sustainment funding is focused primarily on mission-critical facilities, such as command-and-control facilities and runways, lower-priority facilities have experienced increased deterioration. These lower-priority facilities frequently include living quarters and childcare centers—facilities that affect personnel and their families’ quality of life.<sup>45</sup> Component and installation officials consistently told us that the department’s focus on sustaining mission-critical facilities results in lower-priority facilities being chronically neglected—to the point where, they said, facilities fail and need restoration or replacement actions that invariably cost more than the sustainment activities that were deferred.

Officials at one installation, for example, told us that deterioration of living quarters necessitated relocating servicemembers to hotels for several months, which increased the cost of housing these personnel and also adversely affected unit cohesion. Officials at multiple installations told us that child development centers have been closed or are operating at reduced capacity because of deteriorating conditions. Lack of access to childcare can reduce the availability of personnel to participate in training and other work.

We identified examples in which unit commanders tried to address the lack of funding for lower-priority facilities by giving those facilities higher priority in the funding allocation process. For example, commanders at Malmstrom Air Force Base, Montana, prioritized the sustainment of living quarters because the rapid availability of the enlisted servicemembers housed in those buildings was deemed critical to the mission, and alternative accommodations in the surrounding area were limited (see figure 5).

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<sup>45</sup>The living quarters we included in our review are housing for servicemembers without family members—referred to by DOD as “unaccompanied” housing. This housing is owned and managed by DOD.

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**Figure 5: Malmstrom Air Force Base, Montana, Living Quarters**



Source: U.S. Air Force/Technical Sergeant P. Terry (left); U.S. Air Force/Technical Sergeant N. Suksangplank (right). | GAO-22-104481

However, we also identified examples in which lower-priority facilities were not funded in a timely manner, and the condition of those facilities deteriorated as a result. For example, Navy officials we met with described a situation at Naval Station Norfolk, Virginia, in which more than half (114 out of 214) of the rooms in a building used for living quarters were uninhabitable because of mold, requiring sailors to find accommodations in the surrounding community (see figure 6). Navy officials told us that this building required more sustainment than the installation could support.

**Figure 6: Naval Station Norfolk, Virginia, Living Quarters with a Mold-Affected Room**



Source: U.S. Navy/J. Lambert. | GAO-22-104481

**DOD-wide SMS Implementation Should Help Officials Better Manage Risks Posed by Deferred Maintenance, but Faces Challenges**

We found that DOD’s plan to use the Sustainment Management System (SMS) to better manage the risks posed by deferred maintenance faces limitations that could undermine the tool’s ultimate effectiveness. In congressional testimony, DOD senior officials have stated that they are accepting risk by investing less than what DOD had determined was needed to keep facilities in good working order.<sup>46</sup> *Standards for Internal Control in the Federal Government* states that agencies should identify risks to achieving defined objectives, estimate the significance of identified risks, and design responses so that the risks are contained within defined risk tolerances.<sup>47</sup> However, DOD officials told us that under

<sup>46</sup>*Installations and Engineering: Hearing Before the House of Representatives Appropriations Subcommittee on Military Construction and Veterans Affairs, and Related Agencies*, 117<sup>th</sup> Cong. 6 (2021) (Statement by Acting Assistance Secretary of the Air Force for Installations, Environment and Energy; and the Director of Civil Engineers, Deputy Chief of Staff for Logistics, Engineering and Force Protection); and *Installations, Budget Environment, Quality of Life, and Oversight: Hearing Before the House of Representatives Appropriations Subcommittee on Military Construction and Veterans Affairs, and Related Agencies*, 117<sup>th</sup> Cong. 8-9 (2021) (Statement by Acting Assistant Secretary of the Army for Installations, Energy, and Environment; Sergeant Major of the Army; and Headquarters, Dept. of the Army Deputy Chief of Staff, G-9).

<sup>47</sup>[GAO-14-704G](#).

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the current process, which relies on FSM to estimate sustainment funding requirements, it is challenging for them to pinpoint exactly where the risk is the greatest and to develop plans to mitigate those risks.

According to OSD officials, full implementation of SMS will help them address this problem. Unlike FSM, which provides a top-level estimate of DOD's annual facility sustainment funding needs, SMS estimates the major repair and replacement funding needs of individual facilities and models the impact of underfunding those major repairs and replacements. SMS also can be used to estimate the costs of preventive maintenance tasks.<sup>48</sup> Further, SMS is designed to provide DOD with the ability to make more informed decisions about some facility sustainment investments and model the negative impact on specific facilities of not meeting facility sustainment funding goals.

However, we identified three challenges to SMS implementation, as detailed below.

**Department-wide implementation of SMS is delayed.** DOD components did not meet OSD's goal to standardize facility condition assessments using SMS by September 2018. As of October 2021 SMS implementation was 3 years behind schedule with, according to officials, completion not expected until 2025 at the earliest, and the components' progress toward implementing SMS varies.<sup>49</sup> The Air Force is the farthest along in implementing SMS, using it for condition assessments and to model scenarios of various funding levels and their impact, over time, on facility condition. According to component documents and officials we met with, the Navy, Marine Corps, DHA, and the non-Energy subordinate

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<sup>48</sup>SMS is not designed to estimate the costs of regularly scheduled adjustments and inspections, or emergency response and service calls for minor repairs that DOD also includes in facility sustainment.

<sup>49</sup>In 2013 OSD established a goal to complete standardization of facility condition assessments using SMS by September 2018. Under Secretary of Defense (Acquisitions, Technology, & Logistics) Memorandum, *Standardizing Facility Condition Assessments* (Sept. 10, 2013). In July 2021 OSD told the DOD components to begin using SMS to report facility condition.

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commands of DLA have all implemented SMS to conduct facility condition assessments for some, but not all, facilities.<sup>50</sup>

As of the end of August 2021, the Army had completed condition assessments for 48 percent of its buildings, representing 67 percent of Army buildings' total square footage. The Army expects to complete SMS implementation, including condition assessments of all facilities, in FY2025.

The progress of the DOD components to implement SMS notwithstanding, officials noted that many low-value facilities such as fences, telegraph poles, and signs have been excluded from the initial SMS assessments. Further, SMS modules for some facilities other than buildings—such as fuel tanks, piers, and utility infrastructure—have yet to be finalized and are unavailable to be used for facility condition assessments.

OSD officials told us that one of the reasons why implementation of SMS has been delayed is that some DOD components resisted moving away from the enterprise systems they had been using to track facility condition. Officials from one component told us they had resisted adopting SMS because they believed the SMS modules were initially not as accurate as the systems they were using, so they delayed their adoption of SMS. Officials from three components told us that because SMS does not currently have modules for all the types of facilities used by their respective component, they have largely continued to use their legacy system to track facility condition. Nonetheless, OSD officials confirmed that the department plans to implement SMS by 2025, which is 7 years later than initially planned. *Standards for Internal Control in the Federal Government* emphasizes the need to establish time frames to implement actions effectively.<sup>51</sup> In addition, as we reported in June 2018, establishing time frames with key milestones and deliverables to track implementation progress are important for agency reform efforts.<sup>52</sup>

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<sup>50</sup>DOD policy requires facility condition assessments to be performed at least every 5 years, although some facilities are assessed more often. DOD Instruction 4165.14, *Real Property Inventory (RPI) and Forecasting* (Jan. 17, 2014) (Incorporating Change 2, Aug. 31, 2018).

<sup>51</sup>[GAO-14-704G](#).

<sup>52</sup>GAO, *Government Reorganization: Key Questions to Assess Agency Reform Efforts*, [GAO-18-427](#) (Washington, D.C.: June 13, 2018).

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Without clearly defined milestones for achieving full implementation of SMS and a mechanism for holding DOD component leadership accountable for meeting these milestones, OSD could face further delays in using SMS to manage and evaluate the risk of maintenance backlogs department-wide.

**DOD has not identified a dedicated funding source for implementation of SMS.** Officials from OSD and one component told us that one of the reasons why SMS implementation has been delayed is that it is significantly more expensive to send teams of inspectors to facilities to perform on-site facility condition assessments than to continue the methods previously used by the components. OSD officials added that it is largely up to the individual DOD components to request funding for the transition to SMS.<sup>53</sup> However, OSD and component officials expressed concern to us about the availability of funding for SMS implementation in future years, given the significant constraints on facility sustainment funding that the department has generally experienced. By design, SMS requires on-site facility condition assessments about every 5 years. Therefore, if DOD components evenly distributed this requirement across fiscal years, they would have to assess approximately 20 percent of their facilities annually.

DOD's implementing guidance for SMS notes that increased competition for funding has led facility inspections to be impacted or abandoned at many installations.<sup>54</sup> *Best Practices for Project Schedules* states that schedules should reflect the resources, including funding, needed to do the work—and should identify any funding constraints that could impact project completion.<sup>55</sup> In addition, *Best Practices for Developing and Managing Program Costs* states that it is imperative for funding to be available when needed so as not to disrupt program schedules.<sup>56</sup> However, officials told us that the DOD components have not prepared funding plans that identify a source of funding for ongoing SMS condition assessments. The availability of funding for facility condition assessments will likely affect the reliability and utility of SMS over time. Moreover, if

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<sup>53</sup>As of FY2022, DOD components can fund SMS implementation with annual facility sustainment funding.

<sup>54</sup>Under Secretary of Defense (Acquisitions, Technology, and Logistics) Memorandum, *Standardizing Facility Condition Assessments* (Dec. 2, 2014).

<sup>55</sup>[GAO-16-89G](#).

<sup>56</sup>[GAO-20-195G](#).

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funding for required, periodic SMS condition assessments is not forthcoming, DOD components likely will be challenged in maintaining SMS in a way that provides DOD with reliable facility condition data.

**SMS is being implemented inconsistently by the components.** We identified inconsistencies in the ways in which SMS is being implemented by the six components we reviewed, raising uncertainty as to whether SMS will be implemented in a way that fully leverages its capabilities. For example, according to officials, the Army, Marine Corps, DHA, and DLA require inspection of all 13 core building systems to complete a condition assessment. In contrast, officials indicated that the Navy and the Air Force require inspections of fewer systems—10 for the Navy and 7 for the Air Force. According to the Navy, systems such as building foundations are run to failure without sustainment with the intent of replacing the systems at the end of a building’s lifespan. According to Air Force guidance, the seven systems for which inspections are required are considered “key” building systems, while other building systems are considered to have longer lifespans with less maintenance needs and a slower degradation over their lifespans. In addition, the Air Force has incentivized condition assessments of facilities with higher mission priority, and the Navy exempts some facility categories—primarily morale, welfare, and recreation facilities—from the 5-year re-assessment requirement. As noted earlier, our analysis found that facilities with a low mission priority experienced chronic delays in sustainment funding.<sup>57</sup>

As OSD stated in its 2013 memorandum, DOD requires a standardized facility condition assessments process to ensure that consistent and reliable data inform sound strategic investment decisions.<sup>58</sup> OSD also noted in the memorandum that DOD components were using different methodologies and schedules to assess the condition of their facilities, resulting in data that lacked credibility as a measure of facility quality. *Standards for Internal Control in the Federal Government* states that

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<sup>57</sup>DOD guidance categorizes morale, welfare, and recreation programs (and their associated facilities) into three categories according to the extent to which programs are essential to sustaining the military mission. For example, childcare and child development programs are classified as category B or basic community support programs, while programs such as motion pictures provided at no cost, on-installation picnic areas, and libraries are category A or mission sustaining programs. DOD Instruction 1015.10, *Military Morale, Welfare, and Recreation (MWR) Programs* (Jul. 6, 2009) (Incorporating Change 1, May 6, 2011).

<sup>58</sup>Under Secretary of Defense (Acquisitions, Technology, and Logistics) Memorandum, *Standardizing Facility Condition Assessments* (Sept. 10, 2013).

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agencies should design controls that evaluate the consistency of performance, and that management should assign responsibility to achieve the entity's objectives, evaluate performance, and hold individuals accountable for their internal control responsibilities.<sup>59</sup> Federal internal controls also state that management can define risk tolerances for defined objectives—specifically, the acceptable level of variation in performance relative to the achievement of objectives—and that agencies should evaluate whether a risk-based approach is appropriately designed by considering whether it is consistent with expectations for the defined objectives.

According to OSD officials, the ultimate goal is for the Office of the Under Secretary of Defense (Comptroller) and the Office of Cost Assessment and Program Evaluation (CAPE) to use SMS to analyze facility sustainment consistently across the defense enterprise. However, they stated that to do so they will need to assess which elements of SMS should be implemented consistently by the components and which can be tailored to each and used differently. The SMS implementing guidance has not been updated since 2013, and, according to officials, DOD has not assessed which elements of SMS should be applied consistently across the components. Without conducting that assessment and using its results to update the SMS implementing guidance, DOD will not have consistent and reliable facility condition data to inform its broad, strategic investment decisions.

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## Conclusions

With more than half a million facilities worldwide and a growing deferred maintenance backlog of at least \$130 billion, DOD faces significant risk to its objective of maintaining facilities in good working order to meet mission requirements. In recent years the department has been working to better evaluate and manage this risk, but those efforts could be strengthened.

First, under its current process, DOD does not account for the costs to sustain facilities that have exceeded their expected lifespans—which represents 29 percent of DOD's buildings, and which DOD officials told us are generally more costly to sustain. Without collecting and assessing information on the effect of facility analysis categories in which the facilities have average ages exceeding their expected lifespans and revising, as necessary, the sustainment unit costs associated with those

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<sup>59</sup>[GAO-14-704G](#).

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facilities, DOD will likely continue to underestimate its annual facility sustainment funding requirements.

Second, DOD is in the process of adopting a new tool—SMS—that should help it identify and mitigate the risks posed by its decisions to defer maintenance. However, implementation of this tool will likely not fully succeed in this mission because of (1) repeated delays; (2) lack of dedicated funding to use the tool for facility condition assessments; and (3) inconsistent use of the tool across the DOD components. By taking steps to address these issues—setting milestones for implementation and holding DOD components accountable to the milestones, identifying a dedicated funding source for use of SMS into the future, and assessing and updating implementing guidance to identify which elements of SMS should be used consistently—DOD officials would be better positioned to formulate, evaluate, and communicate their strategic investment decisions.

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## Recommendations for Executive Action

We are making a total of four recommendations to DOD:

The Secretary of Defense should ensure that the Under Secretary of Defense for Acquisition & Sustainment, in coordination with the FSM Configuration/Support Panel, collects, assesses, and revises—as appropriate—the sustainment unit costs of facility analysis categories in which the average ages of the facilities exceed their expected lifespans. (Recommendation 1)

The Secretary of Defense should ensure that the Under Secretary of Defense for Acquisition & Sustainment, in coordination with the DOD components, sets milestones and holds component leadership accountable for implementing SMS. (Recommendation 2)

The Secretary of Defense should ensure that the heads of the DOD components, in coordination with the Under Secretary of Defense for Acquisition & Sustainment and the Under Secretary of Defense (Comptroller), develop funding plans to support continued implementation of SMS facility condition assessments. (Recommendation 3)

The Secretary of Defense should ensure that the Under Secretary of Defense for Acquisition & Sustainment, in coordination with the DOD components, conducts an assessment of the SMS implementing guidance to determine which elements of SMS should be applied consistently across the components, and uses the results of that assessment to update the guidance for SMS condition assessments to

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ensure that facility condition data are comparable across the department. (Recommendation 4)

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## Agency Comments and Our Evaluation

We provided a draft of this report to DOD for review and comment. DOD provided written comments, which are reprinted in appendix III. DOD concurred with three of our recommendations and did not concur with one recommendation.

DOD did not concur with our recommendation to collect, assess, and revise—as appropriate—the sustainment unit costs of facility analysis categories in which the average age of the facilities exceeds their expected lifespan. In its response, DOD acknowledged that FSM does not adequately account for the age of facilities when estimating its annual facility sustainment funding requirements. DOD also stated that within the next 5 years it would no longer use FSM to determine its facility sustainment funding requirements, and for that reason it would be fiscally inappropriate to make further investments in FSM.

We agree with DOD that it should avoid investing resources in a system that will ultimately be obsolete. However, as noted in this report, DOD's FSM Configuration/Support Panel currently meets three to four times each year to review and update FSM's business rules and cost factors, including facility sustainment unit costs. DOD could use this existing process to collect, assess, and revise—as appropriate—the sustainment unit costs of facility analysis categories in which the average age of facilities exceeds their expected lifespan. Doing so would ensure that DOD more accurately accounts for the additional costs to sustain older facilities—29 percent of Army, Air Force, Navy, and Marine Corps buildings in use or in caretaker status have exceeded their expected lifespan—until FSM is retired.

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We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense, the Acting Director of the Office of Management and Budget, the Under Secretary of Defense (Comptroller), the Acting Under Secretary of Defense for Acquisition and Sustainment, the Secretary of the Army, the Secretary of the Air Force, the Secretary of the Navy, the Commandant of the Marine Corps, the Director of the Defense Logistics Agency, the Director of the Defense Health Agency, the Secretary of Homeland Security, the Commandant of the Coast Guard, the Administrator of General Services, the Administrator of the National Aeronautics and Space Administration, the Secretary of Energy, and the President of the National Academies of Sciences, Engineering,

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and Medicine. In addition, the report is available at no charge on our website at <https://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2775 or [FieldE1@gao.gov](mailto:FieldE1@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

A handwritten signature in black ink, appearing to read "Elizabeth A. Field". The signature is fluid and cursive, with a large loop at the end.

Elizabeth A. Field  
Director, Defense Capabilities and Management

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# Appendix I: Objectives, Scope, and Methodology

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This report examines the extent to which (1) the Department of Defense's (DOD) cost factors for estimating its facility sustainment requirements are comparable to those of other federal agencies and fully account for DOD's facility sustainment costs; (2) DOD's facility sustainment funding aligns with its funding goals; and (3) DOD has a deferred maintenance backlog and a process for managing the risks of any such backlog.

The scope of our review included the Army, the Navy, the Air Force, the Marine Corps, the Defense Logistics Agency (DLA), and the Defense Health Agency (DHA). Collectively, these six DOD components accounted for 88 percent of DOD's facility sustainment funding requirements, according to DOD's Facilities Sustainment Model (FSM) as of October 2020.<sup>1</sup> For fiscal year (FY) 2017 through FY2020, we analyzed DOD's annual facility sustainment requirements, amounts requested to meet those requirements, amounts allotted for facility sustainment from enacted appropriations, and actual obligations for each of those 4 fiscal years.<sup>2</sup>

To obtain installation-level perspectives on facility sustainment, we conducted virtual site visits at a non-generalizable sample of two installations for each of the six DOD components in our scope, for a total of 12 installations. To select installations for the virtual site visits, we obtained and assessed component-level facilities data, where historical data were available.<sup>3</sup> We assessed DOD components' Facility Condition Index (FCI) and plant replacement value data by analyzing for missing and anomalous values and interviewing officials from the six components. While the records contained high missing and anomalous values, the data were suitable for site selection purposes. We selected a random sample

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<sup>1</sup>Space Force data are not included in the Air Force data. Although the Space Force was created in FY2020, it did not have designated installations until FY2021.

<sup>2</sup>An obligation is a definite commitment that creates a legal liability of the government for the payment of goods and services. An agency incurs an obligation, for example, when it places an order or signs a contract. We previously reported on DOD sustainment funding through FY2014. See GAO, *Defense Facility Condition: Revised Guidance Needed to Improve Oversight of Assessments and Ratings*, [GAO-16-662](#) (Washington, D.C.: June 23, 2016). We excluded data prior to FY2017 in our analysis because of DOD changes in the methodology for assembling facility sustainment cost data that would preclude comparisons to recent data. FY2020 was the most recent year for which sustainment funding data were available for our analysis.

<sup>3</sup>The Air Force, DLA, and DHA were unable to provide historical facilities data. As such, we based our site selection for these three components on current year facilities data available as of spring 2021.

of installations based on FCI, plant replacement value, and number of facilities. We used these data to calculate the following values for each installation:

- Change in average FCI during FY2017 through FY2020;<sup>4</sup>
- Total number of facilities for FY2020;
- Plant replacement value for FY2020;
- Plant replacement value divided by the number of facilities for FY2020.

We then organized the results for these values into quartiles and created a sample of installations for each DOD component based on these values:

- Five installations, top quartile of average FCI for FY2017 through FY2020;
- Five installations, bottom quartile of average FCI for FY2017 through FY2020;
- Five installations, top quartile of plant replacement value ÷ number of facilities for FY2020;
- Five installations, bottom quartile of plant replacement value ÷ number of facilities for FY2020.

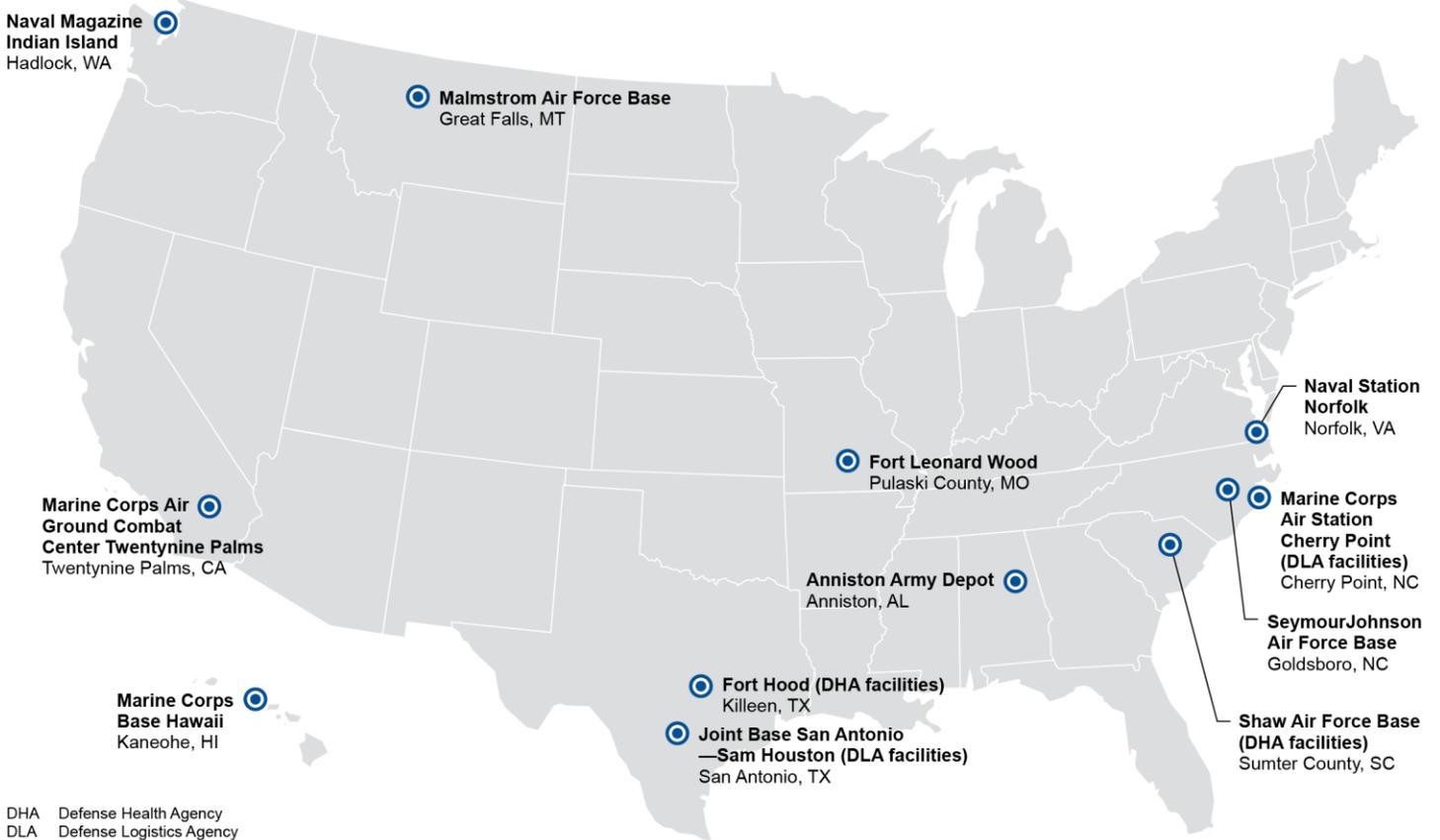
We selected two installations for each component based on the aforementioned criteria (see figure 7). Other data that we considered in selecting installations for our virtual site visits included geographic location, primary mission, and climate type.<sup>5</sup> We excluded reserve component installations from our site selection because the ownership of these installations can be shared with non-federal agencies, state governments, or private-sector entities.

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<sup>4</sup>Average FCI was used for components without historical FCI data.

<sup>5</sup>We determined climate type from Department of Energy data. See Department of Energy, *Building America Best Practices Series, volume 7.3: Guide to Determining Climate Regions by County* (August 2015).

**Figure 7: Department of Defense (DOD) Installations Selected for Virtual Site Visits**



Source: GAO analysis of DOD information; Map Resources (map). | GAO-22-104481

At each site visit, we obtained and discussed installation-level facility sustainment data, photographs of facilities at different condition ratings, and the approach used by installation officials to manage facility sustainment.

For our first objective, we obtained and reviewed information about facility management and estimating facility sustainment requirements from academic and professional journals; the National Academies of Sciences, Engineering, and Medicine, the Federal Facilities Council; and publicly

available DOD Office of Inspector General and our prior reports.<sup>6</sup> To assess the cost factors DOD uses to estimate its annual facility sustainment funding requirements, we analyzed Office of the Secretary of Defense (OSD) guidance, FSM Configuration/Support Panel meeting minutes, and FSM supporting documentation and reviewed DOD component policies and guidance.<sup>7</sup> We also interviewed officials responsible for determining facility sustainment requirements from several OSD offices and each of the six DOD components within our scope.

We compared the ages of specific facilities we discussed with installation officials against their expected lifespans under current design standards. We analyzed data on the expected lifespans of DOD facilities, by facility analysis category. We also analyzed data on the ages of buildings owned, operated, and sustained by each of the military services to determine the number of buildings potentially exceeding their expected lifespans.<sup>8</sup> We included only buildings from the military services' facility systems of record that were recorded as active, semi-active, or caretaker status in FY2020, because buildings with these status designations

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<sup>6</sup>E.g., H. Iijima and S. Takata, "Condition Based Renewal and Integrated Maintenance Planning," *CIRP Annals – Manufacturing Technology*, vol. 65 (2016): 37-40; H. Kaiser, "Facilities Condition Assessment," *APPA Body of Knowledge*, (2020): 1; Federal Facilities Council, *Budgeting for Facilities Maintenance and Repair Activities* (1996); Defense Business Board, *Best Practices for Real Property Management* (Apr. 21, 2016); DOD Office of Inspector General, *Audit of the Department of Defense's Sustainment, Restoration, and Modernization of Military Medical Treatment Facilities* Rep. No. DODIG-2020-103 (July 8, 2020); and GAO, *Coast Guard Shore Infrastructure: Applying Leading Practices Could Help Better Manage Project Backlogs of At Least \$2.6 Billion*, [GAO-19-82](#) (Washington, D.C.: Feb. 21, 2019).

<sup>7</sup>The FSM Configuration/Support Panel is chaired by the Assistant Director for Military Construction in the Office of the Assistant Secretary of Defense (Sustainment), and includes representatives from the Army, Air Force, Navy, Marine Corps, DHA, DLA, DOD Education Activity, and Washington Headquarters Service. The panel and its representatives are responsible for updating FSM's cost factor inputs and facility analysis category data each year.

<sup>8</sup>We did not include age of buildings data from DLA and DHA because most of those agencies' buildings are operated and sustained by the agencies but owned by the military services. In addition, we did not include structures and linear structures in our analysis because of differences in the types of these facilities owned, operated, and sustained by each military service, such as Navy wharfs and piers and Air Force runways. We judgmentally determined that buildings provide a more consistent comparison across the services.

require sustainment.<sup>9</sup> We assessed the reliability of the building age data by manually reviewing their completeness and interviewing cognizant military service officials. Based on these steps, we determined that the building age data were sufficiently reliable for reporting on the number of buildings exceeding their expected lifespans.

We also compared the cost factors DOD used in estimating its facility sustainment funding requirements with those used by the Department of Energy, the National Nuclear Security Administration, the Coast Guard, and the National Aeronautics and Space Administration (NASA). We selected these federal agencies after consulting with officials from the General Services Administration (GSA) and the Federal Facilities Council within the National Academies of Sciences, Engineering, and Medicine.<sup>10</sup> Similar to DOD, these non-DOD federal agencies own, operate, and sustain a relatively large number of facilities that include specialized facilities, such as nuclear facilities and wind tunnels.

We determined that the risk assessment and information and communication components of federal internal control were significant to this objective, along with the underlying principles that management should identify, analyze, and respond to risks and use quality information to achieve agency objectives.<sup>11</sup>

For our second objective, we analyzed data on DOD's facility sustainment funding requirements and allotments for FY2017 through FY2020 for

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<sup>9</sup>DOD designates buildings that are used 6 months or more in a year as active status, and buildings that are used less than 6 months of the year as semi-active status. Buildings in caretaker status are not being used but require a minimal level of sustainment for safety and security reasons.

<sup>10</sup>The GSA oversees the operation and maintenance of federal government buildings, serving about 1 million federal employees across the United States. The GSA Administrator is also a member of the Federal Real Property Council, an interagency council to promote efficient and economical use of federal real property assets. The Federal Facilities Council is a cooperative association of federal agencies to advance technologies, processes and management practices that improve the management, operations, and evaluation of federal facilities.

<sup>11</sup>[GAO-14-704G](#).

each of the six DOD components in our scope.<sup>12</sup> To the extent that data were available, for each fiscal year we calculated the percentage differences between the FSM-estimated facility sustainment funding requirements, amounts requested to meet those requirements, amounts allotted for sustainment activities from enacted appropriations, and actual obligations.<sup>13</sup> We compared those calculations with DOD's stated annual funding goal—90 percent of the estimated facility sustainment funding requirement—to determine whether the goal was met, and if not, at what point in the funding process the gap between the goal and the allotted funding occurred.<sup>14</sup>

To assess the reliability of these data, we reviewed corroborating documentation, assessed the data for inconsistencies, and interviewed DOD component officials about the source, accuracy, and reliability of the data. We determined that the data were sufficiently reliable for our reporting purposes. We requested installation-level facility sustainment funding data for FY2017 through FY2020 from the six components within our review. We assessed the quality of these data and determined they were unreliable for the purposes of reporting. Examples of the data quality issues we found were a high percentage of records missing an FCI value or containing nonsensical FCI values, missing mission dependency codes, and missing historical data. For example, about 68 percent of Air Force and 44 percent of Navy records were missing facility condition index values. Component officials explained that the issue of missing data was attributable, among other things, to ongoing transitions from a previous data system to a new one, and that their data systems do not store historical data. While the data quality prevented us from reporting these data, we found the quality sufficient to inform our virtual site selection (discussed above). Specific data elements with high missing

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<sup>12</sup>DOD facility sustainment funding is derived from multiple appropriation accounts, such as service operations and maintenance (O&M) accounts and military construction accounts. Out of lump sum amounts appropriated into these accounts, DOD and its components internally allot amounts in support of programs, projects, and activities, such as facility sustainment. An allotment is part of an agency's system of administrative control of funds.

<sup>13</sup>An obligation is a definite commitment that creates a legal liability of the government for the payment of goods and services. An agency incurs an obligation, for example, when it places an order or signs a contract.

<sup>14</sup>In 2014 the Under Secretary of Defense for Acquisition, Technology, and Logistics ((USD (AT&L)) reiterated that it was DOD's goal to fund sustainment programs at 90 percent or higher of the Facility Sustainment Model requirement. (USD (AT&L) Memorandum, *Facility Sustainment and Recapitalization Policy* (Apr. 29, 2014).

or nonsensical values were excluded from our consideration of virtual site visits locations.

For our third objective, we analyzed available data on the deferred maintenance backlogs of the six components, as published in the components' annual financial reports for FY2017 through FY2020. We met with officials from OSD and the six components to discuss their approaches for managing deferred maintenance. We also reviewed system documentation and interviewed officials at the U.S. Army Corps of Engineers about DOD's Sustainment Management System (SMS), focusing primarily on the SMS BUILDER module.<sup>15</sup> We interviewed officials at the six components and reviewed BUILDER data, where available, to determine the extent to which they had met OSD's goal for implementing SMS to standardize facility condition assessments across the department. We also reviewed DOD component and OSD documents on SMS implementation. We compared DOD's approach for implementing SMS against a key characteristic—the identification of resources—of effective project schedules.<sup>16</sup>

We determined that the risk assessment and control environment components of federal internal control were significant to this objective, including the underlying principles that management should identify risks to achieving defined objectives, estimate their significance, and design responses to risks that are contained within the defined risk tolerances; as well as that management should assign responsibility to achieve the entity's objectives, evaluate performance, and hold individuals accountable for their internal control responsibilities.<sup>17</sup> Because we found the components' facility condition data were unreliable due to missing and inaccurate entries, as noted above, we were unable to analyze the relationship between facility sustainment funding and facility condition. We previously reported in 2018 on these unreliable data and made

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<sup>15</sup>SMS is a tool for asset life-cycle management that produces multi-year condition trends and investment requirements. There are specialized SMS modules, such as BUILDER (buildings), RAILER (rails), ROOFER (roofs), and PAVER (pavements). Modules are in development for utilities, fuels, water retention structures (e.g., dams and levees), and shorefront assets.

<sup>16</sup>GAO, *Schedule Assessment Guide: Best Practices for Project Schedules*, [GAO-16-89G](#) (Washington, D.C.: Dec. 22, 2015); and *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Program Costs*, [GAO-20-195G](#) (Washington, D.C.: Mar. 12, 2020).

<sup>17</sup>[GAO-14-704G](#).

recommendations focused at improving the quality of data; however, as of September 2021, DOD had not yet implemented our recommendations.<sup>18</sup>

To address all three of our reporting objectives, we met with officials from the following DOD organizations, other federal agencies, and the National Academies of Sciences, Engineering, and Medicine:

Office of the Secretary of Defense

Office of the Under Secretary of Defense, Comptroller

Office of Cost Assessment and Program Evaluation

Office of the Assistant Secretary of Defense (Sustainment)

Department of the Army

Headquarters Army, Office of the Deputy Chief of Staff, G-9,  
Installations

U.S. Army Installation Management Command

U.S. Army Corps of Engineers, Engineer Research and Development  
Center, Construction Engineering Research Laboratory

Anniston Army Depot, Alabama

Fort Leonard Wood, Missouri

Department of the Navy

Deputy Chief of Naval Operations for Fleet Readiness and Logistics

Naval Facilities and Engineering Systems Command

Office of the Assistant Secretary of the Navy, Energy, Installations,  
and Environment Office of the Deputy Assistant Secretary of the  
Navy, Installations, Energy and Facilities

Naval Magazine Indian Island, Washington

Naval Station Norfolk, Virginia

Headquarters Marine Corps, Installations and Logistics

Headquarters Marine Corps, Marine Corps Installations Command

Marine Corps Base Hawaii-Kaneohe Bay, Hawaii

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<sup>18</sup>[GAO-19-73](#).

Marine Corps Air Ground Combat Center Twentynine Palms,  
California

Department of the Air Force

Headquarters Air Force, Office of the Deputy Assistant Secretary  
(Environment, Safety & Infrastructure)

Air Force, Deputy Chief of Staff for Logistics, Engineering and Force  
Protection, Directorate of Civil Engineers

Air Force Installation and Mission Support Center

Air Force Civil Engineer Center

Malmstrom Air Force Base, Montana

Seymour Johnson Air Force Base, North Carolina

Defense Health Agency

DHA, Facilities Enterprise

DHA Facilities, Shaw Air Force Base, South Carolina

DHA Facilities, Fort Hood, Texas

Defense Logistics Agency

DLA Installation Management

Facilities and Equipment

DLA Energy

DLA Distribution and DLA Disposition, Marine Corps Air Station,  
Cherry Point, North Carolina

DLA Disposition, Joint Base San Antonio, Fort Sam Houston, Texas

Other Federal Agencies

Department of Energy and its subordinate National Nuclear Security  
Administration

National Aeronautics and Space Administration (NASA)

Coast Guard within the Department of Homeland Security

General Services Administration

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**Other Organizations**

**National Academies of Sciences, Engineering, and Medicine**

We conducted this performance audit from August 2020 to January 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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# Appendix II: Department of Defense (DOD) Component Facility Sustainment Funding Data for Fiscal Years (FY) 2017 through 2020

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Figures 8 through 13 show the percentages that each of the six DOD components in our review—Army, Air Force, Navy, Marine Corps, Defense Logistics Agency (DLA), and Defense Health Agency (DHA)—reported requesting in the annual budget for FY2017 through FY2020. The figures also show the percentages the components annually obligated for facility sustainment for each of those years. Both these percentages are compared with the Facilities Sustainment Model (FSM) estimated requirements (i.e., 100 percent) and DOD’s goal to fund sustainment programs at 90 percent or higher of the FSM requirements.<sup>1</sup>

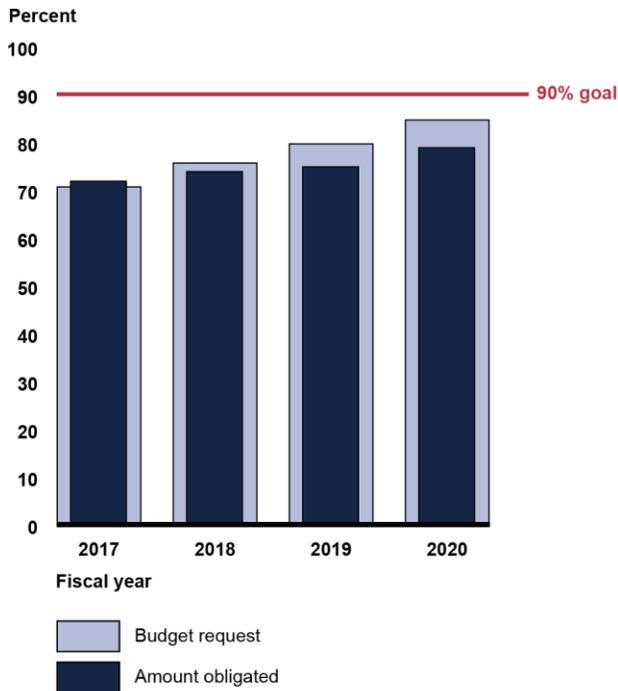
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<sup>1</sup>FSM forecasts facility sustainment funding requirements based on the number and types of facilities included in DOD’s Real Property Assets Database. Under Secretary of Defense (Acquisition, Technology, and Logistics) Memorandum, *Facility Sustainment and Recapitalization Policy* (Apr. 29, 2014).

## Army Facility Sustainment Funding

As shown in figure 8, the Army's percentage of estimated FSM requirements requested in the budget was less than DOD's goal to fund facility sustainment at 90 percent of estimated FSM requirements for FY2017 through FY2020. In addition, the amount obligated for each of these 4 fiscal years was also less than 90 percent of estimated FSM requirements.

**Figure 8: Army Facility Sustainment Funding Levels for Fiscal Years 2017—2020**

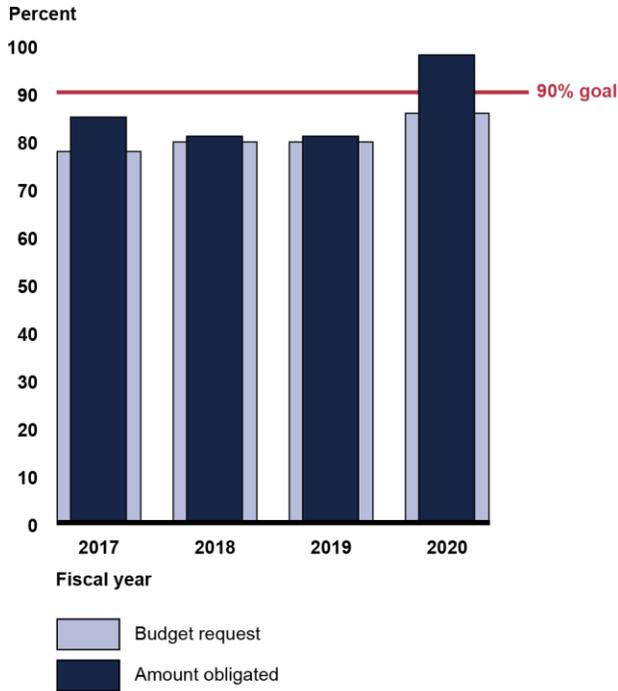


Source: GAO analysis of Department of Defense (DOD) facility sustainment funding data. | GAO-22-104481

Air Force Facility  
 Sustainment Funding

As shown in figure 9, the Air Force’s percentage of estimated FSM requirements requested in the budget was less than DOD’s goal to fund facility sustainment at 90 percent of estimated FSM requirements for FY2017 through FY2020. However, the amount obligated for Air Force facility sustainment surpassed 90 percent in FY2020.

**Figure 9: Air Force Facility Sustainment Funding Levels for Fiscal Years 2017—2020**

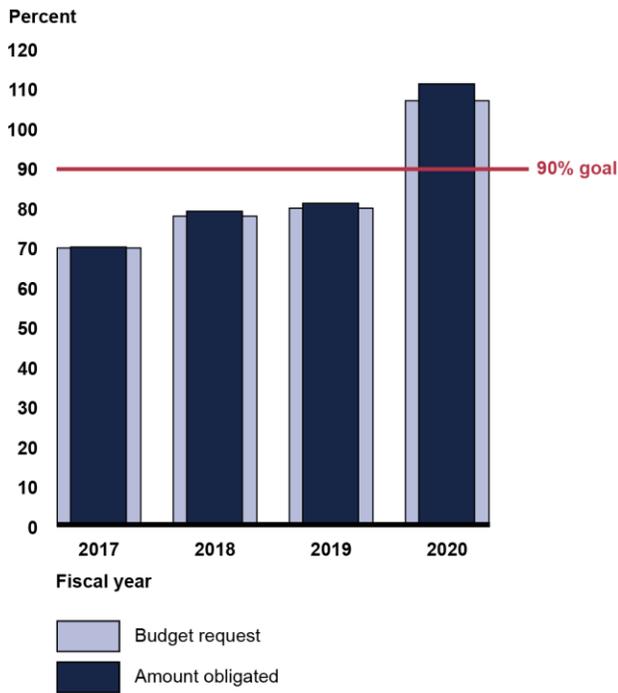


Source: GAO analysis of Department of Defense (DOD) facility sustainment funding data. | GAO-22-104481

## Navy Facility Sustainment Funding

As shown in figure 10, the Navy’s percentage of estimated FSM requirements requested in the budget was less than DOD’s goal to fund facility sustainment at 90 percent of estimated FSM requirements for 3 of the 4 fiscal years we reviewed (FY2017 through FY2019), but surpassed the 90 percent goal in FY2020. Similarly, the amount obligated for FY2017 through FY2019 was also less than 90 percent, but surpassed 90 percent in FY2020.

**Figure 10: Navy Facility Sustainment Funding Levels for Fiscal Years 2017—2020**

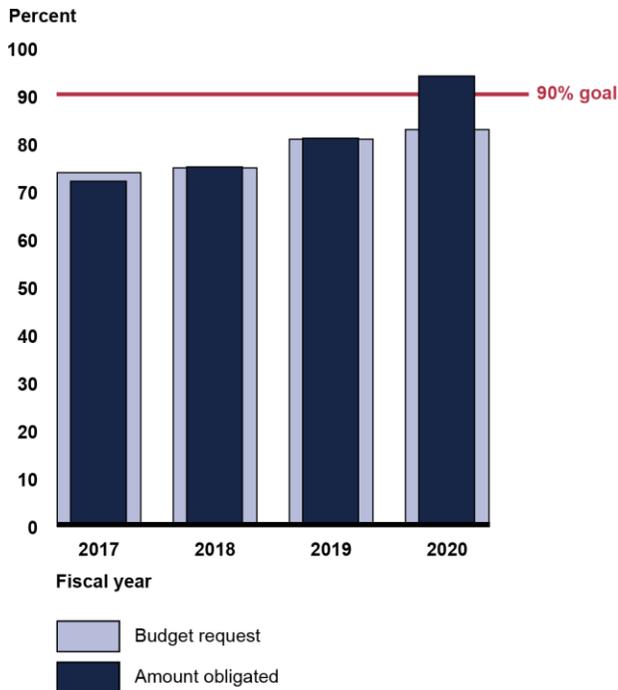


Source: GAO analysis of Department of Defense (DOD) facility sustainment funding data. | GAO-22-104481

## Marine Corps Facility Sustainment Funding

As shown in figure 11, the Marine Corps’s percentage of estimated FSM requirements requested in the budget was less than DOD’s goal to fund facility sustainment at 90 percent of estimated FSM requirements for FY2017 through FY2020. However, the amount obligated for Marine Corps facility sustainment surpassed 90 percent in FY2020.

**Figure 11: Marine Corps Facility Sustainment Funding Levels for Fiscal Years 2017—2020**

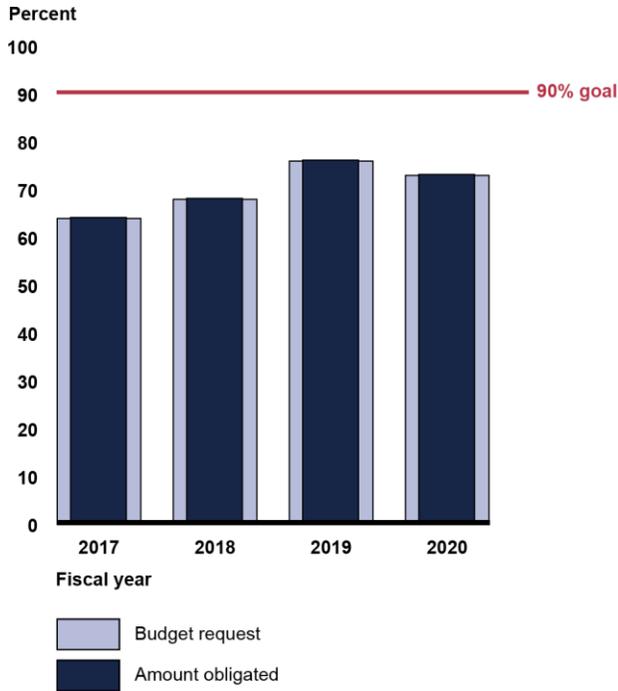


Source: GAO analysis of Department of Defense (DOD) facility sustainment funding data. | GAO-22-104481

Defense Logistics Agency  
 Facility Sustainment  
 Funding

As shown in figure 12, DLA’s percentage of estimated FSM requirements requested in the budget was less than DOD’s goal to fund facility sustainment at 90 percent of estimated FSM requirements for FY2017 through FY2020. Similarly, the amount obligated for those same 4 years was also under 90 percent of estimated requirements.

**Figure 12: Defense Logistics Agency Facility Sustainment Funding Levels for Fiscal Years 2017—2020**

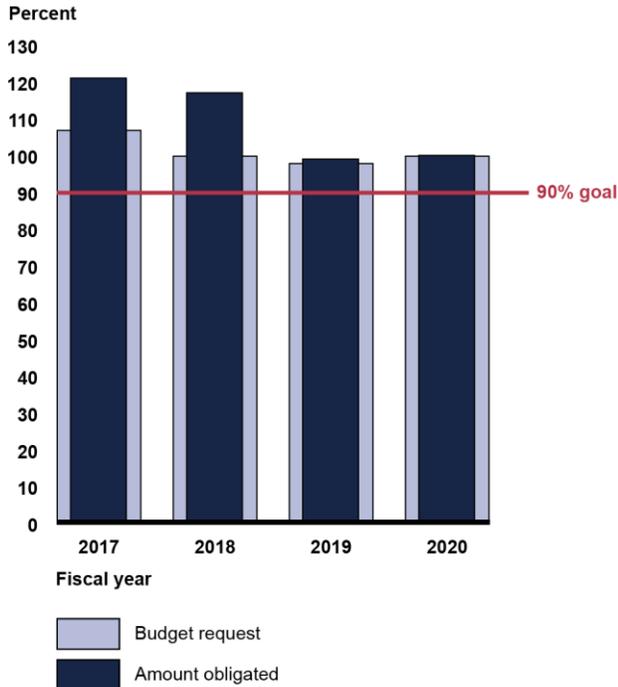


Source: GAO analysis of Department of Defense (DOD) facility sustainment funding data. | GAO-22-104481

Defense Health Agency  
 Facility Sustainment  
 Funding

As shown in figure 13, the percentage of DHA’s estimated FSM requirements requested in the annual budget surpassed DOD’s goal to fund facility sustainment at 90 percent of estimated FSM requirements for FY2017 through FY2020. In addition, the amount obligated for each of these 4 fiscal years also surpassed 90 percent of estimated FSM requirements. Further, the budget request met or surpassed 100 percent of estimated requirements for all but 1 fiscal year (FY2019).

**Figure 13: Defense Health Agency Facility Sustainment Funding Levels for Fiscal Years 2017—2020**



Source: GAO analysis of Department of Defense (DOD) facility sustainment funding data. | GAO-22-104481

# Appendix III: Comments from the Department of Defense



SUSTAINMENT

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE  
3500 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3500

1/12/22

Ms. Elizabeth Field  
Director, Defense Capabilities and Management  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

Dear Ms. Field:

This is the Department of Defense (DoD) response to the GAO Draft Report, GAO-22-104481, "DEFENSE INFRASTRUCTURE: DOD Should Better Manage Risks Posed by Deferred Facility Maintenance," dated December 13, 2021 (GAO Code 104481)

DoD's proposed response to the subject report is enclosed. My point of contact is Mr. Charles Johnson, at [charles.l.johnson92.civ@mail.mil](mailto:charles.l.johnson92.civ@mail.mil) or (703) 695-1019.

Sincerely,

MORANI STEVE Digitally signed by  
MORANI STEVEN J.1174632444  
Date: 2022.01.12 17:15:22 -0500  
N.J.1174632444

Steven J. Morani  
Principal Deputy Assistant Secretary of Defense  
for Sustainment (Logistics)  
Acting Assistant Secretary of Defense for  
Sustainment

Enclosure:  
As stated

cc:  
WHS GAO Affairs Division

GAO DRAFT REPORT DATED DECEMBER 13, 2021  
GAO-22-104481 (GAO CODE 104481)

“DEFENSE INFRASTRUCTURE : “DOD SHOULD BETTER MANAGE RISKS POSED  
BY DEFERRED FACILITY MAINTENANCE”

DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATION

**RECOMMENDATION 1:** The Secretary of Defense should ensure that the Under Secretary of Defense for Acquisition & Sustainment, in coordination with the FSM Configuration/Support Panel, collects, assesses, and revises—as appropriate—the sustainment unit costs of facility analysis categories in which the average age of the facilities exceeds their expected lifespan.

**DoD RESPONSE:** NON-CONCUR. While the Facility Sustainment Model (FSM) has served the Department of Defense (DoD) well over the last 20 years, it is in the process of being terminated within the next 5 years. It would be fiscally inappropriate to make further investments in a model DoD will not be supporting in the near future. The DoD has recognized the FSM does not adequately address individual facility age within its construct. This is one reason DoD has been shifting to an asset management process using its enterprise-wide Sustainment Management System (SMS) in order to determine, at the asset level, facility sustainment and restoration/modernization requirements. The SMS will allow assets to address age aspects of individual subcomponents such as pumps and compressors, which the FSM cannot do today. Taxpayer dollars should not be used to modify a model that is being sunset.

**RECOMMENDATION 2:** The Secretary of Defense should ensure that the Under Secretary of Defense for Acquisition & Sustainment, in coordination with the DoD components, set milestones and hold component leadership accountable for implementing SMS.

**DoD RESPONSE:** DoD CONCUR

**RECOMMENDATION 3:** The Secretary of Defense should ensure that the heads of the DoD components, in coordination with the Under Secretary of Defense for Acquisition & Sustainment and the Under Secretary of Defense for Comptroller, develop funding plans to support continued implementation of SMS facility condition assessments.

**DoD RESPONSE:** DoD CONCUR

**RECOMMENDATION 4:** The Secretary of Defense should ensure that the Under Secretary of Defense for Acquisition & Sustainment, in coordination with the DOD components, conduct an assessment of the SMS implementing guidance to determine which elements of SMS should be applied consistently across the components and use the results of that assessment to update the guidance for SMS condition assessments to ensure that facility condition data are comparable across the department.

**DoD RESPONSE:** DoD CONCUR

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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

Elizabeth A. Field at (202) 512-2775 or [FieldE1@gao.gov](mailto:FieldE1@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Marc J. Schwartz (Assistant Director), Foster Kerrison (Analyst-in-Charge), Chad Hinsch, David Jones, Terence Lam, Kelly Liptan, Felicia Lopez, Tara Porter, Richard Powelson, Monica Savoy, Pamela N. Snedden, Cheryl Weissman (retired), and Erik Wilkins-McKee made key contributions to this report.

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