

April 2008

DEFENSE INFRASTRUCTURE

Continued Management Attention Is Needed to Support Installation Facilities and Operations



G A O

Accountability * Integrity * Reliability

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE APR 2008		2. REPORT TYPE		3. DATES COVERED 00-00-2008 to 00-00-2008	
4. TITLE AND SUBTITLE Defense Infrastructure. Continued Management Attention Is Needed to Support Installation Facilities and Operations				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Government Accountability Office, 441 G Street NW, Washington, DC, 20548				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 69	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Highlights of [GAO-08-502](#), a report to congressional committees

Why GAO Did This Study

The Department of Defense (DOD) manages and operates about 577,000 structures worldwide, valued at about \$712 billion. DOD has worked for several years to develop models that can reliably estimate the installation support funds needed to sustain these facilities, and plans to spend over \$55 billion to support these facilities and operate its bases in fiscal year 2008. Because GAO has identified support infrastructure as a high-risk area that affects DOD's ability to devote funds to other more critical needs, GAO initiated this review under the Comptroller General's authority. This report discusses (1) the reliability of the annual funding estimates produced by the facilities sustainment model, (2) DOD's progress in meeting funding goals for facility sustainment and recapitalization, (3) the extent to which DOD has addressed deferred facility sustainment funding needs, and (4) the status of DOD's efforts to develop a new installation services model. To address these objectives, GAO reviewed the accuracy and support for the model's key inputs, analyzed pertinent documents, and visited eight judgmentally selected installations.

What GAO Recommends

GAO recommends that DOD take several actions to increase the facilities sustainment model's reliability, address deferred facility sustainment funding requirements, and advance progress implementing the installation services model. DOD generally agreed with the recommendations.

To view the full product, including the scope and methodology, click on [GAO-08-502](#). For more information, contact Brian J. Lepore at (202) 512-4523 or leporeb@gao.gov.

DEFENSE INFRASTRUCTURE

Continued Management Attention Is Needed to Support Installation Facilities and Operations

What GAO Found

Although the facilities sustainment model, implemented in 2003, provides a consistent and reasonable framework for preparing estimates of DOD's annual facility sustainment funding requirements, accuracy and supportability issues with two of the model's key inputs have affected the reliability of the model's estimates. First, regarding the inventory quantity input, GAO found that the services had not complied with DOD regulations requiring verification of each real property inventory record. Without the verifications, DOD lacked assurance that the model used accurate inventory quantities, and GAO's analysis identified inaccuracies in some quantities used by the model. Second, regarding the sustainment cost factor input, GAO identified issues concerning some cost factors used by the model. For example, an independent study reported that only 13 of 45 cost factors evaluated were deemed to be reasonably accurate and adequately supported. Until DOD improves the accuracy of these two inputs, the model's estimates of facility sustainment funding requirements will not be as reliable as possible.

The military services have not met all of DOD's goals for funding facility sustainment and recapitalization at levels to prevent deterioration and ensure that facilities are restored and modernized. Service officials stated that they generally did not meet the sustainment funding goals because resources were limited and programs such as force modernization often had higher funding priority. Although the services achieved more success in meeting DOD's goal to fund recapitalization, funding remains an issue with the Army, the Navy, and the Air Force reporting recapitalization backlogs of over \$50 billion at the end of fiscal year 2007.

DOD has not taken actions to estimate and address its deferred facility sustainment requirements. In fiscal years 2005 through 2007, the services did not fund over \$3.5 billion of their estimated annual facility sustainment requirements. The services do not have consistent estimates of their deferred sustainment requirements or plans to deal with these needs because DOD has not provided adequate guidance to clearly define deferred sustainment requirements, or direct the services to measure, track, and address these needs. As a result, DOD's plans to address facility sustainment requirements do not include all deferred sustainment requirements, which could result in continued facility deterioration and increased future recapitalization costs.

DOD's progress in developing a new model to estimate funding requirements for installation services, such as airfield and port operations, has been slow. Although DOD's goal is to establish common standards and metrics for installation services by the end of 2008, the services had agreed on common definitions and standards for only 2 of 29 areas by the end of 2007. DOD officials stated that reaching agreement has been difficult for several reasons, such as differences among the services in how tasks for installation services are performed and managed. Without a reliable model, DOD cannot provide the Congress with a clear basis for making funding decisions.

Contents

Letter		1
	Results in Brief	3
	Background	8
	Reliability of the Facilities Sustainment Model's Estimates Can Be Improved	13
	Military Services Have Not Met All Funding Goals for Facility Sustainment and Recapitalization	26
	DOD Has Not Taken Actions to Address Deferred Facility Sustainment Requirements	35
	DOD's Progress in Developing an Installation Services Model Has Been Slow	43
	Conclusions	47
	Recommendations for Executive Action	49
	Agency Comments and Our Evaluation	50
Appendix I	Scope and Methodology	55
Appendix II	Current Methods Used by the Military Services to Estimate Installation Support Services Funding Requirements	58
Appendix III	Comments from the Department of Defense	60
Appendix IV	GAO Contact and Staff Acknowledgments	63
Related GAO Products		64
Tables		
	Table 1: Selected Results from the Independent Validation and Verification Study of DOD's Sustainment Cost Factors	20
	Table 2: Attainment of Sustainment Goals—Percentage of Requirement Funded, Fiscal Years 2005 through 2008	27
	Table 3: DOD Facility Recapitalization Rates Expressed in Years	34

Table 4: Unfunded Annual Facility Sustainment Requirements	37
--	----

Figures

Figure 1: DOD's Planned Fiscal Year 2008 Funding for Installation Support	10
Figure 2: Leaking Pipes and Cracked Walls at a Damaged Warehouse Facility at Fort Sam Houston	29
Figure 3: Deteriorated Barracks Building at Fort Sam Houston	30
Figure 4: Standing Water on a Leaking Roof of a Weapons and Radar Training Building at an Oceana Naval Air Station Annex	31
Figure 5: Damaged Aircraft Hangar Doors at Oceana Naval Air Station	32
Figure 6: Leaking Windows and Electrical Panels that Created a Safety Hazard at a Deteriorated Aircraft Maintenance Hangar on Randolph Air Force Base	33
Figure 7: Cracking Aircraft Aprons at Randolph Air Force Base	33

This is a work of the U.S. government and is not subject to copyright protection in the United States. It may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



United States Government Accountability Office
Washington, DC 20548

April 24, 2008

Congressional Committees

Since 1997, we have identified the Department of Defense's (DOD) management of its support infrastructure as a high-risk area because infrastructure costs have affected the department's ability to devote funds to other more critical programs and needs. DOD is one of the world's largest organizations in terms of physical plant, managing and operating about 577,000 buildings and structures at more than 5,300 sites worldwide with a total replacement value of about \$712 billion. In fiscal year 2008, DOD plans to spend more than \$55 billion to support these facilities and operate its bases. DOD refers to this funding as installations support,¹ which includes funds for facilities sustainment, facilities recapitalization, installation services, and facilities operation services.² Accurate and consistent estimates of funding requirements for these areas can enable DOD to establish goals to optimally meet installation facility and operations needs and make informed decisions to more efficiently allocate resources at a time when our nation faces increased fiscal constraints. By providing adequate funding for facilities support to meet these goals, DOD can prevent facilities from becoming deteriorated and outdated faster than expected, and ensure that installations can provide the services needed to fully support military missions and personnel at the levels desired.

DOD has worked for several years to develop models that can reliably estimate the funds needed in several installation support funding areas to effectively and efficiently support DOD's missions and personnel. To date, DOD has developed and implemented only one installation support

¹Installation support includes five categories of services and support activities through which DOD manages and funds the life-cycle of its installations—facilities, installation services, family housing, environment, and base realignment and closure.

²Facility sustainment provides for the maintenance and repair needed to keep facilities in good working order over their service lives. This includes major repairs or replacement of facility components, such as roof replacements. Facility recapitalization consists of restoration (repair and replacement work) and modernization (alteration of existing facilities). Installation services consist of many diverse program areas, such as installation airfield and port operations, security, legal and financial services, and family and quality of life programs. Facilities operation services include facility-related services, such as utilities, leases, and custodial services, and grounds maintenance. In their budgets, the military components generally continue to refer to funding for installation services and facilities operation services as base operations support funding.

funding model—the facilities sustainment model. This model has been used by the military services since fiscal year 2003 to estimate the annual sustainment funds the services need to budget to perform maintenance and repair activities necessary to keep their buildings and structures in good working order and maximize facility service life. To help estimate other installation facility and operations funding needs, DOD has used a metric for facility recapitalization,³ has developed and will soon implement a model for facilities operation services, and continues to work on a model for other installation services, such as installation airfield and port operations, security, and family support services.

Because of the challenges the department has faced in budgeting for the significant funding required to support DOD installations and the importance of adequate installation support to DOD's missions and the quality of life for DOD personnel, we initiated this engagement under the authority of the Comptroller General of the United States to conduct evaluations on his own initiative.⁴ We are reporting the results of our evaluation to you because of expressed interest related to your committees' oversight responsibilities. This report discusses (1) the reliability of the annual funding estimates produced by the facilities sustainment model, (2) DOD's progress in meeting funding goals for facility sustainment and recapitalization, (3) the extent to which DOD has addressed deferred facility sustainment funding needs, and (4) the status of DOD's efforts to develop a funding requirements model for installation services.

To address these questions, we (1) reviewed the adequacy of the documentation supporting the key inputs used by the facilities sustainment model as well as the military services' compliance with procedures designed to verify the accuracy of the inventory information used by the model; (2) compared DOD's goals for facility funding with accomplishments and discussed progress towards the goals with DOD and

³DOD's recapitalization metric uses as a measure the number of years that will elapse before facilities will be replaced based on the annual funding provided for restoration and modernization. DOD's current goal is for military components to fund facility restoration and modernization in annual amounts that would result in facilities being replaced every 67 years. DOD is developing a new facilities modernization model intended to improve upon the existing recapitalization metric and directly estimate annual funding requirements for facility recapitalization by considering the expected service life for each facility category.

⁴31 U.S.C. 717 (b) (1).

military service officials;⁵ (3) discussed with DOD and military service officials efforts to identify and address deferred facility sustainment requirements, determined the amount of the annual sustainment requirement that was not funded, and reviewed the deferred facility maintenance amounts reported in the military services' financial statements; and (4) documented the development history and status of the installation services model and discussed with DOD officials the remaining obstacles to the model's completion. We also visited eight judgmentally selected military installations, selected to represent several different geographic locations, to gain local-level insight into compliance with inventory verification procedures, the accuracy of real property inventory records, support funding issues, and the condition of facilities. We conducted this performance audit from May 2007 through April 2008, 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. A detailed description of our scope and methodology is included in appendix I of this report.

Results in Brief

Although the facilities sustainment model provides a consistent and reasonable framework for preparing estimates of DOD's annual facility sustainment funding requirements, accuracy and supportability issues with two of the model's key inputs—the inventory quantity and the sustainment cost factor associated with each of DOD's 448 facility categories—have affected the reliability of the model's estimates. Regarding the inventory quantity input, we found that the military services had not complied with DOD real property and financial regulations that require verification of each real property inventory record at least once every 5 years. For example, the Army and the Navy had not verified the accuracy of about 39 percent and 59 percent, respectively, of their real property inventory records during the 5 years ending with fiscal year 2007. Without the verifications, which the services attributed to a lack of personnel, DOD lacked assurance that the inventory quantities used by the model were

⁵In addition to data from the military services, some of the data related to facility funding goals in this report include data from the Defense Logistics Agency, the Tricare Management Activity, and the DOD Education Activity. However, we did not include these components in our review.

accurate, and our analysis identified inaccuracies in some inventory quantities subsequently used by the model. During our visits to several installations we also identified discrepancies between the inventory quantities used by the model and the quantities indicated in the supporting real property records. Regarding the sustainment cost factor input, we identified issues concerning the accuracy and supportability of some cost factors used by the model. For example, a contractor hired by DOD to independently verify and validate the model's cost factors reported in February 2006 that only 13 of 45 factors evaluated were deemed to be reasonably accurate and adequately supported. We also found that DOD did not maintain readily accessible information documenting how each factor was calculated or explaining the reasons that some factors changed from one year to the next, even when changes were significant, such as more than 50 percent. Furthermore, a change for fiscal year 2009 in DOD's method for calculating sustainment cost factors that are not based on independent data sources can result in reduced accuracy of those factors. Until DOD takes additional steps to improve the accuracy of its inventory quantity and sustainment cost factor inputs to the facilities sustainment model, the model's estimates of annual facility sustainment funding requirements will not be as reliable as possible, which could jeopardize DOD's ability to adequately provide for and report on its facility sustainment needs.

The military services have not met all of DOD's goals for funding facility sustainment and recapitalization at levels to prevent deterioration and ensure that facilities are restored and modernized in accordance with established benchmarks. Noting in 2004 that full funding of sustainment requirements was the most economical approach over a facility's life cycle, DOD established a goal for the military services to fund sustainment at 95 percent of the requirement determined by the facilities sustainment model beginning in fiscal year 2005, and at 100 percent of the requirement beginning in fiscal year 2008. However, DOD actually funded 79 percent, 91 percent, and 90 percent of its sustainment requirements in fiscal years 2005, 2006, and 2007, respectively, falling short of the goal in each year. In fiscal year 2008, the Army, the Navy, the Air Force, and the Marine Corps budgeted funds to meet 89 percent, 83 percent, 92 percent, and 89 percent of their sustainment requirements, respectively, and thus did not budget to meet the fiscal year's 100 percent funding goal. Service officials stated that they generally did not meet the sustainment funding goals because resources were limited and some programs, such as force modernization, often had a higher funding priority. Moreover, some budgeted sustainment funds were used to pay for other needs, such as unfunded facility restoration projects and bills for installation services, which reduced

funding that would have been used to sustain facilities. At the eight installations we visited, facility sustainment requirements were not fully funded every year during fiscal years 2005, 2006, and 2007, and some facilities had fallen into disrepair at most of these installations. In the facility recapitalization area, the military services achieved more success in meeting DOD's goal to fund recapitalization annually at levels that would result in replacing facilities every 67 years. For example, the Army, the Navy, and the Air Force exceeded the 67-year goal in some years since fiscal year 2005. However, the adequacy of recapitalization funding remains an issue because of underfunding in previous years. The Army, the Navy, and the Air Force reported recapitalization backlogs of about \$20.4 billion, \$27.6 billion, and \$9.3 billion, respectively, at the end of fiscal year 2007 and some of the installations we visited also reported concerns over growing backlogs. As other important priorities, such as force modernization, compete for funding, DOD has been challenged to provide adequate resources for sustaining and recapitalizing its facilities. As a result, some facilities have not been sustained at a level to keep them in good working order and will likely experience reduced service lives, which in turn will lead to more costly recapitalization requirements in the future.

DOD has not taken actions to estimate and address the military's deferred, or backlogged, facility sustainment requirements. Deferred sustainment requirements might not exist if the annual sustainment requirement were fully funded each year. However, as noted above, this has not been the case and, in fiscal years 2005 through 2007, the military services did not fund over \$3.5 billion of their estimated annual facility sustainment requirements. According to DOD, needed sustainment work that is not performed will eventually result in damaged facilities, shortened facility service lives, and increased future costs for facility restoration. Yet, because DOD has not provided guidance that clearly defines deferred sustainment requirements, directs the services to consistently measure and track deferred sustainment needs, or establishes a goal to address these needs, the services do not have consistent estimates of their deferred sustainment requirements or plans to deal with these needs. As a result, DOD lacks a complete picture of its facility sustainment funding needs and DOD's current plans and goals to address facility sustainment requirements do not include all sustainment requirements, which could further jeopardize DOD's ability to adequately provide for its facility sustainment needs and result in continued facility deterioration and increased future recapitalization costs. In addition, the military services' financial reporting of deferred facility maintenance information has been inconsistent with financial reporting requirements intended to provide full disclosure of facility conditions. Largely because of a lack of clear

guidance, the services' financial statements before fiscal year 2007 excluded required information concerning deferred facility sustainment requirements and included information that is not required concerning deferred facility modernization requirements. Although DOD issued revised guidance in September 2007 in part to address this issue, the guidance did not provide sufficient details to ensure that future financial reporting of deferred maintenance would be consistent with reporting requirements. As a result, the military services' financial reporting of deferred maintenance information may continue to be inconsistent with financial reporting requirements.

DOD's progress in developing a model for estimating installation services funding requirements has been slow because DOD has been unable to overcome long-standing inconsistencies among the military services' definitions of support service functions and other obstacles that prevent such a model from being ready for use. In 2004, DOD's installation strategic plan noted the need to develop an analytical model based on common benchmarks to accurately forecast funding requirements for installation services. Although interservice teams have been studying installation support service areas since 2005 to develop common definitions, performance standards, metrics, and cost estimates, the military services had agreed on common definitions and standards for only 2 of 29 service areas by the end of calendar year 2007. According to DOD officials, the difficulty in reaching agreement has been caused by several factors, such as traditional differences among the military services in how tasks and subtasks for installation services are grouped, performed, managed, and funded; differences in the value and emphasis placed on various support services, and differences in support service needs based on installation location and demographic characteristics. Although DOD's goal is to establish common standards and metrics for installation services by the end of 2008, DOD had not formally established a milestone for when the model will be implemented for use in estimating the military's installation services funding requirements. DOD officials stated that additional obstacles must be overcome to meet the 2008 goal and complete development of a reliable model. Key obstacles include overcoming differences among the military services in service program management and funding methods and identifying adequate information sources for estimating costs for the various installation services. In view of these remaining obstacles and prior progress, it is unclear whether the 2008 target will be met. In the absence of a DOD-wide model, each military service has developed methods to determine its installation services requirements and funding needs subject to its own definition of the types and levels of services it deems necessary. According to Army, Navy, and

Air Force officials, funding for installation services in some instances has been inadequate and resulted in installations providing reduced services, which, in turn, adversely affected the quality of life of DOD personnel. Until a reliable model is implemented, DOD cannot know its installation services funding requirements with confidence, set installation services funding and performance benchmarks, measure the military services' progress in providing installation services, or provide the Congress with a clear, consistent basis for making related funding decisions.

We are making several recommendations to increase the reliability of the facilities sustainment model, address deferred facility sustainment funding requirements, and advance progress towards implementing the installation services model. Specifically, we are recommending that DOD monitor and ensure compliance with guidance requiring verification of real property inventory records, maintain documentation on the basis for the sustainment cost factors used by the model, and revert to the previously used method to calculate sustainment cost factors that are not based on independent data sources. We also are recommending that DOD provide guidance that clearly defines deferred facility sustainment requirements, directs the services to consistently measure and track deferred sustainment needs, establishes a goal to address these needs, and ensures that the military services' financial reporting of deferred facility maintenance is consistent with financial reporting requirements. Further, we are recommending that DOD establish a milestone for implementing the installation services model and provide adequate senior-level oversight to ensure that the milestone is met.

In written comments on a draft of this report, DOD generally agreed with our recommendations and stated that it had already initiated several of the recommended actions. However, DOD's comments and stated actions did not fully address some of our recommendations. Specifically, in addition to the steps that DOD stated it has taken or plans to take, we continue to believe that DOD needs to take further steps to monitor and ensure compliance with inventory verification guidance, provide a clear definition of deferred facility sustainment requirements, direct the military services to consistently measure and track deferred sustainment needs, ensure that the military services' financial reporting and disclosure information regarding deferred facility maintenance is consistent with financial reporting requirements, and provide adequate senior-level oversight to ensure that an installation services model is implemented as soon as possible. DOD's comments are discussed in more detail at the end of this report and are reproduced in full in appendix III.

Background

Since 1997, we have identified management of DOD support infrastructure as a high-risk area because infrastructure costs have affected the department's ability to devote funds to other more critical programs and needs. In a January 2007 update to our high-risk series, we noted that DOD continued to face significant challenges in funding its installation support and sustainment, restoration, and modernization of its facilities, and questions persisted over the adequacy of funding provided to these areas.⁶ Further, we noted that because of these long-standing issues, DOD's management of support infrastructure remains a high-risk area.

We have issued several reports in recent years highlighting the long-term challenges DOD faces in managing its portfolio of facilities and halting the degradation of facilities. For example, in February 2003, we found that funds designated for facilities sustainment were held back at the service headquarters, major command, and installation levels to cover more pressing needs or emerging requirements, which resulted in continued facility deterioration.⁷ In May 2003, we reported that although funding for maintaining and constructing reserve component facilities had increased by almost 50 percent during 1998 through 2003, the reserve components indicated the condition of about 64 percent of their facilities was inadequate.⁸ In a June 2005 report, we found that DOD did not have a common framework for identifying base operating support functions and funding requirements to ensure adequate delivery of services, particularly in a joint environment.⁹ We also found that, because of a lack of a common terminology across the services in defining base support functions and the lack of a mature analytic process for developing credible and consistent requirements, the services moved hundreds of millions of operation and maintenance dollars designated for facilities sustainment and other purposes to pay for base operations support. While such funding movements are permissible, we found that they were disruptive to the

⁶GAO, *High-Risk Series: An Update*, [GAO-07-310](#) (Washington, D.C.: January 2007).

⁷GAO, *Defense Infrastructure: Changes in Funding Priorities and Strategic Planning Needed to Improve the Condition of Military Facilities*, [GAO-03-274](#) (Washington, D.C.: Feb. 19, 2003).

⁸GAO, *Defense Infrastructure: Changes in Funding Priorities and Management Processes Needed to Improve Condition and Reduce Costs of Guard and Reserve Facilities*, [GAO-03-516](#) (Washington, D.C.: May 15, 2003).

⁹GAO, *Defense Infrastructure: Issues Need to Be Addressed in Managing and Funding Base Operations and Facilities Support*, [GAO-05-556](#) (Washington, D.C.: June 15, 2005).

orderly provision of services and contributed to the overall degradation of facilities. In another 2005 report, we found that many of DOD's training ranges were in deteriorated condition and lacked modernization, which adversely affected training activities and jeopardized the safety of military personnel.¹⁰

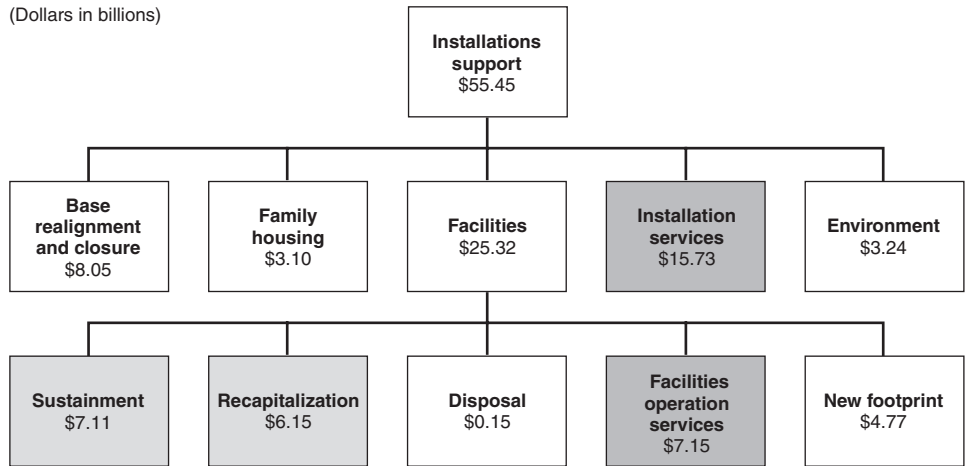
Funding of Installation Support

The Office of the Deputy Under Secretary of Defense for Installations and Environment has overall responsibility for DOD's facilities and installations, which includes about 577,000 buildings and structures at more than 5,300 sites worldwide with a total replacement value of about \$712 billion. During fiscal year 2008, DOD plans to spend around \$55 billion to support its facilities and installations. DOD refers to this funding as installation support, which includes five broad categories of services, programs, and support activities—facilities, installation services, family housing, environment, and base realignment and closure. As shown in figure 1, the facilities category is composed of five subcategories—sustainment, recapitalization, disposal, facilities operation services, and new footprint, which includes facility construction related to new or expanded missions.

¹⁰GAO, *Military Training: Better Planning and Funding Priority Needed to Improve Conditions of Military Training Ranges*, [GAO-05-534](#) (Washington, D.C.: June 10, 2005).

Figure 1: DOD's Planned Fiscal Year 2008 Funding for Installation Support

(Dollars in billions)



Appropriation	Amount
Operation and maintenance	\$30.28
Military construction	9.73
Military personnel	3.06
Procurement	0.41
Working capital fund	0.57
Family housing	3.10
Base realignment and closure	8.05
Other	0.25
Total	\$55.45

	Sustainment and recapitalization (\$13.26)
	Installation services related (\$22.88)

Source: DOD.

Note: The Congress appropriates funds according to the categories listed under the appropriation heading, and DOD classifies funds for installation support according to the categories in the chart. Numbers in the chart may not total correctly due to rounding.

Of these installation support categories, this report focuses on facility sustainment, recapitalization, installation services, and facilities operation services—the categories where DOD has or intends to implement models to help estimate funding requirements.

- Sustainment, funded primarily with operation and maintenance appropriations, includes the maintenance and repair activities necessary to prevent deterioration, maintain safety, and keep facilities in good working order over their service lives. 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 a facility's life cycle, such as regular roof replacement; refinishing wall surfaces; repairing and replacing electrical, heating, and cooling systems; and replacing tile and carpets. According to DOD, needed sustainment work that is not performed will eventually result in damaged facilities, shortened facility service lives, and increased future costs for facility restoration.

- Recapitalization, funded primarily with operation and maintenance and military construction appropriations, provides for improving facilities through restoration and modernization. Restoration includes repair and replacement work needed to restore facilities degraded from several causes, such as natural disaster, fire, accident, excessive age, or inadequate sustainment. Modernization includes both renovation and replacement of existing facilities to implement new or higher standards, accommodate new functions, or replace building components that typically last more than 50 years.
- Installation services, funded primarily with operation and maintenance appropriations, includes the personnel, support equipment, contracts, and associated costs to plan, manage, and deliver installation services and functions. Installation services consists of nine major program areas which include many diverse subfunctions, such as installation airfield and port operations; security; transportation; supply; communications; information management; personnel management; food services; administrative, legal, and financial services; unaccompanied personnel housing management; family and quality of life programs; and environmental compliance.
- Facilities operation services, funded primarily with operation and maintenance appropriations, includes 10 facility-related services—fire and emergency services, utilities, pavement clearance, refuse collection and disposal, real property leases, grounds maintenance, pest control, custodial services, real property management and engineering services, and engineering readiness. DOD previously referred to facility operations as real property services and, together with installation services, family housing, and environment, were referred to as base operations support. In general, the military services' budgets continue to refer to funding for installation services and facility operation services as base operations support funding.

DOD Intends to Use Models to Estimate Funding Requirements

In order to more effectively and efficiently support DOD missions, several years ago the Office of the Deputy Under Secretary of Defense for Installations and Environment began to lead the military services in developing more accurate methods to estimate installation support funding requirements. According to DOD officials, in the past installation support funding requirements were often artificially derived, such as by basing funding needs on prior-year execution levels. DOD lacked departmentwide standards for determining future funding needs and did not have sufficient data to support informed decision making. DOD's solution was to develop models that could predict future requirements based on known inputs that were specific to a facility category type, service, and location. The idea was to better support funding decisions by developing models that used benchmarked and validated inputs, estimated needs based on service levels commensurate with industry standards, where applicable, and showed the impact if funds were not provided. According to DOD officials, models can improve consistency, increase credibility, establish an auditable process, and provide a tool for setting funding goals and measuring progress towards meeting those goals. The following is a summary status of DOD's model development for installation support as of January 2008.

- The facilities sustainment model has been implemented and used by the military services to estimate the annual facility sustainment funding requirements since fiscal year 2003. The model estimates sustainment requirements for each of DOD's 448 facility categories. DOD determined the facility categories by grouping facilities with similar functions and units of measure to provide for consistent analysis and planning across the military.
- The facilities modernization model is under development and DOD plans to begin using the model to estimate recapitalization funding requirements in fiscal year 2010. According to DOD, the model will estimate annual funding requirements and improve upon DOD's recapitalization metric that has been used for several years to help assess restoration and modernization funding needs. The recapitalization metric uses as a measure the number of years it would take for facilities to be replaced based on the annual funding provided for restoration and modernization. DOD's current goal is for military services to fund facility restoration and modernization in annual amounts that would result in facilities being replaced every 67 years. DOD established the 67-year benchmark after an assessment of DOD's real property inventory in the late 1990s. According to DOD, the facilities modernization model will determine funding needs based on DOD's real property inventory and the expected service life for each

facility category, rather than using the 67-year average service life for all facility categories.

- The facilities operation model has been under development since fiscal year 2005 and DOD plans for all military services to use the model to estimate the fiscal year 2010 facilities operation funding requirements. According to DOD, the model will use commercial benchmarks for similar services performed in the private sector. The Air Force used a prototype of the model to help estimate the Air Force fiscal year 2008 funding requirement for facilities operation.
- The installation services model has been under development since 2006, although work required to support the model, such as developing DOD-wide common definitions for support services, began in fiscal year 2004. The model is intended to provide a consistent framework in which the military services can develop annual funding requirements for installation services. DOD's goal is to complete development of the model in calendar year 2008. DOD has not set a date for the military services to begin using the model to develop their installation services funding requirements.

Reliability of the Facilities Sustainment Model's Estimates Can Be Improved

Although the facilities sustainment model provides a consistent and reasonable framework for preparing estimates of DOD's annual facility sustainment funding requirements, accuracy and supportability issues with two of the model's key inputs—the inventory quantity and the sustainment cost factor associated with each of DOD's 448 facility categories—have affected the reliability of the model's estimates. Regarding the inventory quantity input, we found that the military services had not verified the accuracy of the facility inventory records as required by DOD guidance, the model has used some inaccurate inventory quantities, and discrepancies existed between some facility inventory quantities used by the model and the quantities shown in supporting installation inventory records. Regarding the sustainment cost factor input, we identified issues concerning the accuracy and supportability of some cost factors used by the model. Because of these issues, the model's estimates of annual facility sustainment funding requirements are not as reliable as possible.

Facilities Sustainment Model Provides a Consistent and Reasonable Framework for Preparing Funding Estimates

The facilities sustainment model provides a consistent and reasonable framework for estimating DOD's facility sustainment requirements, providing that the information input to the model is accurate. DOD officials stated that the model was designed to incorporate the basic characteristics of effective cost estimates¹¹ and was independently validated prior to implementation. The model calculates annual facility sustainment funding requirements for each of DOD's facility categories by using an equation that considers four quantifiable variables:

Sustainment requirement = (inventory quantity) times (sustainment cost factor) times (geographic location adjustment factor) times (inflation adjustment)

The inventory quantities used by the model come from the real property inventory records maintained by military installations. Inventory quantities are totaled for each facility category and reported to DOD at the end of each fiscal year. Sustainment cost factors are estimates of the average annual unit cost to sustain the average size facility in each facility category—such as \$2.53 per square foot for an aircraft maintenance hangar. DOD determines the sustainment cost factor from a variety of sources, such as private sector cost benchmarks for buildings and building components, other government agency standard cost estimates, and military-component-validated cost factors for facilities with no commercial counterpart. Although DOD prefers these sources to determine sustainment cost factors, DOD officials noted that such sources are not available for some facility categories. In these cases, DOD usually determines the cost factor based on costs from a separate but similar facility category. The model also adjusts sustainment costs to account for geographic location differences and annual inflation. To do this, the model applies a location factor developed by DOD to account for differences in labor, material, and equipment costs depending on where installations are located, and applies an inflation factor, determined by DOD, to account for cost escalation. Finally, the model makes adjustments to remove those facilities that are slated for closure or demolition in the near future, add those facilities under construction, account for some data differences among the military services, and categorize sustainment costs under the appropriate DOD organization and appropriation type.

¹¹See GAO, *Cost Assessment Guide: Best Practices for Estimating and Managing Program Costs*, Exposure Draft, [GAO-07-1134SP](#) (Washington, D.C.: July 2007).

Facility Inventory Data Used in the Model Have Not Been Validated as Required

We found the model's estimates (output) were less reliable than possible in part because the facility inventory data used as an input by the model had not been validated as required. The model uses facility inventory information from each military installation as a key input in determining sustainment funding requirements, so the inventory information must be accurate if the model's estimates are to be accurate. To help ensure inventory accuracy, DOD guidance requires that DOD components verify the accuracy of each real property inventory record every 5 years.¹² The instructions require that the verifications be based on a physical inventory, which can verify that the inventory records accurately describe all installation facilities and accurately record each facility's size, or quantity, using the unit of measure that DOD has prescribed for each facility category. The verification of real property inventory records also helps ensure the accuracy of facility-related information included in the military services' annual financial statements.

Despite the guidance, we found that the military services had not verified the accuracy of all facility inventory records within the past 5 years. According to service officials, the inventory verifications had not been performed because personnel resources at military installations were limited and the installations had higher priority work for the personnel who were available. The level of compliance with the verification requirements varied among the military services.

- Army information showed that the inventory records for over 90,000 Army facilities, about 39 percent of all Army facilities, had not been verified within the 5-year period ending with fiscal year 2007. Although some Army installations met the 5-year verification requirement, most installations did not. At some installations, a significant percentage of inventory records was not verified. For example, at Forts Irwin, Bragg, Shafter, and Polk, 93 percent, 83 percent, 82 percent, and 75 percent, respectively, of the inventory records had not been verified within the past 5 years.
- Navy information showed that Navy installations had not verified the accuracy of about 59 percent of their real property inventory records within the 5-year period ending with fiscal year 2007. More specifically, the inventory records for about 49 percent of the Navy's buildings,

¹²See DOD Instruction No. 4165.14, *Real Property Inventory and Forecasting* (Mar. 31, 2006) and DOD Financial Management Regulation 7000.14-R, vol. 4, ch. 6, *Property, Plant, and Equipment* (July 2006).

58 percent of other Navy structures, and 80 percent of the Navy's utility facilities had not been verified within the required time frame.

- Although Air Force headquarters did not track compliance with the real property inventory verification requirement, at our request the Air Force queried its major commands about compliance levels. The Air Education and Training Command reported that about 17 percent of its inventory records had not been verified within the past 5 years. The Air Combat Command, the Space Command, and Materiel Command reported that about 10 percent, 3 percent, and 2 percent, respectively, of their inventory records had not been verified within the past 5 years. Reported information from the remaining commands did not state their level of compliance but stated that the commands were verifying about 20 percent of their inventory records each year.
- Marine Corps headquarters also did not track compliance with the real property inventory verification requirement. However, in May 2007, the Naval Audit Service issued a report on the reliability of the real property information included in the Marine Corps' financial statements. The report stated that physical inventories of real property were not being performed every 5 years as required and that documentation supporting the performance of the physical inventories did not exist, except for critical facilities.¹³

During visits to eight installations, we found that while four installations had verified their facility inventory records within the past 5 years, the other four installations had not performed this verification. For example, Randolph Air Force Base officials stated that about 60 percent of the installation's real property inventory records had not been validated by a physical inventory within the past 5 years because of limited personnel. The officials stated that inventory validations were one of the last tasks to be performed because other tasks were given higher priority. At Langley Air Force Base, officials stated that about 50 percent of the installation's real property inventory records had not been validated within the past 5 years, also because of limited personnel. From a list of the inventory records that had been verified, we judgmentally selected and reviewed the documentation supporting the verifications of 10 records. We found discrepancies in 8 of the 10 records that raise questions about the

¹³Naval Audit Service, *Independent Attestation Report--Agreed-Upon Procedures Attestation Engagement of Marine Corps Real Property Financial Statement Information*, N2007-0031 (May 7, 2007).

reliability of the verifications at Langley Air Force Base. For example, the inventory verification documentation identified one facility as a billboard when the real property record identified the facility as a vehicle bridge, and the verification documentation identified another facility as a youth center when the real property record identified the facility as an Air Force clinic. In addition, the inventory verification documentation in some cases included no signature, date, or facility size, as required by installation procedures.

Inaccurate Inventory Quantities Used by the Model

We also question the reliability of the facilities sustainment model's estimate (output), because we found several errors in the inventory quantities used as input to the model. As shown in the following examples, the inventory quantity errors caused inaccuracies in the model's funding estimates.

- The inventory quantity used in the model to estimate sustainment requirements for the military services' vehicle maintenance facilities increased from 6,785 facilities in fiscal year 2006 to 14,760 facilities in fiscal year 2007, an increase of 118 percent. The quantity then decreased to 6,599 facilities in fiscal year 2008. When we asked for an explanation for the fluctuation, DOD officials stated that the fluctuation was most likely caused by errors in five inventory records at one installation. These records used the wrong unit of measure in fiscal year 2007 to report inventory quantity. Specifically, the installation reported the square footage of the facilities as the inventory quantity instead of reporting the number of facilities. For example, a vehicle maintenance facility with 3,325 square feet was counted as 3,325 separate facilities. Because of this error, the facilities sustainment model overstated the sustainment requirement for vehicle maintenance facilities by about \$12.0 million in fiscal year 2007.
- The inventory quantity used by the model to estimate sustainment requirements for the Navy's hazardous waste storage or disposal facilities increased from 399 facilities in fiscal year 2006 to 2,350 facilities in fiscal year 2007, an increase of 489 percent. The quantity then decreased to 385 facilities in fiscal year 2008. When we asked for an explanation for the fluctuation, Navy officials stated that the fluctuation was caused by an error in reporting the inventory quantity in fiscal year 2007. Because of this error, the facilities sustainment model overstated the sustainment requirement for the Navy's hazardous waste storage or disposal facilities by about \$10.8 million in fiscal year 2007.

-
- The inventory quantity used by the model to estimate sustainment requirements for unsurfaced airfield pavement in the Army increased from 762,553 square yards in fiscal year 2005 to 2,634,221 square yards in fiscal year 2008, an increase of 245 percent. When we asked Army officials to explain the basis for the increase, Army officials stated that the Army had increased data emphasis and installations made great efforts to accurately capture their entire inventories. Although the dollar amount associated with this change in inventory is relatively small, the Army's statement indicates that the Army's previously reported inventory quantities for unsurfaced airfield pavement were not accurate.

Discrepancies Existed between Quantities Used in the Model and Supporting Inventory Records

Our review also identified discrepancies between facility inventory quantities used by the facilities sustainment model and quantities shown in the supporting real property inventory records. We identified such discrepancies at five of the eight installations we visited. In many instances, the difference in the inventory quantities was relatively small. Nevertheless, local officials could not explain the differences, which cause the accuracy of the facility quantities used by the model to be questionable. The following examples illustrate discrepancies we identified during installation visits.

- At Fort Eustis, we selected 39 facilities and for each facility compared the inventory quantity shown in the installation's real property inventory record with the inventory quantity used in the facilities sustainment model. In 36 of the 39 cases, the inventory quantities did not match and local officials could not explain why. For example, the Fort Eustis inventory record showed the size of a shore erosion prevention facility to be 9,333 linear feet but the inventory size used in the model was 30,839 linear feet, a difference of 230 percent. In another instance, the Fort Eustis inventory record showed the size of a bulkhead facility to be 2,594 linear feet but the inventory size used in the model was 1,394 linear feet, a difference of 86 percent. In neither case could Fort Eustis officials explain the discrepancy between the quantities contained in the facility inventory records and the quantities used by the model.
- At Randolph Air Force Base, we selected 39 facilities and for each facility compared the inventory quantity shown in the installation's real property inventory record with the inventory quantity used by the facilities sustainment model. In 5 of the 39 cases, the inventory quantities did not match and local officials could not explain why. For example, the Randolph Air Force Base inventory record showed the

size of a heat source facility to be 5,918 million British thermal units, but the inventory size used in the model was 27.15 million British thermal units. The quantity used by the model was a default reset value that the model used when the reported size for this facility type exceeded 500 million British thermal units and the reporting installation did not confirm that its reported facility size was correct. Randolph Air Force Base officials did not resolve the discrepancy during our visit.

- At Camp Lejeune, we found discrepancies in several of the inventory records we checked. For example, the model estimated sustainment requirements for seven aircraft runways at Camp Lejeune. When we asked for the supporting facility inventory records in order to compare inventory quantities in the records with the quantities used by the model, Camp Lejeune officials stated that they could not locate the inventory record for one of the runways. The model had used an inventory size of 172,083 square yards for this runway and estimated that its annual sustainment requirement was about \$207,000. Camp Lejeune officials did not resolve the discrepancy during our visit.

An Independent Study Found Concerns with the Model's Sustainment Cost Factors

An independent study that found concerns with the sustainment cost factors used in the model contributed to our finding that the model's estimates were less reliable than possible. As with inventory quantities, the facility sustainment cost factors associated with each of DOD's 448 facility categories are a key input to the facilities sustainment model. The cost factors used by the model must be reliable in order for the model's requirements estimates to be reliable. To assess the quality of the factors, DOD hired a contractor in fiscal year 2005 to perform an independent validation and verification study. The contractor selected 45 cost factors, primarily from those factors associated with facility categories with the highest sustainment requirements, independently determined a value for each factor, and compared these values with the cost factor values used by DOD. The study, completed in February 2006, reported that only 13 of 45 factors evaluated were deemed to be reasonably accurate and adequately supported. The study concluded that 32 of DOD's cost factors were either overvalued or undervalued and recommended that DOD adjust its cost factor values in order to more accurately estimate sustainment requirements. Table 1 illustrates selected results from the study.

Table 1: Selected Results from the Independent Validation and Verification Study of DOD's Sustainment Cost Factors

Facility category	Unit of measure	DOD's cost factor value ^a	Study's estimated cost factor value ^a	DOD's factor value less study's factor value:	
				Amount	Percentage
Surfaced road	Square yard	\$0.54	\$1.77	(\$1.23)	-228
Unsurfaced road	Square yard	0.16	0.53	(0.37)	-231
Operating fuel storage	Gallon	0.08	0.26	(0.18)	-225
Sidewalk and walkway	Square yard	0.86	1.84	(0.98)	-114
Vehicle bridge	Square yard	76.42	37.79	38.63	51
Standby emergency power	Kilowatt	17.17	10.43	6.74	39
Airfield pavement lighting	Linear foot	3.30	2.30	1.00	30
General administration building	Square foot	2.56	3.21	(0.65)	-25
Fence and wall	Linear foot	0.60	0.73	(0.13)	-22
Potable water distribution line	Linear foot	0.85	0.67	0.18	21

Source: US COST, Facilities Sustainment Cost Factor Evaluation for the Office of the Secretary of Defense (February 2006).

^aFiscal year 2005 dollars.

In response to the study's recommendations, DOD made changes to some but not all of the factors recommended for adjustment. Specifically, DOD cited the study as the basis for making changes to 16 cost factors when factors were adjusted for use in estimating the fiscal year 2009 sustainment requirements. However, some of these changes were not consistent with the study's recommendations. For example, the study found that the factor for general administration buildings was 25 percent too low and recommended a change. Although DOD made a change and attributed the study for the change, the revised cost factor was still 16 percent below the study's recommended amount after adjusting for inflation. The study also found that the factor for standby emergency power facilities was 39 percent too high and recommended a change. Although DOD made a change and attributed the study for the change, the revised cost factor was still 40 percent higher than the study's recommended amount after adjusting for inflation.

DOD did not document the reasons why some of the study's recommendations were accepted and some were not, and in some cases DOD's decisions appeared inconsistent. For example, the study recommended increasing the cost factors for surfaced roads and unsurfaced roads. DOD accepted the recommendation for unsurfaced roads, which will result in adding over \$90 million to the sustainment requirement, but did not accept the recommendation for surfaced roads.

Because the reasons for these decisions were not documented, we asked DOD officials to explain the basis for the decisions. The officials stated that the recommendation for unsurfaced roads was accepted because a DOD panel decided that the data used to support the study's recommended cost factor value were superior to the data used to support DOD's cost factor value. However, because the data used by the study were readily available to DOD, it is unclear why the data were not already used as the basis for DOD's cost factor. The officials stated that the panel decided the opposite for surfaced roads—that the data used to support DOD's cost factor were superior to the data supporting the study's recommended cost factor. However, the basis for the panel decision is somewhat unclear because DOD's cost factor was based on a University of Kansas study and reasons were not stated to explain why that study was considered a superior source.

It is important to note that the verification and validation study evaluated 45 (about 10 percent) of DOD's 448 sustainment cost factors and identified concerns with 32 (about 71 percent) of the factors evaluated. Of these 32 factors, DOD made changes to 16 factors and attributed the changes to the study. On the basis of these percentages, it appears likely that if further study and analysis were performed on the remaining 395 cost factors not subjected to an independent review, additional reliability concerns would be identified and DOD would be in a position to make adjustments to additional factors.

Support for Some Sustainment Cost Factors Is Unclear

We identified issues concerning the supportability of some cost factors used by the facilities sustainment model. DOD officials stated that, as resources permit, several cost factors are refined each year in an effort to continually improve the accuracy of the model. However, DOD has not provided a clear audit trail with readily accessible information documenting the support or basis for each factor's value, such as the details on the calculations used and explanations for changes in factors from year to year. Without this documentation, the support for many factors is unclear, as illustrated below.

- From fiscal year 2008 to 2009, DOD decreased the sustainment cost factor for potable water storage facilities and pedestrian bridges by 90 percent and 88 percent, respectively. Because documentation did not explain the reason for these changes, we asked DOD officials for an explanation. The officials stated that the changes were made to correct a math error that had been made in the calculation of the previously used cost factor values. Such errors might be more easily detected if

calculation details were provided in the documentation supporting the cost factors.

- From fiscal year 2008 to 2009, DOD increased the sustainment cost factor for airfield pavement lighting by 90 percent. The February 2006 verification and validation study had found this factor, before the increase, to be high. Because documentation did not explain the reason for the increase, we asked DOD officials for an explanation. The officials stated that the increase resulted from a change in the basis for the cost factor. The revised cost factor was based on a detailed cost analysis of a standard design using vendor quotes. Still, documentation showing the calculations and the number of vendors contacted to ensure competitive pricing would help support this cost factor change.
- From fiscal year 2008 to 2009, DOD increased the sustainment cost factor for fences and walls by 92 percent. Because documentation did not explain the reason for the increase, we asked DOD officials for an explanation. The officials stated that the change resulted from a change in the planned design life for fences and walls from 50 to 26 years. The February 2006 verification and validation study had recommended that this factor be increased by 22 percent but did not recommend a change in service life. Documentation showing the detailed reasons for the change and the calculations used would help support this cost factor change.
- From fiscal year 2008 to 2009, DOD decreased the sustainment cost factor for sidewalks and walkways from \$1.82 per square yard to \$0. The change reduced DOD's sustainment requirements by about \$98 million. Because documentation did not explain the reason for the decrease, we asked DOD officials for an explanation. The officials stated that the decrease resulted from a change in the planned design life for sidewalks and walkways from 50 to 28 years, which resulted in eliminating sustainment costs but increasing recapitalization costs. We asked facility maintenance personnel at four of the installations we visited whether they agreed with the change in the cost factor. In each case, the officials stated that they disagreed because sidewalks and walkways do have sustainment costs. Documentation showing the detailed reasons for the change and the calculations used would help support this cost factor change.

The support for some sustainment cost factors was also unclear because of the method DOD used to determine the values for the factors. Specifically, DOD attempts to use independent data sources as the basis for determining sustainment cost factors. However, according to DOD

officials, independent data sources are not available for some facility categories. To develop a sustainment cost factor for one of these facility categories, DOD normally performs a ratio analysis based primarily on costs from a similar facility category where costs are based on independent sources.¹⁴ For example, the sustainment cost factor for satellite communications buildings is based on a ratio of costs from communications buildings, where the sustainment cost factor is based on independent data sources.

However, we found that the cost factors for some facility categories were based on costs from seemingly dissimilar facility categories. In such cases, the support for the factors was unclear because documentation did not explain the relationship between the facility categories. For example, the sustainment cost factor for petroleum pipelines, which are measured in miles, and the sustainment cost factor for aircraft fueling facilities, which are measured in gallons per minute, were both based on a ratio of costs from automobile service facilities, which are measured in square feet. DOD officials stated that sustainment costs for automobile service facilities include hydrant and fuel truck station records, periodic maintenance inspections, and replacement of worn parts, which are similar to costs associated with petroleum pipelines and aircraft fueling facilities. However, because automobile service facilities also include costs for items not clearly associated with petroleum pipelines and aircraft fueling facilities, such as linoleum flooring, painted walls, water heaters, and heating and air conditioning systems, the connection between these facility categories remains unclear.

¹⁴The premise is that there is a similar relationship between the sustainment and replacement cost factors for two facility categories. The replacement cost factor is DOD's estimate of the average unit cost to replace a facility in a given facility category based on the category's prescribed unit of measure. Thus, when the sustainment and replacement cost factors for the first facility category are known and the replacement cost factor of the second facility category is known, a ratio analysis can be used to estimate the unknown sustainment cost factor of the second facility category by multiplying the ratio of the cost factors from the first facility category by the replacement cost factor of the second facility category.

DOD's Fiscal Year 2009 Calculation Method Can Reduce the Accuracy of Sustainment Cost Factors Not Based on Independent Data Sources

Each year since the facilities sustainment model was implemented in 2003, DOD has adjusted the sustainment cost factors for estimated inflation. However, for fiscal year 2009, DOD changed the calculation method used to make the inflation adjustment and the change can result in reduced accuracy for those sustainment cost factors that are not based on independent data sources but rather are based on ratio analyses. As discussed above, when independent data sources are not available to estimate a sustainment cost factor for a facility category, DOD normally estimates the unknown cost factor by performing a ratio analysis based on costs from a similar facility category where the costs are based on independent sources. DOD's premise is that because there is a similar relationship between the sustainment and replacement cost factors for the two facility categories, a ratio analysis can be used to estimate the unknown sustainment cost factor.¹⁵ DOD uses ratio analyses to estimate the sustainment cost factors for approximately one-third of DOD's facility categories.

DOD officials stated that because several years had passed since the facilities sustainment model was implemented and the actual inflation rates for each of those years was known, DOD decided that it could improve the accuracy of the factors if they were recomputed using the actual prior year inflation rates. Thus, in developing the cost factors to be used in estimating DOD's fiscal year 2009 facility sustainment funding requirements, DOD recomputed all cost factors using actual prior year inflation rates.

The recomputation should result in increased accuracy for those sustainment cost factors that are based on independent data sources. However, depending on the method used to make the inflation adjustment for those cost factors that are based on ratio analyses, the recomputation can also result in decreased accuracy for those factors. To illustrate, for cost factors based on ratio analyses, DOD previously made inflation adjustments by first applying the estimated annual inflation rate to the individual sustainment and replacement cost factors and then using a ratio analysis to calculate the unknown sustainment cost factor. DOD did not use this method for fiscal year 2009. Instead, DOD used the value of the sustainment cost factor that was determined in the first year that a ratio analysis was used and then applied actual prior year inflation to recompute the cost factor's value for fiscal year 2009. DOD's new method

¹⁵See note 14.

would be appropriate and result in accurate estimates under two circumstances—if the similar relationship between the two facility categories used in the ratio analyses existed only in the first year that the ratio analysis was used, or if the relationship between the known sustainment and replacement cost factors used in the ratio analysis remained the same from the original year to the current year. However, according to DOD officials and our review of supporting documentation, neither circumstance is applicable. More specifically, DOD officials stated that the similar relationship between the facility categories continues from year to year and our review found that the relationship between the known sustainment and replacement cost factors often do not stay the same because the individual costs can change at different rates from year to year.

For example, the cost factor for retaining structure facilities is not based on independent data sources but rather on a ratio analysis of costs from fence and wall facilities. To adjust the retaining structure facilities' cost factor for fiscal year 2009, DOD applied actual inflation rates to the factor's value in 2005, the year that the factor was first determined using a ratio analysis. The result was a sustainment cost factor of \$11.57 per linear foot. However, if DOD had used its previously used method and calculated the cost factor using a ratio analysis after the individual costs used in the analysis had been adjusted for actual inflation, the sustainment cost factor would have been \$21.99 per linear foot, or 90 percent more. Using the previously used calculation method would have increased the accuracy of the cost factor because costs would continue to be based on a current year ratio analysis and actual prior year inflation would still be considered because the individual costs used in the ratio analysis would have been adjusted for actual prior year inflation. Based on DOD's inventory of retaining structure facilities, the difference resulted in the facilities sustainment model estimating about \$13 million less for sustaining these facilities in fiscal year 2009.

As another example, the cost factor for petroleum pump station facilities is not based on independent data sources but rather on a ratio analysis of costs for automobile service facilities. To adjust the petroleum pump station facilities' cost factor for fiscal year 2009, DOD applied actual inflation rates to the factor's value in 2006, the year that the factor was first determined using a ratio analysis. The result was a sustainment cost factor of \$20.85 per square foot. However, if DOD had calculated the cost factor using the previously used method, the sustainment cost factor would have been \$18.56 per square foot, or 11 percent less. Based on DOD's inventory of petroleum pump station facilities, the difference

resulted in the model estimating about \$2.4 million more for sustaining these facilities in fiscal year 2009.

In commenting on the calculation method used for fiscal year 2009 and the resulting impact on those factors based on ratio analyses, DOD officials stated that the intent was to reduce the number of variables and unknowns in developing the cost factors and inflating the original calculation appeared to be the least complicated method. Although the method used by DOD for fiscal year 2009 may provide for some consistency, the method does not appear to be any less complicated than the previously used method, does not appear to reduce any variables or unknown quantities, and can result in reduced accuracy for those cost factors that are determined by a ratio analysis.

Military Services Have Not Met All Funding Goals for Facility Sustainment and Recapitalization

The military services have not met all of DOD's goals for funding facility sustainment and recapitalization at levels to prevent deterioration and ensure that facilities are restored and modernized in accordance with established benchmarks. Full funding of sustainment requirements is the most cost-effective approach to managing facilities because it provides the most performance over the longest period for the least investment. However, the military services collectively have not met DOD's facility sustainment funding goals each year since goals were established in fiscal year 2005, and some facilities had fallen into disrepair at most installations we visited. As a result, some facilities have deteriorated and will likely experience reduced service lives, which, in turn, will lead to more costly recapitalization requirements in the future. Although the military services achieved more success in meeting DOD's recapitalization goals—largely because of factors outside the normal facility recapitalization funding process—service officials noted concern over the shortage of restoration and modernization funds and a growing backlog of restoration and modernization requirements.

Full Funding of Sustainment Requirements Is Cost Effective

According to DOD, full funding of sustainment requirements is the most cost effective approach to managing facilities because it provides the most performance over the longest period for the least investment. However, as other important priorities, such as force modernization, have competed for funding, DOD has been challenged to provide adequate resources for sustaining and recapitalizing its facilities. In April 2007 testimony, DOD noted that full funding of facilities sustainment had been and continued to be the foundation of the department's long-term facilities strategy and goals in order to optimize DOD's facility investment and ensure facility

readiness.¹⁶ When full sustainment funding is not provided, service officials noted that facility deterioration accelerates, facility service lives shorten, mission capabilities and quality of life decrease, and expected future costs increase. In view of these positions and recognizing that funding of sustainment requirements had been a challenge because of competing budget priorities, DOD’s 2004 installations strategic plan established a goal for the military services to fund sustainment at 95 percent of the requirement determined by the facilities sustainment model beginning in fiscal year 2005, and at 100 percent of the requirement beginning in fiscal year 2008. Because the facilities sustainment model provides a consistent and reasonable framework for estimating sustainment requirements, use of the model for setting funding goals appears reasonable, even though the reliability of the model’s estimates can be improved.

Military Services Have Not Met Sustainment Goals

Collectively, the military services did not meet DOD’s sustainment funding goal in fiscal years 2005 through 2007 and they did not budget funds to meet the goal in fiscal year 2008. As shown in table 2, during fiscal years 2005 through 2007, only the Marine Corps met or exceeded the goal by funding over 100 percent of the Marine Corps’ annual sustainment requirement in fiscal years 2006 and 2007, thus reducing some of the Marine Corps’ backlog of deferred sustainment needs.

Table 2: Attainment of Sustainment Goals—Percentage of Requirement Funded, Fiscal Years 2005 through 2008								
Component	Fiscal year 2005		Fiscal year 2006		Fiscal year 2007		Fiscal year 2008	
	Goal	Actual	Goal	Actual	Goal	Actual	Goal	Budgeted
Army	95	64	95	88	95	73	100	89
Navy	95	90	95	79	95	92	100	83
Air Force	95	78	95	84	95	88	100	90
Marine Corps	95	94	95	126	95	113	100	89
DOD-wide ^a	95	79	95	91	95	90	100	88

Source: DOD.
^aAlso includes data from the Tricare Management Activity and the DOD Education Activity.

¹⁶Statement of Mr. Philip W. Grone, Deputy Under Secretary of Defense (Installations and Environment), before the Subcommittee on Readiness and Management Support, Senate Armed Services Committee (Apr. 10, 2007).

Service officials stated that they generally did not meet the sustainment funding goals because resources were limited and some programs, such as force modernization, often had higher funding priority. In addition, in some cases funds budgeted for sustainment needs were used to pay for other needs, such as unfunded facility restoration projects or unfunded bills for installation services. When sustainment funds are used to pay for other needs, the result is that even more facility sustainment requirements are unmet, which could lead to additional restoration and modernization requirements in the future. The following is a summary of the comments on this issue from the military services.

- Army officials stated that the Army achieved a lower facility sustainment rate than budgeted in some years because facility sustainment funds were used to make up for funding shortages in installation services by covering some must-pay bills. In fiscal year 2005, the officials stated about \$600 million of budgeted sustainment funds were used to pay for installation support services. The officials also noted that, because sustainment requirements have not been fully funded, using sustainment funds for other purposes amplifies the impact on facilities by causing additional deterioration.
- Navy officials also stated that budgeted sustainment funds were used to pay for other critical unfunded needs. The officials stated that about \$200 million in budgeted sustainment funds were used each year to pay for critical restoration and modernization projects. In addition, Navy officials told us that about \$195 million and \$184 million of budgeted sustainment funds in fiscal years 2005 and 2006, respectively, were used to pay for installation support services. Navy officials also stated that although other critical needs were met with the sustainment funds, the result was the deferment of a significant amount of needed sustainment work.
- Air Force officials noted that in some instances installations have used sustainment funds to pay for unfunded restoration and modernization projects in order to repair damaged facilities or prevent catastrophic facility failures so that missions were met. The officials stated that in fiscal year 2005 and also in fiscal year 2006, about \$250 million of budgeted sustainment funds were used each year to pay for facility restoration projects. Although the result was less funding for needed sustainment work, the officials stated that the funds were still used on facility needs rather than on other needs, such as installation services.
- Marine Corps officials stated that nearly all budgeted sustainment, restoration, and modernization funds have been used as intended.

Underfunding of Sustainment Requirements Has Resulted in Some Deteriorated Facilities

Although many facilities are in good condition, service officials stated that underfunding of sustainment requirements over many years has resulted in some deteriorated facilities. Deteriorated facilities will likely experience reduced service lives, which, in turn, will lead to more costly recapitalization requirements in the future. Army officials noted that when sustainment funding is inadequate, planned projects are delayed, which sometimes causes further deterioration, such as damage to interior walls and floors from leaking roofs. Navy and Air Force officials also stated that inadequate facility sustainment funding has resulted in deteriorated facilities, reduced mission capabilities, and lower quality of life for installation personnel. Navy officials stated that in some instances installation aircraft runways have been closed because sustainment funds were not available to perform needed repairs.

At the eight installations we visited, facility sustainment requirements were not fully funded every year during fiscal years 2005, 2006, and 2007. At some, but not all, of the installations, local officials stated that sustainment funding had not been available to accomplish all needed work and, as a result, many installation facilities were in a deteriorated condition. For example, officials at Fort Sam Houston stated that the foundation of a warehouse facility had shifted, which caused cracks in the walls, warped door frames, and leaking pipes (see fig. 2). Repairs had not been completed because adequate sustainment funds were unavailable. Fort Sam Houston officials also noted that several barracks buildings, which were still in use, had deteriorated because of inadequate funding. For example, porch surfaces were crumbling, paint was peeling, and windows needed repair (see fig. 3).

Figure 2: Leaking Pipes and Cracked Walls at a Damaged Warehouse Facility at Fort Sam Houston



Source: GAO.

Figure 3: Deteriorated Barracks Building at Fort Sam Houston



Source: GAO.

Officials at Oceana Naval Air Station stated that many facility roof structures at the installation had exceeded their service lives and some were leaking, causing damage to interior building components. The officials noted that the roof of a weapons and radar training building at an Oceana Naval Air Station annex had standing water and leaked, which caused problems inside the building (see fig. 4). Local officials stated that the roof repair would cost about \$2.3 million and had been deferred because of inadequate sustainment funding. Oceana officials also stated that needed repairs to several aircraft hangar doors at the installation had been deferred due to inadequate sustainment funding (see fig. 5). Because hangar door motors did not work, employees used a tow tractor to open and close the doors, which resulted in additional damage to the doors. The officials also stated that an employee had been injured by a hangar door because the door's safety device did not work.

Figure 4: Standing Water on a Leaking Roof of a Weapons and Radar Training Building at an Oceana Naval Air Station Annex



Source: GAO.

Figure 5: Damaged Aircraft Hangar Doors at Oceana Naval Air Station



Source: GAO.

At Randolph Air Force Base, officials stated that although an aircraft maintenance hangar needed substantial window repairs or replacement to prevent safety violations, funds were not available to accomplish the work. The officials noted that the facility's window frames were corroded, which allowed rain water to enter the building. The windows were located directly above electrical panels and water ran over the panels when it rained, creating a safety hazard (see fig. 6). On occasion, water in the building had caused aircraft maintenance operations to temporarily shut down. The officials told us that the facility had already received one safety violation and another one could permanently shut down the facility. Randolph Air Force Base officials also stated that some aircraft runways and aprons had deteriorated due to inadequate sustainment funding. The officials said the concrete on some runways and aprons was old and prone to cracking, which could cause concrete pieces to break off, creating a foreign object hazard to aircraft engines (see fig. 7). The officials explained that some holes had been patched as a temporary fix, but that the patches tended to crack and pop out. The officials stated that projects costing about \$56 million were needed to complete all needed runway and apron repairs.

Figure 6: Leaking Windows and Electrical Panels that Created a Safety Hazard at a Deteriorated Aircraft Maintenance Hangar on Randolph Air Force Base



Source: GAO.

Figure 7: Cracking Aircraft Aprons at Randolph Air Force Base



Source: GAO.

Military Services Achieved More Success in Attaining Recapitalization Goals

In comparison to facility sustainment goals, the military services have achieved more success in attaining DOD recapitalization goals. Although DOD has not used a standardized model to determine facilities recapitalization funding requirements, for several years the department has used a metric that measures the number of years that would be required to replace the facility inventory on the basis of the annual funding provided for restoration and modernization. According to February 2006 testimony, DOD's recapitalization rate in fiscal year 2001 was 192 years, a rate that DOD considered inadequate in view of DOD's current goal of

67 years and similar private sector industries, which replace their facilities every 50 years, on average.¹⁷

Since fiscal year 2001, DOD's recapitalization rate has improved and, as shown in table 3, the military services have met or bettered the 67 year benchmark in many instances. For example, the Army bettered the goal in fiscal years 2005, 2006, and 2007, the Navy bettered the goal in fiscal years 2006 and 2007, and the Air Force bettered the goal in fiscal year 2005.

Table 3: DOD Facility Recapitalization Rates Expressed in Years				
Component	Fiscal year 2005	Fiscal year 2006	Fiscal year 2007	Fiscal year 2008 ^a
Army	62	61	42	72
Navy	77	48	62	66
Air Force	66	69	71	97
Marine Corps	72	97	119	83
DOD-wide^b	67	60	59	74

Source: DOD.

Note: To exceed DOD's 67-year recapitalization rate goal, the number of years must be less than 67.

^aBudgeted.

^bAlso includes data from the Defense Logistics Agency, the Tricare Management Activity, and the DOD Education Activity.

According to DOD officials, one reason for greater success in meeting recapitalization goals is that additional restoration and modernization funds were provided from programs outside of the normal funding process. For example, the officials stated that many installations have received additional recapitalization funding as the result of decisions related to the implementation of base realignment and closure recommendations, the global basing strategy, and the Army's restructuring initiative.

Although the military services met recapitalization goals in some years, the adequacy of restoration and modernization funding remains an issue, particularly in view of existing backlogs of needed restoration and

¹⁷Statement of Mr. Philip W. Grone, Deputy Under Secretary of Defense (Installations and Environment), before the Military Quality of Life and Veterans Affairs Subcommittee, House Appropriations Committee (Feb. 15, 2006).

modernization work. Army officials stated that Army restoration and modernization needs were not fully funded in fiscal years 2005 and 2006, and at the end of fiscal year 2007 the Army reported a backlog of restoration and modernization needs of about \$20.4 billion. Navy officials stated that the Navy's restoration and modernization backlog grew from about \$13.3 billion in fiscal year 2005 to about \$27.6 billion at the end of fiscal year 2007, an increase of 108 percent. Air Force officials stated that restoration and modernization requirements had not been adequately funded and that the Air Force had a restoration and modernization backlog of about \$9.3 billion at the end of fiscal year 2007. Marine Corps officials stated that the Marine Corps had a restoration and modernization backlog of about \$1 billion at the end of fiscal year 2007. Without adequate restoration and modernization funding, facilities cannot be restored, improved, or modernized in accordance with military needs and expectations.

Officials at some of the installations we visited also stated that inadequate funding for restoration and modernization needs was a concern. For example, officials at Fort Sam Houston stated that the installation's backlog of restoration and modernization requirements grew from about \$341 million in fiscal year 2005 to about \$456 million in fiscal year 2007, an increase of about \$115 million (34 percent). At Langley Air Force Base, officials stated that the installation's backlog of restoration and modernization requirements grew from about \$24 million in fiscal year 2005 to about \$46 million in fiscal year 2007, an increase of about \$22 million (92 percent).

DOD Has Not Taken Actions to Address Deferred Facility Sustainment Requirements

DOD has not taken actions to estimate and address the military's deferred facility sustainment requirements. Deferred facility sustainment requirements—specifically unfunded facility sustainment needs that carry over from one year to the next—can eventually result in damaged facilities, shortened facility service lives, and increased future costs for facility restoration. However, because DOD has not provided guidance that clearly defines deferred sustainment requirements, directs the services to consistently measure and track deferred sustainment needs, or establishes a goal to address these needs, the military services do not have consistent estimates of their deferred sustainment requirements or plans to deal with these needs. As a result, DOD lacks a complete picture of its facility sustainment funding needs and DOD's current plans and goals to address facility sustainment requirements do not include all sustainment requirements. In addition, without consistent estimates, the military services' annual financial statements have not included the cumulative

amount of deferred facility sustainment requirements as required by Federal Financial Accounting Standards in order to provide full disclosure of facility conditions.

DOD Has Not Provided Adequate Guidance on Deferred Sustainment Requirements

The military services do not have consistent estimates of their deferred sustainment requirements or plans to deal with these needs because DOD has not provided adequate guidance on deferred sustainment requirements. Although DOD guidance provides a clear definition of work classified as facility sustainment and DOD's facilities sustainment model provides a framework for estimating and addressing annual facility sustainment funding requirements, DOD has not provided a clear definition of work that should be classified as deferred facility sustainment or issued guidance for estimating and addressing deferred sustainment funding requirements. According to DOD officials, deferred sustainment has not been emphasized because the goal has been for the military services to fully fund their annual sustainment requirements. If the annual sustainment requirements were fully funded each year, then facilities could be optimally maintained and needed sustainment work would not be deferred, so deferred sustainment requirements would not exist. However, this has not been the case. As shown in table 4, the military services did not fund over \$3.5 billion of their annual sustainment requirements in fiscal years 2005 through 2007. According to DOD, needed sustainment work that is not performed—specifically unfunded facility sustainment needs that carry over from one year to the next—will eventually result in damaged facilities, shortened facility service lives, and increased future costs for facility restoration.

Table 4: Unfunded Annual Facility Sustainment Requirements

(Dollars in millions)

Component	Fiscal year 2005	Fiscal year 2006	Fiscal year 2007	3-year total
Army	\$918	\$574	\$735	\$2,228
Navy	34	61	121	216
Air Force	375	418	214	1,007
Marine Corps	70	47	(15) ^a	102
Total	\$1,398	\$1,100	\$1,056	\$3,553

Source: DOD.

Note: The amounts shown reflect the difference between each service's annual facility sustainment requirements, as determined by the facilities sustainment model, and the amount each service spent on facility sustainment. The actual unfunded facility sustainment requirements could differ from the estimates due to concerns with the model's inputs that we discussed earlier in this report. Numbers in the table may not total correctly due to rounding.

^aThe Marine Corps funded more than its annual sustainment requirement in fiscal year 2007.

Services Do Not Have Consistent Estimates of Deferred Sustainment Needs and Preparing These Estimates Can Be Difficult

Without guidance that places emphasis on deferred facility sustainment needs, the military services and the installations we visited did not have consistent estimates of their deferred sustainment needs, and DOD officials noted that preparing these estimates is difficult for several reasons. Although each service knew the amount of its annual sustainment requirements that was not funded, they did not know the amounts of their deferred sustainment requirements and each service expressed a different view of the issue. For example, Army officials stated that although the Army does not have information documenting its cumulative deferred sustainment requirements, deferred sustainment needs were being addressed with the Army's current funding of its annual sustainment, restoration, and modernization programs. However, the Army did not fund over \$735 million of its annual sustainment requirements in fiscal year 2007 and budgeted funds to pay for only 89 percent of the Army's fiscal year 2008 sustainment requirements. Meanwhile, Navy officials stated that it did not need to estimate deferred sustainment needs because sustainment work that is deferred becomes a restoration and modernization requirement. However, according to DOD definitions, deferred sustainment does not become a restoration requirement until it results in damaging a facility, and it could take several years before deferred sustainment work actually damages a facility to the point that it must undergo restoration. In contrast, officials from the Air Force stated that deferred sustainment requirements should be estimated and added to the annual sustainment requirements in order to see the total sustainment funding requirement, even though the cost to fund the total requirement

would be too high to be fully funded considering other Air Force budget priorities. Finally, Marine Corps officials stated that, based on periodic facility inspections, it has an estimate of total facility needs that includes all deferred sustainment, restoration, and modernization requirements. However, this estimate does not distinguish the deferred sustainment requirement from the restoration and modernization requirement, which means that the Marine Corps does not know its actual deferred sustainment requirement. The Marine Corps also stated that funding over 100 percent of the annual sustainment requirement, as it did in fiscal year 2007, would be required to reduce the size of the deferred sustainment requirement.

At some of the installations we visited, officials noted that deferred sustainment requirements needed to be adequately estimated and addressed if facilities are to be sustained at an optimum level. For example, officials at Langley Air Force Base stated that because the facilities sustainment model only estimated the annual sustainment requirement and did not address deferred sustainment, deferred facility sustainment needs at many installations would not be met even if the installations were funded at the amounts estimated by the model. The officials also stated that deferred sustainment requirements needed to be specifically recognized and a plan developed to address these requirements. At Camp Lejeune, officials noted that the facilities sustainment model was based on facility life-cycle costs and the model's annual funding estimates were based on the assumption that facilities were fully sustained in the past and were in good condition. However, the officials stated that this is not the case at many installations because years of inadequate funding had resulted in a backlog of deferred sustainment requirements. Fort Sam Houston officials stated that although a backlog of deferred sustainment needs existed, it was difficult to quantify the size of the backlog because the installation lacked the personnel required to fully inspect all installation facilities and catalogue all of the needed sustainment work and projects. Similarly, Randolph Air Force Base officials stated that all deferred sustainment needs at the installation had not been identified partly because there was little confidence that the work would be funded even if the effort were expended to document the requirement.

Although Federal Real Property Council guidance requires federal activities to know the repair needs of their facilities,¹⁸ DOD officials indicated that for several reasons, determining deferred facility sustainment needs is not an easy task. First, DOD officials noted that all unfunded annual sustainment requirements do not become deferred requirements. To illustrate, if a facility has an annual inspection requirement and the inspection is not performed, the inspection cost would not become a deferred sustainment requirement because two annual inspections would not be required in the following year and the facilities sustainment model would include the annual inspection cost in the subsequent year's funding estimate. However, if a facility were scheduled for a roof replacement and roof was not replaced, the cost of the replacement would become a deferred requirement because it would still be needed and the cost would not be included in the subsequent year's funding estimate.

Second, DOD officials also noted that the facilities sustainment model estimates the average annual sustainment funding requirements for each facility category but does not identify the actual sustainment work that each installation facility needs. The officials noted that a model might be developed that could provide reliable estimates of deferred sustainment requirements. However, according to the officials, actual facility sustainment needs can only be determined through facility inspections in which actual conditions are determined, needed repair and maintenance work is documented, and costs to complete this work are estimated. A comparison of an installation's actual facility sustainment needs with the installation's annual sustainment funding would provide an estimate of the installation's deferred sustainment requirement. Of the military services, only the Marine Corps systematically inspected its facilities and documented needed repairs and improvements so that actual deferred facility needs were known. However, because the documentation did not distinguish facility sustainment needs from restoration and modernization needs, the Marine Corps did not know its actual deferred sustainment funding requirements. The Army used a facility inspection method that provided an estimate of facility funding needs based on facility condition assessments. However, the method did not document each facility's actual needed sustainment, restoration, and modernization projects. The Navy stopped performing facility condition inspections after fiscal year 2005

¹⁸Federal Real Property Council, *2007 Guidance for Real Property Inventory Reporting* (June 8, 2007).

because of the high cost of the inspections. Although the Navy plans to implement a model beginning in fiscal year 2008 designed to estimate facility conditions and funding needs, the model will not document each facility's actual needed sustainment, restoration, and modernization projects. Air Force officials stated that its facilities are inspected as funds permit and facility deficiencies, work requests, and projects are documented. However, the officials stated that the list of needed work was not considered all inclusive and did not categorize needed work as sustainment, restoration, or modernization.

Third, as noted previously, estimating deferred sustainment requirements can be further complicated by DOD's definition of facility restoration and the associated decisions on when deferred sustainment requirements become restoration requirements. Specifically, DOD defines restoration as including repair and replacement work to restore facilities damaged by inadequate sustainment, excessive age, disaster, accident, or other causes. Marine Corps officials noted that it can be difficult to determine when deferred sustainment work actually damages a facility and thus should be reclassified from a sustainment funding requirement to a restoration funding requirement.

Lack of Clear Guidance Impedes Reliable Financial Reporting of Deferred Sustainment Costs

The military services' financial reporting of deferred facility maintenance information is not consistent with federal financial reporting requirements due to a lack of clear DOD reporting guidance. We found that prior to fiscal year 2007, the services' financial statements excluded required information concerning deferred facility sustainment requirements and included information concerning deferred facility modernization requirements. Including deferred facility modernization requirements is not consistent with federal financial reporting requirements because these requirements pertain to activities intended to expand or upgrade facility capacity. Although DOD issued revised guidance in September 2007 in part to address these issues, the guidance did not provide sufficient details to ensure that future financial reporting of deferred maintenance would be consistent with reporting requirements. Unreliable deferred maintenance information, could further jeopardize DOD's ability to adequately provide for its facility sustainment needs and result in continued facility deterioration and increased future recapitalization costs.

Federal financial accounting standards require that federal entities that own property, plant, and equipment include information in their financial statements disclosures related to the condition and the estimated deferred maintenance costs of these assets.¹⁹ The accounting standards define maintenance as the act of keeping fixed assets in acceptable condition, including preventive maintenance, normal repairs, replacement of parts and structural components, and other activities needed to preserve the asset so that it continues to provide acceptable services and achieves its expected life. The distinction between maintenance and deferred maintenance is that deferred maintenance is maintenance that was not performed when it should have been or was scheduled to be and which, therefore, was put off or delayed for a future period. By definition, both maintenance and deferred maintenance exclude activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve needs different from, or significantly greater than, those originally intended. In other words, expenditures to modernize or upgrade property, plant, and equipment should not be reported as maintenance costs.

According to DOD officials, prior to fiscal year 2007, the military services' financial statement reports included disclosures pertaining to only to the annual amount of their sustainment requirements, as determined by the facilities sustainment model, which was not funded. In addition, the military services' financial statement disclosures for deferred maintenance also included information on the cumulative deferred restoration and modernization requirements as a component of the reported deferred maintenance amounts. Reporting deferred modernization requirement amounts is not consistent with reporting standards because modernization includes facility work to implement new or higher facility standards, accommodate new functions, or replace building components that have exceeded their useful life, typically about 50 years. However, DOD guidance did not clearly instruct the military services to exclude deferred modernization requirement amounts from the amounts they reported for deferred maintenance. Thus, the reporting of deferred modernization requirements as part of deferred facility maintenance in the financial statements results in misleading deferred maintenance disclosures and is not consistent with what is called for by federal accounting standards.

¹⁹Statement of Federal Financial Accounting Standards No. 6, *Accounting for Property, Plant, and Equipment* (June 1996) and Statement of Federal Financial Accounting Standards No. 14, *Amendments to Deferred Maintenance Reporting* (April 1999).

DOD officials further stated that while in the process of updating DOD financial regulations in 2007, DOD recognized that the financial statements should include the cumulative, not just the annual, deferred sustainment amounts. To address this issue beginning with the fiscal year 2007 financial statements, an official in the Office of the Secretary of Defense (Comptroller) stated that the military services were directed to begin reporting deferred maintenance amounts that include cumulative deferred sustainment requirements. However, because the military services did not have estimates of their deferred sustainment requirements, DOD officials stated that the military services were directed to estimate their total deferred maintenance needs based on each service's facility quality ratings. Facility quality ratings, prepared for each real property inventory asset, reflect each facility's condition at a specific point in time and the estimated cost to correct existing deficiencies to bring the facility to a fully serviceable operating condition.

Although DOD decided to use the facility quality ratings for estimating and reporting deferred maintenance, DOD's guidance for determining the quality ratings specifically excluded consideration of sustainment requirements and specifically included all restoration and modernization requirements, except for construction of new facility capacity.²⁰ To address this issue, DOD issued new guidance on September 5, 2007.²¹ The new guidance directed the military services to begin including sustainment requirements in the facility quality ratings and to exclude restoration and modernization requirements that were related to facility conversion and construction of new facility capacity. However, the guidance did not provide details to the military services on how to do implement these changes and permitted each service to decide on a method, as long as the service validated the accuracy of the method used.

Although the military services attempted to implement the new guidance in reporting deferred maintenance information in their fiscal year 2007 financial statements, the reported information was still inconsistent and incomplete. First, because the new guidance did not provide details on how to implement the changes, each service used its own methods. Yet, according to a May 2006 report commissioned by DOD to provide an

²⁰See Department of Defense Instruction No. 4165.14, *Real Property Inventory and Forecasting* (Washington, D.C.: Mar. 31, 2006).

²¹See Under Secretary of Defense (Acquisition, Technology and Logistics) Memorandum, *Facility Quality Rating Guidance* (Washington, D.C.: Sept. 5, 2007).

independent verification and validation of the services' facility quality ratings, the services used inconsistent methods to determine facility conditions, which resulted in inconsistent estimates of needed maintenance costs.²² Second, with the new guidance being issued on September 5, 2007, the military services had little time to make any adjustments to their facility quality ratings prior to preparation of their fiscal year 2007 financial statements, which were due in November 2007. According to Navy officials, Navy facility quality ratings had not been updated since 2005 because the Navy stopped performing facility inspections. Third, when reporting deferred facility maintenance amounts in its fiscal year 2007 financial statement, the Air Force included a note stating that the use of facility quality ratings as a basis for calculating deferred maintenance did not seem prudent because the quality of the information used to determine the ratings was questionable. Without guidance providing for consistent methods for measuring deferred sustainment requirements and determining which portion of the deferred restoration and modernization requirements to include in the financial statements, the military services' financial reporting of deferred maintenance information may continue to be inconsistent with financial reporting requirements, which could further jeopardize DOD's ability to adequately provide for its facility sustainment needs and result in continued facility deterioration and increased future recapitalization costs.

DOD's Progress in Developing an Installation Services Model Has Been Slow

DOD's progress in developing a model for estimating installation services funding requirements has been slow because DOD has been unable to overcome long-standing inconsistencies among the military services' definitions of support service functions and other obstacles that prevent such a model from being ready for use. In an effort to ensure consistent delivery of adequate installation services among DOD components and provide the Congress with a clearer basis for making funding decisions, DOD began in 2004 to develop an analytically sound model for determining installation services funding requirements. However, progress has been slow and it is unclear whether DOD's target for completing this work will be met. Without a DOD-wide model, the military services have used various methods to estimate their support services requirements subject to their own definition of the types and levels of services deemed necessary. On the basis of these estimates, Army, Navy, and Air Force officials have

²²Black & Veatch, *DOD Facility Quality IVV Report - Independent Verification and Validation of Condition Reporting for Defense Facilities* (May 16, 2006).

raised concerns about the adequacy of support services funding from fiscal years 2005 through 2007, stating that this funding was less than the amounts needed to provide services at the levels desired and resulted in some installations providing reduced services, which caused the quality of life of DOD personnel in some instances to be negatively affected.

Efforts to Develop an Installation Services Model Began in 2004

DOD's efforts to develop a model for estimating installation services funding requirements began in 2004, when the Office of the Deputy Under Secretary of Defense for Installations and Environment designated the improvement of installation services management as a priority. According to officials from this office, DOD's and the military services' ability to forecast installation services requirements and funding needs had been hindered by the lack of a common terminology across the military services and the lack of common definitions had caused differing expectations for service support when multiple military services were collocated on a single installation.²³ The 2004 *Defense Installations Strategic Plan* articulated the need to define common standards and performance metrics for managing installation support and established goals to implement DOD-wide support service standards and to develop an analytical model based on common benchmarks to accurately forecast installation services funding requirements. The plan noted that installation services included a large collection of diverse functions and that work towards a model would first focus on services related to real property—work that subsequently resulted in DOD's facilities operation model—and then on all other installation services—work now directed at developing the installation services model.

Also in 2004, in an effort to promote joint installation management, DOD established a working group to develop policy and create a strategic framework for delivery of installation services. The framework was to include the establishment of common definitions, tiered performance standards, and performance measures to assist in managing support services resources and help ensure the common delivery of applicable support services across all military installations. To support this effort, service standards teams, composed of members from each military service, were formed and charged with developing common output-level standards, which include common definitions, performance standards, metrics, and unit cost estimates for each installation support service. The

²³See [GAO-05-556](#).

common output-level standards would also provide a key component needed to develop an installation services model.

Service standards teams were formed to develop common definitions and standards for 29 different support services. The initial goal was for the teams to complete their work by February 2006. According to DOD officials, from the beginning the teams had difficulty completing their work and obtaining agreement from all military services on the common definitions and standards. By December 2007, the military services had accepted the common definitions and service standards for only 2 of the 29 support services addressed by the service standards teams, and the target date for completing the work had slipped to March 2008. DOD's 2007 *Defense Installation Strategic Plan* set a goal to establish common standards and metrics for installation services and complete the model by the end of 2008.

Several Factors Have Hampered Progress in Developing an Installation Services Model

According to DOD officials, several factors have hampered progress towards completing the common output-level standards and developing the installation services model. For example, each military service has its own long-standing policies and practices on how tasks and subtasks for each installation service are grouped, performed, managed, and funded. Also, differences in the military services' policies, practices, and traditions have resulted in service differences in (1) the value of and emphasis placed on the various support services, (2) views on whether service programs should be managed and funded centrally or not, and (3) support service requirements based on installation location and demographic characteristics. For example, remote installations might provide some services that are normally provided by local communities in more populated areas, and installations with a high percentage of young, single personnel might provide some services not provided at installations with different demographics.

As one example of an installation support service that is managed differently among the military services, DOD cited differences in the management of chaplain services. According to DOD officials, the Navy, in accordance with its policy, donates all funds collected during on-base religious services to charities. The other military services, in accordance with their policies, use funds collected during on-base religious services to directly support the chaplain program, such as paying for program expenses. Thus, in order to reach a common definition and service standard for the chaplain program, this difference among the military services must be resolved.

Office of the Deputy Under Secretary of Defense for Installations and Environment officials, who were overseeing the development of the model, stated that resolving the differences in support service definitions and service standards remains a key obstacle to completing an installation services model that can reliably estimate the funds required to provide services at appropriate levels across all installations. The officials also noted that other obstacles exist and must be overcome before a model is completed. For example, because each of the installation services is unique, a separate model will be required for each service. Thus, the installation services model will be a collection of many separately developed, service-specific models. According to the officials, a few service standards teams believe the services they studied will be difficult to model. Further, it may also be difficult to identify adequate information sources for estimating the standard costs for some installation services, such as for mission-based services, including airfield and port operations, and regulatory services, including environmental services. The problem is that historical metrics and costs for some services are not readily available within DOD, and private sector data sources may not be suitable for services that are performed differently by the private sector and DOD. Given these obstacles and the slow pace of prior progress in developing the common definitions and standards, it is unclear whether the 2008 target in DOD's plan will be met. In addition, the plan did not establish a milestone for when the model will be implemented for use in estimating the military's installation services funding requirements. Until DOD formally establishes a milestone for when the installation services model will be implemented and provides adequate senior-level oversight to ensure that the milestone is met, DOD may not have the necessary impetus to resolve these obstacles so that development of the model can be completed.

Adequacy of Installation Services Funding Has Been a Concern

The adequacy of funding for installation services has been a concern for the military services. Without a DOD-wide model, each military service has developed methods to estimate its installation services requirements and funding needs subject to its own definition of the types and levels of services it deems necessary. Appendix II provides a brief description of the methods used by each military service to estimate installation services funding requirements. On the basis of these estimates and other information, Army, Navy, and Air Force officials stated that installation services funding for fiscal years 2005 through 2007 was less than the amounts needed to provide services at the levels desired. For example, according to Army officials, installation services and facility operations services—collectively classified as base operations support in the Army's

budget—were funded at about 80 percent, 82 percent, and 87 percent of requirements in fiscal years 2005, 2006, and 2007, respectively. Of the military services, only the Marine Corps stated that its installation services and facility operations services were adequately funded during these fiscal years.

Although it was beyond the scope of our review to assess the impacts that resulted from less than full funding of installation services, we did ask the military services for their views. Army officials stated that, because of inadequate funding levels, installation services were reduced and provided at lower than optimum levels at some installations, which reduced the support provided to military personnel. Navy officials stated that effects of inadequate funding included (1) reduced operating hours at some installation entrance gates, which slowed base access; (2) reduced law enforcement patrols, pier security, and surveillance detection, which increased security risks; (3) cutbacks in facility cleaning contracts, which caused mold and mildew growth, which could potentially create health issues; (4) closure of some installation swimming pools and automobile hobby shops, which affected personnel quality of life; and (5) scaled back special events, which reduced the connection between some bases and the local communities. Air Force officials stated that inadequate installation services funding resulted in reduced in-house and contractual support for day-to-day operations at some installations in areas such as installation security, transportation, and supply. In addition, the quality of life for service members was affected at some installations by the closure of dining and fitness facilities and decreased library hours and other contractual services supporting base personnel.

Officials at some of the installations we visited also commented that because of inadequate funding, some installation services and facility operations services were reduced causing negative effects on the quality of life of installation personnel. At Fort Eustis, for example, officials estimated that custodial services were funded at about 25 percent of the amount needed to meet normal requirements. The officials stated that custodial services no longer provided for cleaning carpets or windows and only provided for cleaning restrooms once a week. At Langley Air Force Base, officials stated that, although essential services were being provided, funding shortages had caused the installation to reduce custodial and ground maintenance services and close one dining facility.

Conclusions

Although the facilities sustainment model provides a consistent and reasonable framework for preparing estimates of DOD's annual facility

sustainment funding requirements, accuracy and supportability issues with two of the model's key inputs—the inventory quantity and the sustainment cost factor associated with each of DOD's 448 facility categories—have affected the reliability of the model's estimates. In particular, the military services had not complied with DOD guidance that requires verification of real property inventory records and consequently the inventory records contained inaccuracies and discrepancies, information documenting the basis for each sustainment cost factor was not readily available, and the fiscal year 2009 method for calculating sustainment cost factors that are not based on independent data sources can reduce the accuracy of these factors. Until DOD takes additional steps to improve the accuracy and supportability of its inventory quantity and sustainment cost factor inputs to the facilities sustainment model, the model's estimates of annual facility sustainment funding requirements will not be as reliable as possible, which could jeopardize DOD's ability to adequately provide for its facility sustainment needs.

Furthermore, because the military services do not have consistent estimates of their deferred facility sustainment requirements, DOD lacks a complete picture of its facility sustainment funding needs. Thus, current plans and goals to address sustainment needs do not include all sustainment requirements, which could further jeopardize DOD's ability to adequately sustain its facilities and result in continued facility deterioration and increased future restoration costs. In addition, largely because of lack of clear guidance, the military services' financial reporting of deferred facility maintenance information has been inconsistent with financial reporting requirements intended to provide full disclosure of facility conditions. Until DOD provides guidance that clearly defines deferred sustainment requirements, directs the services to consistently measure and track deferred sustainment needs, establishes a goal to address these needs, and ensures that the military services' financial reporting of deferred facility maintenance is consistent with financial reporting requirements, the services will not have consistent estimates of their total facility sustainment requirements, will be unable to develop plans to address these needs, and may continue to report deferred maintenance information that is inconsistent with financial reporting requirements.

DOD has yet to overcome long-standing inconsistencies among the military services' definitions of support service functions, as well as other obstacles, to complete a model for estimating installation services funding requirements. Until a reliable model is implemented, DOD cannot know its installation services funding requirements with confidence, set installation

services funding and performance benchmarks, measure the military services' progress in providing installation services, or provide the Congress with a clear, consistent basis for making related funding decisions. DOD has a goal to establish common standards and metrics for installation services by the end of 2008. However, until DOD formally establishes a milestone for when the installation services model will be implemented and provides adequate senior-level oversight to ensure that the milestone is met, DOD may not have the necessary impetus to complete the model as quickly as possible.

Recommendations for Executive Action

To improve the support provided for DOD's facilities and installation services, we recommend that the Secretary of Defense direct the Deputy Under Secretary of Defense (Installations and Environment) to take the following five actions in order to increase the reliability of the facilities sustainment model, address deferred facility sustainment funding requirements, and advance progress towards implementing the installation services model:

- Monitor and ensure compliance with guidance requiring verification of real property inventory records.
- Maintain documentation regarding the basis for the sustainment cost factors used by the model to include the calculations used to determine each factor as well as the reasons for any changes from year to year.
- Revert to the previously used ratio analysis method to calculate the values of those sustainment cost factors that are not based on independent data sources.
- Issue guidance to the military services that (1) provides a clear definition of deferred facility sustainment requirements and explains when deferred facility sustainment becomes a facility restoration requirement, (2) directs the military services to consistently measure and track deferred sustainment needs, (3) establishes a goal to address deferred facility sustainment needs, and (4) ensures that the military services' financial reporting and disclosure information regarding deferred facility maintenance is consistent with financial reporting requirements.
- Establish a milestone for implementing the installation services model for use in estimating DOD's installation services funding requirements

and provide adequate senior-level oversight to ensure that the milestone is met.

Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD concurred with four recommendations, partially concurred with one recommendation, and stated that it had already initiated several of the recommended actions. However, DOD's comments and stated actions did not fully address some of our recommendations. While DOD's actions represent positive first steps, we believe that DOD needs to take additional steps to fully address the issues discussed in this report. Specifically, in addition to the steps that DOD stated it has taken or plans to take, we continue to believe that DOD needs to take further steps to monitor and ensure compliance with inventory verification guidance, provide a clear definition of deferred facility sustainment requirements, direct the military services to consistently measure and track deferred sustainment needs, ensure that the military services' financial reporting and disclosure information regarding deferred facility maintenance is consistent with financial reporting requirements, and provide adequate senior-level oversight to ensure that an installation services model is implemented as soon as possible.

DOD concurred with our recommendation to monitor and ensure compliance with guidance requiring verification of real property inventory records. DOD stated that it added a data element to its real property inventory records that will record the most recent date that each facility was inspected. DOD stated that this data, which it expects will be available by fiscal year 2009, will provide a means of identifying the verification dates and taking action to update them as required. However, as noted in this report, data are already available showing facility inspection dates and the data show that the military services have not complied with verification requirements. Our recommendation is that DOD ensure compliance with the guidance in order to help ensure inventory accuracy and it is not clear that DOD's action of adding a data element to its inventory records will improve compliance. We continue to believe that additional steps are needed to monitor and ensure compliance with guidance requiring verification of real property inventory records.

DOD concurred with our recommendation that it maintain documentation regarding the basis for the sustainment cost factors used by the model to include the calculations used to determine each factor as well as the reasons for any changes from year to year. DOD stated that it has maintained documentation for sustainment cost factors since the

inception of the facilities sustainment model. However, as noted in this report and as we discussed with DOD officials during our review, the documentation did not always show the basis for the sustainment cost factors, the calculations used to determine each factor, or the reasons for any changes from year to year and that is the basis for our recommendation. DOD also stated that it has revised its documentation standards to improve the level of detail and accessibility. If fully implemented, DOD's action should result in an improved audit trail documenting the basis for each factor's value.

DOD concurred with our recommendation that it revert to the previously used ratio analysis method to calculate the values of those sustainment cost factors that are not based on independent data sources. DOD stated that it will adopt the GAO-preferred method to inflate the small number of sustainment cost factors generated by ratios beginning in fiscal year 2009. As noted in this report, the "GAO-preferred" method is the method that can result in greater accuracy of the sustainment cost factor values. Also, regarding the "small" number of sustainment cost factors generated by ratios, as noted in this report, DOD has used a ratio analysis to estimate the sustainment cost factors for approximately one-third of DOD's 448 facility categories.

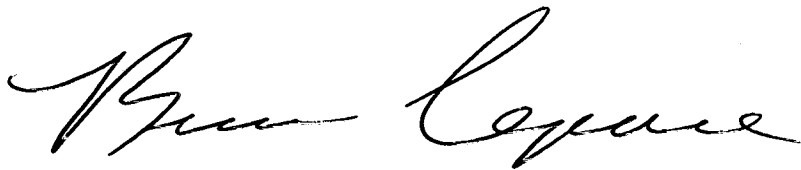
DOD concurred with our recommendation related to deferred facility sustainment requirements stating that it had issued guidance in September 2007 that revised the definition of facility quality ratings to represent deferred sustainment and restoration, revised its methodology for estimating deferred maintenance in its financial reports by using the facility quality ratings, and planned to develop program guidance with the fiscal year 2011 budget process to establish goals to address deferred sustainment requirements. As noted in this report, we were aware of the September 2007 guidance. However, we made our recommendation because our review found that the guidance did not provide a clear definition of deferred facility sustainment requirements, details to the military services on how to implement the revised quality rating guidance, or sufficient details to ensure that future financial reporting of deferred maintenance would be consistent with reporting requirements. We continue to believe that additional guidance is needed to provide a clear definition of deferred facility sustainment requirements, direct the military services to consistently measure and track deferred sustainment needs, and ensure that the military services' financial reporting and disclosure information regarding deferred facility maintenance is consistent with financial reporting requirements.

DOD partially concurred with our recommendation to establish a milestone for implementing the installation services model for use in estimating DOD's installation services funding requirements and provide adequate senior-level oversight to ensure that the milestone is met. DOD stated that it had established a milestone to implement an installation services model in support of the fiscal year 2012 budget and had made initial progress toward that goal. However, DOD stated that the development process had revealed several obstacles that may require it to reevaluate the goal for at least some installation service functions. Although we believe that DOD's action to establish an implementation goal is a step in the right direction, we also recommended and continue to believe that adequate senior-level oversight is needed to ensure that an installation services model is implemented as soon as possible. DOD's comments did not explain to what extent it plans to do this.

DOD's comments are reproduced in full in appendix III.

We are sending copies of this report to the Secretaries of Defense, the Army, the Navy, and the Air Force; the Commandant of the Marine Corps; and the Director, Office of Management and Budget. We will provide copies of this report to others upon request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions on the information discussed in this report, please contact me on (202) 512-4523 or leporeb@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.



Brian J. Lepore
Director
Defense Capabilities and Management

List of Committees

The Honorable Carl Levin
Chairman
The Honorable John McCain
Ranking Member
Committee on Armed Services
Unites States Senate

The Honorable Daniel K. Inouye
Chairman
The Honorable Ted Stevens
Ranking Member
Subcommittee on Defense
Committee on Appropriations
Unites States Senate

The Honorable Tim Johnson
Chairman
The Honorable Kay Bailey Hutchison
Ranking Member
Subcommittee on Military Construction,
Veterans' Affairs, and Related Agencies
Committee on Appropriations
Unites States Senate

The Honorable Ike Skelton
Chairman
The Honorable Duncan L. Hunter
Ranking Member
Committee on Armed Services
House of Representatives

The Honorable John P. Murtha
Chairman
The Honorable C.W. Bill Young
Ranking Member
Subcommittee on Defense
Committee on Appropriations
House of Representatives

The Honorable Chet Edwards
Chairman
The Honorable Zach Wamp
Ranking Member
Subcommittee on Military Construction,
Veterans' Affairs, and Related Agencies
Committee on Appropriations
House of Representatives

Appendix I: Scope and Methodology

To determine the reliability of the annual funding estimates produced by the facilities sustainment model, we reviewed the documentation supporting the model's analytic framework—including the model's inputs, calculations, and assumptions—to determine whether the model provides a consistent and reasonable framework for estimating sustainment funding requirements. In addition, we assessed the accuracy and supportability of the model's key inputs—the inventory quantity and the sustainment cost factor. Regarding inventory quantity, we reviewed DOD regulations that require periodic verification of the accuracy of real property inventory information, determined the extent to which the military services had complied with these regulations, and discussed with service officials the reasons for noncompliance. During visits to eight military installations,¹ we compared the inventory information contained in selected installation real property records with the inventory information used by the model and asked local officials to explain discrepancies. We judgmentally selected the records to include a variety of facility categories. At the installations visited, we also determined compliance with the required procedures for verifying real property inventory accuracy and, at one installation, we reviewed the records that documented the compliance. In addition, we analyzed the inventory quantities used by the model for each facility category during fiscal years 2005 through 2008 to identify large fluctuations from one year to the next and asked DOD and service headquarters officials to explain some of the fluctuations. In cases where the fluctuations were caused by an error, we determined the resulting impact on the model's sustainment cost estimate by recomputing sustainment costs based on the correct inventory quantity. Although we assessed the accuracy of selected real property inventory information, which is discussed in this report, we did not assess the overall reliability of DOD's real property inventory records. Regarding sustainment cost factors, we discussed the development of the factors with DOD officials, reviewed the findings of a study designed to provide an independent verification and validation of the sustainment cost factors used by the

¹To gain insight at the installation level into the accuracy of real property inventory records, compliance with inventory verification procedures, support funding issues, and the condition of facilities, we visited the following eight installations: Fort Eustis, Virginia; Fort Sam Houston, Texas; Naval Air Station Oceana, Virginia; Naval Station Mayport, Florida; Langley Air Force Base, Virginia; Randolph Air Force Base, Texas; Marine Corps Base Quantico, Virginia; and Marine Corps Base Camp Lejeune, North Carolina. We judgmentally selected these installations because they represented two installations from each of the military services and were located in several different geographic locations. We recognize that information obtained from these installations, as well as the facility conditions observed, may or may not be representative of other military installations.

model, and documented DOD's response to the study's recommendations. In addition, we reviewed the documentation supporting the factors for each facility category to determine whether the documentation provided a clear basis for each factor's value. Further, we analyzed the impact of a revised method used by DOD to adjust factors for use in fiscal year 2009 by comparing the values of selected factors adjusted under the revised and the previously used methods.

To determine DOD's progress in meeting funding goals for facility sustainment and recapitalization, we reviewed DOD's installation strategic plans to identify DOD's goals for facility sustainment and recapitalization. We also reviewed DOD information showing the amounts budgeted for facility sustainment, restoration, and modernization for fiscal years 2005 through 2008 and the amounts spent for fiscal years 2005 through 2007 and compared these amounts to the corresponding goals.² The amounts budgeted and spent represented DOD official financial information and we did not independently verify the amounts. In addition, we reviewed prior DOD testimony on installation support funding goals and we discussed the goals and DOD's progress in meeting the goals with DOD and service headquarters officials. To the extent that goals were not met, we asked DOD and service officials to explain why and describe the associated consequences on installation facilities. We also reviewed the restoration and modernization backlog amounts reported by the military services. At each of the installations visited, we asked local officials to describe the impacts when sustainment and recapitalization funding goals were not met. Further, we observed and took photographs of installation facilities that were in a deteriorated condition because of a shortage of sustainment funds.

To determine the extent to which DOD has addressed deferred facility sustainment funding needs, we compared the military services' annual sustainment funding requirements with the amounts actually funded to determine the annual unfunded sustainment requirements for fiscal years 2005 through 2007. We discussed the issue with DOD and military service officials and reviewed DOD guidance and definitions related to facility maintenance. We also reviewed prior DOD testimony on installation

²In addition to data from the military services, some of the data related to facility funding goals in this report include data from the Defense Logistics Agency, the Tricare Management Activity, and the DOD Education Activity. However, we did not include these components in our review.

support and DOD's installation strategic plans for information on deferred sustainment requirements. We asked officials in each military service whether any difficulties or obstacles existed in developing estimates of deferred sustainment needs, whether the service had estimated its deferred sustainment funding requirements, and whether the service had plans or goals to address deferred sustainment requirements. In addition, we reviewed federal financial accounting requirements pertaining to the reporting of deferred property maintenance and compared these requirements to the information reported in the military services' financial statements. Further, we reviewed the military services' efforts to respond to September 2007 DOD guidance that was intended to improve the military services' reporting of deferred maintenance amounts.

To determine the status of DOD's efforts to develop a funding requirements model for installation services, we obtained and reviewed documentation on the history of the model's development and interviewed DOD officials concerning past progress on the model, the model's status at the end of calendar year 2007, and future plans for completing and implementing the model. We also documented the timeline of DOD's efforts since DOD decided to develop the model and compared various developmental milestones with actual progress. Further, we discussed with DOD officials the factors that have affected progress in developing the model and asked the officials to identify any remaining obstacles that must be overcome before the model could be completed and used to estimate DOD's installation services funding requirements. In the absence of a DOD-wide model, we also interviewed officials from each of the military services and reviewed related information to document the methods used by each military service to determine installation services funding needs. Further, we asked service headquarters officials and officials at the installations we visited to explain the consequences when installation services funding was less than required.

We conducted this performance audit from May 2007 through April 2008, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Current Methods Used by the Military Services to Estimate Installation Support Services Funding Requirements

The Army determines its installation services funding requirements primarily through the Army's base operations support requirements model. This model uses Army-defined service standards and a costing methodology that estimates costs for 95 different installation services across Army installations based on cost pacing measures and data unique to each support service. Examples of cost pacing measures include population served, facility square footage, and number of transactions required. According to the Army, the model's process results in estimated funding requirements for what each support service should cost based on a predefined level of support. The Army adjusts the model's funding estimate to include costs for some services that are not modeled and determines the amount of funding actually budgeted based upon the availability of resources and Army priorities. Beginning with its fiscal year 2010 budget, the Army plans to use the facilities operation model to estimate support services funding requirements for the facility-related services included in that model.¹

The Navy determines its installation services funding requirements primarily from the Navy's base operating support model. This model estimates the funding required for 18 Navy service support functions, which represent about 67 percent of all Navy support services costs. Funding estimates for 9 other service support functions are not modeled but are determined primarily from prior-year costs for the required level of support. For each of the 18 modeled service support functions, the model estimates funding requirements for four separate standard levels of service by multiplying a unit factor, such as square feet of a building, by a unit cost factor for each of the four levels of service that could be provided. According to the Navy, the unit costs used by the model are established in several ways, including Navy historical costs and commercial estimating manuals and data sources. Each year senior Navy leadership decides which of the four levels of service will be provided for each service support function at naval installations. On the basis of these decisions and information from the model, the Navy determines its installation services funding requirement. Beginning with its fiscal year 2010 budget, the Navy

¹Since fiscal year 2005, DOD has been developing a model to estimate funding requirements for 10 facility-related services—fire and emergency services, utilities, pavement clearance, refuse collection and disposal, real property leases, grounds maintenance, pest control, custodial services, real property management and engineering services, and engineering readiness. According to DOD, the model will use commercial benchmarks for similar services performed in the private sector. DOD plans for all military components to use the model to estimate the fiscal year 2010 facilities operation funding requirements.

plans to use the facilities operation model to estimate support services funding requirements for the facility-related services included in that model.

The Air Force used a prototype of the facilities operation model to estimate its fiscal year 2008 funding requirements for the 10 facility-related support services included in that model. Even though the model was not yet at full operational capability, the Air Force decided that the model provided a more realistic estimate of facility-related service funding requirements than the Air Force's previously used method, which was based on historical costs. The Air Force plans to continue to use this model. To estimate its funding requirements for several other installation services that are not included in the model, including security forces, airfield operations, installation administration, food services, and lodging, the Air Force uses a cost projection formula. The formula primarily uses the number of personnel assigned to each installation and the value of the installation's facilities as key inputs to determining its funding requirements estimates. The Air Force does not use a model or formula for some installation services, such as environmental conservation and compliance, pollution prevention, unaccompanied personnel housing, child development centers, and base communications and multimedia activities. According to Air Force officials, the Air Force leadership makes final decisions on the annual installation services budget based on Air Force priorities and budget constraints.

The Marine Corps currently does not use a comprehensive model to estimate funding requirements for installation services except for utility costs. For utilities, Marine Corps officials stated that funding requirements are based on a model that organizes and aggregates available consumption and cost data by utility type and predicts future costs to support budgeting and programming needs. For all other installation support service areas, the Marine Corps estimates funding requirements primarily by direct review of historical program execution and future needs. During its budget development process, the Marine Corps makes final decisions on funding levels based on needs, resources, and priorities. Beginning with its fiscal year 2010 budget, the Marine Corps plans to use the facilities operation model to estimate support services funding requirements for the facility-related services included in that model.

Appendix III: Comments from the Department of Defense



ACQUISITION
TECHNOLOGY
AND LOGISTICS

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

APR 18 2008

Mr. Brian Lepore
Director, Defense Capabilities and Management
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Lepore:

This is the Department of Defense (DoD) response to the GAO draft report, GAO-08-502, 'DEFENSE INFRASTRUCTURE: Continued Management Attention Is Needed to Support Installation Facilities and Operations,' dated March 3, 2008 (GAO Code 351029). The Department had already initiated several of the recommended actions and appreciates GAO's support for further improving DoD's facilities budget models. Specific comments are enclosed.

Sincerely,

Wayne Army
Deputy Under Secretary of Defense
(Installations and Environment)

Enclosure:
As stated



**GAO DRAFT REPORT - DATED MARCH 3, 2008
GAO CODE 351029/GAO-08-502**

**“DEFENSE INFRASTRUCTURE: Continued Management Attention Is Needed to Support
Installation Facilities and Operations”**

**DEPARTMENT OF DEFENSE COMMENTS
TO THE RECOMMENDATIONS**

RECOMMENDATION 1: The GAO recommends that the Secretary of Defense direct the Deputy Under Secretary of Defense (Installations and Environment) to monitor and ensure compliance with guidance requiring verification of real property inventory records.

DOD RESPONSE: Concur. DoD has added a new data element to its Real Property Inventory Requirements (RPIR) document to address this issue as part of the department’s overall effort to transform business processes and improve the quality of real property inventory data. The new data element, “Asset Review Date,” provides visibility of the most recent inspection date for each asset. This data element will provide a direct means of identifying verification dates in the inventory and taking action to update them as required. DoD initiated this data element in FY 2007 and expects to fully populate the date for all records by FY 2009.

RECOMMENDATION 2: The GAO recommends that the Secretary of Defense direct the Deputy Under Secretary of Defense (Installations and Environment) to maintain documentation regarding the basis for the sustainment cost factors used by the model to include the calculations used to determine each factor as well as the reasons for any changes from year to year.

DOD RESPONSE: Concur. DoD has maintained documentation for sustainment cost factors since the inception of the facilities sustainment model, and has revised the standards to improve the level of detail and accessibility for the FY 2008 cost factor documentation, now in progress.

RECOMMENDATION 3: The GAO recommends that the Secretary of Defense direct the Deputy Under Secretary of Defense (Installations and Environment) to revert to the previously used ratio analysis method to calculate the values of those sustainment cost factors that are not based on independent data sources.

DOD RESPONSE: Concur. DoD will adopt the GAO-preferred method to inflate the small number of sustainment cost factors generated by ratios beginning in FY 2009.

RECOMMENDATION 4: The GAO recommends that the Secretary of Defense direct the Deputy Under Secretary of Defense (Installations and Environment) to issue guidance to the Services that (1) provides a clear definition of deferred facility sustainment requirements and explains when deferred facility sustainment becomes a facility restoration requirement, (2) directs the Services to consistently measure and track deferred sustainment needs, (3) establishes a goal to address deferred facility sustainment needs, and (4) ensures that the

Services' financial reporting and disclosure information regarding deferred facility maintenance is consistent with financial reporting requirements.

DOD RESPONSE: Concur. DoD issued guidance in September 2007 that revised the definition of facility quality ratings (Q-ratings) to represent deferred sustainment and restoration. Military Services are required to establish Q-ratings and report them in their real property inventories for each asset. Effective with the end-of-FY 2007 financial report on deferred maintenance, DoD revised its methodology for estimating real property deferred maintenance to incorporate the revised Q-ratings, and expects this change to be fully implemented with the next annual report on deferred maintenance. DoD agrees that establishing goals to address deferred sustainment requirements would be useful and plans to develop program guidance with the FY 2011 budget process.

RECOMMENDATION 5: The GAO recommends that the Secretary of Defense direct the Deputy Under Secretary of Defense (Installations and Environment) to establish a milestone for implementing the installation services model for use in estimating DoD's installation services funding requirements and provide adequate senior level oversight to ensure that the milestone is met.

DOD RESPONSE: Partially concur. DoD has established a milestone to implement an installation services model in support of the FY 2012 budget and has made initial progress toward that goal. However, the development process has revealed several obstacles that may require DoD to re-evaluate this goal for at least some installation service functions. As a result, DoD may adjust its milestone.

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Brian J. Lepore, (202) 512-4523 or leporeb@gao.gov

Acknowledgments

In addition to the contact named above, Mark Little, Assistant Director; Bonita Anderson; Harry Knobler; Mary Jo Lacasse; Josh Margraf; and Gary Phillips made significant contributions to this report.

Related GAO Products

Cost Assessment Guide: Best Practices for Estimating and Managing Program Costs. Exposure Draft. [GAO-07-1134SP](#). Washington, D.C.: July 2007.

High-Risk Series: An Update. [GAO-07-310](#). Washington, D.C.: January 2007.

Defense Infrastructure: Issues Need to Be Addressed in Managing and Funding Base Operations and Facilities Support. [GAO-05-556](#). Washington, D.C.: June 15, 2005.

Military Training: Better Planning and Funding Priority Needed to Improve Conditions of Military Training Ranges. [GAO-05-534](#). Washington, D.C.: June 10, 2005.

Defense Infrastructure: Changes in Funding Priorities and Management Processes Needed to Improve Condition and Reduce Costs of Guard and Reserve Facilities. [GAO-03-516](#). Washington, D.C.: May 15, 2003.

Defense Infrastructure: Changes in Funding Priorities and Strategic Planning Needed to Improve the Condition of Military Facilities. [GAO-03-274](#). Washington, D.C.: February 19, 2003.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday, GAO posts newly released reports, testimony, and correspondence on its Web site. To have GAO e-mail you a list of newly posted products every afternoon, go to www.gao.gov and select "E-mail Updates."

Order by Mail or Phone

The first copy of each printed report is free. Additional copies are \$2 each. A check or money order should be made out to the Superintendent of Documents. GAO also accepts VISA and Mastercard. Orders for 100 or more copies mailed to a single address are discounted 25 percent. Orders should be sent to:

U.S. Government Accountability Office
441 G Street NW, Room LM
Washington, DC 20548

To order by Phone: Voice: (202) 512-6000
TDD: (202) 512-2537
Fax: (202) 512-6061

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Ralph Dawn, Managing Director, dawnr@gao.gov, (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, DC 20548