



February 2019

COAST GUARD SHORE INFRASTRUCTURE

Applying Leading Practices Could Help Better Manage Project Backlogs of At Least \$2.6 Billion

Accessible Version

GAO Highlights

Highlights of [GAO-19-82](#), a report to congressional requesters

Why GAO Did This Study

The Coast Guard, within the Department of Homeland Security (DHS), owns or leases more than 20,000 shore facilities, such as piers, docks, boat stations, air stations, and housing units, at more than 2,700 locations. In June 2017, the Coast Guard testified to Congress that it had a \$1.6 billion recapitalization backlog for its shore infrastructure, which had a replacement value of about \$20 billion.

GAO was asked to review the Coast Guard's management of its shore infrastructure. This report examines: (1) what is known about the condition and costs of managing the Coast Guard's shore infrastructure, and (2) the extent to which the Coast Guard's process for managing its shore infrastructure meets leading practices.

To answer these questions, GAO reviewed relevant laws and Coast Guard annual reports on its shore infrastructure, analyzed Coast Guard data, and interviewed Coast Guard officials. GAO also compared Coast Guard policies and procedures, and actions taken during fiscal years 2012 through 2018 to manage its shore infrastructure, against the leading practices that GAO previously identified for managing public sector maintenance backlogs.

What GAO Recommends

GAO is making six recommendations, which DHS agreed to implement, including that the Coast Guard align its management of its shore infrastructure backlogs with leading practices by requiring the use of models for predicting the outcome of, and optimizing among, competing investments for maintenance projects.

View [GAO-19-82](#). For more information, contact Nathan Anderson at (202) 512-3841 or andersonn@gao.gov.

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What GAO Found

About 45 percent of the Coast Guard's shore infrastructure is beyond its service life, and its current backlogs of maintenance and recapitalization projects, as of 2018, will cost at least \$2.6 billion to address, according to Coast Guard information. The deferred maintenance backlog included more than 5,600 projects, with an estimated cost of \$900 million. The recapitalization and new construction backlog had 125 projects, with an estimated cost of at least \$1.77 billion as of 2018 (see figure). GAO's analysis of Coast Guard data found that as of November 2018 there were hundreds of recapitalization projects without cost estimates—the majority of recapitalization projects. Coast Guard officials told GAO that these projects are in the preliminary stages of development.

Value of Coast Guard's Backlog of Recapitalization and New Construction Projects, Fiscal Years 2012-2018



Source: GAO analysis of Coast Guard data. | GAO-19-82

Note: The arrows are intended to characterize the uncertain costs due to the lack of Coast Guard cost estimates associated with those projects.

The Coast Guard's process for managing its shore infrastructure did not fully meet 6 of 9 leading practices that GAO previously identified. Of the nine leading practices, the Coast Guard met three, partially met three, and did not meet three. For example, the Coast Guard generally has not employed models for predicting the outcome of maintenance investments and optimizing among competing investments, as called for in leading practices. In one instance, the Coast Guard used a model to optimize maintenance for its aviation pavement and, according to Coast Guard officials, found that it could save nearly \$14 million by accelerating investment in this area (e.g., paving runways) sooner rather than deferring such maintenance. Coast Guard officials told us that such modeling could be applied within and across all of its shore infrastructure asset types, but the Coast Guard did not implement the results of this model and does not require their use. Without requiring the use of such models, the Coast Guard could be missing opportunities to achieve cost savings and better manage its maintenance backlogs.

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Abbreviations

AC&I	Acquisition, Construction, and Improvements
AOR	Area of Responsibility
ATON	Aids to Navigation
C4IT	Command, Control, Communications, Computers, and Information Technology
CEU	Civil Engineering Unit
CFO	Chief Financial Officer
CG-4	Assistant Commandant for Engineering and Logistics
CG-43	Coast Guard Office of Civil Engineering
CIP	Capital Investment Plan
DCMS	Deputy Commandant for Mission Support
DCO	Deputy Commandant for Operations
DLM	Depot-Level Maintenance
DOD	Department of Defense
FRPC	Federal Real Property Council
FRPP	Federal Real Property Profile
GPRA	Government Performance and Results Act of 1993
GSA	General Services Administration
LANTEREA	Atlantic Area Command
NRC	National Research Council
OIG	Office of Inspector General
OLM	Organizational-Level Maintenance
OMB	Office of Management and Budget
O&M	Operations and Maintenance
PACAREA	Pacific Area Command
PC&I	Procurement, Construction, and Improvements
SAM	Shore Asset Management
SILC	Shore Infrastructure Logistics Center
UFC	Unified Facilities Criteria

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February 21, 2019

The Honorable Sam Graves
Ranking Member
Committee on Transportation and Infrastructure
The Honorable John Thune
United States Senate
The Honorable John Garamendi
House of Representatives
The Honorable Duncan Hunter
House of Representatives

The United States Coast Guard, within the Department of Homeland Security, is the principal federal agency charged with ensuring the security and safety of the waters subject to U.S. jurisdiction and enforcing laws which prevent death, injury, and property loss in the maritime environment. To help carry out these and other missions, the Coast Guard owns or leases more than 20,000 shore facilities, such as piers, docks, boat stations, air facilities, and housing units at more than 2,700 locations. This infrastructure is often positioned along the nation's coastlines where it can be vulnerable to damage from extreme weather. All Coast Guard missions begin and end at a shore facility, and over 80 percent of Coast Guard personnel work onshore, according to the Coast Guard.¹ In June 2017, Coast Guard officials testified that the agency had a \$1.6 billion backlog of projects for recapitalization of its shore infrastructure, as well as new construction.² The replacement value of this infrastructure was about \$20 billion as of 2017.³ Being located along the U.S. coastlines has resulted in some facilities requiring unexpected repair and recapitalization, such as those impacted by superstorm Sandy,⁴ and

¹As described later in this report, Coast Guard shore infrastructure includes buildings and structures, such as multimission boat stations or air stations, among others.

²Testimony of Coast Guard Deputy Commandant for Operations Vice Admiral Charles Ray and Coast Guard Deputy Commandant for Mission Support Vice Admiral Sandra Stosz for the House Committee on Transportation and Infrastructure, Subcommittee on Coast Guard and Maritime Transportation hearing titled "Building a 21st Century Infrastructure for America: Coast Guard Sea, Land, and Air Capabilities." June 7, 2017.

³Coast Guard's 2017 Shore Infrastructure Logistics Center annual report.

⁴The Disaster Relief Appropriations Act, 2013, Pub. L. No. 113-2, 127 Stat. 4, 28 (2013) appropriated around \$274 million to the Coast Guard for necessary expenses related to the consequences of superstorm Sandy.

hurricanes Harvey, Irma, Maria, and Matthew.⁵ In July 2018, we reported that the Coast Guard had not been able to address shore infrastructure projects, primarily due to lack of funding, longstanding acquisition management challenges, and that previous Coast Guard leadership prioritized the acquisition of new operational assets to replace aging ships and aircraft, over maintaining and repairing shore infrastructure.⁶

According to the National Research Council (NRC), public sector buildings are assets acquired through the investment of tax dollars, and underfunded maintenance can affect public health and safety, reduce productivity, and cause long-term financial losses.⁷ In 2003, we added the management of federal real property to our high-risk list of the longstanding challenges the government faces.⁸ We have previously reported on leading practices for managing public infrastructure maintenance and repair backlogs, such as having clear maintenance and repair investment objectives, conducting condition assessments as a basis for establishing appropriate expenditure levels, aligning real property portfolios with mission needs, disposing of unneeded assets, and identifying the types of risks posed by the lack of timely investment.⁹ We have also reported that public assets require adequate maintenance,

⁵We have also reported on strategies the Department of Defense (DOD) employs to mitigate the effects of extreme weather events on its facilities. GAO, *Climate Change Adaptation: DOD Needs to Better Incorporate Adaptation into Planning and Collaboration at Overseas Installations*, [GAO-18-206](#) (Washington, D.C.: November 13, 2017).

⁶GAO, *Coast Guard Acquisitions: Actions Needed to Address Longstanding Portfolio Management Challenges*, [GAO-18-454](#) (Washington, D.C.: July 24, 2018). We recommended, among other things, that the Coast Guard's annual Capital Investment Plans reflect acquisition trade-off decisions and their effects. The Coast Guard agreed with this recommendation, and estimated implementing actions by March 2020.

⁷NRC, *Committing to the Cost of Ownership: Maintenance and Repair of Public Buildings*, (Washington, D.C.: 1990).

⁸GAO's high-risk program identifies government operations with greater vulnerabilities to fraud, waste, abuse, and mismanagement or the need for transformation to address economy, efficiency, or effectiveness challenges. GAO, *High Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed On Others*, [GAO-17-317](#) (Washington, D.C.: February 15, 2017).

⁹GAO, *Federal Real Property: Improved Transparency Could Help Efforts to Manage Agencies' Maintenance and Repair Backlogs*, [GAO-14-188](#) (Washington, D.C.: January 23, 2014).

repair, and recapitalization¹⁰—which can include replacing systems at the end of their useful life—to keep them in good condition.¹¹

You asked us to review the condition of and costs associated with the Coast Guard’s management of its shore infrastructure. This report examines (1) what is known about the condition and costs of managing the Coast Guard’s shore infrastructure, and (2) the extent to which the Coast Guard’s process for managing its shore infrastructure meets leading practices for managing public maintenance backlogs.

To identify what is known about the condition and costs of managing the Coast Guard’s shore infrastructure, we reviewed Coast Guard annual reports on its shore infrastructure.¹² We also reviewed Coast Guard documentation and data on its shore infrastructure inventory to describe the condition and costs of managing these assets. We examined the Coast Guard’s shore Acquisition, Construction, and Improvements (AC&I) backlog of projects the Coast Guard has identified as necessary to fulfill its missions (i.e., its Shore Facilities Requirements List) from fiscal years 2012 through 2018,¹³ as well as its depot-level maintenance backlog as of

¹⁰According to the Department of Defense, recapitalization refers to major renovation or reconstruction activities (including facility replacements) needed to keep existing facilities modern and relevant in an environment of changing standards and missions. Recapitalization extends the service life of facilities or restores lost service life. It includes restoration and modernization of existing facilities, as well as replacement of existing facilities with new ones.

¹¹See GAO, *Federal Real Property: Government’s Fiscal Exposure from Repair and Maintenance Backlogs Is Unclear*, [GAO-09-10](#) (Washington, D.C.: Oct. 16, 2008).

¹²This review excludes Waterways Operations (which includes fixed and floating aids to navigation (ATON) and signal equipment)—a segment of shore infrastructure that includes different types of assets used to mark federal waterways to safeguard maritime safety and commerce. In 2017, the Coast Guard reported that its fixed and floating ATON, such as lighthouses and buoys, included more than 58,000 assets, and that its marine environmental response and signal equipment, such as radar signaling devices, included more than 76,000 assets.

¹³We selected 2012 as the starting point for our review because the Coast Guard established its current organizational structure in that year, and also completed an inventory of all of its owned (not leased) real property that year, thereby providing an established baseline of data. We selected 2018 as the endpoint as it is the latest year for which data were available. The Coast Guard began using the Department’s Common Appropriations Structure in its 2019 President’s Budget. The Acquisition, Construction, and Improvements (AC&I) appropriation transitioned to the new Procurement, Construction, and Improvements (PC&I) appropriation. PC&I provides for the acquisition, procurement, construction, rebuilding, and improvement of shore facilities and military housing, as well as vessels, aircraft, and other assets.

March 2018.¹⁴ We also reviewed planning and budget documents such as (a) the Coast Guard's annual Unfunded Priorities List, which identifies projects the Coast Guard would undertake if funding were available, and (b) its Congressional Budget Justifications, to examine how the Coast Guards' reported Procurement, Construction, and Improvements (PC&I) backlog has changed over time. We interviewed officials from Coast Guard headquarters as well as personnel from all six Coast Guard Civil Engineering Units (CEU) with responsibilities for categorizing the condition of infrastructure, among other things, to obtain their field-level perspectives on the condition of Coast Guard shore infrastructure.

To evaluate the extent to which the Coast Guard's process for managing its shore infrastructure met leading practices for managing public sector maintenance backlogs, we analyzed Coast Guard plans, policies, procedures, and related laws for managing, maintaining, and repairing shore infrastructure. We identified and analyzed Coast Guard guidance on its process for prioritizing projects for maintenance and repair of its shore infrastructure, and we assessed Coast Guard practices against the leading practices for managing maintenance backlogs that we identified in our prior work.¹⁵ We also compared Coast Guard practices with the Office of Management and Budget's (OMB) program evaluation and capital programming guidance.¹⁶ We used the following scale to evaluate the Coast Guard's management of its shore infrastructure deferred maintenance and repair against the leading practices:

- **Met**—The Coast Guard properly considered the leading practice and demonstrated with documentary evidence that it had fully applied it.
- **Partially Met**—The Coast Guard properly considered and demonstrated with some documentary evidence that it had applied the leading practice to some extent.

¹⁴Depot-level maintenance is non-recurring major maintenance beyond the capability and authority of a local Coast Guard unit to execute. Data from March 2018 was the most recent available at the time we requested information about the depot-level maintenance backlog.

¹⁵[GAO-14-188](#).

¹⁶Office of Management and Budget, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, OMB Circular A-94 (Washington, D.C.: 1992). Office of Management and Budget, *Preparation, Submission, and Execution of the Budget*, OMB Circular A-11 (Washington, D.C.: 2018).

- **Not Met**—The Coast Guard did not properly consider or apply the leading practice and had no documentary evidence verifying that it had applied it.

We interviewed officials from Coast Guard Headquarters, the Shore Infrastructure Logistics Center, the Coast Guard's two operational commands (Atlantic Area Command and Pacific Area Command), and the six CEUs to obtain their perspectives on the process for maintaining and repairing shore infrastructure, and to assess the extent to which Coast Guard actions align with leading practices for managing federal agencies' deferred maintenance and repair backlogs. For both objectives, we conducted data reliability assessments, including interviewing agency officials and reviewing documentation, to ensure that the data used in our analyses were sufficiently reliable for our purposes. While we identified limitations with some of the data, as discussed later in our report, we determined that the data are sufficiently reliable for the purposes of reporting on the Coast Guard's overall portfolio of shore infrastructure assets, and reporting on the minimum amount of money the Coast Guard identified as needed to complete deferred repair and Procurement, Construction and Improvements projects. See Appendix I for additional details on our scope and methodology.

We conducted this performance audit from November 2017 to February 2019 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.

Background

Coast Guard's Organizational Approach to Managing Its Shore Infrastructure Portfolio

Coast Guard shore infrastructure includes buildings and structures,¹⁷ which it has organized into 13 asset types, known as asset lines.¹⁸ Table 1 provides information on Coast Guard asset lines, including examples of assets, the number within each asset line in 2017, and the Coast Guard's estimated replacement value of each asset line in 2017—the most recent value available at the time of our review.¹⁹

Table 1: Information on Coast Guard Shore Infrastructure Asset Lines for Fiscal Year 2017

Asset Line	Examples of assets	Number of assets	Replacement Value (\$)
Aviation	Runways, landing areas, hangars	333	2,595,816,173
Waterfront	Piers, wharfs, boathouses, small boat lifts	1,590	2,507,680,516
Shore operations	Stations, maintenance buildings, cutter support operations	1,027	1,913,350,877
Sector/ District	Regional operations centers, command buildings, warehouses	483	2,066,839,441
Technology	Communication towers, vessel traffic service, Rescue 21 ^a	1,937	877,523,263
Civil works	Utility distribution, water lines, pipelines, fuel storage	6,633	1,858,048,879
Base services	Vehicle garages, parking, hazardous materials storage	4,219	1,068,509,668

¹⁷Coast Guard guidance defines a building as a fully-enclosed structure, typically affixed to the ground through mechanical means or a structurally supportive foundation, with walls, floor(s) and a roof, accessible through doors, consisting of one or many levels, in which personnel work or dwell, equipment is maintained or stored, or other authorized activities are conducted. Coast Guard guidance defines a structure as any construction affixed to the ground through a structurally supportive foundation that does not meet the definition of a building. Examples include, but are not limited to; helicopter landing pads, towers, platforms, equipment pads, docks, pavilions, open-sided storage facilities, flagpoles, swimming pools, monuments, and piers.

¹⁸Coast Guard's five product lines and the asset lines within them are: (1) Tactical Operations—Aviation, Waterfront, Shore Operations; (2) Mission Support—Civil Works, Base Services, Industrial; (3) Mission Readiness—Housing, Community Services, Training; (4) Strategic Operations—Sector/District, Technology; and (5) Waterways Operations—Fixed and Floating Aids to Navigation (ATON), Marine Environmental Response and Signal Equipment.

¹⁹The Coast Guard defines the replacement value of a building or structure as the amount estimated to be needed to completely replace the asset, not including the land it resides on or personal property within it.

Asset Line	Examples of assets	Number of assets	Replacement Value (\$)
Industrial	Maintenance shops, corrosion control facilities, ship lifts	52	466,672,941
Community services	Medical, dining, physical fitness and recreation	1,148	1,400,869,367
Training	Flight simulators, rescue training facilities	177	418,653,799
Housing	Housing	2,961	2,934,936,066
Total:	—	20,560	18,108,900,990

Legend: “—” = not available or applicable.

Source: GAO analysis of Coast Guard documents. | GAO-19-82

Note: Table includes owned and leased assets, and excludes details about and replacement value of Waterways Operations asset lines (Fixed and Floating Aids to Navigation and Signal Equipment). The Coast Guard defines the replacement value of a building or structure as the amount estimated to be needed to completely replace the asset, not including the land it resides on or personal property within it. According to Coast Guard guidance, a single Coast Guard asset may be comprised of a system of man-made objects. For example, a Coast Guard housing area site could have multiple roads, driveways, and parking lots associated with its housing units and buildings, and the Coast Guard could classify all of this pavement as a single asset. Further, a single Coast Guard housing asset may be composed of multiple dwellings and associated structures. For example, a Coast Guard owned apartment complex or multiplex could consist of multiple dwellings and could include structures like carports and individual storage units.

⁹Rescue 21 is a network of radio towers that receive distress calls in the coastal waters and rivers of the continental United States, Hawaii, and U.S. territories. Rescue 21 has been deployed in the Western River and Alaska regions.

The Coast Guard’s Office of Civil Engineering sets Coast Guard-wide civil engineering policy, which includes facility planning, design, construction, maintenance, and disposal. The Coast Guard’s Shore Infrastructure Logistics Center, established in 2009, is to manage and coordinate infrastructure condition assessments via six regional Civil Engineering Units (CEUs), along with other divisions and offices.²⁰ The condition of individual shore infrastructure assets is determined by CEU personnel and civil engineers in the field. According to Coast Guard officials, every Coast Guard facility, such as a base or boat station, is to be inspected by a CEU representative every 3 years. The representative is to conduct a facility condition assessment of all shore infrastructure assets—buildings and structures—located at that facility. According to Coast Guard CEU officials, the representative is to identify if any new maintenance-related deficiencies exist at the facility and add them to the backlog of projects, review the previous backlog, and verify that the Coast Guard’s shore facilities’ inventory records are correct. This process is intended to help define the current conditions of assets and identify maintenance needs.

²⁰The Coast Guard has four main CEUs, located in Cleveland, OH; Oakland, CA; Providence, RI; and Miami, FL, and two subordinate CEUs: CEU Honolulu, HI and CEU Juneau, AK, according to Coast Guard officials. Each of these CEUs is responsible for a geographic Area of Responsibility (AOR), which generally align with the Coast Guard’s geographic District Commands.

According to Coast Guard guidance, the Shore Infrastructure Logistics Center also establishes project priorities for the acquisition, programmed depot maintenance, major repair, and modification of Coast Guard shore facilities, and implements shore infrastructure policies.²¹ Among other things, the Shore Infrastructure Logistics Center is to (1) assure that all Coast Guard facilities meet their operational and functional requirements, (2) take corrective action before advanced deterioration requires major repairs, (3) ensure preventative maintenance is performed on a routine schedule, and (4) prevent over-maintenance and under-maintenance. In addition, this guidance states that all Coast Guard property must have a documented, standardized system of maintenance for facilities by designated personnel familiar with, and properly trained on, the maintenance system in place to support its shore infrastructure.

Coast Guard's Civil Engineering Program Has a Requirements-Based Budget to Determine Funding Needs

In 2016, the Coast Guard's civil engineering program began using requirements-based budget planning to determine shore infrastructure funding needs. According to the Coast Guard, a requirements-based budget is an estimate of the cost to operate and sustain the Coast Guard's shore infrastructure portfolio of assets over the lifecycle of the asset, from initial construction or capital investment through divestiture or demolition.²² Coast Guard budgeting for shore infrastructure distinguishes between procurement and acquisitions and recurring and non-recurring maintenance, among other things. Procurement and acquisitions encompasses major projects to alter, acquire, or build new infrastructure—for example, modifying the bay doors on a boat garage so that larger boats can be accommodated. In contrast, there are two types of maintenance for shore infrastructure. Routine recurring maintenance, known as Organizational-Level Maintenance (OLM), includes tasks such as clearing moss and debris from a rooftop drain or applying caulk to seal

²¹*Civil Engineering Manual*. United States Coast Guard, COMDTINST M11000.11B (May 2014).

²²Coast Guard officials told us its requirements-based budget planning is based on industry standards and that it aligns with the National Academy of Sciences benchmarks for sustainable facility and infrastructure management. NRC, *Stewardship of Federal Facilities: A Proactive Strategy for Managing the Nation's Public Assets* (Washington, D.C.: National Academies Press: 1998).

a building. Non-recurring maintenance, known as Depot-Level Maintenance (DLM), consists of major maintenance tasks that are beyond the capability of an individual unit, such as replacing exterior doors and windows.²³

The Coast Guard uses three accounts for its shore infrastructure. Amounts in the Procurement, Construction and Improvements (PC&I) account are used for the acquisition, procurement, construction, rebuilding, and improvement of shore facilities and are directed to specific projects. Amounts in the shore OLM account are used for routine recurring maintenance, and amounts in the DLM account are used for major maintenance and repair of Coast Guard real property.²⁴ See Table 2 for additional information about these accounts.

²³Organizational-level maintenance is performed by the operating units—i.e., by boat station personnel. According to the Coast Guard, it assigns maintenance requirements at the operating unit level only if it has been determined that the task is within the ability of the personnel to complete, taking into account additional demands such as training, and the availability of tools at the station to complete the assigned task. Depot-level maintenance is maintenance beyond the capability of the station personnel, including changes and modifications to the station facilities deemed too extensive to be performed by the crew.

²⁴The Coast Guard began using the Department's Common Appropriations Structure in its 2019 President's Budget. The Acquisition, Construction, and Improvements (AC&I) appropriation transitions to the new Procurement, Construction, and Improvements (PC&I) appropriation. PC&I provides for the acquisition, procurement, construction, rebuilding, and improvement of shore facilities and military housing, as well as vessels, aircraft, and other assets.

Table 2: Coast Guard Budget Accounts Related to Shore Infrastructure

Account	Description	Allotment
Procurement, Construction and Improvements (PC&I):	This account funds the acquisition, procurement, construction, rebuilding, and improvement of Coast Guard buildings such as military housing or cutter support facilities, as well as structures such as aircraft hangars or boat docks. It funds the acquisition of new capital assets, the construction of new facilities, and physical improvements to existing facilities and assets. Each year, the Coast Guard updates its Shore Facilities Requirements List, which lays out the Coast Guard's prioritized and unprioritized PC&I projects and are generally to be executed within the next 3 to 5 fiscal years, subject to the availability of funds.	Coast Guard allotted about \$45 million to shore PC&I for fiscal year 2017, excluding aids to navigation.
Shore Organizational-Level Maintenance (OLM):	This account funds routine recurring maintenance of Coast Guard buildings, structures, and utility systems. Coast Guard uses OLM to achieve and sustain the optimal service life of its shore infrastructure. Shore OLM also funds inspections of facilities to identify deficiencies so they can be remedied. Each Coast Guard shore unit has a designated OLM representative who is responsible for coordinating that unit's shore OLM activities.	Coast Guard could not disaggregate expenditures from this allotment because OLM funds are used for both maintenance and operational expenses.
Depot-Level Maintenance (DLM):	This account funds nonrecurring major maintenance, repair, and rebuilding of Coast Guard real property assets to ensure these assets fulfill their intended purpose and attain their maximum service life. DLM projects are managed by the Shore Infrastructure Logistics Center and executed by the Coast Guard's six Civil Engineering Units. The Coast Guard may also use DLM funds to perform limited construction and improvements; DLM construction and improvement projects are statutorily limited to \$1 million for any given location.	About \$189 million was allotted to DLM for fiscal year 2017, excluding floating aids to navigation. ^a

Source: GAO analysis of Coast Guard budget documents. | GAO-19-82

^aThis review excludes fixed Aids to Navigation (ATON) structures which are used to mark federal waterways to safeguard maritime safety and commerce. However, the Coast Guard could not disaggregate ATON expenditures from this allotment because they are not separate accounting items.

Coast Guard Utilizes Planning Boards to Prioritize Shore Infrastructure Projects

The Coast Guard makes decisions regarding the allotment of resources for shore infrastructure through PC&I, regional DLM, and central DLM planning boards, which meet twice annually to prioritize Coast Guard shore infrastructure needs on the basis of expected appropriations and other factors, such as damage caused by natural disasters. These boards are responsible for evaluating potential shore infrastructure projects that have been identified by managers who are responsible for evaluating, ranking, and recommending projects to the boards within their specified product line. For example, aviation asset line managers are responsible for aviation-related shore infrastructure projects, such as runways, landing areas, and hangars. Table 3 provides specific information on these planning board responsibilities and members.

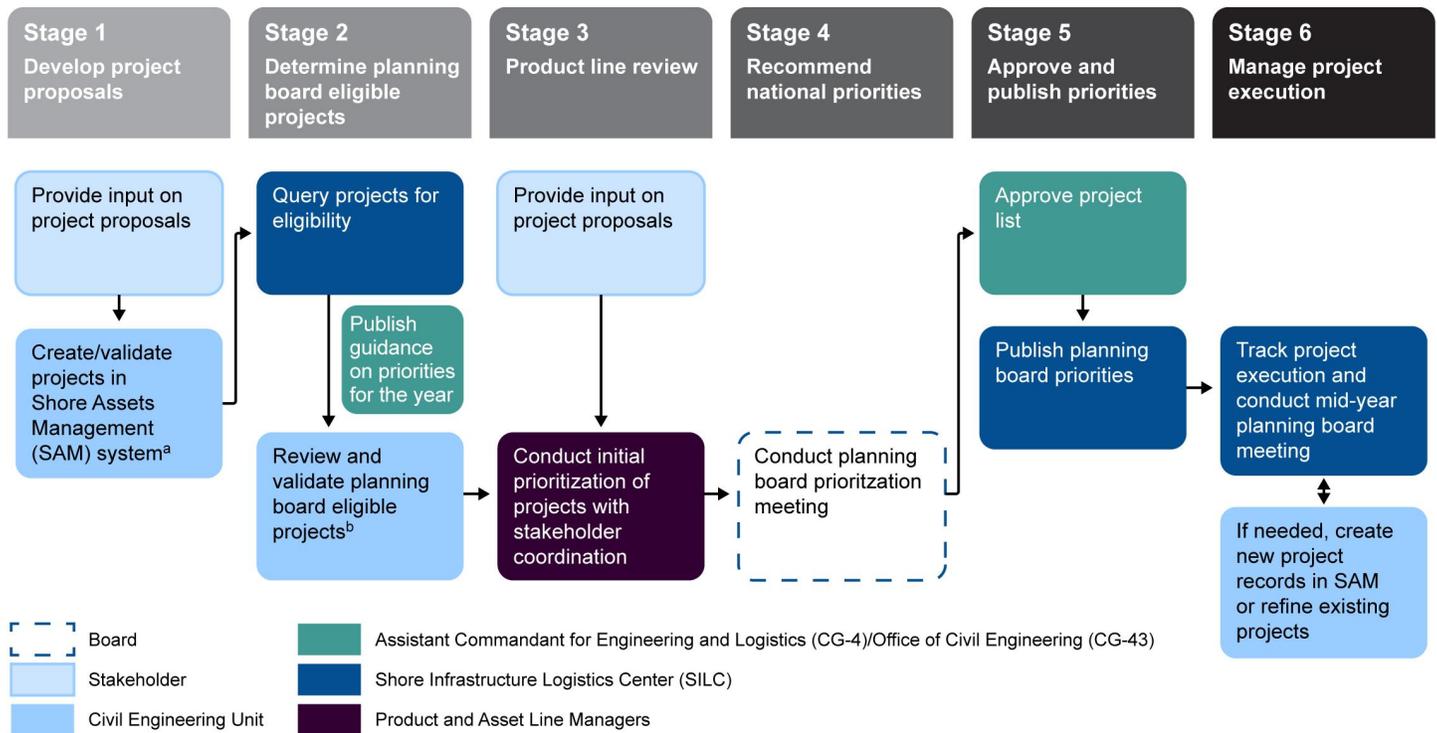
Table 3: Coast Guard’s Shore Infrastructure Planning Boards

Planning Board	Responsibilities	Members
Procurement, Construction and Improvements (PC&I) planning board	Responsible for prioritizing approved PC&I-funded projects such as new construction or modifying existing facilities to meet new requirements. Serves to influence long-term capital planning and its 5-year Capital Investment Plan (CIP), and prioritize future planning work.	Chaired by a Shore Infrastructure Logistics Center deputy who casts the tiebreaker vote when the four-member board is tied. Voting members include representatives from Pacific Area Command (PACAREA), Atlantic Area Command (LANTAREA), the Deputy Commandant for Operations (DCO), and the Deputy Commandant for Mission Support (DCMS). District planners, headquarters program managers, asset and product line managers, facility engineers, and civil engineering units (CEU) provide input.
Regional Depot-level maintenance (DLM) planning board	Responsible for prioritizing about 70 percent of the Coast Guard’s DLM funding, which is used for major non-recurring regional (e.g., District, Sector, or unit) maintenance projects.	According to Coast Guard officials, the process the regional planning boards follow, including identifying membership, is not documented for 5 of 6 CEUs. One CEU has written guidance that outlines a process for CEU and district officials, who have a responsibility to maintain mission capability, to follow to ensure that maintenance funds are properly allocated. However, none of the other five CEUs have similar written guidance, so it is unclear who participates in these board meetings.
Central Depot-level maintenance planning board	Responsible for prioritizing about 30 percent of DLM funding, which is used to meet the most urgent Coast Guard-wide infrastructure needs and to fund limited improvements and upgrades to existing infrastructure. Board is to consider factors outlined in the annual guidance, such as prioritizing projects that will address safety issues, reduce life cycle costs, or completing projects from prior year.	Chaired by a Shore Infrastructure Logistics Center deputy who casts the tiebreaker vote when the four-member board is tied. Voting members include representatives from PACAREA, LANTAREA, DCO, and the DCMS. District planners, headquarters program managers, asset and product line managers, facility engineers, and CEUs provide input.

Source: GAO analysis of Coast Guard documents. | GAO-19-82

Figure 1 shows how the planning boards are to prioritize shore infrastructure projects. Additional details about the planning boards' processes, including the extent to which they are documented and align with leading practices, are described later in this report.

Figure 1: Coast Guard's General Process for Prioritizing Shore Infrastructure Projects



Source: GAO analysis of Coast Guard documents and interviews with officials. | GAO-19-82

^aThe SAM system is a computer database used by the Coast Guard Civil Engineering program to manage and execute its Organizational-Level Maintenance (OLM), Depot-Level Maintenance (DLM) and Procurement, Construction, and Improvements (PC&I) programs.

^bThe Coast Guard makes decisions regarding the allotment of resources for shore infrastructure through PC&I, regional DLM, and central DLM planning boards, which meet twice annually to prioritize Coast Guard shore infrastructure needs on the basis of expected appropriations and other factors, such as damage caused by natural disasters. These boards are responsible for evaluating potential shore infrastructure projects that have been identified by managers who are responsible for evaluating, ranking, and recommending projects to the boards within their specified product line.

Coast Guard Is Required to Report Unfunded Shore Infrastructure Priorities

The Coast Guard is statutorily required to provide a list of each unfunded priority, including unfunded shore infrastructure priorities, to certain committees of Congress to support the President's budget,²⁵ and its 5-year Capital Investment Plan (CIP).²⁶ The term 'unfunded priority' means a program or mission requirement that (1) has not been selected for funding in the applicable proposed budget, (2) is necessary to fulfill a requirement associated with an operational need, and (3) the Commandant would have recommended for inclusion in the applicable proposed budget had additional resources been available, or had the requirement emerged before the budget was submitted.²⁷

²⁵Coast Guard and Maritime Transportation Act, 2012, Pub. L. No. 112-213, § 213, 126 Stat. 1540, 1552-53 (codified as amended at 14 U.S.C. § 2902).

²⁶14 U.S.C. § 2902. Since 2012, the Coast Guard has been required to submit its CIP in coordination with the President's budget in any given year. The CIP is approved by DHS and the Office of Management and Budget and, as we have reported in the past, is subject to significant changes each year. The 5-year CIP provides information on the proposed budget for the upcoming fiscal year, as well as the following 4 fiscal years. We have previously reported that Coast Guard officials view the 5-year CIP as the starting point for developing the acquisition, construction, and improvements budget for a given year. [GAO-18-454](#).

²⁷14 U.S.C. § 2902(c).

Almost Half of the Coast Guard's Shore Infrastructure is Beyond Its Service Life, and Project Backlogs Will Cost at Least \$2.6 Billion to Address

Coast Guard Reported that 45 Percent of Its Shore Infrastructure Is Beyond Its Service Life

As of 2017, the Coast Guard's annual report on shore infrastructure stated that 45 percent of Coast Guard assets have exceeded their service lives.²⁸ The Coast Guard also reported that its overall shore inventory has a 65-year service life. For example, the Coast Guard's 2017 shore infrastructure report identified at least 65 percent of aviation pavements, 60 percent of aviation fuel facilities, and at least 53 percent of piers—all of which the Coast Guard has identified as mission-critical assets—as being past their service lives.²⁹ Coast Guard officials told us that the agency had changed their service life standard from 50 years to service lives linked to each asset's assigned category code, based on Department of Defense (DOD) standards, before they reported service life calculations in their 2017 annual report on shore infrastructure. As a result of this change, some shore infrastructure that has been in service 50 to 65 years, which would previously have been identified as past its service life, will be characterized by the Coast Guard as within its service life—a better

²⁸According to the Coast Guard, its asset service life ranges from 6 to 75-years, depending on the type of asset. The Coast Guard adopted the Useful Service Life assigned to category codes in the 2016 Unified Facilities Criteria (UFC) 3-701-1, Change 10, Table 3 for the Asset Service Life metrics in the 2017 shore infrastructure report. Officials said these UFC category code-based service lives were also used to calculate the Condition Index metric, which contributes to formulation of the Infrastructure Grade Calculation.

²⁹Useful service life, as established by the UFC, is 45 years for aviation pavements, 30 years for aviation fuel facilities, and 50 years for piers. 2016 Unified Facilities Criteria (UFC) 3-701-1, Change 10, Table 3.

condition than the Coast Guard would have reported under its 50-year standard.³⁰

Additionally, in 2017, the Coast Guard rated³¹ its overall shore infrastructure condition as a C-³² based on criteria it derived from standards developed by the American Society of Civil Engineers.³³ Some asset lines, such as aviation, whose assets are generally mission-critical, are rated lower. For example, the Coast Guard rated its industrial asset line as a D, in part because 8 of the 9 assets which comprise the Coast Guard Yard—the only Coast Guard facility that can perform drydock maintenance on large Coast Guard ships—are more than 5 years beyond their service life.³⁴ Table 4 shows additional detail about Coast Guard asset lines, including the rate at which the Coast Guard reported these

³⁰By comparison, we previously reported that DOD officials told us that DOD often uses its facilities for 50 or more years. GAO, *Climate Change Adaptation: DOD Needs to Better Incorporate Adaptation into Planning and Collaboration at Overseas Installations*, [GAO-18-206](#) (Washington, D.C.: November 13, 2017). Coast Guard officials said the 65-year service life was used for its requirements-based budget calculations. For example, a 55-year old facility that had been considered past its service life under the 50-year standard, would be within its service life if the standard for that facility was changed to 65 years.

³¹Coast Guard assigned each asset line a letter grade that it partially calculated based on the dollar value of the DLM backlog for the asset line, the plant replacement value for that asset line, and an age-based condition index, adapted from a format used by the American Society of Civil Engineers, which Coast Guard officials said consider the following eight attributes: Capacity, Funding, Operations and Maintenance, Resilience, Condition, Future Need, Public Safety, and Innovation. As noted by the Coast Guard's fiscal year 2017 shore infrastructure report, these infrastructure grades provide a broad basis for performance analysis and consider how well the Coast Guard is able to achieve mission objectives in relation to its dependencies on shore infrastructure.

³²According to the American Society of Civil Engineering, upon which Coast Guard based its grades, an "A" is generally excellent condition, a "B" is in good to excellent condition, a "C" is mediocre/ in fair to good condition but showing signs of deterioration and increasingly vulnerable to risk, a "D" is in poor to fair condition and mostly below standard, and an "F" is failing/critical, unfit for purpose, and in an unacceptable condition with widespread advanced signs of deterioration.

³³Coast Guard has assigned grades to its asset lines since 2015, but in August 2018 informed us that the grades are not comparable from year to year due to continual changes in how the grades are calculated. Officials said they anticipate the grades being more stable and comparable in the future. The 2017 grades provide a snapshot of what the Coast Guard considered the condition of its shore infrastructure.

³⁴These are maintenance tasks performed when a Coast Guard ship is hoisted out of the water. Maintenance conducted in a drydock is only capable of being done on dry land and includes items such as repainting of the hull, and shaft removal and reinstallation among others.

assets were functioning past their service life, and the condition grades assigned by the Coast Guard for fiscal year 2017.

Table 4: Coast Guard Reported Asset Line Grades and Shore Infrastructure Operating Past Service Life for Fiscal Year 2017

Asset line	Percent of assets past service life ^a	Percent of assets operating more than 5 years past service life ^a	2017 condition grade ^b
Aviation	62	34	D+
Waterfront	54	25	C
Shore operations	39	19	B-
Sector/District	27	15	C-
C4IT ^c	22	15	C
Civil Works	54	33	C
Base Services	60	32	D+
Industrial	51	48	D
Housing	26	25	D+
Community Services	64	36	D
Training Facilities	34	27	C
Total	45	28	C-

Source: GAO analysis of Coast Guard documents. | GAO-19-82

Note: Table excludes two asset lines—fixed and floating aids to navigation and signal equipment—which are used to mark federal waterways to safeguard maritime safety and commerce, among other things. The Coast Guard informed us that some of the annual reports we analyzed, upon which the information is based, are not used by Coast Guard senior leaders for tactical decisions, but provide a snapshot of information that is reliable for the purpose of reporting on the overall portfolio of shore infrastructure.

^aThe Coast Guard does not have complete service life data on all of its assets. For example, 17 percent of the aviation asset line does not have data on the percent of service life remaining.

^bAccording to the American Society of Civil Engineering, upon which Coast Guard based its grades, an “A” is generally excellent condition, a “B” is in good to excellent condition, a “C” is mediocre/ in fair to good condition but showing signs of deterioration and increasingly vulnerable to risk, a “D” is in poor to fair condition and mostly below standard, and an “F” is failing/critical, unfit for purpose, and in an unacceptable condition with widespread advanced signs of deterioration. The formula upon which the Coast Guard assigns grades is based on a number of factors, including the results of its facility inspections, and the percent of assets past service life is independent of the grade calculation. In 2018, the Coast Guard told us that some of its data on shore infrastructure may not be complete if field inspectors did not identify and record problems at facilities they inspected. As a result, condition grades could be overly positive.

^cC4IT = Command, Control, Communications, Computers, and Information Technology. The C4IT Asset Line consists of Coast Guard communications towers and navigation facilities.

According to Coast Guard officials, the demand placed on the Coast Guard’s shore infrastructure in recent years has increased because of the new ships and aircraft the Coast Guard has acquired. For example, a senior Coast Guard official told us that the agency has recently needed to upgrade some of its hangars with liquid oxygen storage facilities in order

to support the Coast Guard’s new HC-27A aircraft.³⁵ Another official told us that because the Coast Guard’s National Security Cutters—which the Coast Guard began operating in 2010—are 40 feet longer than the High Endurance Cutters they are replacing, the Coast Guard has had to either build new piers or lengthen existing ones.

Coast Guard’s Data Indicate that Project Backlogs of Shore Infrastructure Will Cost At Least \$2.6 Billion to Address, as of 2018

Coast Guard data show that it will cost at least \$2.6 billion to address its two project backlogs—(1) recapitalization and new construction, and (2) deferred maintenance. Given the level at which the Coast Guard has been requesting such funding, it will take many years for the agency to address the backlogs. For example, the Coast Guard estimated that based on its fiscal year 2017 appropriation it would take 395 years to address its current \$1.77 billion PC&I recapitalization and new construction backlog, assuming that funding would continue at this level.³⁶ This time frame estimate does not include the Coast Guard’s deferred DLM maintenance backlog, which the Coast Guard estimated to be nearly \$900 million in fiscal year 2018. Table 5 provides information on the Coast Guard’s two shore infrastructure backlogs as of August 2018.

Table 5: Coast Guard’s Estimated Shore Infrastructure Backlogs, as of August 2018

Account	Backlog Total (\$)	Description
Procurement, Construction, and Improvements (PC&I)	1,774,228,000	As of August 2018, the more than \$1.7 billion backlog includes 125 recapitalization and new construction projects. In 2017, the Coast Guard removed 132 projects from the backlog that it determined were no longer valid. ^a
Deferred Depot-Level Maintenance (DLM)	899,957,114	Increased by \$300 million since FY 2012 and includes more than 5,600 deferred maintenance projects.
Total	2,674,185,114	—

³⁵In 2014, the National Defense Authorization Act, 2014, Pub. L. No. 113-66, § 1098, 127 Stat. 672, 881-886 (2013), directed the Secretary of Defense to begin the transfer of certain aircraft to the Secretary of Homeland Security and excess initial spares and necessary ground support equipment for the aircraft to the Secretary of Homeland Security for use by the Commandant of the Coast Guard as maritime patrol aircraft.

³⁶Using Coast Guard’s cost parameters, we verified the Coast Guard’s calculation that it would take 395 years to address the current backlog if no additional projects were added. However, the number of years it would take to address the backlog is dependent on appropriated amounts, which have varied considerably.

Legend: “—” = not available or applicable.

Source: GAO analysis of Coast Guard data. | GAO-19-82

Note: In July 2018, Coast Guard officials told us that the majority of PC&I projects do not have associated cost estimates, and that projects without cost estimates have not been factored into the backlog estimates that have been previously reported to Congress. In addition to PC&I projects and DLM funding to address deferred maintenance and other needs, routine and recurring maintenance is also achieved through Organizational-Level Maintenance (OLM) funding; however, funding for maintenance projects cannot be disaggregated from overall OLM funding. Because of this, OLM funding is not included in this table.

^aAccording to Coast Guard officials, in 2017 the Coast Guard reviewed all projects on the PC&I backlog to determine if each project was needed and valid based on input from area leadership, Civil Engineering Units, and facility engineers, and removed projects that it determined were no longer necessary based on mission change, alternative solutions, or the need being met through another project. The Coast Guard was not able to identify the estimated total cost for the 132 projects it removed.

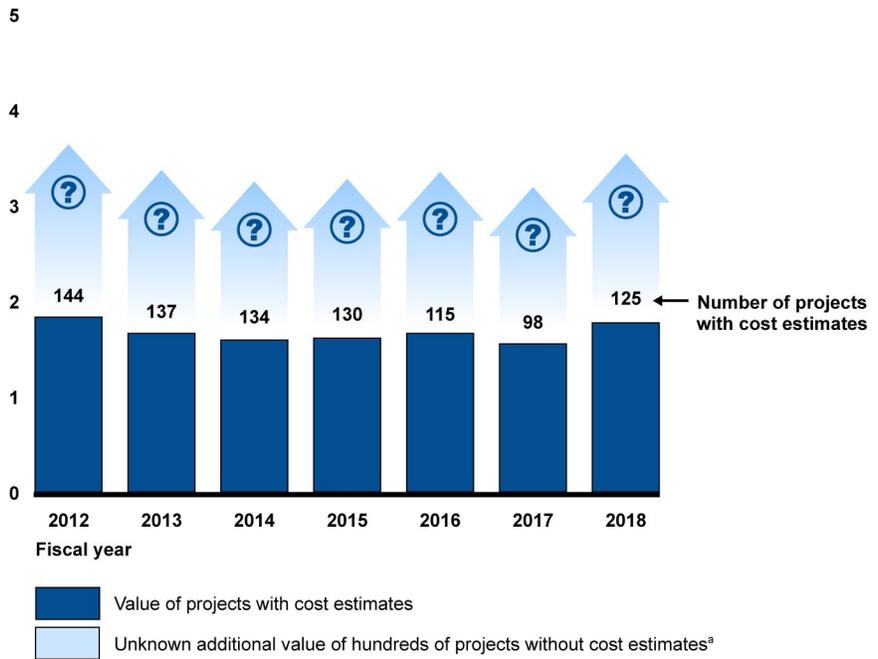
However, the number of projects in the Coast Guard’s backlogs and the associated cost for addressing them is incomplete. In July 2018, Coast Guard officials told us that the majority of the projects on the PC&I backlog do not yet have associated cost estimates, and thus have not been factored into the backlog cost estimates they have previously reported to Congress. In November 2018, the Coast Guard told us there were 205 projects on the PC&I backlog without cost estimates.³⁷ Officials explained that they have not prepared cost estimates for these projects because they are in the preliminary stage of development and cost estimates would not be accurate.³⁸ Figure 2 shows the number of projects with cost estimates and the estimated value of its PC&I backlog for fiscal years 2012 through 2018. See appendix II for additional details.

³⁷In July 2018, the Coast Guard informed us that in 2017 officials had reviewed all projects on the PC&I backlog to determine if each project was needed and valid based on input from area leadership, CEUs, and facility engineers, and removed projects that it determined were no longer necessary based on mission change, alternative solutions, or the need being met through another project. We did not assess the process the Coast Guard applied to removing projects from its list. The Coast Guard was not able to identify the estimated total cost for projects it removed, but informed us that it removed 132 projects from the backlog.

³⁸In 2018, the Coast Guard’s projected costs for individual shore PC&I projects with cost estimates ranged from \$2 million to approximately \$95 million per project. We did not evaluate the accuracy of Coast Guard cost estimating practices.

Figure 2: Coast Guard’s Reported Number of Projects and Estimated Value of its Procurement, Construction and Improvements Backlog of Shore Infrastructure Projects, Fiscal Years 2012 through 2018

Dollars (in billions)



Source: GAO analysis of Coast Guard data. | GAO-19-82

^aIn November 2018, the Coast Guard told us there were 205 projects without cost estimates, and that it had removed 132 projects from the backlog in 2017. Because the Coast Guard was unable to provide additional details, we did not assess the process the Coast Guard applied to removing projects. The Coast Guard was also not able to identify the estimated total cost for projects it removed. Coast Guard officials told us that projects without cost estimates have not been factored into the backlog estimates that have been previously reported to Congress. The arrows are intended to characterize the uncertain costs due to the lack of Coast Guard cost estimates associated with those projects.

“Making Do”: Coast Guard Station Vallejo

Station Vallejo is a boat station facility used to conduct maritime search and rescue and other Coast Guard missions. In 2014, an earthquake damaged Station Vallejo’s components, including its foundations, piers, water lines, and doors.



Damage to deck foundation of Station Vallejo’s main office building

Separately from the 2014 earthquake damage, Coast Guard officials in California told us that mold and damage to this station’s housing facilities could have presented a health hazard to station personnel, and required relocating personnel to smaller temporary facilities, which impedes training due to limited space. These officials told us that due to budget constraints and competing priorities, Station Vallejo has “made do” without permanent facilities since at least 2009. This station was not prioritized for funding until 2012, funding was not appropriated until fiscal year 2016, and permanent facilities will not be constructed until fiscal year 2019.

Source: U.S. Coast Guard documents and testimony; U.S. Coast Guard (photo). | GAO-19-82

In addition to the estimated \$2.6 billion backlogs of PC&I recapitalization and new construction and DLM deferred maintenance projects, the Coast Guard carries out routine and recurring maintenance and repairs (maintenance) through OLM funding. However, Coast Guard officials stated that funding for maintenance projects cannot be disaggregated from overall OLM funding.³⁹ The Coast Guard’s 2017 shore infrastructure annual report states that industry studies establish that the most effective maintenance organizations spend about 17 percent of their staff labor effort on corrective maintenance (i.e., repairs) and 83 percent on preventative maintenance (e.g., activities such as changing buildings systems’ filters and oil, resealing pavement surfaces, or repainting buildings). However, Coast Guard’s analysis of OLM records indicated that 66 percent of their facilities’ staff labor effort was used for corrective maintenance. This imbalance indicates that fewer funds are available for preventative maintenance than industry studies suggest, which could increase costs and affect service lives if preventative maintenance cannot be performed to the extent necessary. The annual report further stated that the significant investment needed for corrective maintenance reflects the state of the Coast Guard’s aging infrastructure and the strain it places on maintenance personnel. Moreover, Coast Guard officials testified to Congress in June 2017 that aging infrastructure adversely affects operational efficiency.⁴⁰ Further, in July 2018 Congressional testimony by

³⁹In January 2014 we reported on the Federal Real Property Profile (FRPP)—a database overseen by OMB in coordination with agencies comprising the Federal Real Property Council (FRPC)—which provides information that can be used to estimate an agency’s backlog, including the Coast Guard’s. We reported that because the “annual operating cost” data element in the FRPP database did not differentiate the amount spent on recurring maintenance and repairs from other annual operating expenses, such as costs for janitorial services and utilities, that the data were not sufficiently useful to allow full insight into agencies’ funding of maintenance and repairs. We recommended that OMB, in collaboration with agencies, collect and report information on funding spent to manage their existing backlogs, among other things. OMB agreed with our recommendations and expects these actions to be completed by the fiscal year 2018 FRPP reporting cycle. In December 2016, the General Services Administration (GSA), with the support of OMB, issued a memorandum to the senior members of the FRPP council which stated that all Chief Financial Officers (CFO) Act agencies will have to develop processes for reporting (1) operations and (2) maintenance costs as separate data elements no later than the 2018 FRPP reporting cycle. As of March 28, 2017, OMB had not provided GAO with any additional updates regarding the status of this recommendation. [GAO-14-188](#).

⁴⁰Testimony of Coast Guard Deputy Commandant for Operations Vice Admiral Charles Ray and Coast Guard Deputy Commandant for Mission Support Vice Admiral Sandra Stosz for the House Committee on Transportation and Infrastructure, Subcommittee on Coast Guard and Maritime Transportation *Building a 21st Century Infrastructure for America: Coast Guard Sea, Land, and Air Capabilities*. (June 7, 2017).

the Coast Guard Deputy Commandant for Mission Support stated that the agency needs to rebuild shore infrastructure readiness with sound investments in operations and maintenance, but budget realities result in deferred maintenance, fewer spare parts, and infrastructure reliability and security concerns.⁴¹

The Coast Guard’s Process for Managing Its Shore Infrastructure Does Not Fully Meet 6 of 9 Leading Practices, Resulting in Management Challenges

The Coast Guard’s process to manage its shore infrastructure recapitalization and deferred maintenance backlogs does not fully meet 6 of 9 leading practices we have previously identified for managing public sector maintenance backlogs.⁴² Specifically, of the nine leading practices, the Coast Guard met three, partially met three, and did not meet three, as shown in Table 6. We, as well as others, have identified that deferring maintenance and repair backlogs can lead to higher costs in the long term and pose risks to safety and agencies’ missions.⁴³

Table 6: Extent to Which Coast Guard’s Management of its Shore Infrastructure Backlogs Met Leading Practices

Leading Practice	Extent to which Coast Guard met leading practice
Identify the types of risks posed by lack of timely investment	Met
Identify types of facilities or specific buildings (i.e., assets) that are mission-critical and mission-supportive	Met
Identify the primary methods to be used for delivering maintenance and repair activities	Met

⁴¹Testimony of Coast Guard Deputy Commandant for Operations Vice Admiral Daniel B. Abel, and Coast Guard Deputy Commandant for Mission Support Vice Admiral Michael F. McAllister for the House Committee on Transportation and Infrastructure, Subcommittee on Coast Guard and Maritime Transportation *Update on Coast Guard Acquisition Programs and Mission Balance/Effectiveness*. (July 24, 2018).

⁴²GAO-14-188.

⁴³GAO-14-188. NRC, *Predicting Outcomes of Investments in Maintenance and Repair of Federal Facilities*, (Washington, D.C.: 2012). Jacobs, *U.S. Coast Guard Shore Infrastructure Mission Support Business Model ISO 55000 Gap Analysis Findings*.

Leading Practice	Extent to which Coast Guard met leading practice
Conduct condition assessments as a basis for establishing appropriate levels of funding required to reduce, if not eliminate, any deferred maintenance and repair backlog	Partially met
Establish performance goals, baselines for performance outcomes, and performance measures	Partially met
Align real property portfolios with mission needs and dispose of unneeded assets	Partially met
Establish clear maintenance and repair investment objectives and set priorities among outcomes to be achieved	Not met
Employ models for predicting the outcome of investments, analyzing trade-offs, and optimizing among competing investments	Not met
Structure budgets to identify funding allotted (1) for routine maintenance and repair and (2) to address any backlog of deferred maintenance and repair deficiencies because insufficient levels of such funding can cause agencies' backlogs to increase	Not met

Source: GAO analysis of U.S. Coast Guard and Office of Management and Budget documents and data. | GAO-19-82

Note: These nine leading practices were derived from reports published by the National Research Council of the National Academies of Science, Engineering, and Medicine and analyzed in a 2014 GAO report. GAO, *Federal Real Property: Improved Transparency Could Help Efforts to Manage Agencies' Maintenance and Repair Backlogs*, [GAO-14-188](#) (Washington, D.C.: January 23, 2014).

Coast Guard Met 3 of 9 Leading Practices for Managing Public Maintenance Backlogs

The Coast Guard met 3 of 9 leading practices for managing public maintenance backlogs by identifying the types of risks posed by not making timely investments in its shore facilities; identifying the types of assets, such as buildings, that are mission-critical; and by establishing guidance that identifies the primary methods to be used for delivering maintenance and repair activities, among other things. We have previously found that these three practices are an important step toward increased transparency and more effective management of maintenance backlogs.⁴⁴

Identify the Types of Risks Posed By Lack of Timely Investment

According to leading practices, agencies should identify the types of risks posed by not investing in deteriorating facilities, systems, and components because this is important for providing more transparency in the decision-making process, and for communicating with staff at all organizational levels. The Coast Guard has a process to identify, document and report risks in its annual shore infrastructure reports for

⁴⁴[GAO-14-188](#).

fiscal years 2015 through 2017.⁴⁵ These reports identified the types of risks the Coast Guard faces in not investing in its facilities, including financial risk, capability risk, and operational readiness risk, but did not specifically measure these risks. The Coast Guard met this leading practice because the leading practice requires agencies to identify risk in general terms—for example, in terms of increased lifecycle costs, or risk to operations. The leading practice does not require the agency to quantify or measure this risk by, for example, calculating the probability that a building or structure will fail and impair the Coast Guard’s operations.

Identify Types of Facilities or Specific Buildings that Are Mission-Critical and Mission-Supportive

Leading practices state that agencies should identify buildings as mission-critical and mission-supportive to help establish where maintenance and repair investments should be targeted, to ensure that funds are being used effectively. Since at least 2012, the Coast Guard has documented its process to classify all of its real property under a tier system and established minimum investment targets by tier as part of its central DLM planning boards. These tiers—mission-critical versus mission-supportive—were incorporated into the guidance that Coast Guard decision-makers are to follow in their deliberations about project funding and to help them determine how to target funding more effectively. For example, the Coast Guard’s PC&I planning board guidance for fiscal years 2019 through 2023 prioritized expenditures on shore infrastructure-supporting front line operations such as piers or runways over shore infrastructure providing indirect support to front line operations such as administrative buildings.

Identify the Primary Methods to Be Used for Delivering Maintenance and Repair Activities

Identification of the primary methods of delivery for maintenance and repair activities is intended to help agencies determine the level of resources that should be allocated to each type of maintenance activity and to repair projects, according to leading practices. The Coast Guard’s Civil Engineering Manual and other guidance documents detail how the maintenance and repair program is structured and how budget accounts

⁴⁵The Coast Guard did not produce annual reports for years prior to 2015.

are to be utilized. For example, the manual defined how projects should be classified and funded—e.g., DLM or OLM—which has helped to determine the Coast Guard units responsible for carrying out these maintenance or repair activities.

Coast Guard Partially Met 3 of 9 Leading Practices for Managing Maintenance Backlogs

The Coast Guard partially met 3 of 9 leading practices for managing public sector maintenance backlogs, including conducting condition assessments, establishing performance goals and measures, and aligning property portfolios with mission needs and disposing of unnecessary assets.⁴⁶

Conduct Condition Assessments as a Basis for Establishing Appropriate Levels of Funding Required to Reduce, If Not Eliminate, Any Deferred Maintenance and Repair Backlog

Conducting periodic condition assessments are an effective approach for facility management as identifying condition deficiencies can inform budgeting decisions, according to leading practices. Under the Coast Guard's process, facility condition assessments are to be used to evaluate the condition of infrastructure and identify deficiencies. These assessments are to lead to the creation of the maintenance and recapitalization projects that then compose the Coast Guard's deferred maintenance backlogs.⁴⁷ However, the Coast Guard partially met this leading practice because it has not issued specific guidance on how these assessments are to be conducted, nor do the six CEUs follow a standardized or consistent process for conducting their assessments, according to Coast Guard field and headquarters officials.⁴⁸ Further,

⁴⁶[GAO-14-188](#).

⁴⁷Condition assessments, among other things, are to be conducted on facilities once every 3 years and used to identify repair needs or other maintenance problems. Depending on the estimated cost to address the problems identified, these problems become projects that are either added to the PC&I backlog or the deferred DLM backlog, which are described elsewhere in this report.

⁴⁸The Coast Guard Civil Engineering manual contains broad general guidance on how facility condition assessments are to be conducted. According to the Coast Guard, the manual provides the overarching policy and guidance. However, we found that the guidance is not detailed and specific enough to produce standardized outputs.

Coast Guard officials at 5 of the 6 CEUs told us that some or all of the officials who conduct facility condition assessments serve on a rotational basis. As a result, the level of familiarity inspectors have with the facilities they inspect may vary, which could lead to differences in the assessments they produce. Moreover, while inspectors at 3 of the 6 CEUs are to use checklists when conducting their inspections, all of these checklists are different, and the other three CEUs do not currently use checklists. We found that these differences have contributed to inconsistencies in the information collected. For example, assessment results we analyzed used different scales for prioritizing maintenance projects, such as letter grades or red/amber/green scales. One assessment we reviewed listed both DLM and OLM projects, and provided the unit commander with detailed instructions accompanied by pictures explaining how to address these issues, whereas other assessments only identified DLM projects or “items of concern.” One senior official acknowledged that the Coast Guard did not have standardized assessments, and that developing them had not been the highest priority among numerous guidance documents the Coast Guard is trying to complete. Without standardized assessments, the Coast Guard’s ability to systematically compare projects for prioritization is limited, and this could directly impact its ability to establish appropriate levels of funding for addressing the backlog, as identified in this leading practice.

Coast Guard officials told us they intend to issue guidance to standardize facility condition assessments, but they could not provide a date for completing the guidance that would be issued. Moreover, according to the Coast Guard, it began to modernize its shore infrastructure civil engineering management in 2006, and it has been working to develop its current asset management model, including updating guidance, since 2013. By executing plans for a standardized facility condition assessment process and developing a plan with milestones and timeframes for standardizing the process, the Coast Guard will be better positioned with more consistent data to prioritize and plan its shore infrastructure projects.

Establish Performance Goals, Baselines for Performance Outcomes, and Performance Measures

According to leading practices, establishing performance goals, baselines for performance outcomes, and performance measures allows agencies to track the effectiveness of maintenance and repair investments, provide feedback on progress, and indicate where investment objectives, outcomes, or procedures require adjustment. According to Coast Guard

guidance, the Chief of the Office of Civil Engineering and the Shore Infrastructure Logistics Center are to identify and promulgate performance metrics annually. The Coast Guard partially met this leading practice by documenting and tracking facility condition information using a letter grade system and reporting this in its annual reports from 2015 through 2017. However, the Coast Guard has not set performance goals for improving an asset's grade, or established baselines to indicate where investments require adjustment, because it continues to revise the formula it uses to calculate the letter grades. Consequently, the letter grades from fiscal years 2015 through 2017 are not comparable year to year to measure performance.

Definitions of Performance Management Common Terms

Performance goal - a target level of performance expressed as a tangible, measurable objective against which actual achievement can be compared, including a goal expressed as a quantitative standard, value, or rate. A performance goal is comprised of a measure, a time frame, and a target.

Performance measure - a tabulation, calculation, recording of activity or effort, or assessment of results compared to intended purpose, that can be expressed quantitatively or in another way that indicates a level or degree of performance.

Performance target - quantifiable or otherwise measurable characteristic typically expressed as a number that tells how well or at what level an agency or one of its components aspires to perform.

Baselines for Performance Outcomes- a quantifiable point at which an effort began and from which a change in outcomes can be measured and documented.

Source: Government Performance and Results Act of 1993 (GPRA), National Academy of Public Administration, Office of Management and Budget Circular A-11, and the National Research Council. | GAO-19-82

In 2017, the Coast Guard reported a new performance measure for its maintenance efforts, called Average Condition Index, which reflects the average condition of the assets weighted by their replacement value. The Coast Guard set targets for this measure, but it did not establish what actions it would take to meet these targets. Limitations with the Coast Guard’s performance measures for its shore infrastructure are not a new issue, as they were also identified in 2015 by an external study commissioned by the Coast Guard. Specifically, the study reported that the Coast Guard’s condition index, which was more than 15 years old at the time, was not defensible because it lacked trend data and analysis capabilities.⁴⁹ This study recommended that the Coast Guard develop key performance measures, among other things, for managing its shore infrastructure.

Coast Guard officials told us that it has collected data and drafted some performance measures, but they have not yet implemented the recommendations from the 2015 study or set a time frame for doing so because they had not identified it as a priority. Establishing goals, measures, and baselines would better position the Coast Guard to assess their effectiveness and take appropriate actions to improve the condition of its shore infrastructure.

Align Real Property Portfolios with Mission Needs and Dispose of Unneeded Assets

Leading practices state that agencies should efficiently employ available resources, limit construction of new facilities, adapt existing buildings to new uses, and transfer ownership of unneeded buildings to other public or private organizations to align real property with mission needs. In addition, facilities that are functionally obsolete, not needed to support an agency’s mission, not historically significant, or not suitable for transfer or

⁴⁹In 2015, the Coast Guard commissioned a study to examine the level of alignment between its asset management framework and certain standards relevant to shore infrastructure maintenance, among other things. This study concluded, among other things, that the Coast Guard has faced challenges with strategic leadership related to asset management, including in balancing budgetary support for long-term initiatives like developing an asset management framework against short-term infrastructure investment needs, and in communicating asset management policies. This study also found that stakeholder input to establishing requirements for shore infrastructure are stovepiped, limited to project concerns, and that project expectations do not focus on shore infrastructure performance. This study cost approximately \$90,700. Jacobs, *U.S. Coast Guard Shore Infrastructure Mission Support Business Model ISO 55000 Gap Analysis Findings* (Washington, D.C.: May 29, 2015).

adaptive reuse should be demolished whenever it is cost effective to do so, under this leading practice. We have previously reported that the eventual need to address deferred maintenance and repair could significantly affect an agency's future budget resources.⁵⁰ The Coast Guard has made limited progress and partially met this leading practice by disposing of some unneeded assets, but it has not consistently or extensively aligned its property and mission needs. For example, in 2017, the Coast Guard's Civil Engineering Units and facility engineers reviewed all projects on its \$1.77 billion PC&I project backlog and removed 132 projects from it because, according to officials, they were either no longer valid as a result of mission changes, a non-PC&I alternative/solution was found to be more beneficial, or the need was met through another project.⁵¹ This validation effort was a positive step toward aligning property and mission needs, but it raises questions about whether and to what extent the PC&I backlog is routinely and consistently managed to ensure that projects reflect mission needs.⁵²

The Coast Guard made some progress aligning property and mission needs through the sale of some assets. For example, in 2017, it sold 189 of its 2,961 housing assets through use of an initiative to divest itself of some housing assets—an effort which garnered \$26.8 million in total sales proceeds over the life of the program.⁵³ However, the Coast Guard's ability to dispose of unneeded assets has been limited in some

⁵⁰[GAO-14-188](#).

⁵¹The Coast Guard could not provide a list or estimated cost for the 132 projects it removed from its PC&I backlog.

⁵²In November 2018, a senior Coast Guard official told us that ideally they will conduct a validation every other year, and that they plan to validate the projects on the list in 2019. This official told us that the 2017 validation consisted of Coast Guard personnel reviewing projects on the PC&I backlog to determine if each need was still valid. This validation was not based on specific criteria but removing a project from the backlog required the agreement of the affected Area Command and the Shore Infrastructure Logistics Center.

⁵³In its fiscal year 2014 budget justification, the Coast Guard identified an initiative to divest of some housing intended to reduce maintenance costs by eliminating 300 housing units identified as excess by the Coast Guard's National Housing Assessment. This initiative achieves savings by maintaining these units in a nonoperational status (reducing operating and maintenance requirements) until they can be divested, leveraging the authorities provided in the Coast Guard Authorization Act, 2010, Pub. L. No. 111-281, 124 Stat. 2905 (2010). The Coast Guard owns and maintains approximately 4,000 housing units, many of which are not fully occupied because of rental market conditions and an extensive backlog of maintenance work affecting habitability. The budget justification further stated that to achieve recurring savings for FY 2014 and beyond, the excess housing units were to be secured and readied for disposition during FY 2013.

instances. For example, in 2013, the Coast Guard identified 18 multimission stations with duplicative coverage that could be permanently closed, using a process based on criteria that reflected mission needs. In October 2017, we reported that closing these stations could potentially generate \$290 million in cost savings over 20 years; however, as of September 2018, the Coast Guard had taken no action to close these stations or establish time frames for their closure, although Coast Guard agreed with our recommendation that they do so.⁵⁴ Moreover, our analysis of Coast Guard planning documents found that 5 of the 18 multimission stations recommended for closure in 2013 have projects on the Coast Guard's current PC&I backlog. For example, Station Shark River, in New Jersey, was recommended for recapitalization in fiscal year 2017, despite Coast Guard recommendations to close the station in 1988, 1996, 2007, and 2013.⁵⁵ Notably, the Coast Guard has made multiple attempts in previous years to close stations that it deemed suitable for closure but was unable to close them due to congressional intervention, and subsequent legislation prohibiting closures.⁵⁶ Given the Coast Guard's competing acquisition, operational, and maintenance needs, and PC&I backlog that will cost at least \$1.77 billion to address, difficult trade-off decisions to align real property needs by disposing of unneeded assets may help to mitigate some resource challenges.

Coast Guard Did Not Meet 3 of 9 Leading Practices for Managing Shore Infrastructure Backlogs

The Coast Guard did not meet 3 of 9 leading practices for managing shore infrastructure backlogs, including establishing clear maintenance and repair investment objectives, employing models for predicting the

⁵⁴GAO, *Coast Guard: Actions Needed to Close Stations Identified as Overlapping and Unnecessarily Duplicative*, [GAO-18-9](#) (Washington, D.C.: October 17, 2017).

⁵⁵Projects added to the PC&I backlog in 2017 involving stations previously recommended for closure included Station Oxford, Station Ocracoke, Station Fortescue, and Station Kenosha.

⁵⁶Department of Transportation and Related Agencies Appropriations Act, 1989, Pub. L. No. 100-457, 102 Stat. 2125, 2126 (1988). Id. at § 350, 102 Stat. 2156. See also, 14 U.S.C. § 675. See Howard Coble Coast Guard and Maritime Transportation Act, 2014, Pub. L. No. 113-281, § 225(b), 128 Stat. 3022, 3039 (2014). See also, 14 U.S.C. § 676a. In 1990, we reported that the Department of Transportation Inspector General recommended that the Coast Guard close 21 stations, and the Coast Guard recommended additional closures. See [GAO/RCED-90-98](#). See also, [GAO-18-9](#).

outcomes of investments and analyzing trade-offs, and structuring budgets and related information to address maintenance backlogs.

Establish Clear Maintenance and Repair Investment Objectives and Set Priorities among Outcomes to Be Achieved

Agencies with maintenance and repair responsibilities should determine what outcomes are most important to achieve and set priorities among them, according to leading practices. Coast Guard provided guidance for central DLM planning boards, which calls for stakeholders to identify which projects will be reviewed by the planning boards, for board members to consider project trade-offs and to make recommendations on which projects to fund, and for stakeholders to then review the results.⁵⁷ However, Coast Guard headquarters did not provide documented guidance to the six CEUs responsible for administering regional DLM planning boards—a process intended to establish clear objectives or priorities among outcomes to be achieved for approximately 70 percent of the Coast Guard’s DLM funds.⁵⁸ Coast Guard headquarters officials told us that they instead rely on each CEU to hold their respective regional planning boards in accordance with locally established practices. However, only 1 of the 6 CEUs has developed and implemented written guidance for its DLM planning board process, and it is not clear how these boards set objectives or priorities among outcomes to be achieved.⁵⁹

The Coast Guard provided some documentation detailing how regional DLM planning board inputs and subsequent decisions were linked to decision-making criteria for one regional DLM planning board meeting hosted by one of its nine Districts. Table 7, among other things, shows

⁵⁷The Coast Guard issued manuals for how its PC&I and central DLM planning boards were to be conducted, but did not do so for its regional DLM planning boards. However, 1 of the 6 CEUs followed written instructions issued by the Coast Guard District that comprises that CEU’s area of operations, and the Coast Guard was able to provide documentation for one of this CEU’s regional DLM meetings. The Coast Guard also issued annual prioritization guidance for its PC&I and central DLM planning boards and in 2015 specified that this annual guidance also applied to its regional DLM Planning boards.

⁵⁸Between fiscal years 2012 and 2017, the Coast Guard reported that it expended an average of \$208 million per year on DLM.

⁵⁹Coast Guard officials we interviewed from 5 of 6 CEUs told us that decisions were generally consensus based, but they were unable to provide documentation to verify these decisions.

the limited extent of documentation to substantiate Coast Guard decisions. However, the Coast Guard did not meet this leading practice because it could not demonstrate, with documentation, how decisions were linked to criteria for its PC&I planning board meetings, central DLM planning board meetings, or any other regional DLM planning board meeting.⁶⁰ Without the full range of information on which planning board decisions were made, neither we, nor the Coast Guard, could substantiate the extent to which the Coast Guard followed its processes or evaluate whether its processes for managing shore infrastructure projects were sound.

Table 7: Coast Guard’s Shore Infrastructure Project Prioritization Processes, Planning Boards, and the Extent of Decisions Substantiated with Documentation

Planning board	Guidance for project prioritization process	Extent to which Coast Guard verified, with documentation, that it followed its prioritization processes
Procurement, Construction, and Improvements (PC&I) planning board	<p>The PC&I planning board guidance states that projects will be scored using a transparent and auditable framework.</p> <p>Coast Guard guidance states that the PC&I board is to consist of four voting members and one chair member. The guidance also states that, to ensure equity and transparency, this board is to review and discuss project presentations and then vote on overall prioritized project list.</p> <p>Coast Guard guidance states that using data submitted by field units, Civil Engineering Units (CEU) are to execute a metric-based grading and ranking of products in their portfolio, which are forwarded to the PC&I board for prioritization. This guidance included a sample project spreadsheet.</p>	<p>Coast Guard was unable to provide documentation to verify the use of a scoring approach that is transparent and auditable.</p> <p>Coast Guard was unable to provide documentation to verify the attendance of required board participants at meetings for prioritizing projects.</p> <p>Coast Guard was unable to provide documentation to verify use of standardized information or templates for board presentations. A partial sample spreadsheet was provided.</p>
Regional Depot-level maintenance (DLM) planning board	<p>The Coast Guard Civil Engineering Manual provides an overarching outline for how the Coast Guard is to make maintenance decisions and is to prioritize projects.</p>	<p>Coast Guard was unable to provide documentation to validate regional boards’ deliberations as it is not maintained per field officials.^a</p>

⁶⁰Without this information, we could not determine the extent to which the Coast Guard applied the criteria outlined in its planning board guidance, and accordingly, we could not evaluate the overall soundness of the process. In some instances, Coast Guard officials told us that documentation outlining the decision process, such as meeting notes or minutes from the PC&I central DLM and regional DLM planning board deliberations, did not exist.

Planning board	Guidance for project prioritization process	Extent to which Coast Guard verified, with documentation, that it followed its prioritization processes
Central DLM planning board	<p>According to Coast Guard guidance and officials, maintenance project inputs are to include details such as that project’s scope and why it should be a priority, for example, because it will improve safety or reduce operating costs. The guidance also calls for central DLM planning board members to review the lists of priority projects generated by Asset and Product line managers.</p> <p>The central DLM planning board is to make decisions by voting on whether to prioritize projects nominated primarily by the Product Line Managers. For example, the Tactical Operation Product Line Manager is to nominate projects pertaining to infrastructure such as piers, runways, or seawalls.</p>	<p>Coast Guard was unable to provide documentation to verify the inputs, priority justifications, or the review of priority projects from Asset and Product line managers.</p> <p>Coast Guard was unable to provide documentation, such as meeting minutes, to verify the nature or extent of board deliberations or its decision-making process.</p>

Source: GAO analysis of Coast Guard documents. | GAO-19-82

³Coast Guard headquarters officials told us they do not maintain documentation of the six regional planning boards’ project prioritization deliberations or issue instructions on how these planning boards are to be conducted. One of the 6 CEUs followed written guidance for conducting its regional planning board meetings and provided two examples of documentation related to its deliberations; the other five did not. Coast Guard officials we interviewed from 5 of 6 CEUs told us that decisions were generally consensus-based, but no documentation was provided to verify project prioritization decisions.

OMB guidance calls for agencies to use information to support decision-making, such as whether an asset is continuing to meet business needs and contribute to goals, and whether there are smarter or more cost effective ways to deliver the function.⁶¹ This guidance is comparable to the leading practice discussed above, which calls for agencies to establish clear maintenance and repair investment objectives and set priorities among outcomes to be achieved. Additionally, according to OMB, agencies are to have a plan for periodic, results-oriented evaluations of program effectiveness, and agencies should discuss the results of these evaluations when proposing reauthorizations.⁶²

Establishing guidance for planning boards to document project prioritization decision-making, as well as the impact of trade-off decisions, would allow agency decision makers, and Congress, to better understand Coast Guard priorities and how shore infrastructure project priorities might potentially affect other priorities. The Coast Guard was unable to provide documentation showing how it prioritized projects for a number of reasons, including that they didn’t have written guidance, documentation to verify the use of standardized meeting inputs such as presentations,

⁶¹Office of Management and Budget, *Circular A-11*.

⁶²Office of Management and Budget, *Circular A-94*.

and meeting minutes. Furthermore, officials could not explain why certain documentation was not maintained to demonstrate how the Coast Guard had made and prioritized funding decisions. Such documentation may allow the Coast Guard to show, for example, why repairing a station they previously wanted to close is a higher priority than fixing a station they appear to need to perform maintenance on certain assets (see fig. 3).

Figure 3: Coast Guard Maintenance Facilities Requiring Refurbishment Because They Cannot Accommodate Newer, Taller Boats



Source: GAO. | GAO-19-82

Employ Models for Predicting the Outcome of Investments, Analyzing Trade-offs, and Optimizing among Competing Investments

To ensure that investment decisions are aligned with agency missions and goals, agencies should employ models to predict the future condition and performance of its facilities as a portfolio, according to leading practices. Performance-prediction models predict the deterioration of building components over time and are important because certain facility components are particularly prone to deterioration or failure, thus requiring more frequent maintenance or repairs. A 2015 review of the Coast Guard’s asset management framework identified the benefit of analyzing tradeoffs between reactive and preventative maintenance and

described how preventative maintenance efforts could translate into cost savings.⁶³

Coast Guard officials provided one example of its efforts to model outcomes, but it did not meet this leading practice because it has not properly used the results of this model to optimize competing investments for that asset line or any other asset line or provided documentary evidence verifying that it properly applied it. In December 2017, a Coast Guard Aviation Pavement Study employed a model that found that the Coast Guard could more efficiently prioritize investment in aviation pavement. It also identified strategies to achieve a long-term sustainable pavement condition. A proposed fiscal year 2018 to 2020 Coast Guard aviation pavement maintenance and recapitalization plan proposed using the study results and recommended actions that it said could save the Coast Guard \$13.8 million by accelerating investment in aviation pavement sooner rather than deferring such maintenance and recapitalization.⁶⁴ According to Coast Guard officials, the analytical approach outlined in its 2017 study could be applied to all 13 of its shore infrastructure asset lines. However, the Coast Guard has not properly implemented a maintenance and recapitalization strategy based on the results of its aviation pavement plan, nor has it applied the analytical approach from this plan to other asset lines. Coast Guard officials told us they have not fully acted on the aviation pavement plan nor developed models for other asset lines. Specifically, a Coast Guard official described actions the agency is taking as piecemeal; 1 of 5 PC&I projects identified by their plan has been prioritized and funded. According to Coast Guard officials, the other pavement projects continue to be a priority for the asset line, but funding decisions have been deferred due to resource constraints and other competing priorities.⁶⁵ As a result of not properly implementing its plan, it is unclear if the Coast Guard will achieve the cost savings it projected. By not employing similar models across its asset lines for predicting the outcome of investments, analyzing trade-offs, and optimizing decisions among competing investments, the Coast Guard is

⁶³Jacobs, *U.S. Coast Guard Shore Infrastructure Mission Support Business Model*.

⁶⁴We could not verify the calculations, and the Coast Guard did not provide further documentation or details to support this assertion.

⁶⁵Coast Guard provided one example of a PC&I project they prioritized as a result of this plan, which was to cost \$3.8 million. However, they deferred prioritization decisions for four of the other PC&I projects required by this plan, which were to cost about \$24.3 million to conduct.

missing opportunities to potentially identify and achieve cost savings across other asset lines.

Structure Budgets to Identify Funding Allotted (1) for Routine Maintenance and Repair and (2) to Address Any Backlog of Deferred Maintenance and Repair Deficiencies Because Insufficient Levels of Such Funding Can Cause Agencies' Backlogs to Increase

According to leading practices, agencies should structure maintenance and repair budgets to differentiate between funding allotted for routine maintenance and repairs, and funding allotted to addressing maintenance and repair backlogs, to help ensure that underfunding does not affect the health and safety or reduce the productivity of employees, among other things. We found that Coast Guard budget requests did not provide Congress with accurate information about its funding needs. Specifically, we found that the Coast Guard did not meet this leading practice as its budget requests (1) have not clearly identified funding allotted for routine shore infrastructure maintenance needs, and (2) have not generally addressed deferred maintenance and repair deficiencies, resulting in increases to its backlogs. In addition, the Coast Guard has not included information in its Unfunded Priorities Lists and other related reports that clearly articulated trade-offs, or aligned with its requirements-based budget targets for shore infrastructure. Coast Guard officials were not able to tell us why they have not requested maintenance and repair funding to adequately address their shore infrastructure backlog of deferred maintenance and repair deficiencies.

First, we found that Coast Guard budget requests did not clearly identify funding allotted for routine shore infrastructure maintenance needs to address backlogs. Specifically, we found that budget requests related to shore infrastructure for fiscal years 2012 through 2019 did not provide Congress with required and complete information, as previously noted, necessary to inform decision-makers of the risks posed by untimely

investments in maintenance and repair backlogs.⁶⁶ While major maintenance and repair funding can be tracked within the Coast Guard's budget, funding for routine recurring maintenance for shore infrastructure is embedded in a budget account that is used for both maintenance and operational expenses. As a result, the Coast Guard could not disaggregate expenditures from this account or determine how much funding goes towards routine maintenance.⁶⁷

Second, we found that Coast Guard budget requests did not generally identify funding to address any backlogs of deferred maintenance or recapitalization, except for one fiscal year—2012—when the Coast Guard requested \$93 million to recapitalize deteriorated/obsolete facilities and address the highest priority Shore Facilities Requirements List backlog items. The 2012 budget request also noted that the health and maintenance of its shore facilities are foundational for the safe and effective execution of Coast Guard missions. However, the Coast Guard reported on some challenges to completing maintenance projects. For example, Coast Guard officials we interviewed stated that the annual Congressional Budget cycle has contributed to infrastructure management challenges because they are prohibited from signing contracts for maintenance projects during continuing resolutions. For example, since the fiscal year 2018 budget was not passed until March 2018, they had to rush during the summer, their busiest time of year, to establish contracts and work orders to ensure projects were funded before the end of the fiscal year on September 30th.

⁶⁶Coast Guard and Maritime Transportation Act, 2012, Pub. L. No. 112-213, § 213, 126 Stat. 1540, 1552-53 (codified as amended at 14 U.S.C. § 2902). The Coast Guard is statutorily required to provide a list of each unfunded priority, including unfunded shore infrastructure priorities, to certain committees of Congress to support the President's budget, and 5-year capital investment plan. The term 'unfunded priority' means a program or mission requirement that (1) has not been selected for funding in the applicable proposed budget; (2) is necessary to fulfill a requirement associated with an operational need; and (3) the Commandant would have recommended for inclusion in the applicable proposed budget had additional resources been available, or had the requirement emerged before the budget was submitted.

⁶⁷As noted previously, we previously recommended that OMB, in collaboration with agencies, collect and report information on funding spent to manage existing maintenance backlogs, among other things. OMB agreed with our recommendations and expects these actions to be completed by the fiscal year 2018 FRPP reporting cycle. Further, agencies, including the Coast Guard will have to develop processes for reporting (1) operations and (2) maintenance costs as separate data elements for the 2018 FRPP reporting cycle. [GAO-14-188](#).

Third, we found that the Coast Guard's annual Unfunded Priorities Lists and other reports, including their 5-Year CIP, did not clearly describe trade-offs. In July 2018, we reported that by continuing to manage its operational asset acquisitions through its annual budget process and 5-year CIP, the Coast Guard creates constant churn as program baselines must continually realign with budget realities, instead of budgets being formulated to support program baselines.⁶⁸ Coast Guard officials said that prioritization and trade-off decisions are made as part of the annual budget cycle, and that the shore infrastructure projects on its Unfunded Priorities List reflect the highest priorities for the department within the given top level funding.⁶⁹ However, the annual Unfunded Priorities List does not clearly articulate prioritization decisions, including information about trade-offs among competing project alternatives, as well as the impacts on missions conducted from shore facilities in disrepair that had not been prioritized in previous years. According to Coast Guard officials, and as we previously reported, such information is not included in the 5-Year CIP or Unfunded Priorities List because it is not statutorily required.⁷⁰ These information shortcomings are consistent with previous findings and recommendations that the DHS Office of Inspector General has made.⁷¹

⁶⁸We recommended that the Coast Guard work with Congress to include in its annual 5-year CIP a discussion of the acquisition programs it prioritized that describes how trade-off decisions could affect other acquisition programs, such as by delaying other recapitalization efforts. The Coast Guard agreed with this recommendation, but, as of August 2018, had not taken any action to implement it. [GAO-18-454](#).

⁶⁹Coast Guard officials told us that OMB gives the Coast Guard a specific dollar amount (i.e., top level funding level) around which they have to develop their budget. Coast Guard guidance for its PC&I planning board, discussed earlier in this report, establishes that near-term projects that meet an urgent need or are Congressionally-directed, among other things, are also to be prioritized when making trade-offs.

⁷⁰[GAO-18-454](#).

⁷¹In 2008, DHS's Office of Inspector General (OIG) found that Coast Guard funding for shore PC&I was well below industry standard—at 0.03% rather than the 2% standard for 2003-2006—and that as a result the Coast Guard had to use maintenance funds to execute PC&I projects, which the OIG reported could cause a critical situation with the structural integrity of Coast Guard shore facilities, and which, if uncorrected, could compromise the Coast Guard's overall operational capability. DHS's OIG also reported that in 2003 Congress appropriated almost twice what the Coast Guard requested. Department of Homeland Security Office of Inspector General, *Maintenance, Rehabilitation, and Upgrading of Shore Facilities in Support of United States Coast Guard Missions*, OIG-08-24 (Washington, D.C.: February 14, 2008).

Finally, we found that Coast Guard budget requests have not been aligned with its requirements-based budget targets for shore infrastructure. For example, we found that Coast Guard budget requests have not identified appropriations sufficient to meet its DLM maintenance and repair targets, which call for annual expenditures equal to two percent of plant replacement value. According to the Coast Guard, meeting its target for DLM would require allocating about \$260 to \$392 million annually for these repairs.⁷² Coast Guard officials told us that they have made difficult decisions to postpone necessary facility maintenance and construction projects in order to address other competing priorities related to mission execution, such as maintaining, operating, and recapitalizing its aging surface and air fleets. Between fiscal years 2012 and 2017, the Coast Guard reported that it expended an average of \$208 million per year on DLM, and officials stated that the Coast Guard never met its target during this time period. Similarly, Coast Guard budget requests have not been in alignment with its PC&I targets for recapitalization. For example, Coast Guard recapitalization targets show a far greater need for funding than the allotments from the appropriations it requested between fiscal years 2012 and 2019. Specifically, Coast Guard targets for recapitalization of shore assets indicate that \$290 to \$392 million in PC&I funding is needed annually. However, the Coast Guard budget requests for fiscal years 2012 through 2018 have ranged between about \$5 million and about \$99 million annually, as shown in Table 8.⁷³

⁷²The Shore Infrastructure Logistics Center's 2017 Annual Report lists the Coast Guard's required annual shore depot-level maintenance budget as \$260 million based on the Coast Guard Civil Engineering requirements-based budget. However, a senior Coast Guard official told us in May 2017 that Coast Guard estimates of its funding needs are based on using an industry and government standard of 2 percent of its shore infrastructure's plant replacement value annually, which was \$19.6 billion in 2017. Two percent of \$19.6 billion is about \$392 million.

⁷³The Coast Guard's civil engineering program began using a requirements-based budget standard in fiscal year 2016 which was not used in earlier years. However, had the Coast Guard implemented this standard before 2016, its budget requests would have to have been greater than \$290 million to align with this standard since the number and cost of projects on its PC&I backlog has remained relatively constant since 2012. We include this information as context for the differential between actual requests and what the standard would indicate was needed had it been in place.

Table 8: Coast Guard Allotments for Shore Procurement, Construction, & Improvements (PC&I) from its Appropriations, FY2012-2018 (in thousands)

Fiscal Year	2012	2013 ^a	2014	2015	2016	2017	2018
President's PC&I budget request	1,421,924	1,192,309	951,116	1,084,193	1,017,269	1,136,788	1,203,745
PC&I appropriation enacted	1,463,968	1,465,422	1,373,135	1,230,008	1,928,393	1,370,007	2,694,745
Shore infrastructure requirements-based budget (\$)	—	—	—	—	— ^b	290,000	290,000
Amount requested for shore infrastructure (\$)	99,192	20,000	5,000	24,580	46,900	23,100	10,000
Total allotted for shore infrastructure (\$)	119,192	4,755	5,000	24,580	129,600	44,519	44,519
Difference, if any, between amount allotted and requested (\$)	20,000	(15,245)	—	—	82,700	21,419 ^c	34,519

Legend: "—" = not applicable or no difference between amount requested and amount appropriated. FY = fiscal year.

Source: GAO analysis of U.S. Coast Guard documents. | GAO-19-82

Notes: Current year dollars. The FY 2019 President's budget request refers to PC&I which refers to Acquisition, Construction, and Improvements in the annual fiscal year appropriations. "Amount requested" represents the amount requested in the President's budget as identified in the Coast Guard's fiscal year congressional justifications.

^a2013 values reflect sequestration.

^bBeginning in 2016, Coast Guard began using a requirements-based budget to determine shore infrastructure budget needs and applied it for the first time with its fiscal year 2017 submission. According to this budgeting approach and Coast Guard officials, the Coast Guard needs between \$290 and \$400 million in PC&I funding each year to meet its recapitalization targets.

^cThe \$44.5 million allotted for fiscal year 2017 is about \$245 million less the \$290 million Coast Guard's requirements-based budget identified as needed for that fiscal year to manage its shore infrastructure and meet its target, and around \$21 million more than the Coast Guard requested.

Notwithstanding the mismatch between Coast Guard budget requests and its requirements-based budget targets, allotments for Coast Guard shore PC&I from its appropriations in fiscal years 2016 through 2018 exceeded the Coast Guard's requests. For example, in fiscal year 2016, the Coast Guard's allotment of \$130 million was almost three times the nearly \$47 million requested. In 2018, the almost \$45 million allotted was more than four times the \$10 million requested. Explanatory materials on the annual appropriations act for fiscal year 2018 indicated that the appropriated funding above requested amounts was to be used for modernization and recapitalization of facilities, and facility improvements, among other things.⁷⁴ Without accurate and transparent information about the Coast Guard's budgetary requirements, Congress will lack critical

⁷⁴In July 2018, we reported on similar gaps between funding requests and appropriations related to Coast Guard aircraft and cutter procurement. [GAO-18-454](#).

information that could help to prioritize funding to address the Coast Guard's shore infrastructure backlogs.

Conclusions

The Coast Guard's inventory of shore infrastructure assets is vast, aging, and vulnerable to damage from extreme weather. Many of these assets are also critical to the Coast Guard's operational mission performance. The Coast Guard has taken some steps to manage this infrastructure by implementing 3 of 9 leading practices for managing public sector maintenance backlogs—including identifying assets that are mission-critical, identifying risks posed by untimely investments, and identifying the primary methods for delivering maintenance and repair activities. However, significant work remains if the Coast Guard is going to make headway on reducing its backlog of at least \$2.6 billion. Fully implementing the three leading practices that the Coast Guard now partially meets could help ensure that it benefits from establishing timeframes for and enhancing its guidance, establishing its performance metrics, baselines, and targets, and shedding unneeded assets. Additionally, fully implementing the leading practices that it does not meet—including implementing new approaches for documenting its project prioritization decisions, developing models that could help identify cost savings, and providing Congress with transparent and requirements-based budget requests that clearly identify alternatives and trade-offs—could help the Coast Guard more efficiently manage existing resources and better position the Coast Guard and Congress to address the shore infrastructure challenges.

Recommendations for Executive Action

We are recommending the following six actions to the Coast Guard:

- The Commandant of the Coast Guard should direct the program managers to develop a plan with milestones and time frames for standardizing Coast Guard's facility condition assessments. (Recommendation 1)
- The Commandant of the Coast Guard should direct program managers to establish shore infrastructure performance goals, measures, and baselines to track the effectiveness of maintenance and repair investments and provide feedback on progress made. (Recommendation 2)

- The Commandant of the Coast Guard should work with Congress to develop and implement a process to routinely align Coast Guard's shore infrastructure portfolio with mission needs, including by disposing of all unneeded assets. (Recommendation 3)
- The Commandant of the Coast Guard should establish guidance for planning boards to document inputs, deliberations, and project prioritization decisions for infrastructure maintenance projects. (Recommendation 4)
- The Commandant of the Coast Guard should employ models for its asset lines for predicting the outcome of investments, analyzing trade-offs, and optimizing decisions among competing investments. (Recommendation 5)
- The Commandant of the Coast Guard should include supporting details about competing project alternatives and report trade-offs in Congressional budget requests and related reports. (Recommendation 6)

Agency Comments and Our Evaluation

We provided a draft of this report to DHS for review and comment. In its comments, reproduced in appendix III, DHS concurred with our recommendations. DHS, through the Coast Guard, also provided technical comments, which we incorporated as appropriate.

DHS concurred with our first recommendation that the Commandant of the Coast Guard direct program managers to develop a plan with milestones and time frames for standardizing the Coast Guard's facility condition assessments. DHS stated that the Coast Guard plans to complete a standardized facility condition assessment by December 2019. However, to fully implement the recommendation, the Coast Guard needs to ensure that it standardizes the process for conducting facility assessments—action that goes beyond completing a singular standardized facility assessment.

DHS concurred with our second recommendation that the Commandant of the Coast Guard direct program managers to establish shore infrastructure performance goals, measures, and baselines to track the effectiveness of maintenance and repair investments and provide feedback on progress made. DHS stated that the Coast Guard plans to develop initial shore infrastructure measures with associated goals and baselines during its annual strategic planning process and expects to complete this process in March 2020.

DHS concurred with our third recommendation that the Commandant of the Coast Guard work with Congress to develop and implement a process to routinely align the Coast Guard's shore infrastructure portfolio with mission needs, including by disposing of all unneeded assets. DHS stated that the Coast Guard plans to establish, by June 2020, a process to assess current and projected operational and mission support needs to identify and recommend disposal of unneeded land, buildings, and structures. The Coast Guard reported that in the interim it will continue to communicate with Congress about unneeded assets through its required annual Conveyance of Coast Guard Real Property Report. The Coast Guard reported that in the interim it will continue to communicate with Congress about unneeded assets through its required annual Conveyance of Coast Guard Real Property Report.

DHS concurred with our fourth recommendation that the Commandant of the Coast Guard establish guidance for planning boards to document

inputs, deliberations, and project prioritization decisions for infrastructure maintenance projects. DHS stated that the Coast Guard plans to review existing guidance and issue updates as necessary and that promulgation of this guidance for its next planning boards will be completed by December 2019. To fully implement this recommendation, the Coast Guard needs to ensure that its guidance requires that inputs, deliberations, and project prioritization decisions for these boards are all fully documented.

DHS concurred with our fifth recommendation that the Commandant of the Coast Guard employ models for its asset lines for predicting the outcome of investments, analyzing trade-offs, and optimizing decisions among competing investments. DHS stated that the Coast Guard plans to assess the use of modeling tools used by the Department of Defense as well as other alternatives to enhance its real property asset management capability. DHS stated that the Coast Guard expects to complete its initial identification of alternatives in December 2019 and complete its examination of alternatives in December 2020.

DHS concurred with our sixth recommendation that the Commandant of the Coast Guard include supporting details about competing project alternatives and report trade-offs in Congressional budget requests and related reports. DHS stated that the Coast Guard plans to submit future budget proposals based on OMB guidance and will include additional information in its Congressionally-mandated future Unfunded Priorities Lists. To fully implement this recommendation, the Coast Guard needs to ensure it includes supporting details about competing project alternatives and report on trade-offs, as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretary of the Department of Homeland Security, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or AndersonN@gao.gov. GAO staff who made key contributions to this report are listed in appendix IV.

A handwritten signature in black ink, reading "Nathan Anderson". The signature is fluid and cursive, with the first name "Nathan" being larger and more prominent than the last name "Anderson".

Nathan J. Anderson
Acting Director, Homeland Security and Justice Issues

Appendix I: Objectives, Scope, and Methodology

The objectives of this report are to evaluate (1) what is known about the condition and costs of managing the Coast Guard's shore infrastructure, and (2) the extent to which the Coast Guard's process for managing its shore infrastructure meets leading practices for managing public maintenance backlogs.

To identify what is known about the condition and costs of managing the Coast Guard's shore infrastructure, we reviewed three Coast Guard annual reports on shore infrastructure, issued for 2015 through 2017.⁷⁵ We also reviewed Coast Guard documentation and data on its shore infrastructure inventory to describe the condition and costs of managing these assets. To measure the size of the Coast Guard's total backlog, we examined the Coast Guard's shore Acquisition, Construction, & Improvements (AC&I)⁷⁶ backlog of projects the Coast Guard has identified as necessary to fulfill its missions (i.e., its Shore Facilities Requirements List) from fiscal years 2012 through 2018,⁷⁷ as well as its

⁷⁵This review excludes Waterways Operations (fixed and floating aids to navigation (ATON) and signal equipment) which are a different type of asset used to mark federal waterways to safeguard maritime safety and commerce, to focus on the other Coast Guard shore infrastructure. In 2017, the Coast Guard reported that its fixed and floating ATON, such as lighthouses and buoys, included more than 58,000 assets, and that its marine environmental response and signal equipment, such as radar signaling devices, included more than 76,000 assets.

⁷⁶The Coast Guard began using the Department's Common Appropriations Structure in its 2019 President's Budget. The Acquisition, Construction, and Improvements (AC&I) appropriation transitioned to the new Procurement, Construction, and Improvements (PC&I) appropriation. PC&I provides for the acquisition, procurement, construction, rebuilding, and improvement of shore facilities and military housing, as well as vessels, aircraft, and other assets.

⁷⁷We selected 2012 as the starting point for our review because the Coast Guard established its current organizational structure in that year, and also completed an inventory of all of its owned (not leased) real property that year, thereby providing an established baseline of data. We selected 2018 as the endpoint as it is the latest year for which data were available. Coast Guard officials told us they pull information from the PC&I backlog lists in June each year to develop the fiscal year Unfunded Priorities List of shore infrastructure projects, therefore we obtained this information as of June of each year to provide a comparative snapshot for 2012 through 2018.

depot-level maintenance backlog as of March 2018.⁷⁸ We also reviewed planning and budget documents to determine how the backlog has changed over time. To identify the appropriation targets the Coast Guard identified as needed to address these backlogs, we reviewed guidance and budget data for the three appropriations related to shore infrastructure, reviewed planning and budget documents such as Coast Guard's annual Unfunded Priorities List—which are lists of projects the Coast Guard would undertake if funding were available—and the Coast Guard's annual Congressional Budget Justifications for fiscal years 2012 through 2019, to demonstrate how the backlog has changed over time relative to budgeted funds. We also interviewed Coast Guard officials at headquarters and in the field to obtain their perspectives on the appropriation targets and budget formulation process.

To obtain additional information about the condition of the Coast Guard's infrastructure in different parts of the country, we interviewed officials from each of the Coast Guard's six geographically-organized Civil Engineering Units (CEUs), which are responsible for implementing both District and Headquarters directives. We also interviewed officials from the Coast Guard's two geographically-defined Area Commands—Pacific Area (PACAREA) and Atlantic Area (LANTAREA), who vote on the Procurement, Construction and Improvements (PC&I) and central DLM planning boards. To review the Coast Guard's longer-term planning process for its shore infrastructure, we reviewed the Coast Guard's 5-year Capital Investment Plan and interviewed agency officials.

To assess the reliability of the Coast Guard's data discussed in this report, we interviewed knowledgeable agency officials, reviewed documentation, and electronically tested the data for obvious errors and anomalies. Specifically, we interviewed Coast Guard officials and discussed the mechanisms they use to assess the quality of their data and the extent to which Coast Guard employs quality control mechanisms, such as automated edit checks. Additionally, in August 2018, the Coast Guard informed us that its data on its shore infrastructure may not be complete if field inspectors did not identify problems at the facilities they inspected. Coast Guard officials also told us in July 2018

⁷⁸ Depot-level maintenance (DLM) is non-recurring major maintenance beyond the capability and authority of a local Coast Guard unit to execute. We selected March 2018 as a point in time based on the availability of Coast Guard data to provide a snapshot of this backlog and because it was the most recent data available at the time we requested this data for our review.

that not all projects on the Coast Guard's PC&I backlog have cost estimates. As a result, the amount of funding needed to address the Coast Guard's backlog of shore infrastructure projects could be understated because the Coast Guard has not identified all deficiencies that exist at its facilities nor estimated the cost to fix all of the deficiencies it knows about. Despite these limitations, we determined that the Coast Guard's data are sufficiently reliable for the purposes of reporting on the Coast Guard's overall portfolio of shore infrastructure assets and the minimum amount of money the Coast Guard identified as needed to complete deferred repair and PC&I projects.

To identify leading practices for managing backlogs of deferred maintenance projects, we reviewed our prior work and the literature on deferred maintenance and repair as it pertains to federal real property portfolios. In our prior work, we identified nine leading practices based on studies conducted by the National Research Council (NRC) of the National Academy of Sciences⁷⁹ between 1998 and 2012.⁸⁰ These studies were (1) *Stewardship of Federal Facilities: A Proactive Strategy for Managing the Nation's Public Assets (1998)*; (2) *Investments in Federal Facilities: Asset Management Strategies for the 21st Century (2004)*; (3) *Predicting Outcomes from Investments in Maintenance and Repair for Federal Facilities (2012)*. As we previously reported, the nine leading practices we employed were the ones we identified as being the most relevant and appropriate to federal agencies managing their deferred maintenance and repair backlogs, however these practices do not represent all actions that federal agencies can employ to improve management of their real property to include their real property maintenance and repair backlogs.

To evaluate the extent to which the Coast Guard's process for managing its shore infrastructure met leading practices for managing public maintenance backlogs, we analyzed Coast Guard plans, policies, procedures, and related laws for managing, maintaining and repairing shore infrastructure. We identified and analyzed Coast Guard guidance on its decision-making process for determining maintenance and repair

⁷⁹The National Academy of Sciences comprises four organizations: the National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council (NRC).

⁸⁰GAO, *Federal Real Property: Improved Transparency Could Help Efforts to Manage Agencies' Maintenance and Repair Backlogs*, [GAO-14-188](#) (Washington, D.C.: January 23, 2014).

decisions, and assessed Coast Guard practices against our main criteria, the leading practice discussed above. We also compared Coast Guard practices with the Office of Management and Budget's (OMB) program evaluation and capital programming guidance.⁸¹

We used the following scale to evaluate the Coast Guard's management of its shore infrastructure deferred maintenance and repair:

- **Met**—The Coast Guard properly considered the leading practice and demonstrated with documentary evidence that it had fully applied it.
- **Partially Met**—The Coast Guard properly considered and demonstrated with some documentary evidence that it had applied the leading practice to some extent.
- **Not Met**—The Coast Guard did not properly consider or apply the leading practice and had no documentary evidence verifying that it had applied it.

To further our understanding of the Coast Guard's process for prioritizing PC&I and deferred maintenance projects and the extent to which Coast Guard actions aligned with the aforementioned leading practices, we interviewed knowledgeable Coast Guard officials with a role in making or implementing decisions related to shore infrastructure to obtain their perspectives. Specifically, we interviewed officials from Coast Guard units to (1) obtain information about local conditions and maintenance practices, and/or to (2) obtain information on the experiences these officials had pertaining to the PC&I planning board, central DLM planning board, and/or regional DLM planning board processes. We interviewed officials from all six of the Coast Guard's regional Civil Engineering Units (CEU) which are responsible for assessing the condition of Coast Guard's shore infrastructure to obtain their perspectives on this topic and to determine the extent to which data from one CEU is comparable to data from another. We also interviewed officials from the Atlantic and Pacific Areas in order to obtain a high-level regional perspective on requirements, conditions, and planning efforts. To evaluate how Coast Guard leadership assesses the condition of its infrastructure and makes trade-offs between competing projects, we also interviewed officials from Coast Guard headquarters units which oversee Coast Guard's shore

⁸¹Office of Management and Budget, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, OMB Circular A-94 (Washington, D.C.: 1992). Office of Management and Budget, *Preparation, Submission, and Execution of the Budget*, OMB Circular A-11 (Washington, D.C.: 2018).

infrastructure. These interviews included officials from the Office of Civil Engineering, the Shore Infrastructure Logistics Center, the Facilities Operations & Support Division, and the Office of the Assistant Commandant for Capability.

To identify examples of (1) what is known about the condition and costs of managing the Coast Guard's shore infrastructure, and (2) obtain information about the Coast Guard's process for managing its shore infrastructure, we conducted a site visit to Coast Guard Base Alameda in Alameda, CA. The selection of Base Alameda for our site visit was based on the concentration there of regional Coast Guard leadership and Coast Guard facilities. Our findings from our Base Alameda site visit are not generalizable to other Coast Guard facilities. Additionally, because the Coast Guard personnel we interviewed were not necessarily performing the same function or role, or even stationed in Alameda, for all years covered by our review (2012-2018), our findings from these interviews are not necessarily generalizable across time. Taken as a whole, however, our site visit provided us with insights into the condition of the Coast Guard's shore infrastructure and into the processes the Coast Guard uses to maintain, repair, and replace these assets.

We conducted this performance audit from November 2017 to February 2019 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: Characteristics of Coast Guard's Shore Infrastructure Procurement, Construction, and Improvements Backlog

This appendix provides summary statistics for the Coast Guard's Procurement, Construction, and Improvements (PC&I) backlog as of June, for 2012 through 2018.¹ Table 9 provides details of individual shore infrastructure projects on the PC&I backlog, table 10 provides details of aids to navigation and projects that were grouped together by the Coast Guard for planning purposes, and table 11 sums values in tables 9 and 10.

Table 9: Number, Value, and Statistical Details of Individual Projects with Cost Estimates on the Coast Guard's Shore Infrastructure Procurement, Construction, and Improvements Backlog, 2012 through 2018 (\$ in thousands)

	Fiscal Year						
	2012	2013	2014	2015	2016	2017	2018
Number of projects with cost estimates	131	131	126	120	99	94	98
Value (\$)	1,637,738	1,595,202	1,515,856	1,521,546	1,558,200	1,500,500	1,666,928
Minimum (\$)	783	783	0	783	1,100	1,100	2,000
Maximum (\$)	57,200	57,200	57,200	57,200	95,600	90,100	95,600
Average (\$)	12,502	12,177	12,031	12,680	15,739	15,963	17,009

Source: GAO analysis of Coast Guard data. | GAO-19-82

Note: Current year dollars. Excludes Aids to Navigation, design estimates, and projects grouped together. Excludes projects that do not have cost estimates. A Coast Guard official told us they pull information from the PC&I backlog lists in June each year to develop the Unfunded Priorities List of shore infrastructure projects, therefore we obtained this information to provide a comparative snapshot for 2012 through 2018.

¹A Coast Guard official told us they pull information from the PC&I backlog lists in June each year to develop its Unfunded Priorities List of shore infrastructure projects, therefore we obtained this information to provide a comparative snapshot for 2012 through 2018.

**Appendix II: Characteristics of Coast Guard's
Shore Infrastructure Procurement,
Construction, and Improvements Backlog**

Table 10: Number, Value, and Statistical Details of Aids to Navigation (ATON) and Other Projects with Cost Estimates on the Coast Guard's Shore Infrastructure Procurement, Construction, and Improvements Backlog, 2012 through 2018 (\$ in thousands)

	Fiscal Year						
	2012	2013	2014	2015	2016	2017	2018
Number of ATON and other projects	13	6	8	10	16	4	27
Value (\$)	189,176	68,176	73,176	89,176	98,810	47,700	107,300
Minimum(\$)	1,000	1,000	500	500	410	4,350	500
Maximum (\$)	50,000	23,000	23,000	25,000	28,000	26,400	28,000
Average (\$)	14,552	11,363	9,147	8,918	6,176	11,925	3,974

Source: GAO analysis of Coast Guard data. | GAO-19-82

Note: Current year dollars. Excludes individual projects. Excludes projects that do not have cost estimates. A Coast Guard official told us they pull information from the PC&I backlog lists in June each year to develop the Unfunded Priorities List of shore infrastructure projects, therefore we obtained this information to provide a comparative snapshot for 2012 through 2018.

Table 11: Total Number of Projects with Cost Estimates and the Value the Coast Guard's Shore Infrastructure Procurement, Construction, and Improvements (PC&I) Backlog, 2012 through 2018 (\$ in thousands)

	Fiscal Year						
	2012	2013	2014	2015	2016	2017	2018
Number of individual, ATON, and other shore PC&I projects with cost estimates	144	137	134	130	115	98	125
Value of shore PC&I Backlog (\$)	1,826,914	1,663,378	1,589,032	1,610,722	1,657,010	1,548,200	1,774,228

Source: GAO analysis of Coast Guard data. | GAO-19-82

Note: Current year dollars. Excludes projects that do not have cost estimates. A Coast Guard official told us they pull information from the PC&I backlog lists in June each year to develop the Unfunded Priorities List of shore infrastructure projects, therefore we obtained this information to provide a comparative snapshot for 2012 through 2018.

Appendix III: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528



**Homeland
Security**

February 5, 2019

Nathan J. Anderson
Acting Director, Homeland Security and Justice
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Management Response to Draft Report: GAO-19-82, "COAST GUARD SHORE
INFRASTRUCTURE: Applying Leading Practices Could Help Better Manage
Project Backlogs of At Least \$2.6 Billion"

Dear Mr. Anderson:

Thank you for the opportunity review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO) work in planning and conducting its review and issuing this report.

The Department is pleased to note GAO's recognition that the Coast Guard is meeting or partially meeting six of nine leading practices for managing public infrastructure maintenance and repair backlogs; an important step toward increased transparency and more effective management of maintenance backlogs. The Coast Guard is committed to continuing to mature the management of its shore infrastructure portfolio to more efficiently govern existing resources and better address shore infrastructure challenges.

The draft report contained six recommendations with which the Department concurs. Attached find our detailed response to each recommendation. Technical comments were previously provided under separate cover.

Again, thank you for the opportunity to review and comment on this draft report. Please feel free to contact me if you have any questions. We look forward to working with you again in the future.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim H. Crumpacker".

JIM H. CRUMPACKER, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

Attachment

**Attachment: Management Response to Recommendations
Contained in GAO-19-82**

GAO recommended that the Commandant of the Coast Guard:

Recommendation 1: Direct the program managers to develop a plan with milestones and time frames for standardizing Coast Guard's facility condition assessments.

Response: Concur. The Coast Guard Office of Civil Engineering is working to complete a standardized facility condition assessment. Estimated Completion Date (ECD): December 31, 2019.

Recommendation 2: Direct program managers to establish shore infrastructure performance goals, measures, and baselines to track the effectiveness of maintenance and repair investments and provide feedback on progress made.

Response: Concur. The Coast Guard Office of Civil Engineering will develop initial shore infrastructure measures with associated goals and baselines during the annual strategic planning process. ECD: March 31, 2020.

Recommendation 3: Work with the Congress to develop and implement a process to routinely align Coast Guard's shore infrastructure portfolio with mission needs, including by disposing of all unneeded assets.

Response: Concur. The Coast Guard Office of Civil Engineering will establish a formalized process to assess current and projected operational and mission support needs to identify and recommend disposal of unneeded land, buildings and structures. In the interim, the Coast Guard will continue to communicate unneeded assets with Congress through the annual Conveyance of Coast Guard Real Property Report as required by Section 688 of Title 14, United States Code. The next Congressional report will be delivered by July 31, 2019. ECD: June 30, 2020.

Recommendation 4: Establish guidance for planning boards to document inputs, deliberations, and project prioritization decisions for infrastructure maintenance projects.

Response: Concur. The Coast Guard Office of Civil Engineering will review existing process guides for planning boards and issue updates as necessary, to include developing specific guidance for regional planning boards. The Coast Guard will continue to provide formal guidance to future central and regional planning boards. Promulgation of guidance for the next central and regional planning boards will be completed by December 31, 2019. ECD: December 31, 2020.

Recommendation 5: Employ models for its asset lines for predicting the outcome of investments, analyzing trade-offs, and optimizing decisions among competing investments.

Response: Concur. The Coast Guard Office of Civil Engineering is assessing the use of modeling tools used by the Department of Defense as well as other existing off-the-shelf alternatives to enhance its real property asset management capability. Initial identification of alternative tools is expected to be completed by December 31, 2019. An examination of the alternatives will then be conducted to inform the viability of future use or procurement of these modeling tools. ECD: December 31, 2020.

Recommendation 6: Include supporting details about competing project alternatives and report trade-offs in Congressional budget requests and related reports.

Response: Concur. DHS and the Coast Guard will continue to develop and submit budgets based on OMB Circular A-11, "Preparation, Submission & Execution of the Budget." This circular outlines what is required in a budget justification (see Section 51), as well as the confidentiality of budget deliberations (see Section 22.1). A copy of the current A-11 can be found at <https://www.whitehouse.gov/wp-content/uploads/2018/06/a11.pdf>.

The Coast Guard Office of Budget and Programs will include additional information in future Unfunded Priorities Lists (UPL), as appropriate. The UPL is a congressionally mandated report that provides an opportunity for the Coast Guard to highlight additional projects they would like to complete which were not included in the current year budget. ECD: December 31, 2019.

Appendix IV: GAO Contact and Staff Acknowledgements

GAO Contact

Nathan J. Anderson, (202) 512-3841 or andersonn@gao.gov.

Staff Acknowledgements

In addition to the contact above, Dawn Hoff (Assistant Director), Andrew Curry (Analyst-in-Charge), Michael Armes, John Bauckman, Chuck Bausell, Rick Cederholm, Billy Commons, John Crawford, Michele Fejfar, Peter Haderlein, Eric Hauswirth, Landis Lindsey, Michael Pinkham, Maria Mercado, Jan Montgomery, Forrest Rule, Christine San, and Adam Vogt made key contributions to this report.

Appendix V: Accessible Data

Data Tables

Data Table for Value of Coast Guard’s Backlog of Recapitalization and New Construction Projects, Fiscal Years 2012-2018

Fiscal Year	Value of projects with cost estimates	Number of projects with cost estimates
2012	1.83	144
2013	1.66	137
2014	1.59	134
2015	1.61	130
2016	1.66	115
2017	1.55	98
2018	1.77	125

Data Table for Figure 2: Coast Guard’s Reported Number of Projects and Estimated Value of its Procurement, Construction and Improvements Backlog of Shore Infrastructure Projects, Fiscal Years 2012 through 2018

Fiscal Year	Value of projects with cost estimates	Number of projects with cost estimates
2012	1.83	144
2013	1.66	137
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2015	1.61	130
2016	1.66	115
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2018	1.77	125

Agency Comment Letter

Text of Appendix III: Comments from the Department of Homeland Security

Page 1

February 5, 2019

Nathan J. Anderson
Acting Director, Homeland Security and Justice
U.S. Government Accountability Office 441 G Street, NW
Washington, DC 20548

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Director
Departmental GAO-OIG Liaison Office

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Page 2

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Page 3

Recommendation 5:

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Washington, DC 20548