



April 2019

MILITARY DEPOTS

Actions Needed to Improve Poor Conditions of Facilities and Equipment that Affect Maintenance Timeliness and Efficiency

GAO Highlights

Highlights of [GAO-19-242](#), a report to the Committee on Armed Services, U.S. Senate

Why GAO Did This Study

The military services' 21 depots maintain the readiness of critical weapon systems such as ships, aircraft, and tanks needed for military operations. The condition of depot facilities and equipment directly affects the timeliness of maintenance and the readiness of the weapon systems they repair. The services have invested over \$13 billion in the depots from fiscal year 2007 to fiscal year 2017.

Senate Report 115-125 included a provision for GAO to examine the services' investment in and performance of their depots. GAO evaluated (1) the condition of depot facilities and equipment, their relationship to depot performance, and the services' tracking of the relationship to depot performance and (2) the extent to which DOD and the services have developed an approach for guiding depot investments to address key challenges. GAO also provides an overview summary for each depot. GAO reviewed data from fiscal years 2007 through 2017 on depot investment, performance, and the age and condition of facilities and equipment; reviewed agency guidance; and interviewed DOD, service, and depot officials.

What GAO Recommends

GAO is making 13 recommendations to improve data collection on the effect of facilities and equipment condition on depot performance, and develop plans that incorporate key elements to guide depot investments. DOD concurred with 12 recommendations, but did not agree to monitor and report on depot investments. We continue to believe monitoring and reporting will enhance DOD's efforts to improve its depots.

View [GAO-19-242](#). For more information, contact Diana Maurer at (202) 512-9627 or maurerd@gao.gov.

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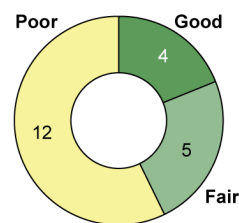
Actions Needed to Improve Poor Conditions of Facilities and Equipment That Affect Maintenance Timeliness and Efficiency

What GAO Found

The condition of facilities at a majority of the Department of Defense's (DOD) depots is poor and the age of equipment is generally past its useful life, but the services do not consistently track the effect that these conditions have on depot performance. Twelve of the 21 depots GAO reviewed—more than half—had "poor" average facility condition ratings (see figure). Some facilities also serve functions for which they were not designed, reducing their efficiency. In addition, the average age of depot equipment exceeded its expected useful life at 15 of the 21 depots. These factors contributed, in part, to a decline in performance over the same period. From 2007 to 2017, performance at the depots generally declined, reducing the availability of the weapon systems repaired for training and operations. Optimizing facilities and equipment at the depots can improve their maintenance efficiency. For example, the Navy estimates that its shipyard optimization effort will save over 325,000 labor days per year, which would allow an additional submarine overhaul annually. However, the services lack data on the effect that facilities and equipment conditions have on maintenance delays, hindering DOD's ability to effectively target investments to the highest priorities.

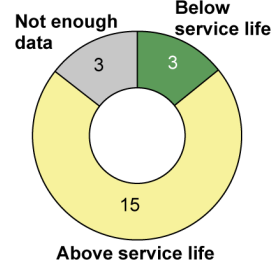
Summary of Facilities, Equipment, and Performance at 21 Service Depots

Facility condition » As of fiscal year 2017



No depots were designated as "failing"

Equipment age » As of fiscal year 2017



Performance » Fiscal years 2007 through 2017

- Navy shipyards**
45% increase in days of maintenance delay
- Navy aviation**
45% on-time decrease
- Air Force**
17% on-time decrease
- Marine Corps**
Less than 1% decrease in meeting planned production
- Army**
Not enough data

Source: GAO analysis of service depot data. | GAO-19-242

DOD and the services' approach for managing investments to improve the efficiency and effectiveness of its depots lacks elements important to addressing key challenges. The services have efforts underway to complete their plans by February 2019 to address their depots' facility and equipment needs. However, GAO found that these plans are preliminary and will not include key elements, such as analytically-based goals; results-oriented metrics; a full accounting of the resources, risks, and stakeholders; and a process for reporting on progress. Addressing the poor conditions at DOD's 21 depots will cost billions and require sustained management attention over many years. However, the DOD office responsible for depot policy does not monitor or regularly report on depot improvement efforts to DOD decision makers and Congress. Until DOD and the services incorporate these key elements into the management approach for their depot investments, they risk continued deterioration of the depots, hindering their ability to meet the Secretary of Defense's goals for improving readiness and reducing operating and support costs.

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Abbreviations

ASD	Assistant Secretary of Defense
DOD	Department of Defense
FRC	Fleet Readiness Center
ALC	Air Logistics Complex
DLA	Defense Logistics Agency

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April 29, 2019

The Honorable James M. Inhofe
Chairman
The Honorable Jack Reed
Ranking Member
Committee on Armed Services
United States Senate

The Department of Defense (DOD) operates public industrial installations that maintain, overhaul, and repair its multitude of complex weapon systems and equipment. This mix of weapon systems and their maintenance needs is continually changing as new weapon systems replace older ones and systems in the field are modified with newer and better technologies. To maintain these systems and equipment, DOD uses a combination of private-sector contractors and public industrial installations that are government-owned and government-operated. These public industrial installations, known as depots, employ over 80,000 civilians, and are crucial to maintaining military readiness by ensuring that the services can regularly repair critical weapon systems and return them to the warfighter for their use in training and operations.¹ DOD annually requests appropriations from Congress for investment in these depots and, from fiscal year 2007 to fiscal year 2017, the Army, Navy, Air Force, and Marine Corps have collectively invested over \$13 billion in their depots.²

In fiscal year 2007, Congress enacted a law requiring each military department to invest in the capital budgets of its depots no less than 6 percent of the average total dollar value of the combined maintenance, repair, and overhaul workload to its depots for the preceding 3 fiscal years.³ In this report, we refer to the 6 percent minimum investment requirement as the “6 percent rule.” The capital budget of a depot includes funds to modernize or improve the efficiency of depot facilities,

¹The term “depots” will refer to all 21 installations reviewed in this report, including the Army’s depots and arsenals, the Navy’s shipyards and fleet readiness centers (FRCs), the Air Force’s air logistics complexes (ALCs), and the Marine Corps’ production plants.

²The services have invested \$13 billion in non-inflation adjusted dollars.

³*John Warner National Defense Authorization Act for Fiscal Year 2007*, Pub. L. No. 109-364, § 332 (2006), codified at 10 U.S.C. § 2476.

equipment, work environment, or processes in direct support of depot operations.⁴ The law prohibits using funds spent for sustainment of existing facilities, infrastructure, or equipment towards meeting the 6 percent investment minimum.

Recognizing that existing depot facilities may not be ideally configured to efficiently and effectively support the services' readiness needs, Senate Report 115-262, accompanying a proposed bill for the National Defense Authorization Act for Fiscal Year 2019, included a provision directing the Secretaries of the Army, Navy and Air Force to submit an engineering master plan for optimal placement and consolidation of facilities and major equipment, as well as an investment strategy addressing the facilities, major equipment and infrastructure requirements of depots under the jurisdiction of each service.⁵

Senate Report 115-125, accompanying a proposed bill for the National Defense Authorization Act for Fiscal Year 2018, included a provision for us to examine the investment in and performance of the service depots. The objectives of this report are to evaluate: 1) the condition of depot facilities and equipment, their relationship to depot performance, and the services' tracking of the relationship to depot performance; and 2) the extent to which DOD and the services have developed an approach for guiding depot investments to address key challenges. In appendix I, we report that the services generally met their minimum depot investments under the 6 percent rule and whether they have included funds spent for sustainment of existing facilities, infrastructure, or equipment towards meeting their 6 percent requirement. Additionally, in appendixes II–XXII we provide summary overviews of each depot's performance, and the condition of their facilities and equipment. We have also provided DOD's comments in appendix XXIV.

For our first objective, we analyzed service reports and performance metrics for the 21 depots from fiscal year 2007 through fiscal year 2017.⁶

⁴Capital budget is defined at 10 U.S.C. § 2476(b).

⁵Throughout this report, we refer to these plans as "optimization plans."

⁶Fiscal year 2007 was the first year that statutorily required summary reports on the level of investment made by each military department became available. The reports contain information regarding any impediments to achieving 6 percent investment; a description of benchmarks and measurement methods for investment at each depot; and an explanation and action plan if the 6 percent requirement was not achieved. Fiscal year 2017 is the latest year these reports are available.

These metrics included facility condition ratings, facility age, facility restoration and modernization backlogs, number of facility repairs, equipment age, number of equipment repairs, and a number of depot performance metrics relating to timeliness of repairs. We also reviewed DOD and service guidance and interviewed service depot, sustainment, and budget officials to obtain an understanding of how they manage the depot investment process and identify funds spent for sustainment of existing facilities, infrastructure, or equipment. We also evaluated data on maintenance delays, including the extent to which this data identifies facilities and equipment conditions at the depots as a cause of delays. In addition, we spoke with service officials about maintenance delays and the ability of the services to collect this data.

For our second objective, we reviewed depot metrics and discussed with officials any challenges to meeting service operational needs, and analyzed service investment plans and processes to assess their use of results-oriented management elements.⁷ This review included visits to three of the 21 depots (selected by resources and availability), the service materiel commands, and the Office of the Deputy Assistant Secretary of Defense for Materiel Readiness.

To determine whether the military departments are complying with the requirements of the 6 percent rule, we reviewed service reports on compliance and validated compliance through assessments of the reliability of the service data. To determine whether the funds identified for capital budget activities by the military departments included funds spent on sustainment of existing facilities, infrastructure, or equipment, we reviewed project investment lists to identify projects with potential for including sustainment activities and reviewed approved project proposals to identify any sustainment funds included. This list was verified by the sustainment officials as sustainment or non-sustainment. A detailed discussion of our scope and methodology is in appendix XXIII.

⁷Our previous work has identified the following as elements of a results-oriented management approach: (1) mission statement; (2) problem definition, scope and methodology; (3) goals, objectives, activities, milestones, and performance measures; (4) resources and investments; (5) organizational roles, responsibilities, and coordination; (6) key external factors that could affect achievement of the goal; (7) demonstrating management commitment; (8) communicating performance information frequently and effectively; (9) aligning goals, objectives, and measures; and (10) developing the capacity to use performance information. For the purposes of this report, we have accounted for the overlapping nature of these 10 elements by summarizing them into six key elements relevant here.

To assess the reliability of the data used in this report, we reviewed systems documentation and interviewed officials to understand system operating procedures, organizational roles and responsibilities, and error checking mechanisms. We also conducted our own error checks to look for inaccurate or questionable data and discussed with officials any data irregularities we found. We conducted these assessments on 13 systems, which are further discussed in appendix XXIII. We found the data that we used from these systems to be sufficiently reliable for the purposes of summarizing trends in the selected facility, equipment, and performance metrics reported.

We conducted this performance audit from August 2017 to April 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.

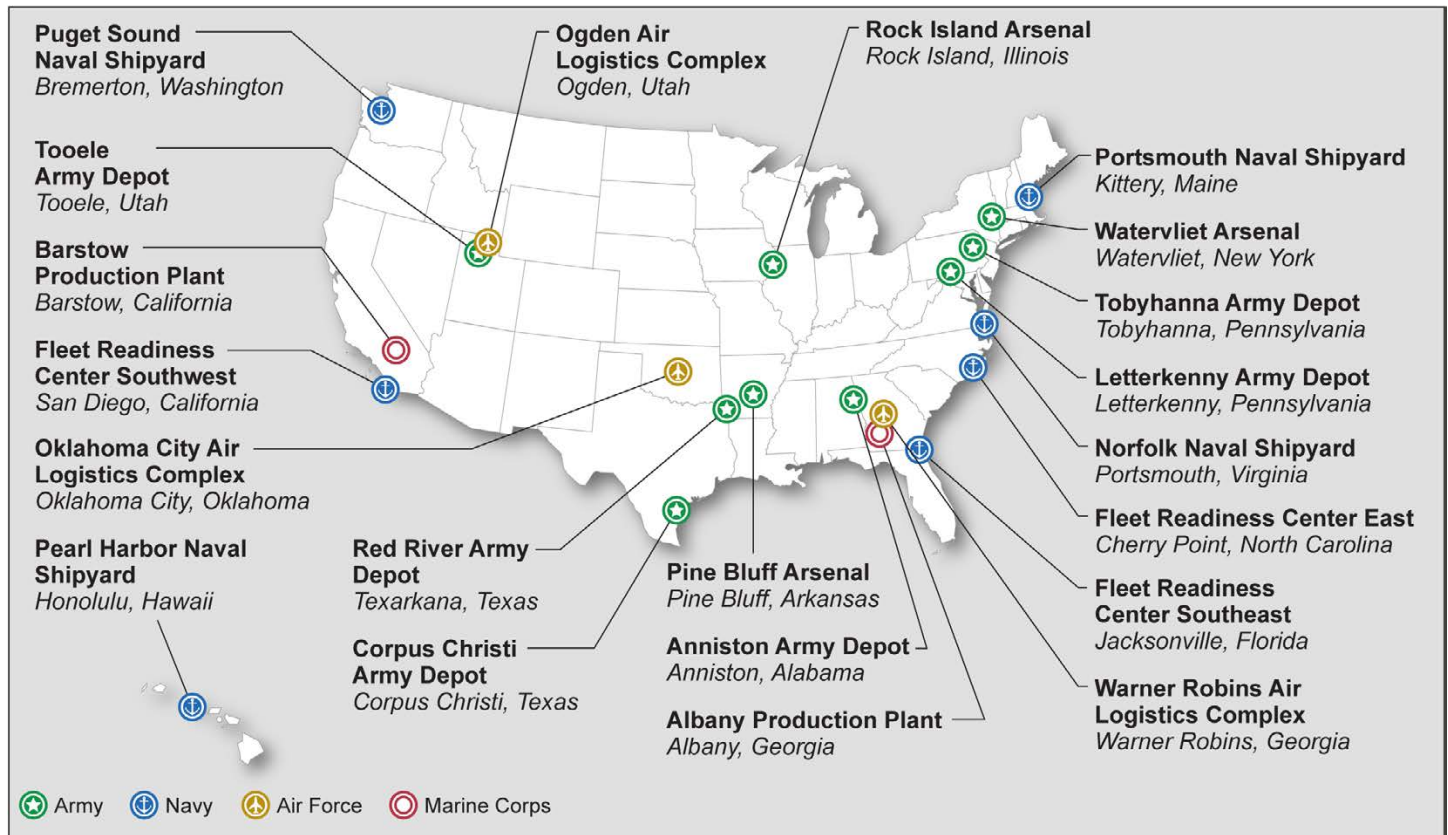
Background

Depots and Related Organizations

Depots are government-owned, government-operated industrial installations that maintain, overhaul, and repair a multitude of complex military weapons systems and equipment for the Department of Defense. These depots are essential to maintaining readiness for DOD, and they have a key role in sustaining weapon systems and equipment in both peacetime and during mobilization, contingency, or other emergency. There are 21 depots operated by the military services that are subject to the 6 percent minimum investment requirement (the “6 percent rule”)—four are Naval Shipyards, three are Navy Fleet Readiness Centers, two are Marine Corps Production Plants, three are Air Force Air Logistics Complexes, and nine are Army Depots and Arsenals.⁸ Figure 1 shows the location of these 21 depots across the United States.

⁸The Navy's Fleet Readiness Centers are primarily focused on aviation-related repairs.

Figure 1: Service Depots Covered under Title 10 U.S.C. §2476 (the “6 percent rule”)



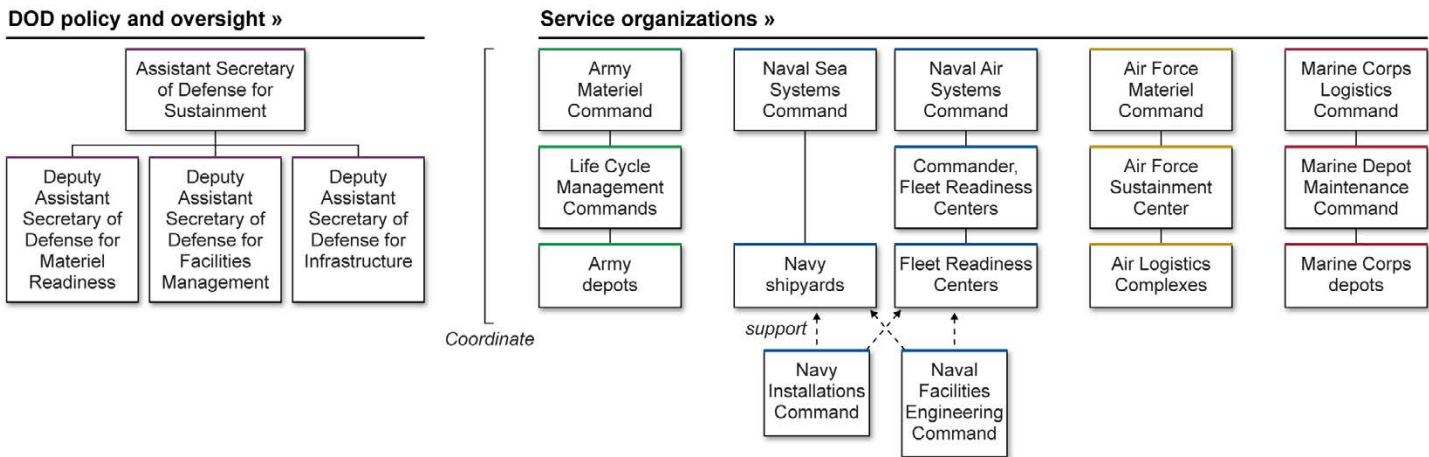
Source: GAO analysis of Department of Defense documents. | GAO-19-242

Note: In fiscal year 2007, Congress enacted a law requiring each military department to invest in the capital budgets of its depots no less than 6 percent of the average total dollar value of the combined maintenance, repair, and overhaul workload to its depots for the preceding 3 fiscal years. In this report, we refer to the 6 percent minimum investment requirement as the “6 percent rule.”

The depots are part of a larger, DOD-wide logistics enterprise that involves a number of different organizations. The Office of the Under Secretary of Defense for Acquisition and Sustainment is responsible for establishing policies for access to, and maintenance of, the defense industrial base, including depots. Specifically, the office is tasked with establishing policies and procedures for the management of DOD installations and environment to support military readiness with regard to facility construction, sustainment, and modernization. The Assistant Secretary of Defense for Sustainment serves as the principal assistant and advisor to the Under Secretary of Defense for Acquisition and Sustainment on material readiness. Among other responsibilities, the

Assistant Secretary of Defense for Sustainment prescribes policies and procedures on maintenance, materiel readiness and sustainment support. DOD officials report that the Office of the Deputy Assistant Secretary of Defense for Materiel Readiness is responsible for maintenance policy along with the development of a strategic vision for DOD's organic depot base. Finally, each service has its own logistics or materiel command component, which provides day-to-day management and oversight of the services' depots (see fig. 2). In addition, service support commands such as Naval Facilities Engineering Command can provide expertise in project design or facility management.

Figure 2: Military Depots and Supporting Organizations



Source: GAO analysis of Department of Defense (DOD) and service documentation. | GAO-19-242

Depot Maintenance Process and the Effects of Maintenance Delays on Readiness and Costs

Depot maintenance across the services generally involves three primary steps: planning, disassembly, and rebuilding. During each step, the depots rely on their facilities and equipment to ensure that they can conduct the large number of activities needed to repair DOD's complex weapon systems and return them to the warfighter to be used during training and operations. Repair duration for each system varies according to the complexity of the repair and the type of use the system has experienced since the last overhaul. Because repair times vary, demands on depot facilities and equipment also vary.

Delays in depot maintenance can directly affect the services' readiness by hindering their ability to conduct training and operations using these weapon systems. For example:

-
- We reported in May 2016 that the Navy’s implementation of sustainable operational schedules—and readiness recovery more broadly—is premised on adherence to deployment, training, and maintenance schedules. However, we found that the Navy was having difficulty implementing its new schedule as intended, in part because public shipyards were challenged to complete maintenance on time.⁹ Specifically, we reported in December 2018 that in fiscal years 2012 through 2018, maintenance overruns on aircraft carrier repairs resulted in a total of 1,207 days of maintenance delay—days that ships were not available for operations—the equivalent of losing the use of 0.5 aircraft carriers each year.¹⁰ Similarly, in fiscal years 2012 through 2018, maintenance overruns on submarine repairs resulted in a total of 7,321 days of maintenance delay—the equivalent of losing the use of almost three submarines each year.
 - We found in September 2018 that depot maintenance delays, among other challenges, limit the Navy, Air Force, and Marine Corps’ ability to keep aviation units ready by reducing the number of aircraft that are available to squadrons for conducting full spectrum training.¹¹
 - We reported in June 2018 that the Army’s depots, which conduct reset and recapitalization to extend the life of the Patriot surface-to-air missile system, have often returned equipment to Patriot units late, which has affected unit training. Specifically, we found that of the seven Patriot battalions that underwent reset from fiscal years 2014 through 2017, only one received its equipment within 180 days in accordance with Army policy.¹²

⁹GAO, *Military Readiness: Progress and Challenges in Implementing the Navy’s Optimized Fleet Response Plan*, [GAO-16-466R](#) (Washington, D.C.: May 2, 2016). For other GAO work in this area, please see the Related GAO Products section at the end of this report.

¹⁰GAO, *Navy and Marine Corps: Rebuilding Ship, Submarine, and Aviation Readiness Will Require Time and Sustained Management Attention*, [GAO-19-225T](#) (Washington, D.C.: Dec. 12, 2018). This does not mean that the Navy is missing presence in a given area, because the Navy has other options to mitigate maintenance delays—such as extending another ship’s deployment.

¹¹GAO, *Weapon System Sustainment: Selected Air Force and Navy Aircraft Generally Have Not Met Availability Goals, and DOD and Navy Guidance Need to Be Clarified*, [GAO-18-678](#) (Washington, D.C.: Sept. 10, 2018).

¹²GAO, *Military Readiness: Analysis of Maintenance Delays Needed to Improve Availability of Patriot Equipment for Training*, [GAO-18-447](#) (Washington, D.C.: June 20, 2018).

Depot maintenance delays also cause the services to incur costs for which they receive no capability. For example, we reported in November 2018 that the Navy is incurring significant costs associated with maintenance delays on attack submarines. We estimated that from fiscal years 2008 to 2018, the Navy had spent more than \$1.5 billion—in fiscal year 2018 constant dollars—to crew, maintain, and support attack submarines that provided no operational capability. This was a result of the submarines sitting idle and unable to conduct normal operations while waiting to enter the shipyards, and from being delayed in completing their maintenance at the shipyard.¹³

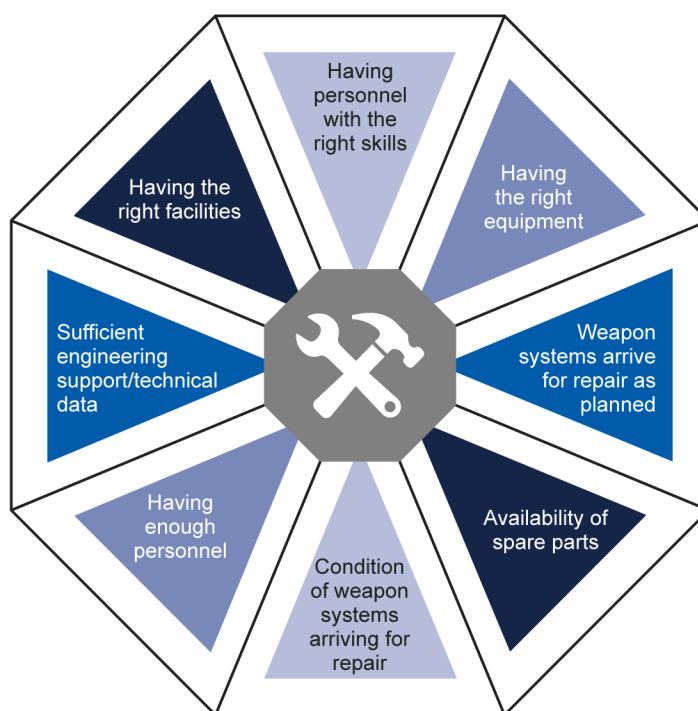
Depot Facilities and Equipment Are Key to Efficient and Effective Depot Maintenance

Our previous work has identified multiple factors that can affect depot performance, including the size and skill of the depot workforce, the condition of weapon systems upon arrival at the depot, the availability of spare parts, and the condition of the depot's facilities and equipment, among others (see fig. 3).¹⁴ In addition, all of these factors can be affected by funding and operational considerations (such as unexpected accidents). DOD officials have stated that disruptions to funding, to include continuing resolutions, affect the ability to conduct depot maintenance.

¹³ GAO, *Navy Readiness: Actions Needed to Address Costly Maintenance Delays Facing the Attack Submarine Fleet*, [GAO-19-229](#) (Washington, D.C.: Nov. 19, 2018).

¹⁴ See GAO, *DOD Depot Workforce: Services Need to Assess the Effectiveness of Their Initiatives to Maintain Critical Skills*, [GAO-19-51](#) (Washington, D.C.: Dec. 14, 2018); *Military Readiness: Analysis of Maintenance Delays Needed to Improve Availability of Patriot Equipment for Training*, [GAO-18-447](#) (Washington, D.C.: June 20, 2018); *Weapon System Sustainment: Selected Air Force and Navy Aircraft Generally Have Not Met Availability Goals, and DOD and Navy Guidance Need To be Clarified*, [GAO-18-678](#) (Washington, D.C.: Sept. 10, 2018); *F-35 Aircraft Sustainment: DOD Needs to Address Challenges Affecting Readiness and Cost Transparency*, [GAO-18-75](#) (Washington, D.C.: Oct., 26, 2017); *Naval Shipyards: Actions Needed to Improve Poor Conditions that Affect Operations*, [GAO-17-548](#) (Washington, D.C.: Sept. 12, 2017); *Military Readiness: Progress and Challenges in Implementing the Navy's Optimized Fleet Response Plan*, [GAO-16-466R](#) (Washington, D.C.: May 2, 2016); *Defense Inventory: Actions Needed to Improve the Defense Logistics Agency's Inventory Management*, [GAO-14-495](#) (Washington, D.C.: June 19, 2014).


Figure 3: Factors Affecting Depot Performance




Source: GAO. | GAO-19-242

Depots rely on working and efficient facilities and equipment to complete repairs and overhauls, and DOD maintenance officials have stated that any underlying conditions – such as leaks, lack of capacity, inefficient layouts, and breakdowns – require workarounds. Facilities are defined as any building, structure, or linear structure (such as a fence or railway). Equipment includes all nonexpendable items needed to outfit or equip an organization; for the depots, that includes items used by depot personnel to conduct depot-level maintenance, such as tools, test equipment, machining equipment, and test stands. We have previously noted that workarounds are additional efforts to complete the task that can delay maintenance, negatively affect productivity, and increase costs of depot maintenance. Functioning depot facilities and equipment are essential to a number of depot processes, as shown in figure 4.


Figure 4: Examples of Depot Facilities and Equipment Support of Maintenance Activity



A drydock allows maintainers to work on the hull of a submarine.




A specialized paint facility allows for temperature and humidity control during the painting process.




A facility can support the power needs of specialized tools.


Facilities




Equipment



X-ray machines can allow non-destructive tests of weapon systems to determine what kinds of repairs are needed.



Industrial equipment allows maintainers to fabricate parts or perform metalworking.



Test stands allow maintainers to conduct repairs more safely and effectively.

Source: GAO site visits and interviews with service officials; U.S. Navy and Defense Visual Information Distribution Service (photos). | GAO-19-242

These facilities and equipment often require significant investment to plan, construct, install, repair, and modernize. For example, new DOD depot facilities can cost millions of dollars and are generally expected to last around 67 years, though facilities can, through restoration and modernization efforts, operate significantly longer. Equipment generally lasts for a shorter length of time, though equipment used in production can be expected to last 10 years or more and can be costly. Because these facility and equipment investments can take years to plan and require significant resources, a depot's decision to invest must often take place well in advance of the specific need the facility or equipment is

intended to serve. Other factors that the depots consider when planning investments include topography, flood plains, environmental and historic preservation needs, roads and parking, utilities, and the effect on continuing depot operations. This makes careful planning and management of these investments essential to ensuring that critical capabilities are not neglected.

In fiscal year 2007, Congress enacted the 6 percent rule, requiring each military department to invest in the capital budgets of its depots no less than 6 percent of the average total dollar value of the combined maintenance, repair, and overhaul workload funded at all the depots of that department over the preceding 3 fiscal years.¹⁵ The departments generally met the minimum investment requirement from fiscal year 2007 through fiscal year 2017, as we discuss in more detail in appendix I.

Poor Condition of Facilities and Equipment Hinders Depot Performance, but the Services Do Not Consistently Track These Effects

Our analysis of service metrics shows that depot facilities are, on average, rated as “poor” on DOD’s facility rating scale, and the age of equipment at the depots generally exceeds its expected useful life. Meanwhile, performance at the service depots has generally declined since fiscal year 2007. Our previous work has shown that facility and equipment condition can affect depot performance. However, the military services do not consistently track the extent to which the condition of facilities and equipment affect depot performance.

Majority of Depot Facilities Are in Poor Condition and Equipment Generally Exceeds Its Expected Useful Life

Depot Facilities

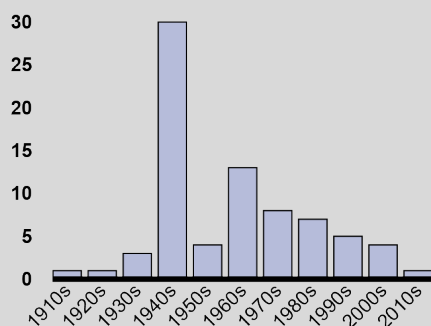
The physical condition of facilities at a majority of the military depots is poor and has been trending downward, according to facility data collected from fiscal year 2013 through fiscal year 2017. The services assess major

¹⁵John Warner National Defense Authorization Act for Fiscal Year 2007, Pub. L. No. 109-364, § 332 (2006), codified at 10 U.S.C. § 2476.

Navy Aviation Depots Rely on Many Facilities from World War II Era

While service officials do not consider the age of a facility to be an ideal indicator of its overall health – since the services regularly restore and modernize older facilities rather than build new ones – the age of facilities can still offer insight into some of the depots’ challenges. For example, over 30 million square feet at the Navy aviation depots was built during the 1940’s – more than one-third of its existing space.

Millions of square feet



Source: GAO analysis of Navy data. | GAO-19-242

Officials note that older facilities can face additional challenges, such as electrical systems built for different weapon systems, historical preservation requirements, and suboptimal layouts. It can be difficult for a depot to maintain complex, modern weapon systems, such as the F/A-18, with facilities that were designed for less complex systems.



Source: Fleet Readiness Center – Southwest. | GAO-19-242

Source: GAO analysis of Navy data. | GAO-19-242

components of a facility—such as the electrical and plumbing systems and use these assessments to develop a condition rating that summarizes the overall health of the facility.¹⁶ In turn, these condition ratings help service officials plan investment strategies and prioritize depot projects. The condition rating does not necessarily correlate with the age of the facility (see sidebar); a relatively new facility might have a poor condition rating if it has been damaged, for example, and an old facility that has recently been modernized might have a high condition rating.

Our analysis of fiscal year 2017 depot facilities data found that the average weighted condition rating at a majority of the 21 service depots is poor.¹⁷ Specifically, 12 of the 21 depots—more than half—have average condition ratings that are below 80, indicating that they are in “poor” condition (see fig. 5).¹⁸ Of the remaining depots, five had an average rating in the “fair” category, and four had an average rating in the “good” category.¹⁹

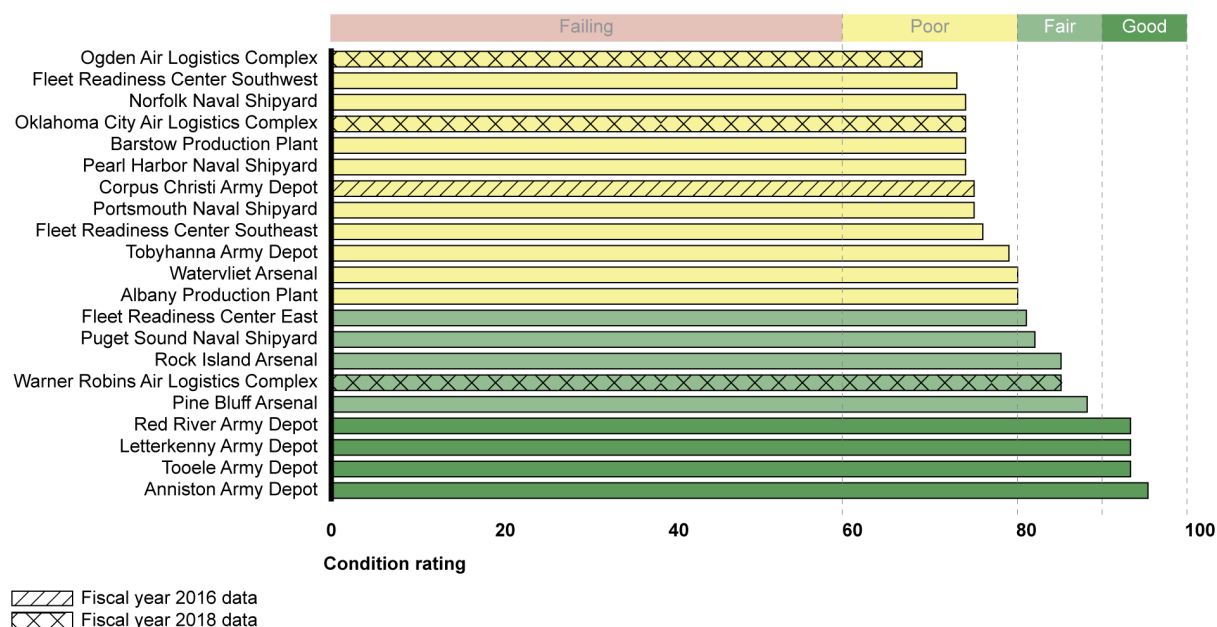
¹⁶A facility’s condition rating indicates the physical condition of the facility with a rating from 0 to 100, in which 0 denotes that the facility’s physical condition is failing and 100 denotes that the facility is in good physical condition. Facilities with a rating between 60 and 79 are considered “poor,” while those with a rating below 60 are considered “failing.” The military departments are required to review each real property asset every 5 years. In September 2013, DOD components were required to adopt a standardized process for facility condition assessments to ensure consistent and reliable data. Facility condition indexes were to be recorded using the standardized process within 5 years of the date of the updated policy, which was September 2018. See Undersecretary of Defense for Acquisition, Technology, and Logistics Memorandum, *Standardizing Facility Condition Assessments* (Sept. 10, 2013).

¹⁷For this analysis, we weighted the condition ratings by the replacement cost of the facility, also known as the plant replacement value. This is to ensure that costlier facilities are weighted more heavily in the condition ratings, so that, for example, an expensive shop plant is weighted as more important than an inexpensive guard shack. For facility condition data on specific depots, including available trends, please see appendixes II through XXII.

¹⁸The Undersecretary of Defense for Acquisition, Technology, and Logistics set a goal in 2014 for each component to have an inventory-wide facility rating of 80 by fiscal year 2016. However, this goal means that a component can meet the target if some facilities are below 80 as long as enough facilities are rated higher to balance those out. Since this review only looked at depot facilities and not any additional service facilities, we cannot state whether the services are or are not meeting this goal.

¹⁹Four depots were unable to provide condition ratings for FY 2017. However, they were able to provide fiscal year 2016 and fiscal year 2018 data, respectively, which generally show their average ratings also in the poor category.

Figure 5: Average Weighted Facility Condition Ratings at the 21 Military Depots, Fiscal Year 2017



Source: GAO analysis of service facility condition data. | GAO-19-242

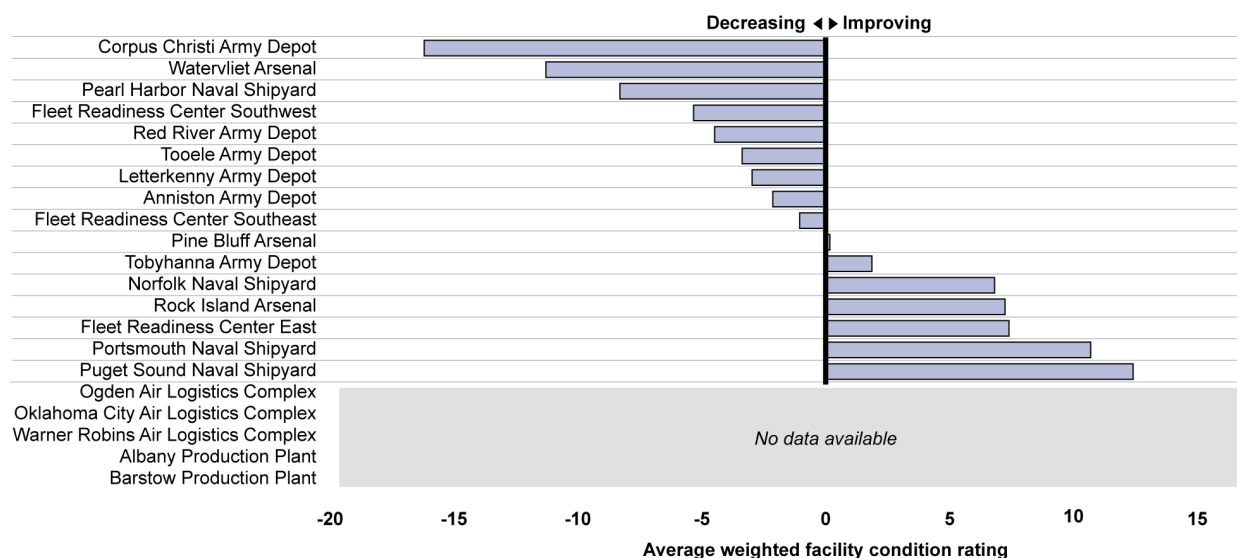
Notes: For this analysis, we weighted the condition ratings by the replacement cost of the facility, also known as the plant replacement value. This is to ensure that costlier facilities are weighted more heavily in the condition ratings, so that, for example, an expensive shop plant is weighted as more important than an inexpensive guard shack. This is the same method used by the Navy to calculate their condition averages.

Because fiscal year 2017 data was not available for Corpus Christi Army Depot, we present their most recent data instead, that of fiscal year 2016. Similarly, fiscal year 2017 data was not available for the three Air Force depots, so we present their fiscal year 2018 data for them.

While none of the depots had a failing average, facility condition could be worse than the data indicate. Some service depot officials stated that they believe their ratings may not reflect the actual state of the facilities, thereby making the physical condition of facilities appear better than they are.

Furthermore, facility condition ratings show a general downward trend. Out of the 16 depots that had available condition rating data from fiscal year 2013 through fiscal year 2017, nine depots show a downward trend in their average condition rating (see fig. 6). For more information on specific depot metrics, see appendixes II through XXII.

Figure 6: Change in Average Weighted Facility Condition Rating for the 21 Military Depots, Fiscal Years 2013 – 2017



Source: GAO analysis of service facility condition data. | GAO-19-242

Note: Five depots only provided condition data for a single fiscal year, which means that no change could be determined for those depots.

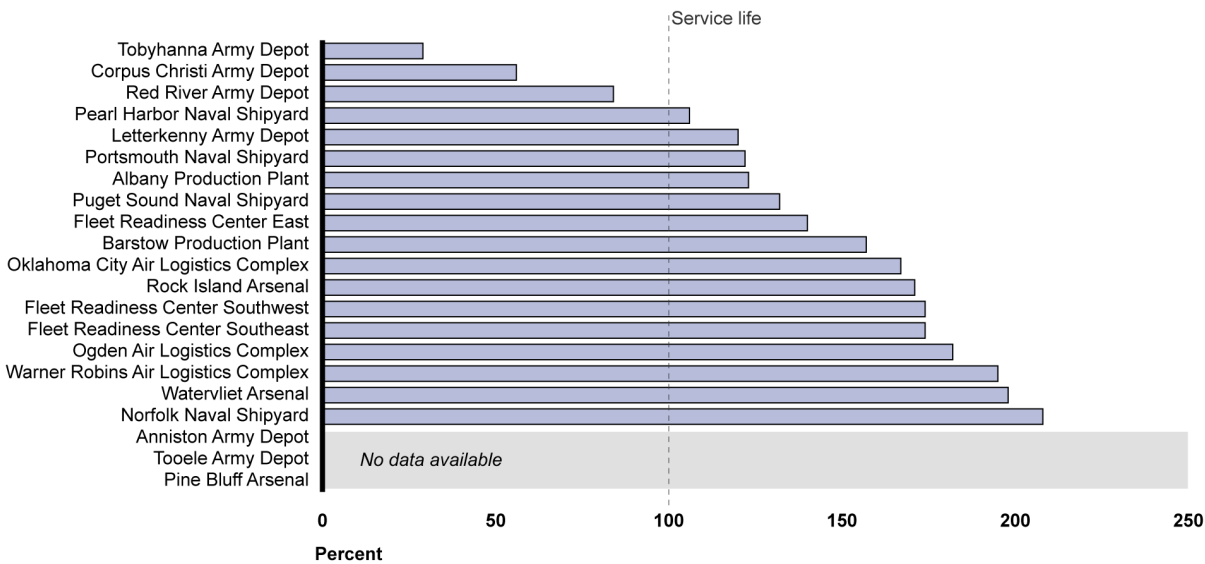
Moreover, facility requirements have evolved since many of the depots were established, further affecting the facilities' ability to support maintenance efficiently and effectively. Modern facilities must meet stringent safety and building standards, such as, for example, anti-terror standards for protecting DOD facilities or historic preservation standards. In addition, the introduction of newer weapon systems and their repair equipment can change the types of facilities that are required. Modern weapon systems may also have special coatings that trigger the need for additional facilities. Further, modern weapon systems may place larger demands on the facility's underlying power and utility systems, which may not have been designed to meet these demands. For example, Navy officials stated that at Fleet Readiness Center Southwest, an aging hangar loses power if maintainers attempt work on more than one Super Hornet aircraft at a time because the facility's electrical system, initially built in the 1930's, was not designed to support this aircraft.

Depot Equipment

Equipment is generally past its expected useful life at most military depots. Each piece of capital equipment has an expected service life, which indicates the number of years that the equipment is expected to operate. Equipment can be operated past its expected service life. However, equipment that is past its expected service life can pose an

increased risk for maintenance delays or higher maintenance costs, affecting the depots' ability to conduct work. As we have previously reported, aging equipment can present a number of challenges, such as more frequent breakdowns, less effective or efficient operation, and safety hazards.²⁰ Our analysis shows that most of the 21 depots reviewed rely on equipment that is past its expected useful life (see fig. 7). As Figure 7 shows, only three depots rely on equipment that is, on average, within its useful life. Three other depots were unable to provide data.

Figure 7: Average Age of Equipment as a Percentage of Its Expected Service Life, by Depot, as of Fiscal Year 2017



Source: GAO analysis of service equipment age data. | GAO-19-242

Note: Three depots were unable to provide data on the age of their depot equipment or its expected service life.

For more detailed information about equipment age and equipment repairs at individual depots, see appendixes II through XXII.

²⁰[GAO-17-548](#).

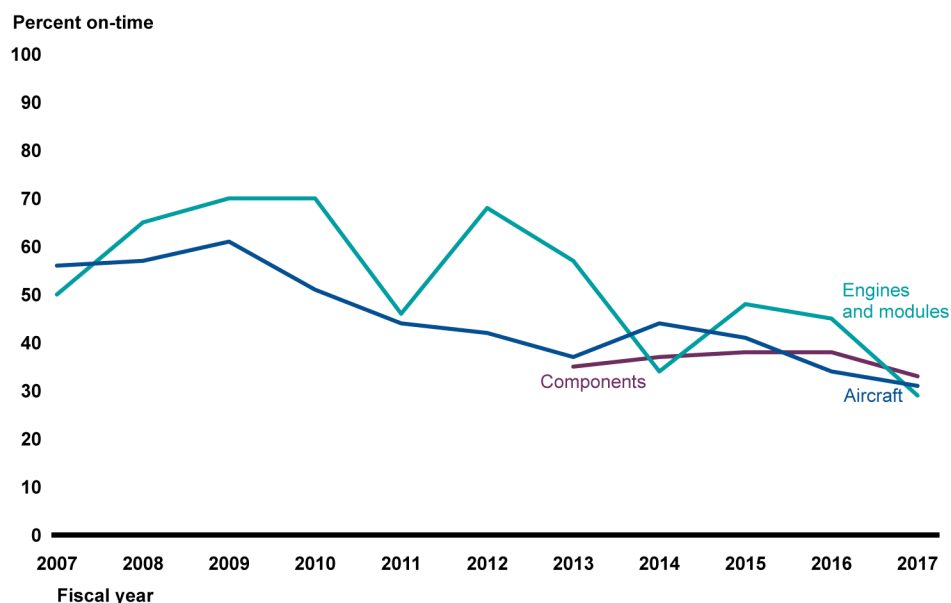
Poor Condition of Depot Facilities and Equipment Contributes to Worsening Performance

The service depots have generally experienced worsening performance in terms of completing maintenance on time or in the required amount over the past decade.²¹ The Navy aviation depots have seen decreases in their timely completion of maintenance for aircraft, engines and modules, and components.²² For example, on-time performance for aircraft completed at the Navy's three aviation depots has decreased from about 56 percent in fiscal year 2007 to about 31 percent in fiscal year 2017 (see fig. 8). This occurred even though the number of aircraft scheduled for repair over that same time period declined by about 26 percent.

²¹We assessed depot performance data for fiscal years 2007 through 2017, where available. Most of the Army depots we reviewed were unable to provide performance data prior to fiscal year 2014. As a result, we assessed Army depot performance from fiscal year 2014 through fiscal year 2017. Depot performance metrics tied to output are generally measured in terms of timeliness, though the specific manner may vary. For example, some depots measure whether an individual repair was completed when expected and measure the number of days past the expected date when the repair was actually completed. Other depots set a target for the number of repairs to complete in a certain period of time and track how many are actually completed each month.

²²The services do not use the same performance metrics in managing their depots. The different performance metrics used in this analysis were: Percent Completed On-Time (Navy aviation and Air Force), Days of Maintenance Delay (Navy shipyards), and Production to Plan (Marine Corps). The Army depots use various schedule performance terms, though the most common is Performance to Promise. Other performance metrics are collected by the depots, such as cost and labor hours. However, for the purposes of this review, we solicited the performance metrics from each service that they used to assess their own depot performance. These are the metrics we present in this section.

Figure 8: On-Time Performance at the Navy's Three Aviation Depots, Fiscal Years 2007 – 2017

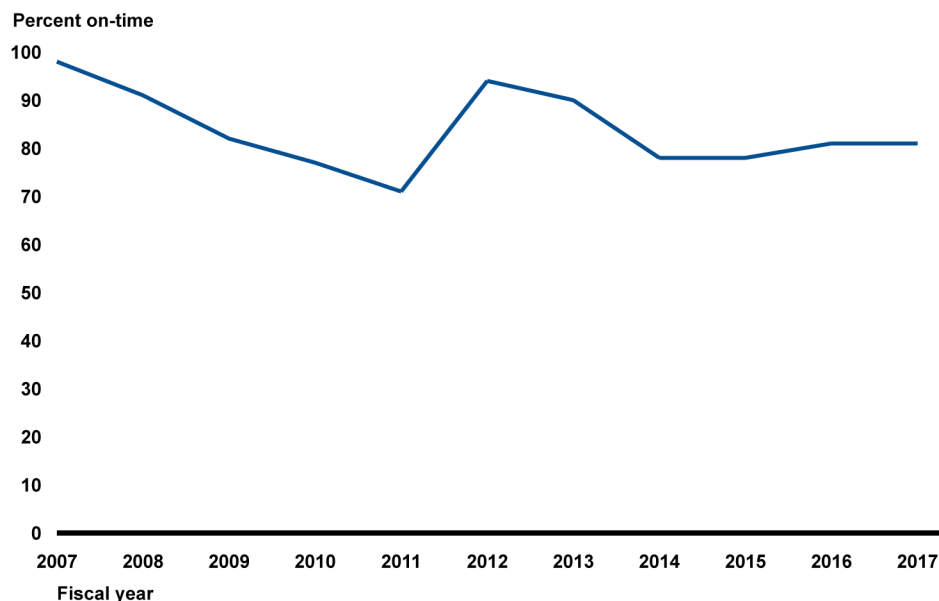


Source: GAO analysis of performance data from the three Navy aviation depots. | GAO-19-242

Note: A Navy official described components as any aircraft assembly or subassembly, such as valves, gearboxes, and rotor heads. Similarly, modules were described as major subassemblies of an engine that other locations can use to complete engine repairs. Navy aviation officials stated that they began tracking on-time performance of components in fiscal year 2013.

Similarly, the three Air Force aviation depots' on-time performance has decreased over this same time period from about 98 percent on-time aircraft completions in fiscal year 2007 to about 81 percent on-time aircraft completions in fiscal year 2017 (see fig. 9). This decrease occurred even though the number of aircraft scheduled for repair declined by approximately 15 percent.

Figure 9: On-Time Performance at the Three Air Force Aviation Depots, Fiscal Years 2007 – 2017



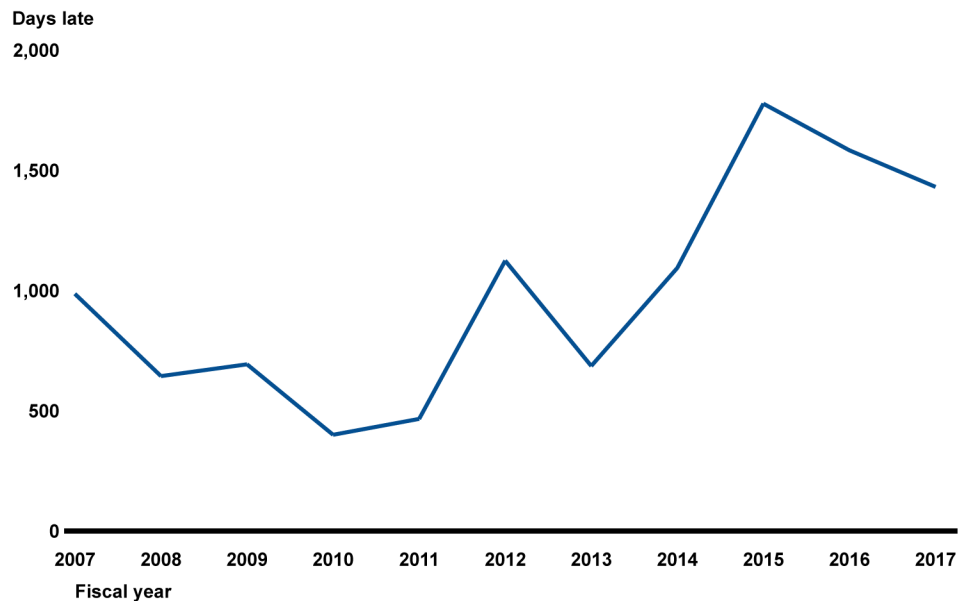
Source: GAO analysis of performance data from the three Air Force aviation depots. | GAO-19-242

Naval shipyards have also experienced performance challenges, such as an increase in maintenance delays (see fig. 10).²³ Our analysis shows that the number of days of maintenance delay at the four Navy shipyards has increased by about 45 percent from fiscal year 2007 through 2017, from 986 days in fiscal year 2007 to 1,431 days in fiscal year 2017. We have previously reported that from fiscal year 2008 through fiscal year 2018, the Navy incurred \$1.5 billion in fiscal year 2018 constant dollars to crew, maintain, and support attack submarines that provided no operational capability as a result of the submarines sitting idle while waiting to enter the shipyards and from being delayed in completing their maintenance at the shipyards.²⁴

²³Previous GAO reporting has described these as lost operational days, but more recent reporting uses the term days of maintenance delay. See [GAO-17-548](#) and [GAO-19-229](#).

²⁴[GAO-19-229](#).

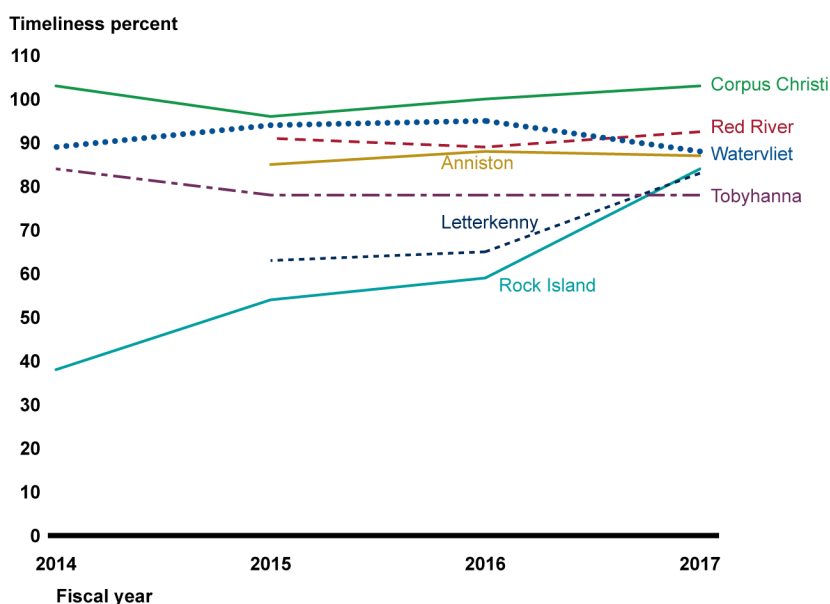
Figure 10: Days of Maintenance Delay at the Four Navy Shipyards, Fiscal Years 2007 – 2017



Source: GAO analysis of performance data from the four Navy shipyards. | GAO-19-242

Army depot data is mixed—our analysis shows that the performance at two depots has decreased, but for others it has held steady or improved. See figure 11 below for changes over time in performance.

Figure 11: Depot Performance Measures at Seven Army Depots, Fiscal Years 2014 – 2017



Source: GAO analysis of performance data from seven of the Army's nine depots. | GAO-19-242

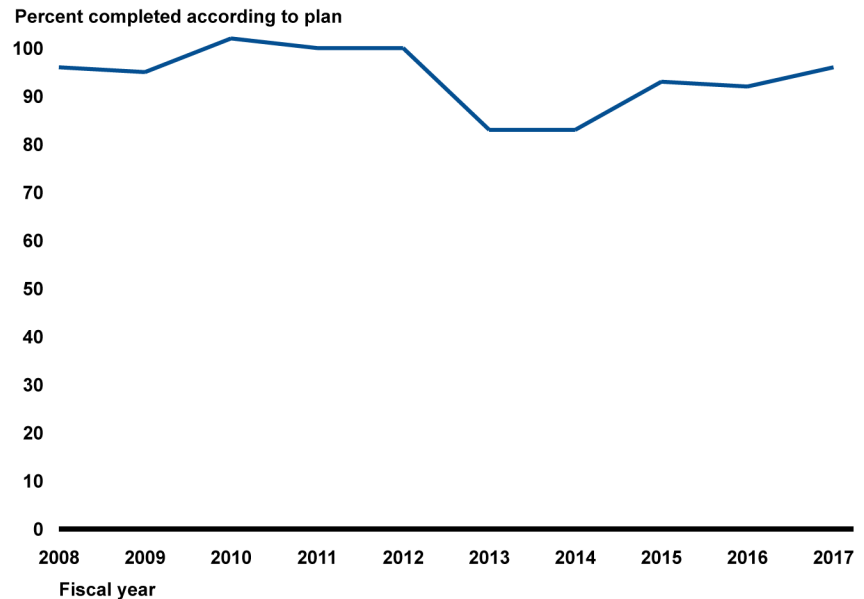
Notes: Depot performance metrics can be measured in terms of timeliness, though the specific manner may vary by depot. For example, some depots measure whether an individual repair was completed when expected and measure the days past the expected date the repair was actually completed. Other depots set a target number of repairs to complete in a certain period of time. Depots that exceed their output target may exceed 100 percent.

The Army depots are shown individually because they do not all measure performance in a manner that allows them to be combined for reporting purposes.

Two Army depots, Pine Bluff and Tooele, only provided performance data for one fiscal year, 2017, and thus are excluded from this figure.

Finally, the Marine Corps depot output decreased by less than 1 percent, as shown in figure 12.

Figure 12: Performance Output at the Two Marine Corps Depots, Fiscal Years 2008 – 2017



Source: GAO analysis of performance data from the two Marine Corps depots. | GAO-19-242

Note: We determined that the Marine Corps depot performance data for fiscal year 2007 were incomplete; for this reason, they are excluded from this figure. Production to plan is the percentage of items completed against the initial planned number. For example, if the depot plans to repair 100 of a given item, but completes only 75, its production to plan for that item is 75 percent.

The depots rely on their facilities and equipment to ensure they can conduct the large number of activities needed to efficiently repair DOD's complex weapons systems. Inadequate facilities can make the overall repair process less efficient, as maintainers perform workarounds that can increase maintenance time and costs. Because the depots are generally operating with equipment past its expected useful life, the depots may be incurring costs related to operating aging equipment – including performing equipment repairs, procuring spare parts, and expending labor hours to repair equipment – while at the same time delaying mission-related work. For example:

- At Albany Production Plant, officials told us that a shortage of paint booths results in vehicles remaining unpainted and stored outside. Exposure to the elements can cause flash rusting in the event of rain or high humidity, necessitating retreatment that increases both maintenance time and cost.

-
- At Norfolk Naval Shipyard, officials had to re-inspect 10 years' of parts made in a single furnace, after it was discovered that the controls on the furnace were reading incorrectly.²⁵
 - At Corpus Christi Army Depot, depot documentation shows that engines are moved nearly 5 miles across the depots during their repair process. According to officials at the depot, this is the result of years of incremental construction that did not allow them to optimize their workflow.
 - At Fleet Readiness Center Southwest, officials told us that they had to develop an inefficient repair process to maintain the CMV-22 due to a lack of hangars that could accommodate the large aircraft.

While maintenance delays can be brief, extended maintenance delays can prevent the timely return of weapon systems to operational status. Delays can cause the services to incur operating and support costs without an operational benefit. Lack of weapon systems can also cause other negative effects such as an inability to train people to use the system, leading to a reduction in readiness.

The services have used various facility strategies to keep the depots operating, such as restoring and modernizing facilities when funding was available, developing workarounds when space or funding was not available, or continuing to use the inadequate facilities. Over time, this patchwork of old, modernized, and workaround solutions for new weapons systems can result in suboptimized workflow that adds time and cost to the maintenance process, which can ultimately affect readiness. For example, at Production Plant Albany, the depot has four welding centers in different locations throughout the depot. According to officials, they utilized these welding centers over time as needs arose, and the centers are not ideally located for an efficient work flow. This means that the depot has to provide welding supplies, shift maintainers between, and deliver vehicles to and from these different locations.

Alternatively, investments that optimize depot facilities and equipment can positively affect maintenance efficiency. For example:

- Fleet Readiness Center Southwest recently built a new facility that optimizes the workflow for its repairs of H-60 helicopters. Officials stated that its previous H-60 facility could only fit eight helicopters at a

²⁵[GAO-17-548](#).

time, and only by crowding them such that using the crane on one required others to be moved as well, adding time and workload to the maintenance process. The new facility can accommodate more than 30 H-60s at a time, and each can be brought into and out of the facility without requiring others to be moved. As part of this effort, the depot also invested in additional lighting, ventilation, and crane capabilities that depot officials stated have increased the depot's capacity for conducting H-60 repairs by more than 20 percent over their previous facility.

- At Corpus Christi Army Depot, planners have designed a multiphase workflow for their engine and component repairs that involves investing in a new facility and related equipment. Officials noted that the current engine repair process has developed over decades, and is spread throughout the depot. The redesigned process, which involves several investments over more than two decades, is intended to have a more efficient workflow. An Army analysis estimated that this investment will reduce the time it takes to repair and test engines and components and could result in the depot requiring about 200,000 fewer labor hours, saving about \$10 million in labor costs annually.
- The Naval Shipyard Optimization Plan released by the Navy in February 2018 addresses the shipyards' ability to maintain the current fleet, and projects that facility and equipment investments at the shipyards will increase efficiency and save resources. For example, the plan estimates that optimized facilities and equipment will save the shipyards over 325,000 labor days per year.²⁶

The Military Services Do Not Consistently Track the Extent to Which Facility and Equipment Conditions Delay Maintenance

Despite the negative effect that poor conditions can have on depot performance, the military services do not consistently track when facilities and equipment conditions lead to maintenance delays. Based on our analysis, the services each track a form of maintenance delay—specifically, work stoppages caused by either equipment or facility conditions. Work stoppages are circumstances where maintenance can no longer proceed because the depot does not have everything it needs, including the facility space to begin additional work or equipment needed to perform a certain function. However, table 1 below shows that although the services have the ability to track work stoppages, they do not all track both facility and equipment-related maintenance delays across all their depots. Further, even within a service, the depots may use different

²⁶According to the Navy, this equates to an additional aircraft carrier maintenance period, one submarine overhaul, or three submarine inactivations per year.

methodologies. Different methodologies make it difficult to compare across depots and identify issues. For example, according to Navy officials, the Navy aviation depots track work stoppages, but each depot uses different standards for determining which incidents are tracked. This means that an event counted as a work stoppage at one location might not be counted at another location.

Table 1: Service Tracking of Work Stoppages Caused by Equipment and Facility Conditions, as of September 2018

	Equipment-related work stoppages	Facility-related work stoppages
Army	Not tracked at seven of nine depots	Not tracked at eight of nine depots
Navy shipyards	Tracked	Not tracked
Navy aviation	Tracked (but methodologies vary) ^a	Tracked (but methodologies vary) ^a
Air Force	Tracked	Not tracked
Marine Corps	Tracked at both depots	Tracked at one of two depots

Source: GAO analysis of service documentation. | GAO-19-242

^aAccording to Navy officials, the Navy aviation depots track work stoppages, but do not use the same standards for tracking incidents at each depot. Officials told us they have begun taking steps to track data consistently.

Standards for Internal Control in the Federal Government states that management should use quality information to achieve an entity’s objectives.²⁷ However, the depots do not track maintenance delays caused by facility and equipment conditions, such as work stoppages, more consistently because there is currently no requirement from their respective materiel commands to do so. Every year, the services spend millions of dollars on depot facilities and equipment to meet their minimum investment requirement.²⁸ Establishing measures and using them to track maintenance delays caused by facility and equipment conditions would help the services to make better investment decisions because they could target investments to facility and equipment needs that would have the greatest impact on repair times or other key performance goals. Without knowing how often facility and equipment conditions lead to work delays, the services risk investing in less critical

²⁷GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

²⁸For more on the services’ compliance with the 6 percent rule and the extent to which sustainment activities were included in investment reporting, see appendix I.

infrastructure and experiencing more work stoppages due to facility or equipment conditions.

DOD's Approach for Guiding Depot Investments Lacks Key Elements Important to Addressing the Depots' Challenges Efficiently and Effectively

The military services are developing optimization plans for their depots, but these plans lack analytically-based goals, results-oriented metrics, a full accounting of the resources, risks, and stakeholders, and a process for reporting on progress. Including these elements could enhance the effectiveness of service depot investments. Furthermore, there is currently no process at the Office of the Secretary of Defense level that monitors depot investment decisions or provides regular reporting to decision makers and Congress.

The Military Services Are Developing Optimization Plans, but These Plans Lack Key Elements to Guide Depot Investment

The services have each begun to develop depot optimization plans, as directed by Congress. In June 2018 Congress directed the Secretaries of the Army, Navy and Air Force to submit an engineering master plan for optimal placement and consolidation of facilities and major equipment, as well as an investment strategy addressing the facilities, major equipment and infrastructure requirements of depots under the jurisdiction of each service.²⁹ These plans are to include a life cycle cost analysis to modernize depot facilities and equipment and an investment strategy.

The Army, Navy, Air Force, and Marine Corps have all begun to develop depot optimization plans, and officials told us that they expect to complete work on these initial plans by the February 2019 date directed by Congress.³⁰ However, material management command officials also noted that more detailed plans – that include workflow optimization, analysis of supporting utilities, and long-term investment planning – would not be possible by that date. Instead, officials intend to use the initial

²⁹S. Rep. 115-262 (2018).

³⁰The Navy's plan for the aviation depots was released in 2019. However, the plan was provided after we had completed audit work on this engagement. As a result, we did not have an opportunity to review the plan to determine if it had the key elements we discuss here.

phase to develop a strategy for completing their final plans. Officials told us that they are using this initial development effort to identify the work needed to fully establish their depot optimization plans, identify the resources and expertise needed for implementation, and develop a timeline for completion. Depot optimization is a challenging effort that involves complex tasks such as, according to service officials, understanding interdependencies between facilities, equipment, and utilities; accounting for environmental, geographic, and economic factors; planning for facility construction and equipment purchases years in advance; and making arrangements for ongoing depot-level maintenance operations while facility and equipment improvements are underway.

The Navy developed a Shipyard Infrastructure Optimization Plan, released in February 2018, to address some of its longstanding challenges—including aging facilities and equipment, inefficient layouts, and lack of capacity. Officials estimate that the effort will cost \$21 billion over 20 years, and will allow for increased repair capacity. Over time, the Navy estimates that this investment could ultimately save more than 328,000 labor days annually in reduced transportation and materiel movement time. We have a separate review examining the Navy's effort to optimize its shipyards, which examines its use of results-oriented elements.³¹

However, based on our discussions with officials from all four services, the depot plans for the Army and Marine Corps depots and arsenals, the Navy Fleet Readiness Centers, and the Air Force Air Logistics Complexes currently under development will lack certain key elements identified in our prior work, including:

- **Analytically-based goals.** The services have not fully established analytically-based goals for their depot investments that are tied to the service's operational needs. For example, Army and Air Force officials told us that they were still in the process of developing goals for their plans. Meanwhile, Navy aviation officials had developed some initial goals, but expected these goals to change as their planning and information became more detailed. The Marine Corps is in the

³¹Senate Report 115-262, accompanying a bill for the National Defense Authorization Act of Fiscal Year 2019, directed GAO to report on the extent to which the Navy's Shipyard Infrastructure Optimization Plan addresses infrastructure deficiencies, and the extent to which the plan includes results-oriented elements to guide shipyard investment. In light of this ongoing effort, we are not making recommendations on the Navy's Shipyard Improvement Optimization Plan in this report.

process of developing its plan, but officials say that they have not determined what analytically-based goals will serve as the foundation of their efforts. Some have told us that the only goal that is feasible by the February 2019 deadline is to plan to develop a better plan. Our prior work has shown that establishing analytically-based goals that define the desired outcomes and results is a leading practice that can enhance the success of an initiative.³²

- **Results-oriented metrics.** As we noted earlier, planners lack key data critical for developing investment plans, such as the source and extent of facilities- and equipment-related maintenance delays. Army, Navy, Air Force, and Marine Corps officials all noted that they were planning to use metrics to determine the effectiveness of their respective plans. However, without established goals for their plans, the services cannot identify the best ways to measure progress in meeting those goals. In addition, the Army, Navy, and Air Force do not have metrics that tie their depot investments to specific outcomes, such as increased performance or improved readiness. Our prior work has shown that using results-oriented metrics enables effective monitoring and facilitates targeting efforts to those with the greatest effect.³³
- **Identification of required resources, risks, and stakeholders.** Army, Navy, Air Force, and Marine Corps officials told us that they have begun identifying the resources needed for their plans. For example, all services have identified at least some of the project costs that will be needed for certain depot facility and equipment improvements. However, without having analytically-based goals to serve as a starting point, it is impossible to fully identify the required resources and risks because the desired end state has not been established. Meanwhile, Army, Air Force, and Navy aviation officials have identified many stakeholders that they intend to involve in their optimization efforts, though in some cases these stakeholders have not been included in the process. Service officials also noted that in some cases they lack the necessary engineering expertise to redesign their depot's workflow process from the ground up.

³²GAO, *Managing For Results: Data-Driven Performance Reviews Show Promise But Agencies Should Explore How to Involve Other Relevant Agencies*, [GAO-13-228](#) (Washington, D.C.: Feb. 27, 2013).

³³GAO, *Results-Oriented Management: Strengthening Key Practices at FEMA and Interior Could Promote Greater Use of Performance Information*, [GAO-09-676](#) (Washington, D.C.: Aug. 17, 2009).

The services have identified about \$6.5 billion in backlogged restoration and modernization projects for their depot facilities. However, this figure is likely understated because our prior work has shown that depot facility projects are subject to factors such as regulatory compliance and historical preservation costs that can be hard to predict.³⁴ Moreover, the services track their backlog of needed facility improvements differently, which makes it difficult to determine the full scope of investment required and to provide effective oversight. Our prior work has shown that fully identifying 1) the resources required to achieve the goals, 2) the stakeholders that have equities and requisite expertise in the effort, and 3) potential risks to the effort are leading results-oriented practices that are key to success.³⁵

- **Reporting on progress.** Army, Navy, Air Force, and Marine Corps officials told us that they are in the process of developing one-time reports for Congress on the depots' investment needs. However, these one-time reports will not provide Congress and decision makers with information after their initial release. Depot optimization planning will require time, along with sustained management and congressional attention to successfully implement. For example, the Navy's Shipyard Optimization Plan estimates that it will be a 20-year effort requiring around \$21 billion. However, the other initial steps taken by the services to address the congressional request are not as focused on the long term. For example, Army and Air Force officials told us that their initial plans will likely be "plans to get to a plan" rather than a decades-long proposal like the Navy shipyards. Our prior work has shown that reporting on progress is a leading results-oriented practice that holds the organization accountable for results and provides information to senior leaders and Congress that can help keep an effort on track and responsive to changes.³⁶

According to service officials, the military services' depot optimization plans will not include all the elements of a results-oriented management approach because there is no requirement that the plans do so. Our prior work has found that a results-oriented management approach can help organizations remain operationally effective, efficient, and capable of

³⁴[GAO-17-548](#).

³⁵See [GAO-13-228](#) and *DOD's 2010 Comprehensive Inventory Management Improvement Plan Addressed Statutory Requirements, but Faces Implementation Challenges*, [GAO-11-240R](#) (Washington, D.C.: Jan. 7, 2011).

³⁶[GAO-09-676](#).

meeting future requirements.³⁷ Specifically, our work has highlighted the importance of elements such as developing analytically-based goals; using results-oriented metrics to monitor progress; fully identifying required resources, risks, and stakeholders; and regular reporting on progress to making reform efforts more efficient, effective, and accountable. Congress directed the services to include some results-oriented elements in their plans, such as an identification of key steps and an initial report to Congress. However, including these additional elements—establishing results-oriented metrics; identifying all necessary resources, stakeholders, and associated risks; and regular reporting to decision makers and Congress—would further enhance the effectiveness of the plans. Without a plan that includes all the key elements of a results-oriented management approach, the services risk continued deterioration of the depots and making suboptimal investments that could hinder their ability to efficiently and effectively support readiness.

The Office of the Secretary of Defense Does Not Provide Oversight of or Report on Service Efforts to Invest in Depots

DOD has not developed a process to oversee the implementation of the services' depot optimization plans or provide reporting on depot investment effectiveness to DOD decision makers and Congress. Officials with the Deputy Assistant Secretary of Defense for Materiel Readiness stated that their role is to advocate for the service depots within DOD, and not to develop depot policies or review service depot investments. Specifically, they stated that they are unable to set infrastructure policy and do not have authority to alter service investment decisions. However, as part of an office reorganization during the summer of 2018, the Secretary of Defense tasked the Assistant Secretary of Defense for Sustainment with developing logistics and maintenance policy.

As of January 2019, the Office of the Assistant Secretary of Defense for Sustainment has not developed a process to monitor the services' efforts to improve the condition of depot facilities and equipment. Furthermore, the Office of the Assistant Secretary of Defense for Sustainment does not report on service depot investments internally to the department or externally to Congress. Other Office of the Secretary of Defense

³⁷ See [GAO-17-548](#) (Washington, D.C.: Sept. 12, 2017); *Defense Inventory: Actions Needed to Improve the Defense Logistics Agency's Inventory Management*, [GAO-14-495](#) (Washington, D.C.: June 19, 2014); [GAO-13-228](#); [GAO-11-240R](#); [GAO-09-676](#); *Managing For Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005); and [GAO/GGD/AIMD-99-69](#).

The Department of Defense's (DOD) Results-Oriented Approach for Improving Inventory Management

In developing the Comprehensive Inventory Management Improvement Plan, DOD took the following actions to establish department-wide metrics to improve the accuracy of demand forecasting, according to DOD officials:

1. It established a team of subject matter experts, including logistics management specialists, information technology and data experts, and operations research analysts (i.e., individuals with expertise in advanced mathematical and analytical methods), representing each of the services and the Defense Logistics Agency (DLA).
2. The team of experts assessed the data sources and methods used by the services and DLA and evaluated potential department-wide metrics for measuring demand forecasting accuracy based on the available data sources.
3. DOD implemented the standardized metrics in a phased approach with the initial phase focused on establishing a baseline for the metrics.

Through the process of establishing these metrics, DOD developed additional areas for exploration and improvement, such as improving its guidance on demand forecasting.

Source: GAO analysis of DOD documentation. | GAO-19-242

organizations have successfully used a results-oriented management approach—which includes regular monitoring and reporting—to oversee the department-wide efforts to drive significant improvements. For example, officials with the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness created a Comprehensive Inventory Management Improvement Plan in 2010 that DOD used to improve data collection, develop standardized metrics, and provide increased oversight (see sidebar). The result was that DOD was able to achieve a number of improvements, such as reducing the value of its on-hand excess inventory by about \$2 billion, improving policy and guidance, and establishing standardized metrics for monitoring its operations. Based on these positive results, DOD institutionalized this process through guidance and has continued to use it since 2010. Using this approach, DOD was ultimately able to improve its inventory management processes enough to have it removed from GAO's High Risk List in 2017.³⁸

DOD does report some depot information to Congress; however, the information reported is limited in nature and does not address key issues concerning depot facilities and equipment. For example, every other year DOD is required to report to Congress on its core depot-level maintenance and repair capability requirements and workload.³⁹ DOD must also report annually on the percentage of depot maintenance funds expended during the preceding fiscal year and projected to be expended during the current and ensuing fiscal year, for performance of depot-level maintenance and repair workloads by the public and private sectors.⁴⁰ Combined with the services' reporting on their depot investment spending (see appendix I), this information provides Congress with some information about depot operations and performance. However, these reports do not inform Congress about several key points, including whether the service depots are becoming more effective and efficient or the extent to which DOD has managed to address depot investment backlogs. We have noted in prior work that the backlog of facilities restoration and modernization projects at the depots can be significant, and that reducing these backlogs will likely take a sustained effort over many years.⁴¹ Furthermore, these efforts are important to improving the

³⁸GAO, *High-Risk Series: Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others*, [GAO-17-317](#) (Washington, D.C.: Feb. 15, 2017).

³⁹10 U.S.C. § 2464.

⁴⁰10 U.S.C. § 2466.

⁴¹[GAO-17-548](#).

effectiveness and efficiency of the depots, which is important to ensuring the readiness of military forces.

Improving readiness is one of DOD's top priorities. Specifically, the Secretary of Defense issued a memorandum in September 2018 about improving readiness which set a minimum target of 80 percent mission capability for DOD's key aviation platforms starting in fiscal year 2019.⁴² In addition, the memorandum identified reducing operating and support costs for these platforms every year beginning in fiscal year 2019 as another priority. Furthermore, DOD has more broadly identified rebuilding readiness as a priority across all the services.⁴³ As noted previously, the depots are essential to providing readiness to DOD in the form of repaired weapon systems, and depot optimization efforts can provide a return on investment in the form of reduced maintenance time and cost. However, the investments made at the depots—which are crucial for optimization, throughput, and ultimately readiness—often need years and millions of dollars to execute, which means that long-term planning is essential to ensuring that investments are made effectively. Regular monitoring of the services' depot investment efforts could ensure that these investments target readiness drivers to produce the greatest effect.

Furthermore, our previous work has noted that timeframes for improvement efforts can slip, which makes reporting to DOD decision makers and Congress essential for holding stakeholders accountable for making progress. For example, we reported in 2017 that even though the Navy had developed capital investment plans in 2013 and 2015 intended to help improve the state of the facilities and equipment at the shipyards, backlogged restoration and maintenance projects had grown by 41 percent over 5 years which extended the amount of time required to clear the backlog under expected funding levels.⁴⁴ Without providing oversight of and reporting on service depot investments, DOD risks continued deterioration of the depots' facilities and equipment, suboptimal investments, and reduced military readiness as the services experience costly maintenance delays.

⁴²Secretary of Defense Memorandum, *NDS Implementation – Mission Capability of Critical Aviation Platforms* (Sept. 17, 2018). This memorandum also noted that additional guidance on improving readiness for ground and naval systems would be forthcoming.

⁴³Department of Defense, *2015-2017 Guidance for the Employment of the Force* (February 2015).

⁴⁴[GAO-17-548](#).

Conclusion

DOD's 21 depots are critical for repairing and maintaining its complex array of weapon systems. Inefficient depots contribute to longer maintenance times, increased costs, and reduced readiness. Currently, a majority of the depots have facilities that are in poor condition and are relying on old equipment that is past its useful service life. The military services spend millions of dollars annually on depot facilities and equipment in order to meet minimum investment requirements designed to sustain depot performance. Notwithstanding these expenditures, the services are not consistently required to track maintenance delays caused by facility or equipment conditions. This lack of tracking hinders the services' ability to target investments to facility and equipment needs that would have the greatest effect on repair times or other performance goals. By knowing how often facility and equipment conditions lead to work delays, the services could reduce the risk of investing in less critical facilities and equipment. They could also reduce the risk of more work stoppages caused by facility or equipment conditions.

The military services are in the midst of developing congressionally-directed depot optimization plans that are expected to include both 1) an analysis of the cost of depot facilities and equipment modernization and 2) an investment strategy. However, with the exception of the plan designed to address the Navy shipyards, the services' plans are still in the initial stages, and each one is expected to lack key elements of a results-oriented management approach—including analytically based goals, results-oriented metrics, full identification of required resources and risks, and regular reporting on progress—that would help guide investment. As the shipyard optimization plan has demonstrated, the cost of optimization may be high and, once defined, will require sustained management attention over many years to carry out successfully. In addition, implementing a regular monitoring and reporting process to provide oversight and accountability over depot investments would further enhance DOD's ability to attain improvements at the depots significant enough to reverse years of decline and reach the challenging goals set by the Secretary of Defense for improving mission capability rates and reducing operating and support costs.

Recommendations for Executive Action

We are making the following 13 recommendations to the Department of Defense.

The Secretary of the Army should ensure that Army Materiel Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays. (Recommendation 1)

The Secretary of the Army should ensure that Army Materiel Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Army depot. (Recommendation 2)

The Secretary of the Navy should ensure that Naval Sea Systems Command and the Commander, Fleet Readiness Centers establish measures for their depots to track facility or equipment conditions that lead to maintenance delays. (Recommendation 3)

The Secretary of the Navy should ensure that Naval Sea Systems Command and the Commander, Fleet Readiness Centers implement tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Navy depot. (Recommendation 4)

The Secretary of the Air Force should ensure that Air Force Materiel Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays. (Recommendation 5)

The Secretary of the Air Force should ensure that Air Force Materiel Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Air Force depot. (Recommendation 6)

The Commandant of the Marine Corps should ensure that Marine Corps Logistics Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays. (Recommendation 7)

The Commandant of the Marine Corps should ensure that Marine Corps Logistics Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Marine Corp depot. (Recommendation 8)

The Secretary of the Army should ensure that Army Materiel Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress. (Recommendation 9)

The Secretary of the Navy should ensure that Commander, Fleet Readiness Centers incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress. (Recommendation 10)

The Secretary of the Air Force should ensure that Air Force Materiel Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress. (Recommendation 11)

The Commandant of the Marine Corps should ensure that Marine Corps Logistics Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress. (Recommendation 12)

The Secretary of Defense should ensure that the Assistant Secretary of Defense for Sustainment develops an approach for managing service depot investments that includes management monitoring and regular reporting to decision makers and Congress on progress. (Recommendation 13)

Agency Comments and Our Evaluation

We provided a draft of this report to DOD for review and comment. In written comments on a draft of this report (reproduced in appendix XXIV), DOD concurred with 12 of our 13 recommendations and stated, in general, that the Service Chiefs for the Army, Navy, Air Force, and Marine Corps will ensure that their respective material commands take actions to implement the recommendations for their service. DOD also provided technical comments, which we incorporated where appropriate.

DOD did not concur with our recommendation that the Assistant Secretary of Defense for Sustainment (ASD for Sustainment) develop an approach for managing service depot investments. In its response, DOD stated it could not develop such an approach until the services finalized and resourced depot optimization plans. DOD stated it would continue to monitor capital investments at service depots through the budget process.

We continue to believe that the ASD for Sustainment should develop an approach for managing service depot investments that includes management monitoring and regular reporting to decision makers and Congress on progress for several reasons. First, our recommendation is focused on the ASD for Sustainment developing an approach for overseeing the services' overall depot investments, not just those contained in their optimization plans. While the depot optimization plans will certainly affect the services' depot investments, the depots will require additional investments to sustain, restore, and modernize their operations apart from their efforts to optimize facility layout and workflow.

Second, the ASD for Sustainment's early involvement in the services' development and resourcing of depot optimization plans could enhance service efforts to identify appropriate analytically-based goals aligned with the Secretary of Defense's readiness objectives, enhance optimization across the DOD enterprise, and ensure sustained senior leadership attention to achieving optimal depot efficiency and effectiveness. Waiting until the services' depot optimization plans have been resourced – that is, funded – could result in the ASD for Sustainment beginning its involvement and oversight after critical optimization decisions, such as setting goals, identifying key metrics, and adjudicating trade-offs across the depot enterprise, have been made on an individual basis by the services.

Third, while monitoring investments at the service depots through the budget process is an important aspect of oversight, the ASD for Sustainment could enhance the oversight of and accountability over depot investments through a more comprehensive oversight approach. This comprehensive approach could include regular monitoring that focuses on ensuring that approved depot investment funding is implemented as planned and achieves desired results. An approach focused on the implementation of efforts aimed at desired outcomes could better position DOD and the services to make sustained progress.

Finally, having regular reporting of progress will help ensure DOD leadership and the Congress have the information needed to help make

critical funding and policy decisions. Reporting on progress towards desired outcomes also could assist in ensuring that there is accountability within the department for reversing years of decline and reaching the challenging goals set by the Secretary of Defense for improving mission capability rates and reducing operating and support costs.

We are sending copies of this report to the appropriate congressional committees, the Acting Secretary of Defense, and the Secretaries of the Army, Navy, Air Force, and the Commandant of the Marine Corps. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have questions about this report, please contact me at maurerd@gao.gov or (202) 512-9627. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix XXV.

A handwritten signature in black ink that reads "Diana Maurer". The signature is written in a cursive, flowing style.

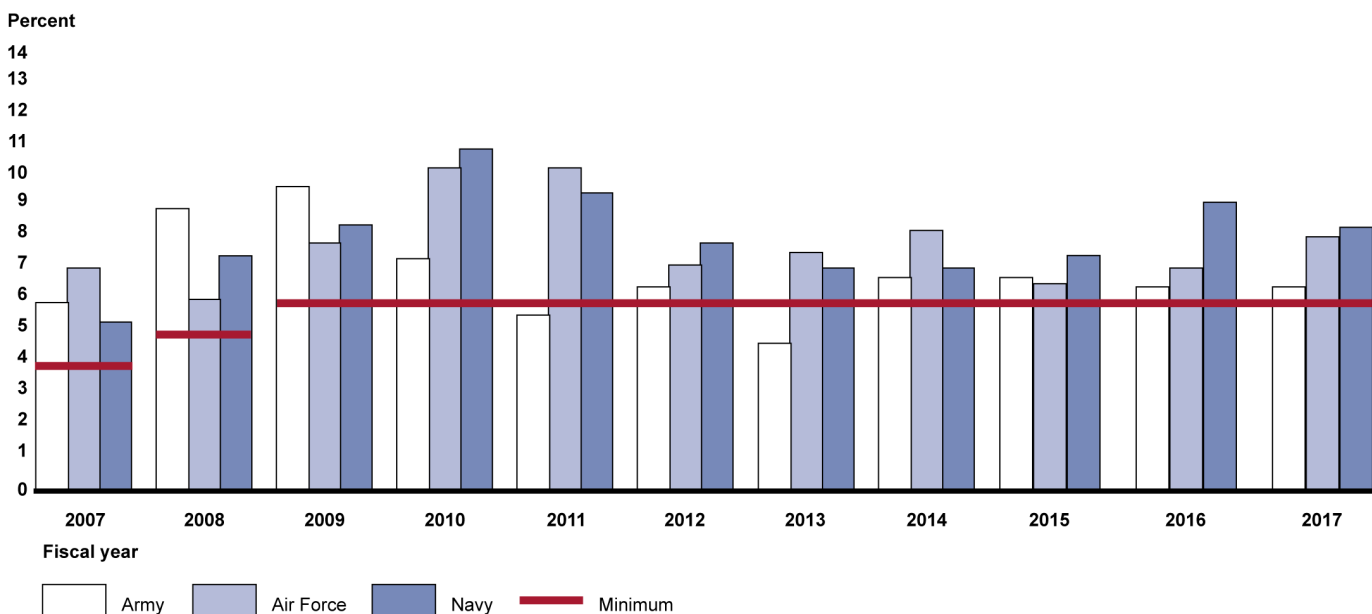
Diana Maurer
Director,
Defense Capabilities and Management

Appendix I: Service Depot Investment Has Generally Met Statutory Requirements

Military Departments Generally Have Met the 6 Percent Rule

Based on our analysis of service budget submissions and 6 percent project lists, we found that the departments have generally met the 6 percent requirement in fiscal years 2007 through 2017 (see fig. 13).

Figure 13: Military Department Reported Depot Investment as a Percentage of Average Total Combined Maintenance, Repair, and Overhaul Workload



Source: GAO analysis of Department of Defense budget justification data. | GAO-19-242

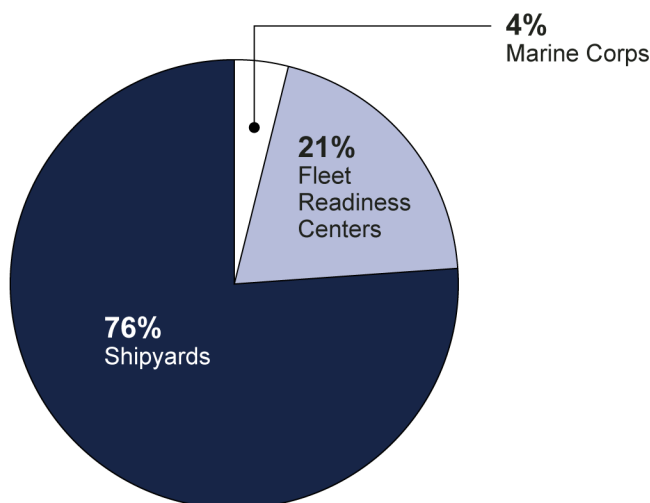
Note: Section 2476 of title 10, United States Code requires the secretary of each military department to invest in the capital budgets of the military department a total amount equal to not less than 6 percent of the average total combined maintenance, repair, and overhaul workload funded at the covered depots for the preceding 3 fiscal years. This is also known as the "6 percent rule". The law allowed the military departments 2 years to reach the required 6 percent investment level prior to full implementation in 2009. The term "covered depot" refers to the 17 Army, Navy, Air Force, and Marine Corps depots and four Army arsenals. Compliance with the 6 percent rule is applied to the military departments, therefore the Marine Corps depot funding is included in Department of the Navy reporting. We found that these totals included some sustainment activity after fiscal year 2012, but the amount did not materially affect compliance with the investment minimum.

As shown above, the Navy and Air Force met the minimum requirement every year since the minimum investment requirement was enacted in fiscal year 2007. The Army met the minimum investment requirement for most years, but did not meet the minimum on two occasions, in fiscal year 2011 and fiscal year 2013. According to Army officials, they missed the fiscal year 2011 minimum by around \$21 million due to a software project that was scheduled to execute in fiscal year 2011, but was unable to execute and moved to fiscal year 2012 instead. An Army official attributed

the difference in fiscal year 2013, which was over \$68 million, to the effects of fiscal year 2013 sequestration, which generally reduced funding available to the services.¹

While the Navy met its minimum investment requirement every year, it is worth noting that the 6 percent rule measures compliance by department. Therefore, the Navy's reported investments include those for its four shipyards, its three fleet readiness centers, and the two Marine Corps depots. From fiscal year 2007 through fiscal year 2017, the shipyards accounted for 76 percent of Navy depot investment (see fig. 14).

Figure 14: Distribution of Navy Depot Investment Spending, by Organization, Fiscal Years 2007 – 2017



Source: GAO analysis of Navy and Marine Corps investment data. | GAO-19-242

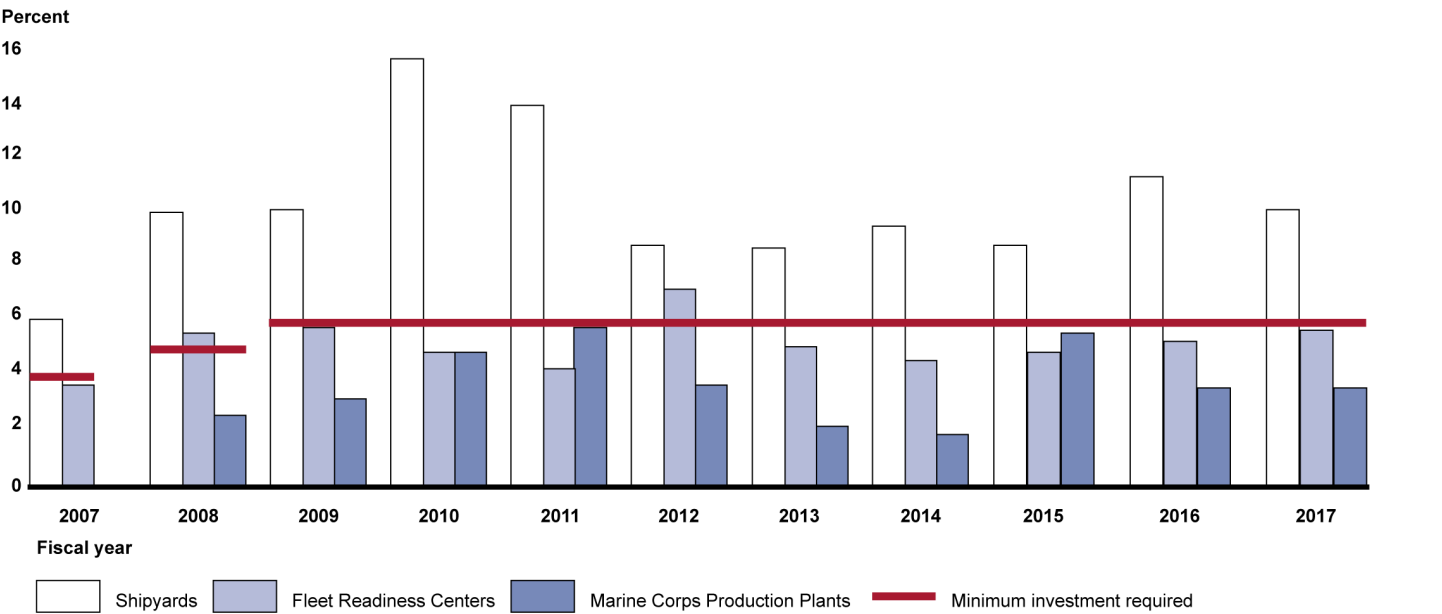
Note: Numbers may not add to 100 due to rounding.

If these three organizations were viewed independently, only the shipyards would have regularly met their minimum investment requirement; the fleet readiness centers and Marine Corps depots have generally invested less than 6 percent of their respective maintenance, repair, and overhaul workload, as shown in figure 15. Under this

¹In March 2013, the President ordered across-the-board spending reductions, known as sequestration, for all federal agencies and departments. As a result, DOD's discretionary resources were reduced by about \$37.2 billion over the remainder of fiscal year 2013. See GAO, *Sequestration: Documenting and Assessing Lessons Learned Would Assist DOD in Planning for Future Budget Uncertainty*, [GAO-15-470](#) (Washington, D.C.: May 27, 2015).

perspective, the fleet readiness centers would only have met the 6 percent minimum in fiscal years 2008 and 2012, and the Marine Corps depots would never have met the 6 percent minimum.

Figure 15: Navy Depot Investment as a Percentage of Average Total Combined Maintenance, Repair, and Overhaul Workload, by Navy Organization, Fiscal Years 2007 – 2017



Source: GAO analysis of Department of Defense budget data and Navy and Marine Corps investment projects. | GAO-19-242

Military Department
Compliance with Fiscal
Year 2012 Change to
Prohibit Facility
Sustainment

The services have counted some facilities sustainment activities towards meeting the 6 percent minimum since fiscal year 2012, but the effect of these activities on the departments' ability to meet the minimum investment requirement appears minimal.² In fiscal year 2012, Congress revised 10 U.S.C. § 2476 to prohibit the services from counting sustainment activity towards meeting their 6 percent investment minimum. Sustainment activities are defined as the regular activities needed to keep a facility in good working order. We requested project documentation from each of the services for a number of the investments that they counted towards their 6 percent minimum.³

Army officials were only able to provide us with about one-third of our requested project documentation (46 out of 158 projects requested); as a result, our assessment of the Army is limited. Of the project documentation we did receive, we found sustainment activities accounted for 13 projects totaling about \$21 million in nominal dollars from fiscal year 2012 through fiscal year 2017. Those projects represent approximately 1 percent of the Army's total depot investment over that time. The Army's compliance with the 6 percent rule would not have been affected if those projects had been properly excluded.

²Sustainment is the maintenance and repair activities necessary to keep an inventory of facilities in good working order. It includes regularly scheduled adjustments and inspections, preventive maintenance tasks, and emergency response and service calls for minor repairs. It also includes major repairs or replacement of facility components (usually accomplished by contract) that are expected to occur periodically throughout the life cycle of facilities. This work includes regular roof replacement, refinishing of wall surfaces, repairing and replacement of heating and cooling systems, replacing tile and carpeting, and similar types of work. It does not include environmental compliance costs, facility leases, or other tasks associated with facilities operations (such as custodial services, grounds services, waste disposal, and the provision of central utilities). DOD 7000.14-R, *Financial Management Regulation*, vol. 2B, chap. 8, § 080105 (Dec. 2016).

³We excluded any 6 percent project that was not related to facilities, such as equipment purchases and process improvements, as these activities cannot, by definition, be sustainment. We also excluded any project that was under \$250,000 in projected costs, in order to focus on those projects with the most likelihood of affecting the departments' compliance with the 6 percent rule. This analysis identified sustainment projects that should not have been counted, but is not a generalizable sample.

Navy and Marine Corps officials were able to provide project documentation for 172 out of 211 projects requested.⁴ Navy sustainment activities accounted for 47 projects totaling about \$94 million in nominal dollars from fiscal year 2012 through fiscal year 2017. Those projects represent about 3 percent of the Navy's total depot investment over that time. If those projects had been properly excluded, the Navy would still have met its 6 percent minimum for each fiscal year.

Finally, Air Force officials were able to provide project documentation for 136 out of 138 projects requested. Air Force sustainment activities accounted for 51 projects totaling about \$45 million in nominal dollars from fiscal year 2012 through fiscal year 2017. Those projects represent about 2 percent of the Air Force's total depot investment over that time. If those projects had been properly excluded, the Air Force would still have met its 6 percent investment minimum for each fiscal year.

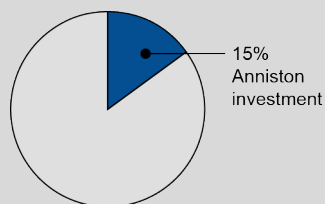
⁴The Navy shipyards were able to provide additional documentation for 143 out of 156 requested projects, the Navy aviation depots were able to provide documentation for 8 out of 33 requested projects, and the Marine Corps were able to provide documentation for 21 out of 22 requested projects.



Mission

Anniston specializes in tracked and wheeled vehicles, artillery, bridging equipment, small arms, and other items.

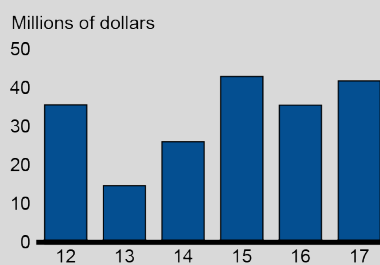
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, about \$196 million – nearly 15% – went to Anniston.

Anniston Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Anniston Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Anniston has identified about \$38 million in backlogged restoration and modernization projects.

Appendix II

Anniston Army Depot Overview

Anniston, Alabama

Figure 16: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Anniston Army Depot

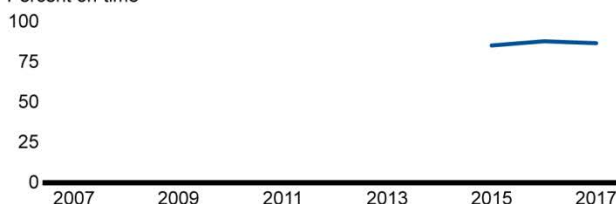
Systems



Performance

Schedule performance »

Percent on-time

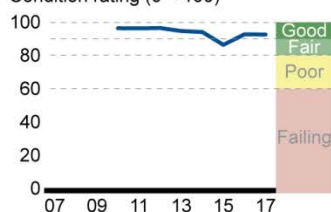


Overall, Anniston's schedule performance has held steady over the past 3 years.

Facilities

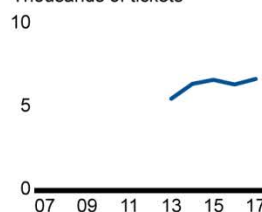
Average weighted facility condition »

Condition rating (0 – 100)



Facility repairs »

Thousands of tickets



The state of facilities at Anniston is mixed. The average condition of its facilities is in the "good" category, though this average has been decreasing over the last 8 years. At the same time, however, the number of facilities repair tickets has increased.

Equipment

Average age »

Average expected service life:
Data not available



Equipment repairs »

Thousands of tickets



Anniston's overall equipment repair requests have remained essentially flat since fiscal year 2013. Meanwhile, the average age of equipment is older than many other Army depots, but no data was provided to determine the average expected service life.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⊖ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- No data or not enough data to determine a trend

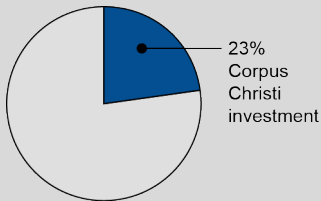
Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Corpus Christi specializes in helicopters (AH-64, AH-1, CH-47, OH-58, UH-60, and UH-1), engines, and associated systems and subsystems.

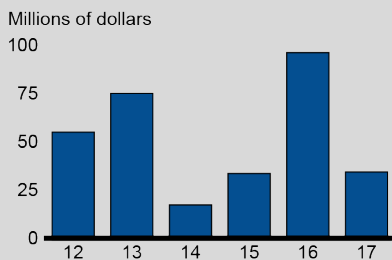
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, about \$311 million – over 23% – went to Corpus Christi.

Corpus Christi Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Corpus Christi Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Corpus Christi has identified about \$25 million in backlogged restoration and modernization projects.

Appendix III

Corpus Christi Army Depot Overview

Corpus Christi, Texas

Figure 17: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Corpus Christi Army Depot

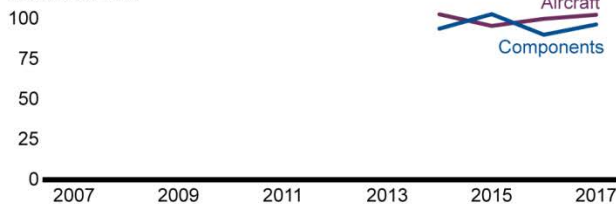
Systems



Performance

Schedule performance »

Percent on-time

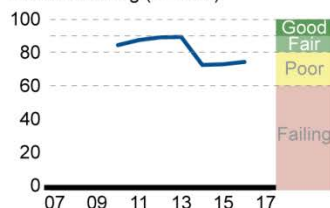


Overall, Corpus Christi's schedule performance has remained fairly steady over the last 4 years, remaining near, and in some cases exceeding, a 100% completion rate.

Facilities

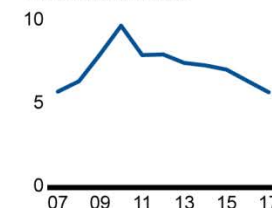
Average weighted facility condition »

Condition rating (0 – 100)



Facility repairs »

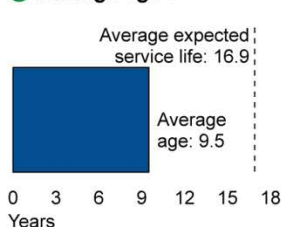
Thousands of tickets



The status of the facilities at Corpus Christi is mixed. The overall condition of facilities has been decreasing, and currently falls in the "poor" category. Meanwhile, the number of facility repair tickets is experiencing a 10 year low.

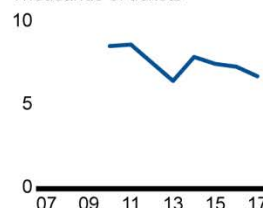
Equipment

Average age »



Equipment repairs »

Thousands of tickets



The state of equipment at Corpus Christi is positive. Corpus Christi's equipment appears to be in good shape. Its overall equipment repair requests have decreased, which can be an indicator of equipment exhibiting fewer problems. This is consistent with its average equipment age, which is still below its expected useful life.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

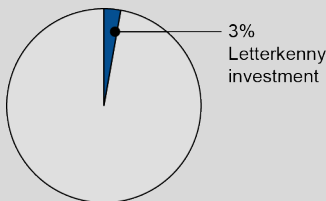
Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Letterkenny specializes in air defense and tactical missiles, mobile electric power, route clearance vehicles (RCV), and material handling equipment (MHE).

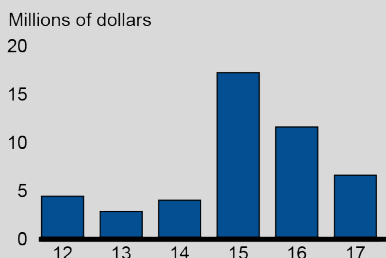
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, about \$47 million – 3% – went to Letterkenny.

Letterkenny Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Letterkenny Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Letterkenny has identified about \$25 million in backlogged restoration and modernization projects.

Appendix IV

Letterkenny Army Depot Overview

Letterkenny, Pennsylvania

Figure 18: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Letterkenny Army Depot

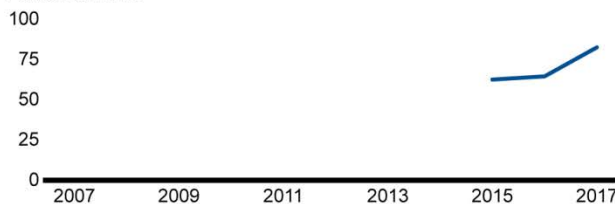
Systems



Performance

Schedule performance »

Percent on-time

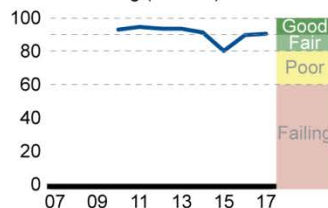


Overall, Letterkenny's schedule performance has increased over the last 3 years.

Facilities

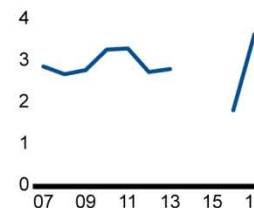
Average weighted facility condition »

Condition rating (0 – 100)



Facility repairs »

Thousands of tickets

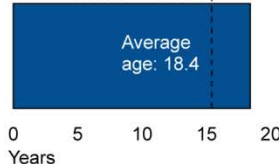


The status of the facilities at Letterkenny is mixed. While its average weighted rating for its facilities is still in the "good" category, this rating has decreased since FY 2010. However, at the same time, the number of facility repair tickets has increased.

Equipment

Average age »

Average expected service life: 15.4



Equipment repairs »

Data not available

The state of Letterkenny's equipment is uncertain. Its overall equipment age is past its expected useful life by an average of 3 years. However, it was unable to provide complete equipment repair data.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

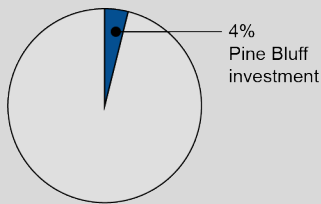
Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Pine Bluff specializes in specialized ammunition and smoke, chemical, biological, radiological, and nuclear (CBRN) defense capabilities through manufacturing, storage, and logistics.

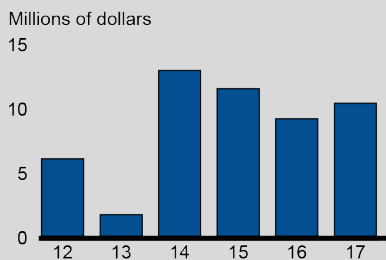
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, about \$52 million – nearly 4% – went to Pine Bluff.

Pine Bluff Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Pine Bluff Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Pine Bluff has identified about \$7 million in backlogged restoration and modernization projects.

Appendix V

Pine Bluff Arsenal Overview

Pine Bluff, Arkansas

Figure 19: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Pine Bluff Arsenal

Systems



Performance

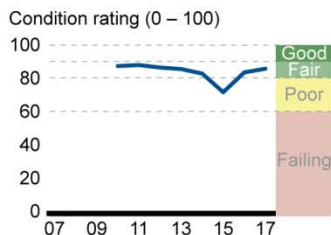
Schedule performance »

Data not available

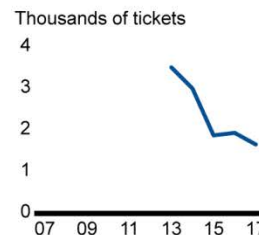
Pine Bluff provided 15 months' worth of performance data, enough to report performance for a single fiscal year. Therefore, no performance trend can be determined.

Facilities

Average weighted facility condition »



Facility repairs »



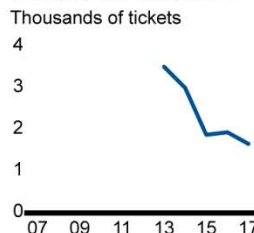
The state of the facilities at Pine Bluff is mixed. The average condition of the facilities is in the "fair" category, though this average has decreased slightly. However, Pine Bluff was unable to separate its facility and equipment repair tickets.

Equipment

Average age »

Data not available

Equipment repairs »



That state of Pine Bluff's equipment is unknown. Pine Bluff was unable to provide data on the age of its equipment, and it was also unable to separate its facility and equipment repair tickets. Therefore, we do not have enough data to know the status of their equipment.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- No data or not enough data to determine a trend

Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Appendix VI

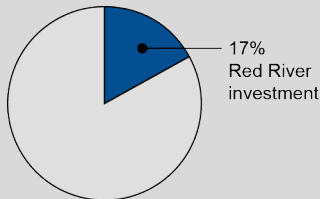
Red River Army Depot Overview

Texarkana, Texas

Mission

Red River specializes in tactical wheeled vehicles—including Mine Resistant Ambush Protected (MRAP) vehicles, High Mobility Multipurpose Wheeled Vehicles (HMMWV), Family of Medium Tactical Vehicles (FMTV), Bradley Fighting Vehicles, and the Multiple Launch Rocket System (MLRS).

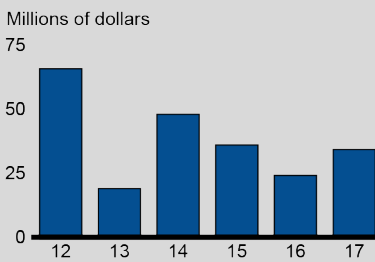
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, about \$227 million – nearly 17% – went to Red River.

Red River Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Red River Facilities Restoration and Modernization Backlog

Red River did not provide any data on their backlog of restoration and modernization projects.

Figure 20: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Red River Army Depot

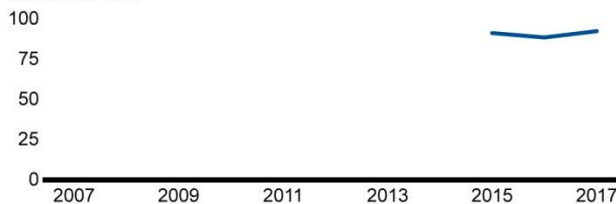
Systems



Performance

Schedule performance »

Percent on-time

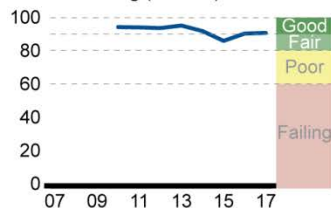


Overall, Red River's schedule performance has remained steady over the last 3 years.

Facilities

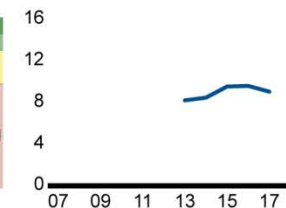
Average weighted facility condition »

Condition rating (0 – 100)



Facility repairs »

Thousands of tickets

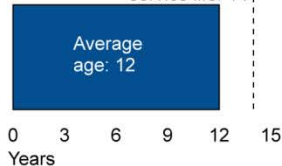


The state of the facilities at Red River is mixed. The overall condition of the facilities is in the "good" category, though it has decreased slightly over the last 8 years. However, at the same time, the number of facilities repair tickets has increased.

Equipment

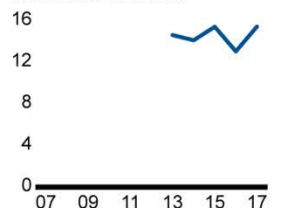
Average age »

Average expected service life: 14



Equipment repairs »

Thousands of tickets



The state of Red River's depot equipment is mixed. Its equipment is still below its expected useful life, one of only four depots for which this is the case. However, its equipment repair requests have increased slightly.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

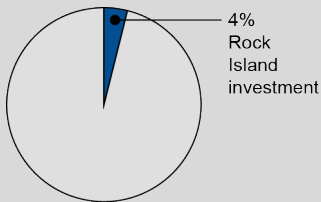
Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Rock Island houses the Joint Manufacturing and Technology Center, which has been designated the Center of Industrial and Technical Excellence for mobile maintenance equipment such as the Forward Repair System. It is also the sole Army location for assembling recoil mechanisms (such as those on howitzers).

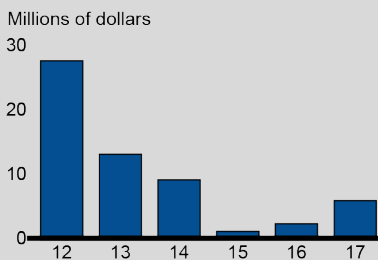
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, about \$59 million – over 4% – went to Rock Island.

Rock Island Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Rock Island Facilities Restoration and Modernization Backlog

Rock Island did not provide any data on their backlog of restoration and modernization projects.

Appendix VII

Rock Island Arsenal Overview

Rock Island, Illinois

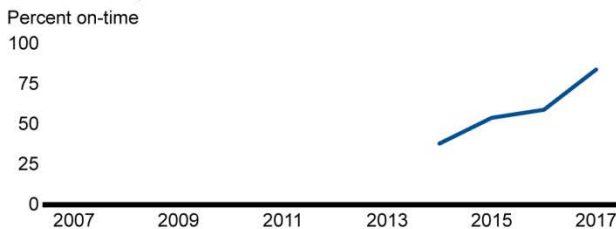
Figure 21: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Rock Island Arsenal

Systems



Performance

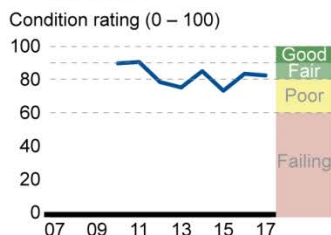
Schedule performance »



Overall, Rock Island's schedule performance has increased steadily over the last 4 fiscal years.

Facilities

Average weighted facility condition »



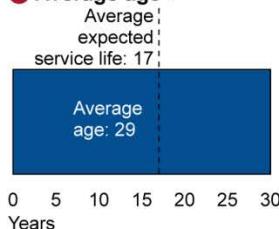
Facility repairs »

Data not available

The state of the facilities at Rock Island is uncertain. Its facility condition generally decreased over the last 8 years. However, no data on the number of facility repairs was available.

Equipment

Average age »



Equipment repairs »

Data not available

The state of Rock Island's equipment is unclear. Its average equipment age is well past its expected useful life, however, no data was available on the number of equipment repair requests submitted at the depot.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

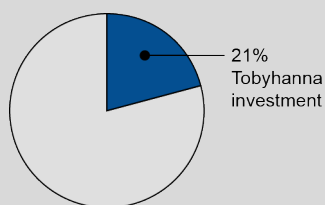
Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Tobyhanna specializes in command, control, communications, computers, intelligence, surveillance and reconnaissance systems, electronics, avionics, and missile guidance and control systems.

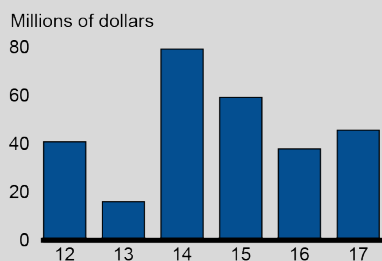
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, about \$279 million – nearly 21% – went to Tobyhanna.

Tobyhanna Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Tobyhanna Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Tobyhanna has identified about \$43 million in backlogged restoration and modernization projects.

Appendix VIII

Tobyhanna Army Depot Overview

Tobyhanna, Pennsylvania

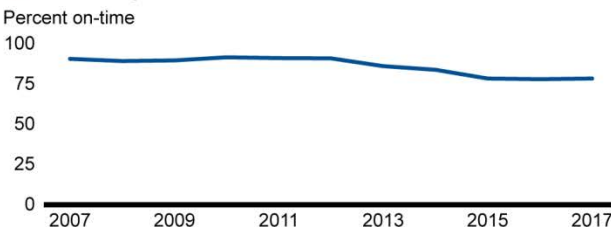
Figure 22: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Tobyhanna Army Depot

Systems



Performance

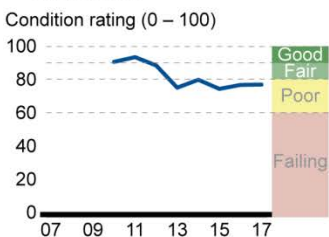
Schedule performance



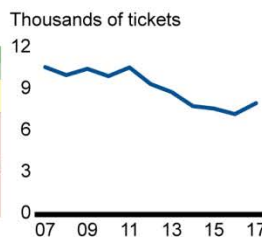
Overall, Tobyhanna's schedule performance has decreased over the last 8 years.

Facilities

Average weighted facility condition



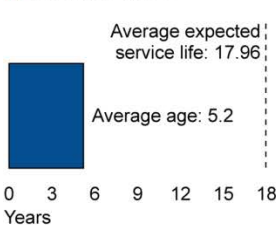
Facility repairs



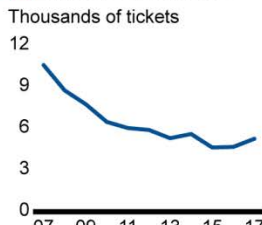
The state of the facilities at Tobyhanna is mixed. The average facility condition rating has decreased since fiscal year 2010 and is currently in the "poor" category. However, the number of facility repair tickets has steadily decreased.

Equipment

Average age



Equipment repairs



The state of equipment at Tobyhanna is positive. Overall equipment repair requests have decreased since 2007 and the average age of equipment is below its expected service life.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

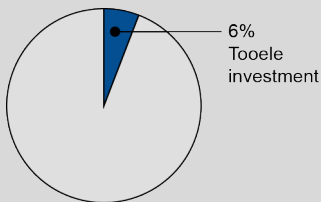
Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Tooele specializes in ammunition logistics (storage, shipping, sorting, and inspecting), as well as production of related equipment needed for ammunition maintenance and demilitarization.

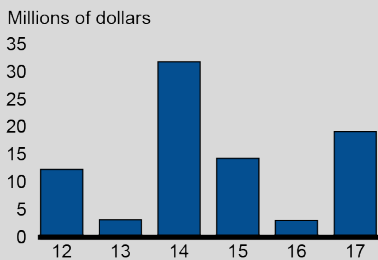
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, about \$84 million – over 6% – went to Tooele.

Tooele Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Tooele Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Tooele has identified about \$21 million in backlogged restoration and modernization projects.

Appendix IX

Tooele Army Depot Overview

Tooele, Utah

Figure 23: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Tooele Army Depot

Systems



Ammunition

Performance

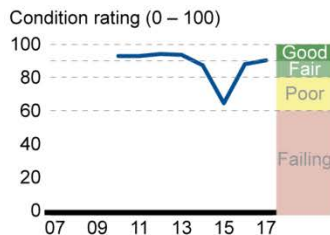
Schedule performance »

Data not available

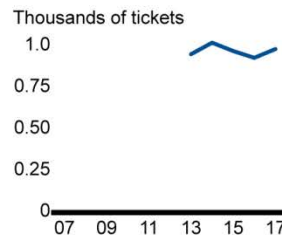
Tooele was only able to provide 15 months' worth of performance data, enough to cover a single fiscal year. Therefore, no trend can be determined.

Facilities

Average weighted facility condition »



Facility repairs »



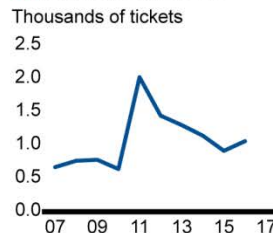
The status of the facilities at Tooele is inconclusive. The overall condition of the facilities has decreased slightly over the last 11 years. However, at the same time, the number of facilities repair tickets essentially held steady.

Equipment

Average age »

Data not available

Equipment repairs »



Tooele's does not have enough information to determine the condition of its equipment. However, equipment repair tickets have increased over the last 11 years.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

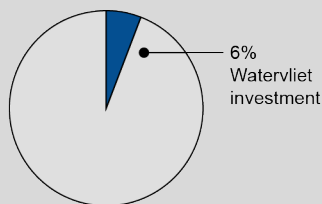
Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Watervliet specializes in cannons, mortars, and associated components, as well as machining and fabrication services.

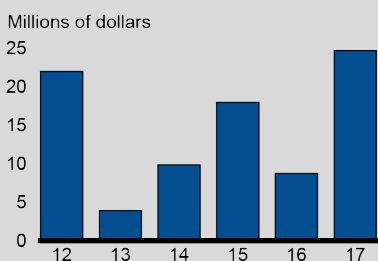
Army Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Of the \$1.6 billion spent by the Army on depot investment between fiscal year 2012 and fiscal year 2017, \$309 million was spent on projects that benefited multiple depots. Of the remaining \$1.34 billion, \$87 million – about 6% – went to Watervliet.

Watervliet Depot Investment



Source: GAO analysis of Army data. | GAO-19-242

Watervliet Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Watervliet has identified about \$36 million in backlogged restoration and modernization projects.

Appendix X

Watervliet Arsenal Overview

Watervliet, New York

Figure 24: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Watervliet Arsenal

Systems



Mortars

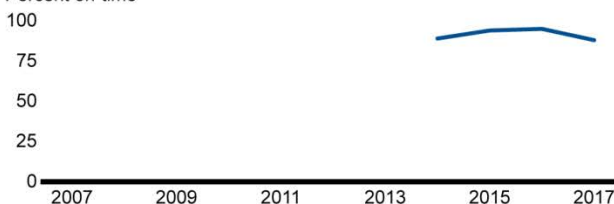
Tank cannons

Howitzers

Performance

Schedule performance »

Percent on-time

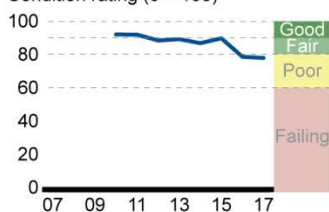


Overall, Watervliet's schedule performance has held fairly steady over the last 4 years.

Facilities

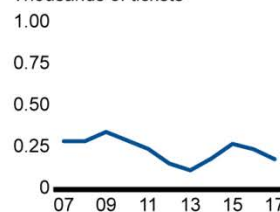
Average weighted facility condition »

Condition rating (0 – 100)



Facility repairs »

Thousands of tickets

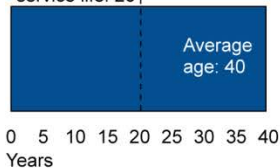


The status of the facilities at Watervliet is mixed. The overall condition of the facilities is in the "poor" category and has been decreasing over the last 8 years. However, at the same time, the number of facilities repair tickets has decreased.

Equipment

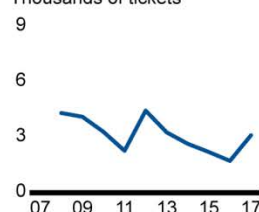
Average age »

Average ; expected ; service life: 20 ;



Equipment repairs »

Thousands of tickets



The state of equipment at Watervliet is mixed. Its overall equipment repair requests have decreased. However, this is in contrast with its average equipment age, which is double its expected useful life.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

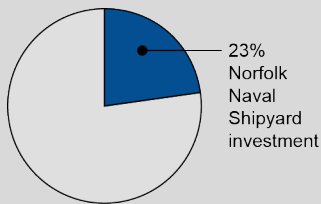
Source: GAO analysis of Army data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Norfolk Naval Shipyard specializes in nuclear aircraft carriers (Nimitz class), submarines (Los Angeles-class and Ohio-class), and various surface combatants (CGs, LHDs, LPDs, LCCs, FFGs, and AS Tenders).

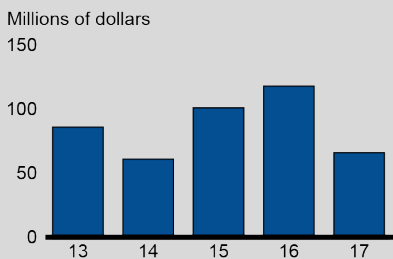
Navy Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Of the \$2.4 billion spent by the four shipyards on depot investment between fiscal year 2012 and 2017, \$557 million—about 23%—was spent on Norfolk Naval Shipyard.

Norfolk Naval Shipyard Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Norfolk Naval Shipyard Facilities Restoration and Modernization Backlog

Norfolk Naval Shipyard identified about \$1.46 billion in backlogged restoration and modernization (R&M) projects in fiscal year 2017. The Navy defines backlog as R&M efforts that have been identified but not yet executed.

Appendix XI

Norfolk Naval Shipyard Overview

Portsmouth, Virginia

Figure 25: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Norfolk Naval Shipyard

Systems



Aircraft carriers



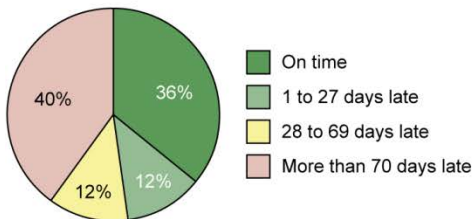
Surface ships



Submarines

Performance

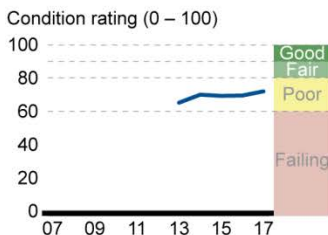
Schedule performance



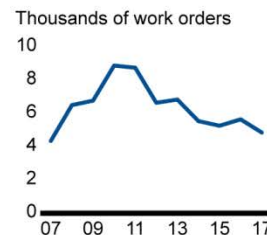
Generally, from fiscal year 2007 through fiscal year 2017, Norfolk Naval Shipyard completed more projects late than on-time. On-time completions represent 36% of all projects. Furthermore, 40% of all projects are completed more than 70 days late.

Facilities

Average weighted facility condition



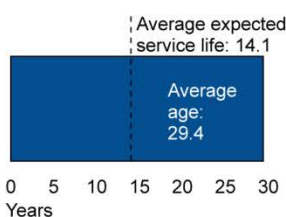
Facility repairs



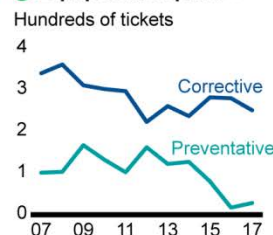
The status of the facilities at Norfolk Naval Shipyard is mixed. Though the average condition rating is in the "poor" category, it has been increasing over the last five years. In addition, the number of facility repair tickets has increased.

Equipment

Average age



Equipment repairs



The state of equipment at Norfolk is mixed. Its average age of equipment is well past its expected service life. However, its equipment repair tickets have decreased from fiscal year 2007 to 2017.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

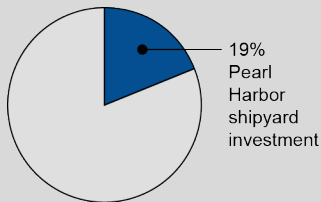
Source: GAO analysis of Navy data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Pearl Harbor Naval Shipyard specializes in nuclear submarines (Los Angeles-class and Virginia-class) and surface combatants (CGs, DDGs, LPDs, FFGs, and AS Tenders).

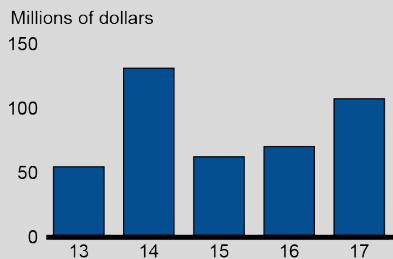
Navy Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Of the \$2.4 billion spent by the four shipyards on depot investment between fiscal year 2012 and 2017, \$458 million—about 19%—was spent on Pearl Harbor Naval Shipyard.

Pearl Harbor Naval Shipyard Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Pearl Harbor Naval Shipyard Facilities Restoration and Modernization Backlog

Pearl Harbor Naval Shipyard identified about \$1.69 billion in backlogged restoration and modernization (R&M) projects in fiscal year 2017. The Navy defines backlog as R&M efforts that have been identified but not yet executed.

Appendix XII

Pearl Harbor Naval Shipyard Overview

Honolulu, Hawaii

Figure 26: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Pearl Harbor Naval Shipyard

Systems

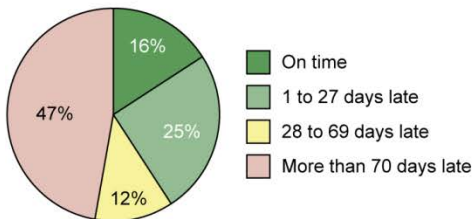


Surface ships

Submarines

Performance ✗

✗ Schedule performance »



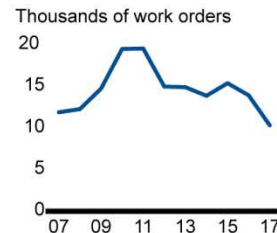
Generally, from fiscal year 2007 through fiscal year 2017, Pearl Harbor Naval Shipyard completed more projects late than on-time. On-time completions represent 16% of all projects. Furthermore, 47% of all projects are completed more than 70 days late.

Facilities ⚖

✗ Average weighted facility condition »



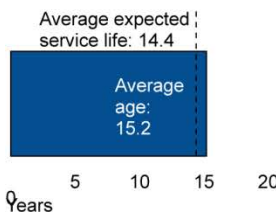
✓ Facility repairs »



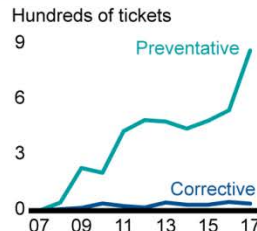
The status of the facilities at Pearl Harbor Naval Shipyard is mixed. The overall condition of the facilities has generally decreased and is currently in the "poor" category. However, the number of facility repair tickets has decreased since fiscal year 2007.

Equipment ✗

✗ Average age »



✗ Equipment repairs »



The state of equipment at Pearl Harbor Naval Shipyard is poor. The average age of equipment is about 1 year more than the average service life of equipment. Additionally, both corrective and preventative maintenance repair tickets have increased.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚖ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- No data or not enough data to determine a trend

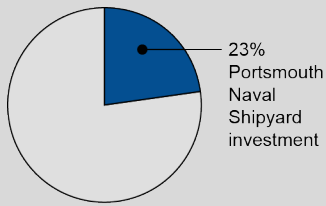
Source: GAO analysis of Navy data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Portsmouth Naval Shipyard specializes in nuclear submarines (Los Angeles-class and Virginia-class).

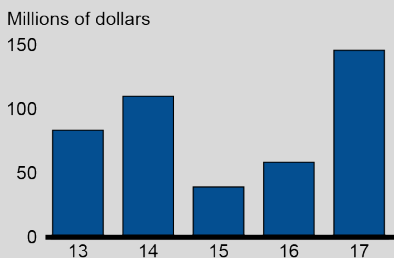
Navy Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Of the \$2.4 billion spent by the four shipyards on depot investment between fiscal year 2012 and 2017, about \$568 million—about 23%—was spent on Portsmouth Naval Shipyard.

Portsmouth Naval Shipyard Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Portsmouth Naval Shipyard Facilities Restoration and Modernization Backlog

Portsmouth Naval Shipyard identified about \$761 million in backlogged restoration and modernization (R&M) projects in fiscal year 2017. The Navy defines backlog as R&M efforts that have been identified but not yet executed.

Appendix XIII

Portsmouth Naval Shipyard Overview

Kittery, Maine

Figure 27: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Portsmouth Naval Shipyard

Systems

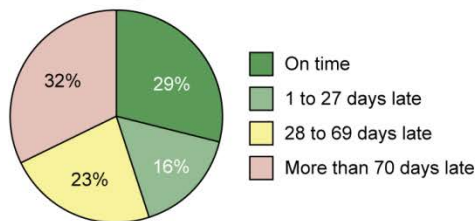


Los Angeles-class submarines

Virginia-class submarines

Performance ✗

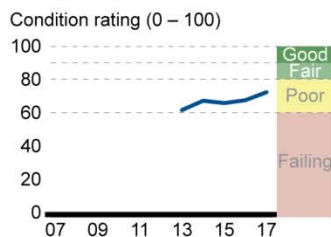
✗ Schedule performance »



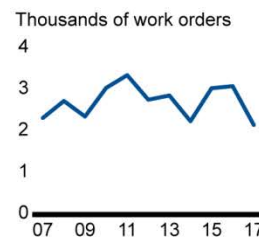
Generally, from fiscal year 2007 through fiscal year 2017, Portsmouth Naval Shipyard completed more projects late than on-time. On-time completions represent 29% of total projects, and projects completed more than 70 days late represent 32% of total projects.

Facilities ✓

✓ Average weighted facility condition »



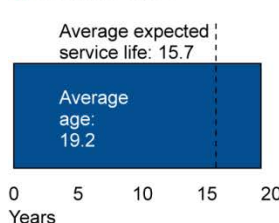
✓ Facility repairs »



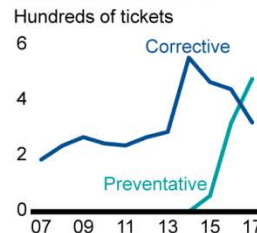
Generally, the condition of facilities in Portsmouth Naval Shipyard is improving. The status of the facilities at Portsmouth Naval Shipyard shows a gradual upwards trend in the reported data, but the condition remains below 80 for all reported fiscal years.

Equipment ✗

✗ Average age »



✗ Equipment repairs »



The state of equipment at Portsmouth Naval Shipyard is poor. The average age of equipment is 3.5 years older than the average service life of equipment. Additionally, both corrective and preventative maintenance repair tickets have increased.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚠ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- No data or not enough data to determine a trend

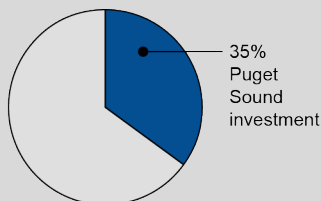
Source: GAO analysis of Navy data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Puget Sound specializes in nuclear carriers (Nimitz class), submarines (Los Angeles-class, Seawolf-class, and Ohio-class), and surface combatants (DDG-51 class).

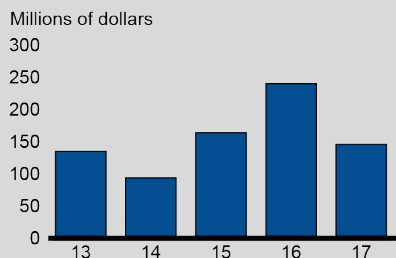
Navy Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Of the \$2.4 billion spent by the four shipyards on depot investment between fiscal year 2012 and 2017, \$841 million—about 35%—was spent on Puget Sound Naval Shipyard.

Puget Sound Naval Shipyard Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Puget Sound Naval Shipyard Facilities Restoration and Modernization Backlog

Puget Sound Naval Shipyard has identified about \$1.49 billion in backlog restoration and modernization (R&M) projects in fiscal year 2017. The Navy defines backlog as R&M efforts that have been identified but not yet executed.

Appendix XIV

Puget Sound Naval Shipyard Overview

Bremerton, Washington

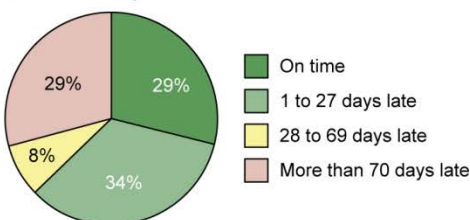
Figure 28: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Puget Sound Naval Shipyard

Systems



Performance

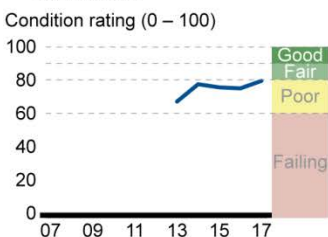
Schedule performance



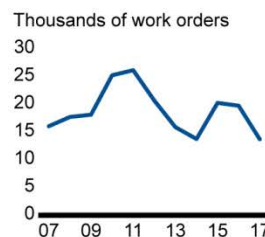
Generally, from fiscal year 2007 through fiscal year 2017, Puget Sound Naval Shipyard completed more projects late than on-time. On-time completions represent 29% of all projects. Furthermore, 29% of all projects are completed more than 70 days late.

Facilities

Average weighted facility condition



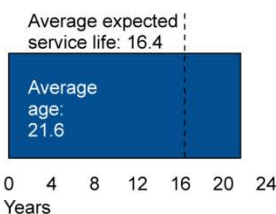
Facility repairs



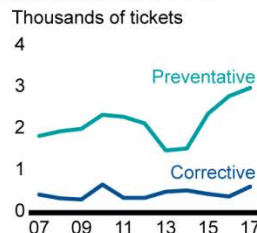
The status of the facilities at Puget Sound Naval Shipyard is positive. The overall condition of facilities shows a gradual trend upwards, and it currently falls in the "fair" category. Additionally, work orders for Puget Sound have decreased.

Equipment

Average age



Equipment repairs



The state of equipment at Puget Sound Naval Shipyard is poor. The average age of equipment is about 5 years older than the average service life of equipment. Meanwhile, corrective maintenance and preventative repair tickets have both increased.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚖ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⬜ No data or not enough data to determine a trend

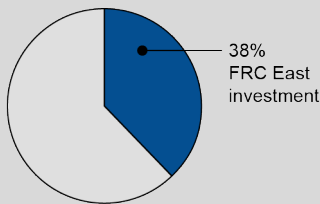
Source: GAO analysis of Navy data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

FRC East specializes in helicopters (AH-1, CH-53E, MH-53E, UH-1Y), airplanes (AV-8B and EA-6B), fighter aircraft (F/A-18 A, C, and D variants), the MV-22 Osprey, and various engines and components.

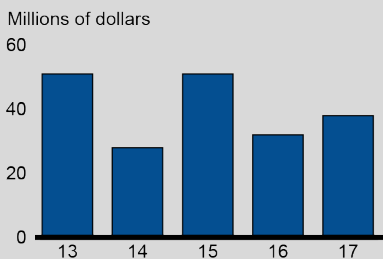
Navy Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Of the \$526 million spent by the three FRCs on depot investment between fiscal year 2013 and fiscal year 2017, \$199 million, about 38%, was spent on projects that benefited FRC East.

FRC East Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

FRC East Facilities Restoration and Modernization Backlog

FRC East identified about \$198 million in backlogged restoration and modernization (R&M) projects in fiscal year 2017. The Navy defines backlog as R&M efforts which have been identified but not yet executed.

Appendix XV

Fleet Readiness Center (FRC) East Depot Overview

Cherry Point, North Carolina

Figure 29: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Fleet Readiness Center – East

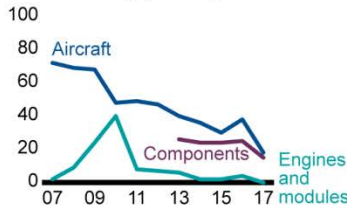
Systems



Performance

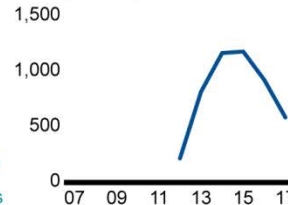
Schedule performance »

Condition rating (0 – 100)



Labor hours »

Hours per completion

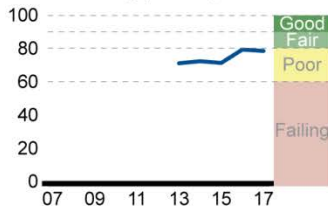


Generally, FRC East's schedule performance has decreased over the last 11 years. Schedule performance for aircraft has decreased by 75%, by 41% for components, and by 100% for engines and modules. Labor hours per completion has also increased since fiscal year 2012.

Facilities

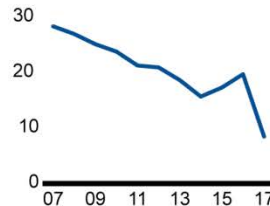
Average weighted facility condition »

Condition rating (0 – 100)



Facility repairs »

Thousands of tickets

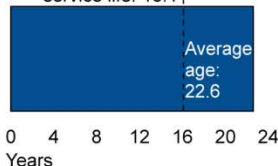


The overall condition of the facilities has increased from fiscal year 2013 to 2017, and is in the "fair" category. Additionally, facility repair tickets have decreased.

Equipment

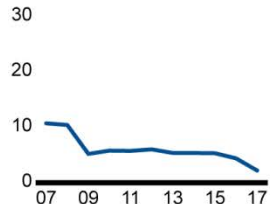
Average age »

Average expected service life: 16.1



Equipment repairs »

Thousands of tickets



The state of equipment at FRC East is inconclusive. The average age of FRC East's equipment is 22.6 years, exceeding its expected service life by 6.5 years. On the other hand, its overall equipment repair requests have decreased by 80%.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

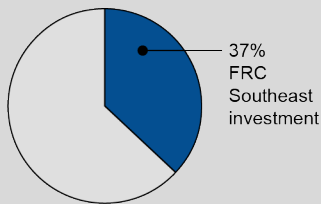
Source: GAO analysis of Navy data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

FRC Southeast specializes in helicopters (MH-60R and S) Aircraft (C-2A and E-2 C and D, EA-6B, P-3), fighter aircraft (F-35, F/A-18 A-F variants), trainers (T-6, T-34, T-44), and various components.

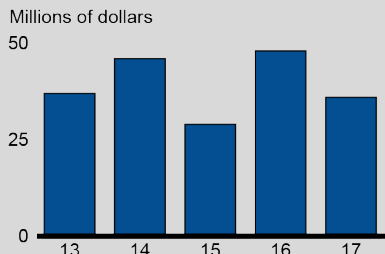
Navy Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Of the \$526 million spent by the three FRCs on depot investment between fiscal year 2013 and fiscal year 2017, \$197 million, about 37%, was spent on projects that benefited FRC Southeast.

FRC Southeast Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

FRC Southeast Facilities Restoration and Modernization Backlog

FRC Southeast identified about \$124 million in backlogged restoration and modernization (R&M) projects in fiscal year 2017. The Navy defines backlog as R&M efforts which have been identified but not yet executed.

Appendix XVI

Fleet Readiness Center (FRC) Southeast Depot Overview

Jacksonville, Florida

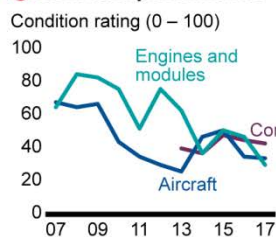
Figure 30: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Fleet Readiness Center – Southeast

Systems

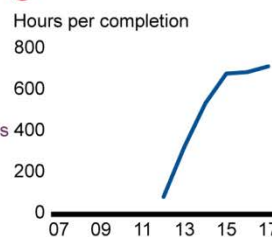


Performance

Schedule performance



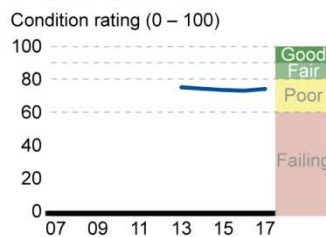
Labor hours



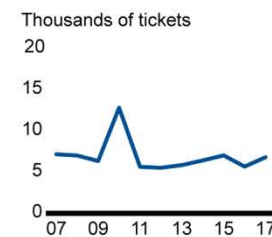
Generally, FRC Southeast's schedule performance has decreased over the last 11 years. Schedule performance has decreased by 50% for aircraft and by 54% for Engines and Modules. Labor hours per completion has also increased.

Facilities

Average weighted facility condition



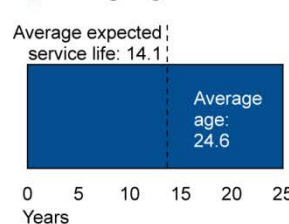
Facility repairs



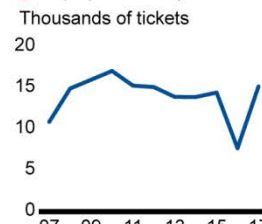
The overall condition of facilities for FRC Southeast is mixed. The overall condition rating of its facilities has changed little since fiscal year 2013, and it remains in the "poor" category. Additionally, facility repair tickets have generally remained flat.

Equipment

Average age



Equipment repairs



The state of equipment at FRC Southeast is poor. The average age of equipment is 24.6 years which exceeds its average service life by 10.5 years. Equipment repair requests have increased by 40%.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

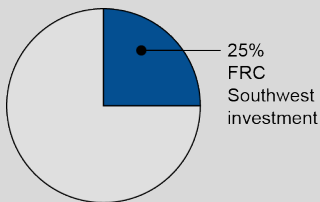
Source: GAO analysis of Navy data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

FRC Southwest specializes in helicopters (AH-1, CH-53E, HH-60, MH-60, and UH-1Y), airplanes (C-2A, E-2C, E-2D, and EA-18G), fighter aircraft (F/A-18 A-F variants), the MV-22 Osprey, and various engines and components.

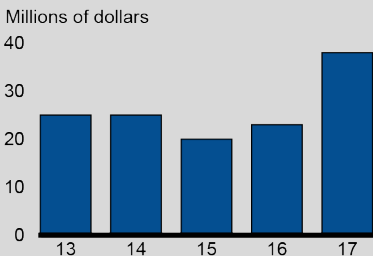
Navy Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

Of the \$526 million spent by the three FRCs on depot investment between fiscal year 2013 and fiscal year 2017, \$131 million, about 25%, was spent on projects that benefited FRC Southwest.

FRC Southwest Depot Investment



Source: GAO analysis of Navy data. | GAO-19-242

FRC Southwest Facilities Restoration and Modernization Backlog

FRC Southwest identified about \$53 million in backlogged restoration and modernization (R&M) projects in fiscal year 2017. The Navy defines backlog as R&M efforts which have been identified but not yet executed.

Appendix XVII

Fleet Readiness Center (FRC) Southwest Depot Overview

San Diego, California

Figure 31: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Fleet Readiness Center – Southwest

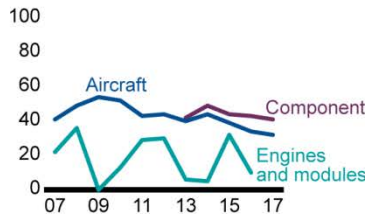
Systems



Performance

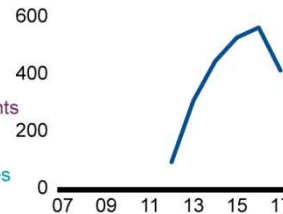
Schedule performance »

Percent on time



Labor hours »

Hours per completion

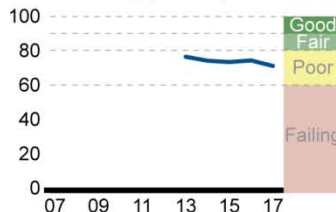


Generally, FRC Southwest's schedule performance has decreased over the last 11 years. Schedule performance for aircraft has decreased by 22% and by 4% for components. Labor hours per completion have also increased since fiscal year 2012.

Facilities

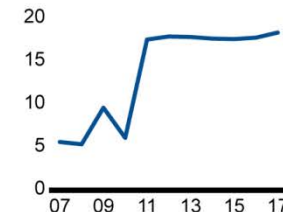
Average weighted facility condition »

Condition rating (0 – 100)



Facility repairs »

Thousands of tickets

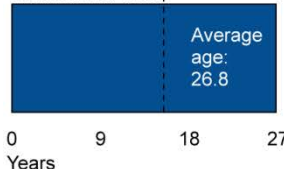


The state of the facilities at FRC Southwest declined in the fiscal years reported. The overall condition of the facilities has decreased from fiscal year 2013 to 2017, and is in the "poor" category. Additionally, facility repair ticket requests have increased.

Equipment

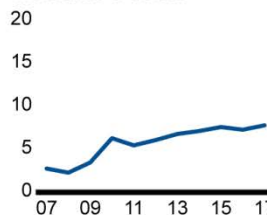
Average age »

Average expected service life: 15.4



Equipment repairs »

Thousands of tickets



The state of equipment at FRC Southwest is poor. The average age of equipment is 26.8 years which exceeds its expected service life by 11.4 years. Meanwhile, its overall equipment repair requests have increased by 183%.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

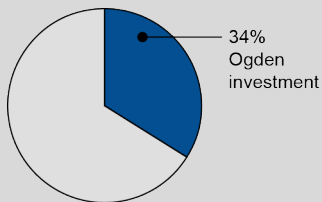
Source: GAO analysis of Navy data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Ogden specializes in depot level maintenance for fighter aircraft (F-35, F-22, F-16, A-10), cargo aircraft (C-130), testers (T-38), other weapons systems (Minuteman III ICBM), and software.

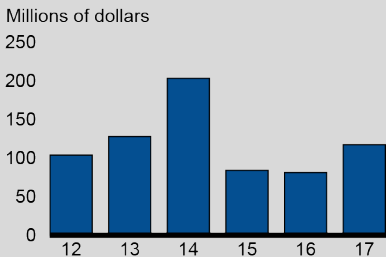
Air Force Depot Investment



Source: GAO analysis of Air Force data. | GAO-19-242

Of the \$2.1 billion spent by the Air Force on depot investment between fiscal year 2012 and fiscal year 2017, \$717.1 million, or 34%, went to the Ogden ALC.

Ogden ALC Depot Investment



Source: GAO analysis of Air Force data. | GAO-19-242

Ogden ALC Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Ogden ALC has identified about \$259 million in backlogged restoration and modernization projects. Backlog is calculated as the difference between programmed requirements and funded requirements in the Complex's annual budgets.

Appendix XVIII

Ogden Air Logistics Complex (ALC) Overview

Ogden, Utah

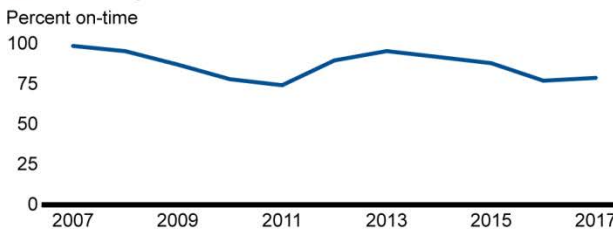
Figure 32: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Ogden Air Logistics Complex

Systems



Performance

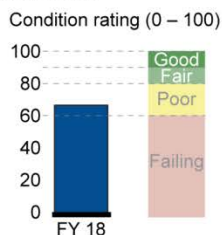
Schedule performance



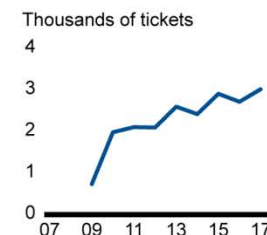
Schedule performance has generally decreased over the last 11 years at Ogden. On-time performance has decreased by about 20% from fiscal year 2007 through 2017.

Facilities

Average weighted facility condition



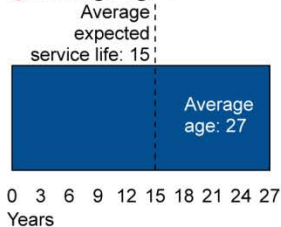
Facility repairs



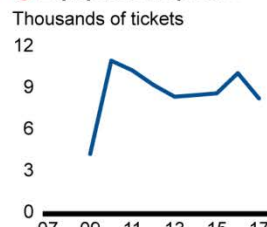
The overall condition of the facilities is inconclusive. The one year of facility condition data provided does not allow us to determine a trend, but shows Ogden's current average in the "poor" category. In addition, the quantity of facility repair tickets has increased significantly since fiscal year 2009.

Equipment

Average age



Equipment repairs



The state of equipment at Ogden is poor. On average, the age of its equipment exceeds its useful life by 12 years. In addition, equipment repair requests have increased since fiscal year 2009.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚖ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

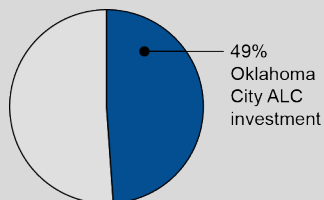
Source: GAO analysis of Air Force data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Oklahoma City specializes in depot level repair of bombers (B-1B, B-52), tankers (KC-135), E-3 Sentry, multiple engine systems, and software.

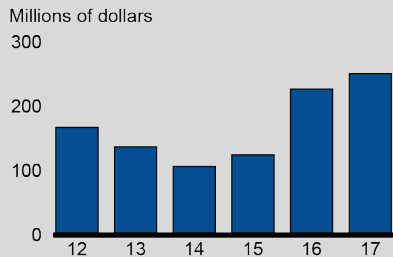
Air Force Depot Investment



Source: GAO analysis of Air Force data. | GAO-19-242

Of the \$2.1 billion spent by the Air Force on depot investment between fiscal year 2012 and fiscal year 2017, \$1.0 billion – nearly half – went to the Oklahoma City ALC.

Oklahoma City ALC Depot Investment



Source: GAO analysis of Air Force data. | GAO-19-242

Oklahoma City ALC Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Oklahoma City ALC has identified about \$104 million in backlog restoration and modernization projects. The backlog is calculated as the difference between total programmed requirements and funded requirements in the Complex's annual budgets.

Appendix XIX

Oklahoma City Air Logistics Complex (ALC) Overview

Oklahoma City, Oklahoma

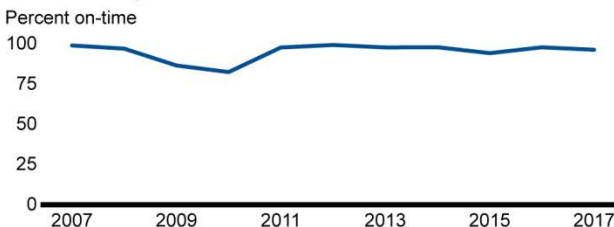
Figure 33: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Oklahoma City Air Logistics Complex

Systems



Performance

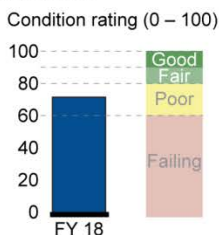
Schedule performance »



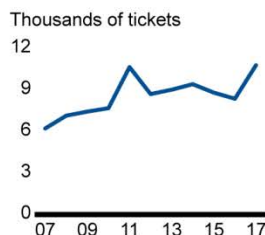
Schedule performance at Oklahoma City has generally remained stable over the last 11 years.

Facilities

Average weighted facility condition »



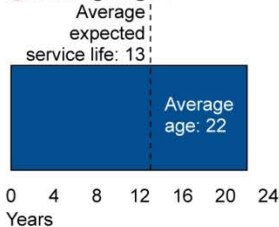
Facility repairs »



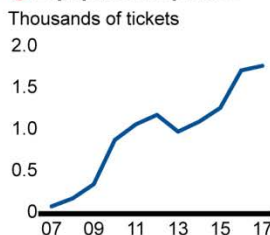
The overall condition of the facilities at Oklahoma City is inconclusive. The one year of facility condition data provided does not allow us to determine a trend, but shows Oklahoma City's current average in the "poor" category. In addition, the quantity of facility repair tickets has increased since fiscal year 2007.

Equipment

Average age »



Equipment repairs »



The state of equipment at Oklahoma City is poor. On average, the age of equipment exceeds its useful life by 9 years. In addition, equipment repair requests have increased steadily since fiscal year 2007.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

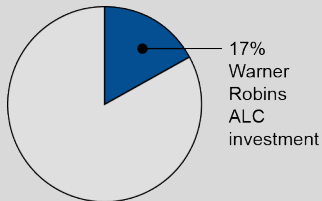
Source: GAO analysis of Air Force data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Warner Robins specializes in maintenance of cargo aircraft (C-130, C-5, C-17), fighter aircraft (F-15), aviation electronics, and software systems.

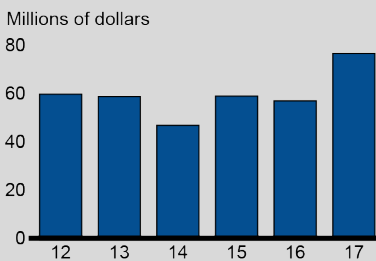
Air Force Depot Investment



Source: GAO analysis of Air Force data. | GAO-19-242

Of the \$2.1 billion spent by the Air Force on depot investment between fiscal year 2012 and fiscal year 2017, \$358 million – 17% – went to the Warner Robins ALC.

Warner Robins ALC Depot Investment



Source: GAO analysis of Air Force data. | GAO-19-242

Warner Robins ALC Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Warner Robins has identified about \$190 million in backlogged restoration and modernization projects. The backlog is calculated as the difference between total programmed requirements and funded requirements in the Complex's annual budgets.

Appendix XX

Warner Robins Air Logistics Complex (ALC) Overview

Warner Robins, Georgia

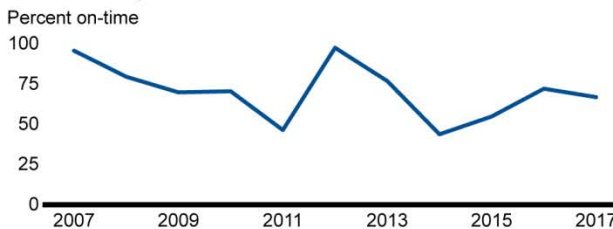
Figure 34: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Warner Robins Air Logistics Complex

Systems



Performance

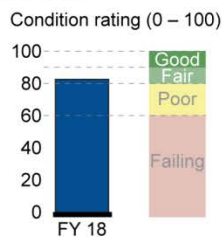
Schedule performance »



Schedule performance has generally decreased over the last 11 years. On-time performance has decreased by about 30% from fiscal year 2007-2017.

Facilities

Average weighted facility condition »



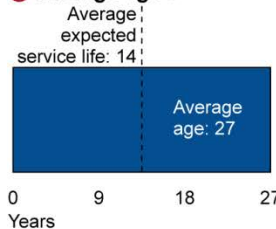
Facility repairs »

Data not available

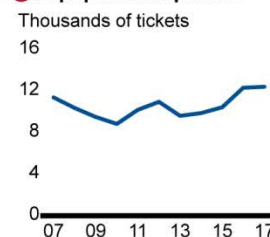
The overall condition of facilities at Warner Robins is inconclusive. The one year of facility condition data provided does not allow us to determine a trend, but shows Warner Robins' current average in the "fair" category. Meanwhile, no data on facility repair requests was available.

Equipment

Average age »



Equipment repairs »



The state of equipment at Warner Robins is poor. On average, the age of equipment exceeds its useful life by 13 years. In addition, equipment repair requests have increased since 2007.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

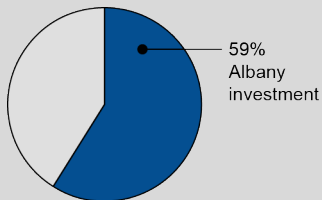
Source: GAO analysis of Air Force data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



Mission

Albany specializes in Amphibious Assault Vehicles (AAV), Light Armored Vehicles (LAV), High Mobility Multipurpose Wheeled Vehicles (HMMWV), Mine Resistant Ambush Protected (MRAP) vehicles, Medium Tactical Vehicle Replacements, communications/electronics equipment, and small arms.

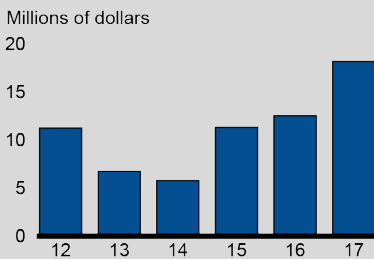
Marine Corps Depot Investment



Source: GAO analysis of Marine Corps data. | GAO-19-242

Of the approximately \$111 million spent by the Marine Corps on depot investment between fiscal year 2012 and fiscal year 2017, \$66 million, about 59%, was spent on projects that benefited Albany Production Plant.

Albany Depot Investment



Source: GAO analysis of Marine Corps data. | GAO-19-242

Albany Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Albany Production Plant has identified about \$12 million in backlog restoration and modernization projects.

Appendix XXI

Albany Production Plant Depot Overview

Albany, Georgia

Figure 35: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Albany Production Plant

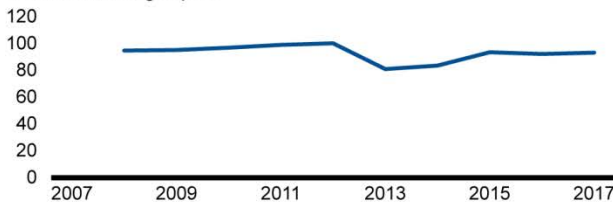
Systems



Performance

Production to plan

Percent according to plan

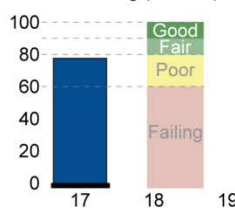


Generally, schedule performance for Albany has remained steady over the past 11 fiscal years.

Facilities

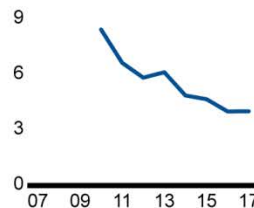
Average weighted facility condition

Condition rating (0 – 100)



Facility repairs

Thousands of tickets



The overall condition of facilities at Albany is inconclusive. The one year of facility condition data provided does not allow us to determine a trend, but shows Albany's current average in the "poor" category. Meanwhile, facility repair requests have decreased since fiscal year 2010.

Equipment

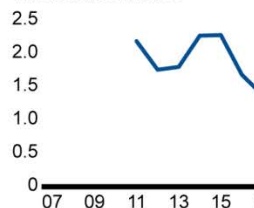
Average age

Average expected service life: 11.3



Equipment repairs

Thousands of tickets



The state of equipment at Albany Production Plant is mixed. Equipment is 2.6 years older than the service life of equipment. However, its overall equipment repair requests show a decreasing trend.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚖ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⬜ No data or not enough data to determine a trend

Source: GAO analysis of Marine Corps data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242



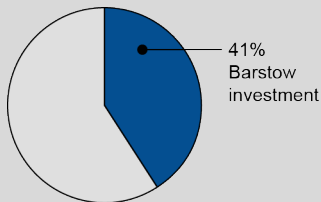
Barstow Production Plant Depot Overview

Barstow, California

Mission

Barstow specializes in Amphibious Assault Vehicles (AAV), Light Armored Vehicles (LAV), High Mobility Multipurpose Wheeled Vehicles, Mine Resistant Ambush Protected (MRAP) vehicles, Medium Tactical Vehicle Replacements (MTVR), howitzers, and communications/electronics equipment.

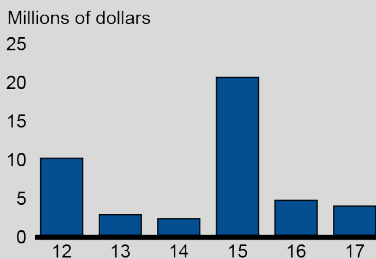
Marine Corps Depot Investment



Source: GAO analysis of Marine Corps data. | GAO-19-242

Of the approximately \$111 million spent by the Marine Corps on depot investment between fiscal year 2012 and fiscal year 2017, \$45 million, about 41%, was spent on projects that benefited Barstow Production Plant.

Barstow Depot Investment



Source: GAO analysis of Marine Corps data. | GAO-19-242

Barstow Facilities Restoration and Modernization Backlog

As of fiscal year 2017, Barstow Production Plant has identified about \$2 million in backlog restoration and modernization projects.

Figure 36: Systems Supported, Depot Performance, Facility Condition, and Equipment Condition at Barstow Production Plant

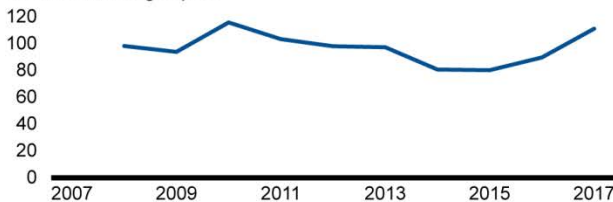
Systems



Performance

Production to plan »

Percent according to plan

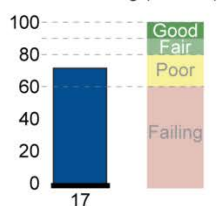


Schedule performance at Barstow has generally remained stable over the last 11 years.

Facilities

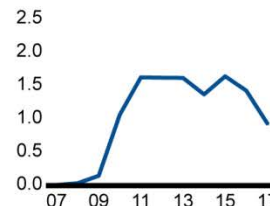
Average weighted facility condition »

Condition rating (0 – 100)



Facility repairs »

Thousands of tickets

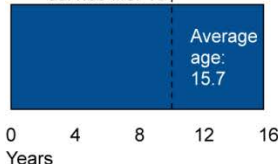


The overall condition of the facilities at Barstow is inconclusive. The one year of facility condition data provided does not allow us to determine a trend, but shows Barstow's current average in the "poor" category. Meanwhile, facility repair requests have increased since fiscal year 2007.

Equipment

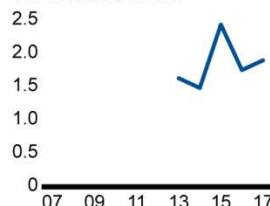
Average age »

Average expected service life: 10



Equipment repairs »

Thousands of tickets



The state of equipment at Barstow is poor. On average, the age of its equipment exceeds its useful life by 5.7 years. In addition, equipment repair requests have increased since fiscal year 2013.

- ✓ Metric has gotten better over time, or in the case of equipment age, below expected service life
- ⚪ Metric is mixed, inconclusive
- ✗ Metric has gotten worse over time, or in the case of equipment age, above expected service life
- ⚪ No data or not enough data to determine a trend

Source: GAO analysis of Marine Corps data (information); Defense Visual Information Distribution Service (photos). | GAO-19-242

Appendix XXIII: Scope and Methodology

To determine the state of the depots' facilities and equipment, we analyzed service reports and performance metrics for the 21 military service maintenance depots from fiscal year 2007, when the minimum investment requirement—known as the 6 percent rule—began, to fiscal year 2017, the latest for which most data are available.¹ This analysis included all maintenance depots covered under the 6 percent rule requirement. The depots we collected data for are:

- Anniston Army Depot, Anniston, Alabama
- Corpus Christi Army Depot, Corpus Christi, Texas
- Letterkenny Army Depot, Letterkenny, Pennsylvania
- Pine Bluff Arsenal, Pine Bluff, Arkansas
- Red River Army Depot, Texarkana, Texas
- Rock Island Arsenal, Rock Island, Illinois
- Tobyhanna Army Depot, Tobyhanna, Pennsylvania
- Tooele Army Depot, Tooele, Utah
- Watervliet Arsenal, Watervliet, New York
- Norfolk Naval Shipyard, Portsmouth, Virginia
- Pearl Harbor Naval Shipyard, Honolulu, Hawaii
- Portsmouth Naval Shipyard, Kittery, Maine
- Puget Sound Naval Shipyard, Bremerton, Washington
- Fleet Readiness Center East, Cherry Point, North Carolina
- Fleet Readiness Center Southeast, Jacksonville, Florida
- Fleet Readiness Center Southwest, San Diego, California
- Ogden Air Logistics Complex, Ogden, Utah
- Oklahoma City Air Logistics Complex, Oklahoma City, Oklahoma
- Warner Robins Air Logistics Complex, Warner Robins, Georgia
- Albany Production Plant, Albany, Georgia
- Barstow Production Plant, Barstow, California

¹The minimum investment requirement, or 6 percent rule, was established in the *John Warner National Defense Authorization Act for Fiscal Year 2007*, Pub. L. No. 109-364, § 332 (2006), codified at 10 U.S.C. § 2476.

For each of these locations, we collected and analyzed data such as facility condition rating, facility age, number of facility repairs, equipment age, number of equipment repairs, restoration and modernization backlog, work stoppages due to facility and equipment conditions, depot investment projects, and depot performance metrics including on-time delivery and delayed maintenance days. Whenever possible, we collected data from fiscal year 2007 – the year in which the 6 percent rule was first enacted – to fiscal year 2017, the latest for which most data were available.

To assess the reliability of the data to address the objectives in this report, we submitted and reviewed service responses to data reliability questionnaires, reviewed system documentation and interviewed officials to understand system operating procedures, organizational roles and responsibilities, and error-checking mechanisms. We also conducted our own error checks to look for inaccurate or questionable data and discussed with officials any data irregularities we found. We conducted these assessments on the following systems:

- the Installation Status Reporting system for data on Army facility condition and replacement cost from fiscal year 2010 to fiscal year 2017;
- the internet Navy Facility Asset Data Score for data on Navy and Marine Corps facility condition, age, and replacement cost from fiscal year 2013 to fiscal year 2017;
- the Automated Civil Engineering System for data on Air Force facility condition and replacement cost for fiscal year 2018;
- the Defense Property Accountability System for data on Army age of equipment for fiscal year 2017;
- the Facilities and Equipment Maintenance system for data on Navy shipyard equipment repair tickets from fiscal year 2007 to 2017, Army and Air Force facility repair tickets from fiscal year 2007 to 2017, and Army and Air Force equipment repair tickets from fiscal year 2007 to 2017;
- the Maximo system for data on Navy shipyard and Navy aviation age of equipment, fiscal year 2017; Navy shipyard, Navy aviation, and Marine Corps facility repair tickets from fiscal years 2007 to 2017; and Navy aviation and Marine Corps equipment repair tickets from fiscal years 2007 to 2017;

- the General Fund Enterprise Business System for data on facility and equipment repairs and investment projects from fiscal year 2007 through fiscal year 2017;
- the Defense Industrial Financial Management System for data on Air Force age of equipment for fiscal year 2017;
- the Logistics Modernization Program for data on Army depot performance from fiscal years 2014 to 2017, investment projects, and equipment repairs from fiscal year 2007 through fiscal year 2017;
- the Navy Modernization Process for data on Navy shipyard performance from fiscal years 2007 to 2017;
- Production Status Reporting for data on Navy aviation depot performance from fiscal years 2007 to 2017;
- the Aircraft/Missile Maintenance Production/Compression Report for data on Air Force depot performance from fiscal years 2007 to 2017; and
- the Master Scheduling Support Tool for data on Marine Corps depot performance from fiscal years 2007 to 2017.

We found the data that we used from these systems to be sufficiently reliable for the purposes of summarizing trends in the selected facility and equipment metrics reported.

To determine the extent to which the services track data on maintenance delays caused by facilities and equipment conditions, we requested data on work stoppages related to facilities and equipment conditions at the depots. We also spoke with service officials about delays and work stoppages and the ability of the services to collect this data, and the extent to which they used delay and work stoppage data to target their investments. We did not assess the reliability of any work stoppage data, as we are not reporting this data.

In our analysis of facility condition ratings, we took the average of the condition ratings for all facilities in a given depot and fiscal year, and then weighted them by the replacement value of the facilities in order to ensure

that costlier facilities were given greater weight in the analysis.² We used this information to determine the current status of the overall depot facility condition and reviewed this in conjunction with the depots' performance metrics. We also reviewed Department of Defense (DOD) and service guidance on logistics, maintenance, facilities, and equipment. We visited three of the 21 service depots, which were selected based on resources and availability, to gain insight into the specific challenges faced at the depots. We also interviewed service depot and budget officials to obtain an understanding of how they manage the depot investment process. To support our analysis on each of our objectives, we interviewed officials from the following organizations:

Office of the Secretary of Defense

- Office of the Deputy Assistant Secretary of Defense for Materiel Readiness

Navy

- Headquarters, Department of the Navy
- Command, Fleet Readiness Centers
- Naval Air Systems Command
- Fleet Readiness Center Southwest
- Naval Sea Systems Command

Army

- Headquarters, Department of the Army
- Army Material Command
- Corpus Christi Army Depot

Marine Corps

- Marine Corps Logistics Command
- Marine Depot Maintenance Command

²This method is similar to the one we used in GAO, *Naval Shipyards: Actions Needed to Improve Poor Conditions that Affect Operations*, [GAO-17-548](#) (Washington, D.C.: Sept. 12, 2017). As we noted in that report, there are other means by which facility ratings can be assessed, such as by using simple averages or weighting by the criticality of the facility. However, the previous report did not identify any particular advantage to using these other methods, and so we continue to use this method for consistency. This method is the same used by the Navy to calculate its condition ratings.

- Marine Corps Logistics Base Albany

Air Force

- Headquarters, Department of the Air Force
- Air Force Material Command
- Air Force Sustainment Center

To determine the extent to which DOD and the services have developed an approach for guiding depot investments to address key challenges, we discussed with service depot and materiel command officials the depot investment process, the existence of investment plans at the DOD, service, or depot levels, and any challenges in meeting service operational needs resulting from inadequate investment. We also reviewed service documentation on current and future investment plans and analyzed the depots' processes guiding investment decisions to determine whether these included any elements of a results-oriented management approach. Our previous work has highlighted the importance of a results-oriented management approach to effective operations and investment at various organizations, including defense logistics.³

To determine whether the military departments are complying with the requirements of the 6 percent rule, we reviewed service reports on compliance and verified the reports by comparing reported figures to the services' approved facility and equipment project lists. To determine the extent to which the amounts identified for capital budget activities by the military departments were spent on sustainment of existing facilities, we reviewed 6 percent project investment lists and obligated amounts provided by the services from fiscal years 2012 – the first year in which sustainment was prohibited in 6 percent reporting – to fiscal year 2017 –

³See GAO, *Naval Shipyards: Actions Needed to Improve Poor Conditions that Affect Operations*, [GAO-17-548](#) (Washington, D.C.: Sept. 12, 2017); *Defense Inventory: Actions Needed to Improve the Defense Logistics Agency's Inventory Management*, [GAO-14-495](#) (Washington, D.C.: June 19, 2014); *Managing for Results: Data-Driven Performance Reviews Show Promise but Agencies Should Explore How to Involve Other Relevant Agencies*, [GAO-13-228](#) (Washington, D.C.: Feb. 27, 2013); *DOD's 2010 Comprehensive Inventory Management Improvement Plan Addressed Statutory Requirements, but Faces Implementation Challenges*, [GAO-11-240R](#) (Washington, D.C.: Jan. 7, 2011); *Results-Oriented Management: Strengthening Key Practices at FEMA and Interior Could Promote Greater Use of Performance Information*, [GAO-09-676](#) (Washington, D.C.: Aug. 17, 2009); *Managing For Results: Enhancing Agency Use of Performance Information for Management Decision Making*, [GAO-05-927](#) (Washington, D.C.: Sept. 9, 2005); and [GAO/GGD/AIMD-99-69](#).

the last year for which projects were available. We compared those lists with the services' actual reported 6 percent spending in their respective budget justification books (specifically, the Fund-6 Report), and reconciled any differences.

We then identified facility projects that cost \$250,000 and above with the potential for sustainment activities.⁴ First, an analyst recorded his assessment of whether a project might include sustainment activity. A second analyst independently reviewed the same information and recorded her assessment. The two analysts created a final assessment that reconciled their two independent assessments and reflects their consensus. This sample is not generalizable to all service projects, but was chosen to identify the projects most likely to affect compliance with the 6 percent rule.

We then requested and collected additional project documentation, such as project proposals, for those projects that both analysts agreed had the potential to include sustainment activities. Using this more detailed project documentation, an analyst recorded his assessment of whether a project included sustainment activity. A second analyst independently reviewed the same information and recorded her assessment of whether the project included sustainment activity. The two analysts created a final assessment that reconciled their two independent assessments and reflects their consensus.

⁴We made the determination as to whether a project had the potential for sustainment activities by comparing its name and/or short description against the DOD definition of sustainment. DOD defines sustainment as the maintenance and repair activities necessary to keep an inventory of facilities in good working order. It includes regularly scheduled adjustments and inspections, preventive maintenance tasks, and emergency response and service calls for minor repairs. It also includes major repairs or replacement of facility components (usually accomplished by contract) that are expected to occur periodically throughout the life cycle of facilities. This work includes regular roof replacement, refinishing of wall surfaces, repairing and replacement of heating and cooling systems, replacing tile and carpeting, and similar types of work. It does not include environmental compliance costs, facility leases, or other tasks associated with facilities operations (such as custodial services, grounds services, waste disposal, and the provision of central utilities). DOD 7000.14-R, *Financial Management Regulation*, vol. 2B, chap. 8, § 080105 (Dec. 2016). The military departments have guidance that promulgates this definition, but in the interest of consistency, we made our determinations solely using the DOD guidance. We limited the review to facilities projects because, by definition, equipment projects cannot be considered sustainment. We also limited the sample to projects that cost \$250,000 and above in order to focus on those projects most likely to have had an impact on whether a service's reporting of sustainment affected their meeting the 6 percent investment minimum.

We then shared the results of our review to obtain the services' perspectives. In some cases, the services provided additional information about a project that led us to revise our initial determination, such as noting that a particular project was conducted as a result of severe weather damage (which is considered restoration, even if the activity would otherwise be considered sustainment). For the Air Force and Navy shipyards, our final determination of sustainment projects – as presented in summary in appendix I – was consistent with the services' respective determinations of which projects included sustainment activity. We presented these amounts using nominal, non-inflation adjusted dollars, in order that the comparison with that year's 6 percent minimum reporting would be comparable. Officials from the Marine Corps and Navy aviation command did not agree with our determination that one and three of the reviewed projects, respectively, included sustainment activity. The Army did not provide a response to most of our sustainment determinations.

We conducted this performance audit from August 2017 to April 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 XXIV: Comments from the Department of Defense



SUSTAINMENT

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

APR 12 2019

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

Dear Ms. Maurer:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-19-242, "MILITARY DEPOTS: Actions Needed to Improve Poor Conditions of Facilities and Equipment that Affect Timeliness and Efficiency of Maintenance" dated February 22, 2019 (GAO Code 102250). Detailed comments on the report recommendations are enclosed. Additionally, and as stressed in the enclosure, I note that the Air Force questions the supporting data for recommendation #5 regarding aging facilities and equipment impacts on depot performance.

Sincerely,

A handwritten signature in black ink, appearing to read "R. McMahon", is written over a horizontal line.

Robert H. McMahon

Enclosure:
As stated

**GAO DRAFT REPORT DATED FEBRUARY 22, 2019
GAO-19-242 (GAO CODE 102250)**

**“MILITARY DEPOTS: Actions Needed to Improve Poor Conditions of
Facilities and Equipment that Affect Timeliness and Efficiency of
Maintenance”**

**DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATIONS**

RECOMMENDATION 1: The GAO recommends that the Secretary of the Army should ensure that Army Materiel Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays.

DoD RESPONSE: Concur. The Secretary of the Army will ensure that Army Materiel Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays.

RECOMMENDATION 2: The GAO recommends that the Secretary of the Army should ensure that Army Materiel Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Army depot.

DoD RESPONSE: Concur. The Secretary of the Army will ensure that Army Materiel Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Army depot.

RECOMMENDATION 3: The GAO recommends that The Secretary of the Navy should ensure that Navy Sea Systems Command and the Commander, Fleet Readiness Centers establish measures for its depots to track facility or equipment conditions that lead to maintenance delays.

DoD RESPONSE: Concur. The Secretary of the Navy will ensure that ensure that Naval Sea Systems Command and the Commander, Fleet Readiness Centers establish measures for its depots to track facility or equipment conditions that lead to maintenance delays.

RECOMMENDATION 4: The GAO recommends that the Secretary of the Navy should ensure that Navy Sea Systems Command and the Commander, Fleet Readiness Centers implement tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Navy depot.

DoD RESPONSE: Concur. The Secretary of the Navy will ensure that Naval Sea Systems Command and the Commander, Fleet Readiness Centers implement tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Navy depot.

RECOMMENDATION 5: The GAO recommends that the Secretary of the Air Force should ensure that Air Force Materiel Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays.

DoD RESPONSE: Concur. The Secretary of the Air Force will ensure that Air Force Materiel Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays. While the Air Force concurs with the GAO's recommendations, it takes issues with the GAO's conclusions in this report. Therefore, the Air Force would appreciate the opportunity to discuss the conclusions with the GAO.

RECOMMENDATION 6: The GAO recommends that the Secretary of the Air Force should ensure that Air Force Materiel Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Air Force depot.

DoD RESPONSE: Concur. The Secretary of the Air Force will ensure that Air Force Materiel Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Air Force depot.

RECOMMENDATION 7: The GAO recommends the Commandant of the Marine Corps should ensure that Marine Corps Logistics Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays.

DoD RESPONSE: Concur. The Commandant of the Marine Corps will ensure that Marine Corps Logistics Command establishes measures for its depots to track facility or equipment conditions that lead to maintenance delays.

RECOMMENDATION 8: The GAO recommends the Commandant of the Marine Corps should ensure that Marine Corps Logistics Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Marine Corp depot.

DoD RESPONSE: Concur. The Commandant of the Marine Corps will ensure that Marine Corps Logistics Command implements tracking of the measures for identifying when facility or equipment conditions lead to maintenance delays at each Marine Corps depot.

RECOMMENDATION 9: The GAO recommends the Secretary of the Army should ensure that Army Materiel Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress.

DoD RESPONSE: Concur. The Secretary of the Army will ensure that Army Materiel Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress.

RECOMMENDATION 10: The GAO recommends the Secretary of the Navy should ensure that Commander, Fleet Readiness Centers incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress.

DoD RESPONSE: Concur. The Secretary of the Navy will ensure that Commander, Fleet Readiness Centers incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress.

RECOMMENDATION 11: The GAO recommends the Secretary of the Air Force should ensure that Air Force Materiel Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress.

DoD RESPONSE: Concur. The Secretary of the Air Force will ensure that Air Force Materiel Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress.

RECOMMENDATION 12: The GAO recommends the Commandant of the Marine Corps should ensure that Marine Corps Logistics Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress.

DoD RESPONSE: Concur. The Commandant of the Marine Corps will ensure that Marine Corps Logistics Command incorporates in its depot optimization plan, key results-oriented elements including analytically-based goals, results-oriented metrics, identification of required resources, risks, and stakeholders, and regular reporting to decision makers on progress.

RECOMMENDATION 13: The GAO recommends the Secretary of Defense should ensure that the Assistant Secretary of Defense for Sustainment develops an approach for managing service depot investments that includes management monitoring and regular reporting to decision makers and Congress on progress.

DoD RESPONSE: Non-concur. The Assistant Secretary of Defense for Sustainment cannot develop an approach for managing depot investments and monitoring progress until depot optimization plans are finalized and resourced through programming actions. After these steps have been accomplished the Department can assess investment progress against the plan for executing resources. The Department will continue to monitor capital investments at Service depots through depot maintenance related budget exhibits and program reviews.

Appendix XXV: GAO Contact and Staff Acknowledgments

GAO Contact

If you or your staff have questions about this report, please contact Diana Maurer, (202) 512-9627 or maurerd@gao.gov

Staff Acknowledgments

In addition to the individual named above, key contributors to this report are Suzanne Wren, (Assistant Director), James Lackey (Analyst in Charge), Andrew Duggan, Amie Lesser, Felicia Lopez, Michael Perkins, Carol Petersen, Michael Silver, John E. “Jet” Trubey, Britney Tsao, and Lillian Yob.

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