



July 2020

MILITARY DEPOTS

Army and Marine Corps Need to Improve Efforts to Address Challenges in Measuring Performance and Planning Maintenance Work

GAO Highlights

Highlights of [GAO-20-401](#), a report to congressional committees

Why GAO Did This Study

The Army and Marine Corps operate large industrial depots to maintain, overhaul, and upgrade numerous weapon systems and equipment. The depots play a key role in sustaining readiness by completing maintenance on time and returning refurbished equipment to warfighting customers.

The Senate Armed Services Committee, in a report accompanying a bill for the National Defense Authorization Act for Fiscal Year 2019, included a provision for GAO to review Army and Marine Corps depots. GAO evaluated the extent to which (1) the Army met its planned maintenance goals and addressed any challenges in measuring depot performance; (2) the Army identified and addressed any key challenges in completing planned maintenance; and (3) the Marine Corps completed its planned maintenance and addressed associated challenges. GAO reviewed depot planning processes; analyzed maintenance goals and data for fiscal years 2018 and 2019 for the Army and fiscal years 2015 through 2019 for the Marine Corps; and met with Army and Marine Corps headquarters, command, and depot officials.

What GAO Recommends

GAO is making five recommendations, including that the Army develop procedures to ensure depot input on metrics, develop guidance for depot customers, and analyze the causes of maintenance changes; and that the Marine Corps develop a complete baseline. DOD concurred with all five recommendations.

View [GAO-20-401](#). For more information, contact Diana Maurer, (202) 512-9627, MaurerD@gao.gov, or Asif Khan, (202) 512-9869, KhanA@gao.gov

July 2020

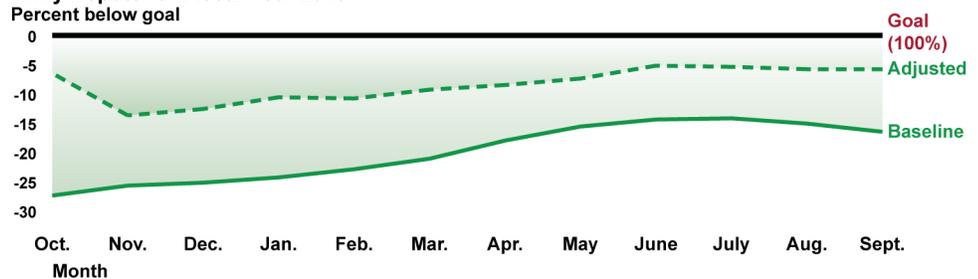
MILITARY DEPOTS

Army and Marine Corps Need to Improve Efforts to Address Challenges in Measuring Performance and Planning Maintenance Work

What GAO Found

The Army reported that it met its goals for about 91 percent of the systems on which it planned to complete maintenance for its customers in fiscal years 2018 and 2019, but its key performance metric has some limitations. Recognizing these limitations, Army Materiel Command (AMC), which oversees the Army depots, has begun assessing performance against monthly (adjusted) and annual (baseline) goals (see figure). AMC also began an effort to improve its performance metrics, but depot officials involved in the effort whom GAO interviewed are uncertain how AMC will incorporate their input. Without AMC procedures to ensure that it will incorporate depot input, as called for by Army guidance on effective teamwork, AMC cannot be assured that it is developing metrics that are beneficial at all levels for assessing depot performance.

Percent Variance from Goal for Average Adjusted and Baseline Depot Performance across Army Depots for Fiscal Year 2019



Source: GAO analysis of Army data. | GAO-20-401

The Army identified a key challenge to meeting the depots' maintenance goals in fiscal years 2018 and 2019, but it has not fully addressed this challenge. During this time the Army experienced schedule changes to more than half of its planned maintenance work. GAO found that most of this variability was caused by changing customer needs and identified two key shortcomings in the Army's approach to minimizing such changes. First, the Army does not have guidance establishing time frames for depot customers to submit their needs during depot planning, resulting in millions of dollars in unplanned work. Without such guidance, depots will continue to experience workload variability. Second, AMC has not systematically analyzed why depot customers have changes, resulting in incomplete information about causes and potential solutions. Without such analysis, the Army will be poorly positioned to address longstanding maintenance challenges.

For fiscal years 2015 through 2019, the Marine Corps reported generally meeting its yearly depot maintenance goals, but GAO found that the Marine Corps has not yet included all its planned work in its baseline schedule for a key performance metric. The Marine Corps also experienced monthly variability in fiscal year 2019 for a variety of reasons, including parts shortages, lack of asset availability, and changing customer needs, and it is undertaking several initiatives to minimize such changes. However, developing a complete baseline will allow the Marine Corps to better assess its performance against its planned maintenance work and better identify and mitigate the causes and effects of any unfavorable performance.

Contents

Letter		1
	Background	6
	The Army Reported Completing Most of Its Planned Maintenance, but Challenges Exist in Improving Metrics for Measuring Depot Performance	16
	Army Depots Have Been Responsive to Changes in Customer Needs, but Face Planning and Analytical Challenges in Minimizing These Changes	25
	Marine Corps Reported That It Generally Completed Its Planned Maintenance, but It Has Not Fully Baselined Its Key Performance Metric and Is Addressing Challenges Related to Changing Customer Needs	34
	Conclusions	41
	Recommendations for Executive Action	42
	Agency Comments	42
Appendix I	Comments from the Department of Defense	45
Appendix II	GAO Contacts and Staff Acknowledgments	50
Related GAO Products		51
Table		
	Table 1: Rates of Maintenance Goal Completion for Scheduled Items by Army Depot for Fiscal Years 2018 to 2019, in Percent	18
Figures		
	Figure 1: Army's and Marine Corps' Maintenance Depots and the Weapons Repaired and Maintained at Those Locations	7
	Figure 2: Examples of Army and Marine Corps Depot Workload	8
	Figure 3: Army and Marine Corps Depot Organizational Structure	10
	Figure 4: Examples of End Item Disassembly at Anniston Army Depot	12

Figure 5: Depot Maintenance Process	13
Figure 6: Timeline for Development of Army and Marine Corps Planning for Fiscal Year 2019 Depot Maintenance Workload	14
Figure 7: Challenges Identified by GAO That Can Affect Department of Defense Depot Performance	15
Figure 8: Sample Calculation of Maintenance Goal Completion for an Army Depot	17
Figure 9: Percent Variance from Goal for Average Adjusted and for Baselined Depot Performance across Army Depots, Fiscal Year 2019	19
Figure 10: M1 Abrams Tanks at Anniston Army Depot	27
Figure 11: Army Processes for Planning Depot Maintenance Work	29
Figure 12: Percentage of Marine Corps Item Maintenance Completed, Fiscal Years 2015 through 2019	36

Abbreviations

AMC	Army Materiel Command
ASA (ALT)	Assistant Secretary of the Army for Acquisition, Logistics, and Technology
CCIR	Commanders' Critical Information Requirements
DLA	Defense Logistics Agency
DOD	Department of Defense
ELMP	Enterprise Lifecycle Maintenance Process
LCMC	Life Cycle Management Command
LMP	Logistics Modernization Program
OIB	Organic Industrial Base
P2P	Performance to Promise

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



July 16, 2020

Congressional Committees

The Army and the Marine Corps operate depots nationwide to maintain thousands of different types of equipment and complex weapon systems through overhauls, upgrades, and rebuilding.¹ These depots are crucial to sustaining military readiness by ensuring that the Army and Marine Corps can regularly maintain critical weapon systems and return them to the warfighter for use in training and operations. The ability of the five Army and two Marine Corps depots to plan and complete maintenance on time directly affects military readiness, as maintenance delays reduce the amount of time during which aircraft, radars, combat vehicles, and other weapon systems and equipment are available for training and operations. The maintenance work performed at Army and Marine Corps depots in fiscal year 2019 totaled \$4.6 billion and \$395 million, respectively, according to fiscal year 2021 budget estimates from the Departments of the Army and the Navy.²

Over the past 10 years, we have issued multiple reports on challenges experienced by Department of Defense (DOD)-owned maintenance depots for all four military services, including deteriorating equipment and facility condition, difficulty in filling critical personnel skills, and growing

¹The Department of the Army operates five depots that perform depot-level maintenance: Anniston Army Depot; Red River Army Depot; Tobyhanna Army Depot; Corpus Christi Army Depot; and Letterkenny Army Depot. The U.S. Marine Corps operates one depot that performs maintenance, and this depot contains two production plants: Albany Production Plant; and Barstow Production Plant. For the purposes of this report, we refer to the U.S. Marine Corps production plants as depots.

²The Army's dollar amount for work performed in fiscal year 2019 includes several Army facilities outside the five that perform depot-level maintenance; specifically, the amount also includes the Army's arsenals and storage depots.

maintenance backlogs.³ These challenges can lead to delays in the maintenance of weapon systems, which ultimately affect readiness by impeding the military services' ability to conduct training and to provide forces with sufficient equipment to perform operations around the world.

In June 2018 the Senate Armed Services Committee, in a report accompanying a bill for the National Defense Authorization Act for Fiscal Year 2019, raised a question regarding how DOD assesses and, to the extent possible, mitigates the risk of maintenance delays when identifying its depot workload requirements.⁴ The report also included a provision for us to examine how the individual military services, including the Army and Marine Corps, have addressed these issues at their respective depots. This report assesses the extent to which (1) the Army met its planned maintenance goals for fiscal years 2018 and 2019, and addressed any challenges associated with measuring depot performance; (2) the Army has identified and addressed any key challenges associated with completing planned maintenance; and (3) the Marine Corps completed its planned maintenance for fiscal years 2015 through 2019, and addressed any associated challenges. We have separate reviews examining these issues at the Air Force and Navy aviation depots and Navy public shipyards.

To address our first objective, we collected and analyzed data on the key metric that the Army used to assess the percentages of maintenance goals completed for fiscal years 2018 and 2019 by its five depots that conduct maintenance work—namely, Anniston Army Depot, Corpus Christi Army Depot, Letterkenny Army Depot, Red River Army Depot, and Tobyhanna Army Depot.⁵ Specifically, we compared these data with the

³See, for example, 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); *Depot Maintenance: DOD Should Adopt a Metric That Provides Quality Information on Funded Unfinished Work*, [GAO-19-242](#) (Washington, D.C.: Jul. 26, 2019); *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: Executed Workload and Maintenance Operations at DOD Depots*, [GAO-17-82R](#) (Washington, D.C.: Feb. 3, 2017); and *Defense Inventory: Further Analysis and Enhanced Metrics Could Improve Service Supply and Depot Operations*, [GAO-16-450](#) (Washington, D.C.: June 9, 2016).

⁴S. Rep. No. 115-262, at 147 (2018).

⁵The Army also manages a number of additional depots that provide other services, such as equipment and ammunition storage and demilitarization. For purposes of this report, we focused solely on those depots conducting maintenance work.

Army goal for this metric to assess the depots' performance over the 2-year period. We then met with Army officials to discuss these trends, as well as the characteristics of this metric and the Army's initiative to revise the metric by developing a new metrics framework.⁶ We compared the Army's metrics initiative with Army guidance on effective teamwork that calls for having a coordinated effort in the interests of a common goal and a process outline or standard operating procedures.⁷ We also found that a key principle of internal control, as outlined in *Standards for Internal Control in the Federal Government*, was significant to this objective—namely, that management should use quality information to achieve an entity's objectives.⁸ We assessed the Army metrics initiative against this principle, in particular that the information requirements necessary to achieve the objectives should occur in an iterative and ongoing process, and should consider both internal and external users. Finally, we compared the Army's metrics initiative with leading collaboration practices, which include establishing mutually reinforcing or joint strategies to enhance and sustain collaboration.⁹ We then met with Army officials to discuss our assessments.

To address our second objective, we collected and analyzed data on reasons why the Army's five depots made changes to their planned maintenance schedule for fiscal years 2018 and 2019. We identified trends associated with these reasons and discussed those trends with Army officials to better understand the key challenges the Army depots faced in completing their work as planned, and how the Army mitigates

⁶We interviewed knowledgeable officials from the following organizations: the Office of the Army Deputy Chief of Staff G-4; the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology; Army Materiel Command, Army Tank-Automotive and Armaments Command; Army Aviation and Missile Command; Army Communications-Electronics Command; and the five Army depots, among others.

⁷Army ATP 6-22.6, *Army Team Building* (Oct. 30, 2015).

⁸GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

⁹GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration Among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.; Oct. 21, 2005); and GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, D.C.: Sept. 27, 2012).

risks to these challenges.¹⁰ We reviewed the Army's processes at the headquarters and depot levels to understand how they plan depot maintenance work, and we also observed a session of the Army's annual process for identifying and validating long-term plans for depot maintenance work funded through payments to the depots from Army customers' operations and maintenance amounts.¹¹ We then compared these processes with Army documents related to materiel maintenance policy and procedures, which call for those responsible for acquisition, budgeting, and requirements processes to work together to identify maintenance needs and any subsequent changes.¹² We also compared these processes with defense acquisition guidance, which calls for depots and their customers to coordinate in early identification and resolution of issues.¹³ We reviewed and discussed specific Army actions taken to minimize the number of changes that occur during the year in which maintenance is conducted, and we compared these actions with best practices for evaluation studies, which can serve as supplements to ongoing performance reporting, as well as with DOD maintenance policy, which highlights the need for analytic capability to make program improvements.¹⁴ We then met with Army officials to discuss our assessments.

To address our third objective, we collected and analyzed data related to the planned and actual items maintained by the Marine Corps depots

¹⁰We interviewed knowledgeable officials from the following organizations: the Office of the Army Deputy Chief of Staff G-4; the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology; Army Materiel Command, Army Tank-Automotive and Armaments Command; Army Aviation and Missile Command; Army Communications-Electronics Command; and the five Army depots, among others.

¹¹The Future Years Defense Program is the program and financial plan for DOD as approved by the Secretary of Defense. The Future Years Defense Program arrays cost data, manpower, and force structure over a 6-year period (force structure for an additional 3 years), portraying these data by major force program for DOD internal review for the program and budget review submission. It is provided to Congress in conjunction with the President's budget.

¹²AMC Regulation 750-55, *U.S. Army Materiel Command Organic Industrial Base (OIB) Operations Management* (May 16, 2019).

¹³DOD Instruction 5000.02T, *Operation of the Defense Acquisition System*, Jan. 7, 2015 (incorporating Change 6, Jan. 23, 2020).

¹⁴GAO, *Program Evaluation: Strategies to Facilitate Agencies' Use of Evaluation in Program Management and Policy Making*, [GAO-13-570](#) (Washington, D.C.: June 26, 2013); and DOD Directive 4151.18, *Maintenance of Military Materiel*, Mar. 31, 2004 (incorporating Change 1, Aug. 31, 2018).

from fiscal years 2015 through 2019, as well as data on reasons why the depots made changes to their planned maintenance schedules for fiscal year 2019, the first year for which data were available. Our analysis identified trends from these data, and we then met with Marine Corps officials to discuss those trends and any challenges associated with completing the Marine Corps' planned depot maintenance work. We assessed the Marine Corps' key metric against criteria such as best practices for project schedules, which call for the development of a baseline schedule against which performance can be measured, monitored, and reported; and DOD guidance for the preparation and implementation of plans and schedules, which states that integrated master plans and schedules provide a systematic approach to program planning, scheduling, and execution.¹⁵ We also discussed any actions the Marine Corps is taking, or plans to take, to address these challenges, and we reviewed documentation related to these actions.¹⁶ In addition, we discussed the Marine Corps' processes for planning and implementing its depot maintenance work with knowledgeable officials and reviewed relevant DOD and Marine Corps policies and guidance related to depot maintenance and planning. We then met with Marine Corps officials to discuss our observations and assessments.

To assess the reliability of the data used in this report, we reviewed documentation on data systems for the Army and Marine Corps and interviewed service officials regarding data 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 we discussed with officials any data irregularities we found. Specifically, for the Army, we received data for fiscal years 2015 through 2019 and compared data provided by Army Materiel Command with data provided directly by the depots. Our analysis of the data, combined with discussions with Army officials, led us to determine that the fiscal year 2015 through 2017 data were not reliable. Thus, we excluded the data for this time frame from our report. Conversely, based on steps taken by the Army to improve data quality, we determined that the data for fiscal years 2018 and 2019 were sufficiently reliable for the purposes of summarizing trends related to overall depot maintenance

¹⁵GAO, *Schedule Assessment Guide: Best Practices for Project Schedules*, [GAO-16-89G](#) (Washington, D.C.: December 2015); DOD, *Integrated Master Plan and Integrated Master Schedule Preparation and Use Guide*, v. 9 (Oct. 21, 2005).

¹⁶We met with officials from the following organizations: the Office of the Deputy Commandant for Installation and Logistics; Marine Corps Logistics Command; Marine Depot Maintenance Command; and both Marine Corps depots, among others.

performance and changes in planned depot maintenance schedules. For the Marine Corps, we reviewed and discussed key data with Marine Corps officials. On the basis of those discussions and our review of the data, we determined that the data on planned and actual items maintained by the Marine Corps depots for fiscal years 2015 through 2019, and the data on reasons for changes to the Marine Corps' depot maintenance schedules for fiscal year 2019, were sufficiently reliable for the purposes of our report.

We conducted this performance audit from March 2019 to July 2020 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.

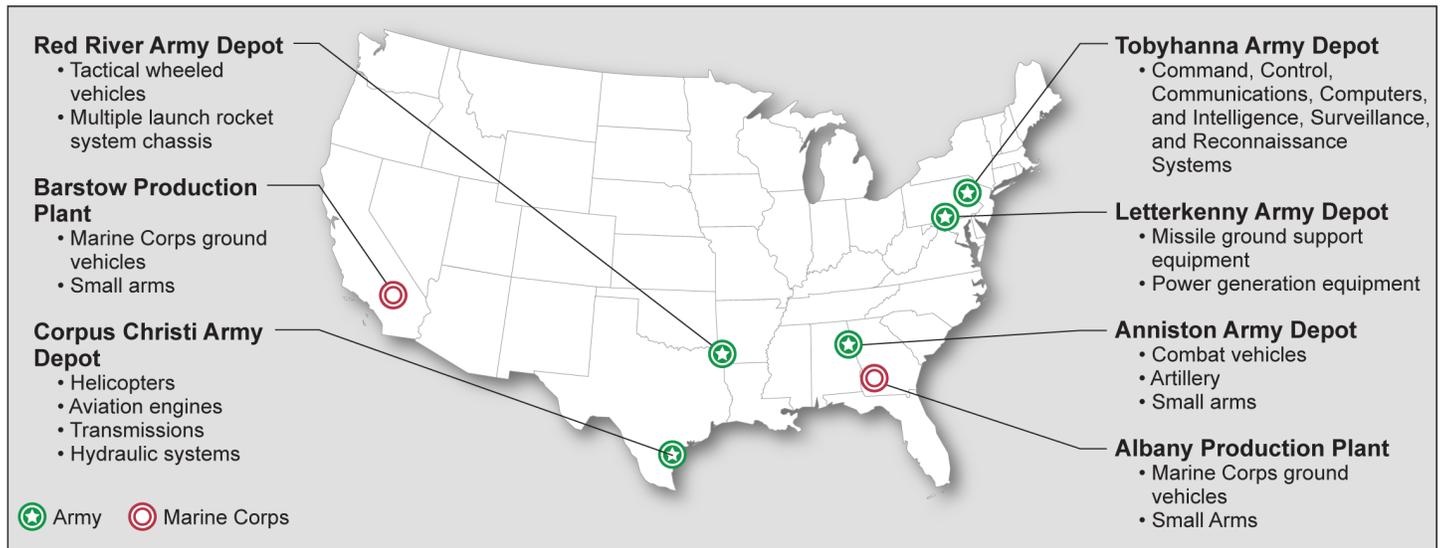
Background

Depots and Related Organizations

Depots are government-owned, government-operated industrial installations that maintain, overhaul, and repair a multitude of complex military weapon systems (for example, helicopters and tanks) and equipment (for example, generators, software, and radars) for DOD. Depots are essential to maintaining surge capacity and readiness for DOD, and they play a key role in sustaining weapon systems and equipment in peacetime, as well as during mobilization, contingency, or other emergency. Specifically, depots provide materiel maintenance or repair requiring the overhaul, upgrading, or rebuilding of parts, assemblies, or subassemblies, and the testing and reclamation of equipment as necessary on weapon-system orders placed by the military services. There are 17 depots operated by the military services that perform depot-level maintenance, seven of which are operated by the Army and the Marine Corps.¹⁷ Figure 1 shows the locations of the Army's and Marine Corps' maintenance depots, and provides a summary of the maintenance work primarily performed at each one.

¹⁷Depot-level maintenance includes inspection, repair, overhaul, or the modification or rebuild of end items, assemblies, subassemblies, and parts that, among other things, require extensive industrial facilities, specialized tools and equipment, or uniquely experienced and trained personnel that are not available in other maintenance activities.

Figure 1: Army's and Marine Corps' Maintenance Depots and the Weapons Repaired and Maintained at Those Locations



Source: GAO analysis of Department of Defense documents. | GAO-20-401

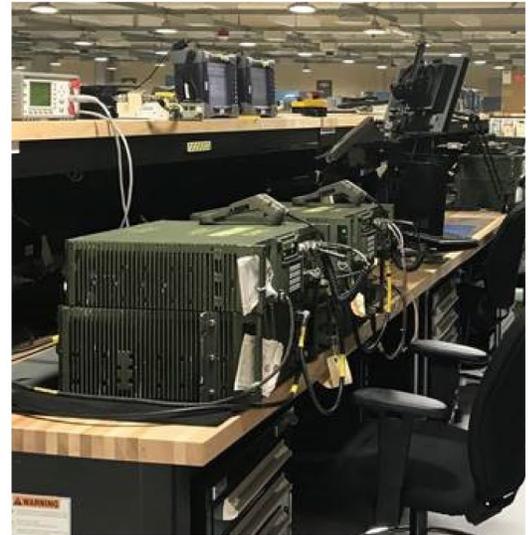
Note: The Marine Corps operates one maintenance depot, consisting of two production plants. For the purposes of this report, we refer to the two production plants as depots.

The seven Army and Marine Corps depots maintain not only thousands of helicopters, combat vehicles, artillery, missile systems, and even locomotives, but also the engines, cables, and electronics, as well as thousands of other small and large parts that make the larger weapon systems work. See figure 2 for examples of the diverse types of equipment maintained at Army and Marine Corps depots.

Figure 2: Examples of Army and Marine Corps Depot Workload



Tracked vehicle at Anniston Army Depot



Radios at Tobyhanna Army Depot



Combat vehicles at Albany Marine Corps Production Plant



Electronics at Barstow Marine Corps Production Plant

Source: GAO (top); U.S. Marine Corps (bottom). | GAO-20-401

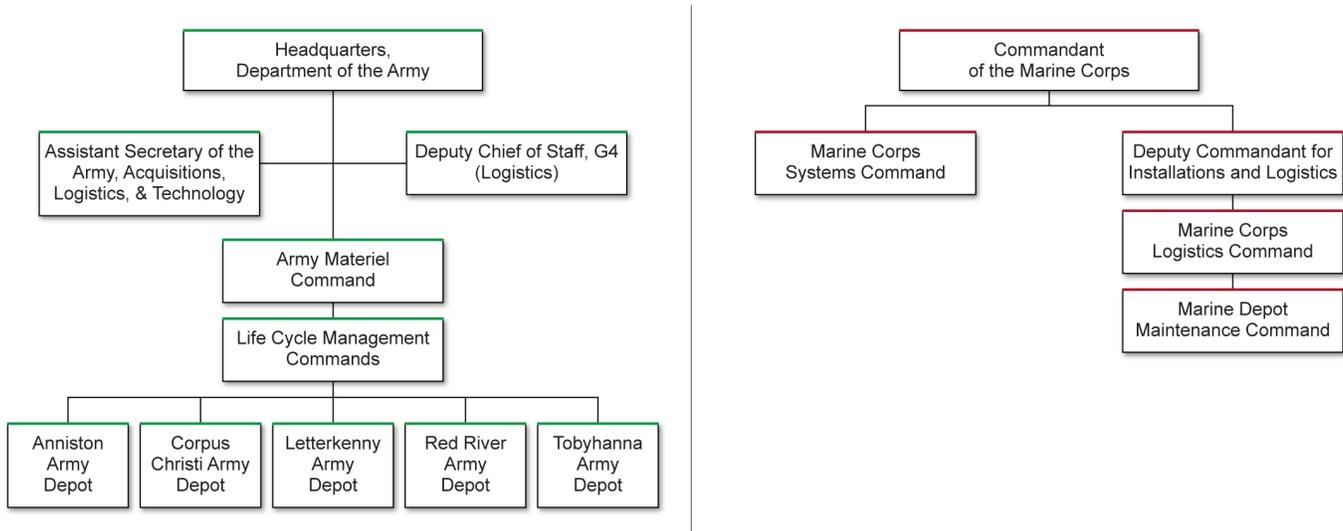
The Army and Marine Corps depots are part of a larger DOD-wide logistics enterprise, including organizations responsible for management and oversight of the depots, as well as headquarters that provide guidance and oversight over the entire enterprise. For example, the Office of the Assistant Secretary of the Army for Acquisitions, Logistics, and

Technology (ASA [ALT]) oversees the management and sustainment of Army weapon systems and equipment—from research and development through test and evaluation, acquisition, logistics, fielding, and disposition. Additionally, the Office of the Army Deputy Chief of Staff, G4 (Logistics) provides comprehensive maintenance support capabilities, among other things. Further, the Army Materiel Command (AMC) provides day-to-day management and oversight of the Army’s depots, each of which falls under one of AMC’s major subordinate commands, which provide materiel life-cycle management.¹⁸

For the Marine Corps, the Office of the Deputy Commandant for Installations and Logistics carries out responsibilities associated with logistics policy and management, while the Program Executive Officer Land Systems Marine Corps partners with Marine Corps Systems Command to sustain ground vehicles, radars, and communications gear for Marine forces. In addition, the Marine Corps Logistics Command provides day-to-day management and oversight of the Marine Corps production plants, which we refer to as depots in this report. See figure 3 below for the Army and Marine Corps depot organizational structure.

¹⁸Each depot is aligned under a major subordinate command—known as a Life Cycle Management Command (LCMC)—in accordance with the nature of its mission. For example, Anniston and Red River Army Depots principally conduct maintenance work on ground systems—such as the Paladin and M1 Abrams tanks—and therefore are aligned with the LCMC known as the Tank-Automotive and Armaments Command. Letterkenny and Corpus Christi Army Depots principally conduct maintenance work on aviation, missile, and unmanned vehicle systems—such as Patriot missiles and Black Hawk helicopters—and therefore are aligned with the Aviation and Missile Command. Tobyhanna Army Depot is principally responsible for conducting maintenance work on command, control, communications, computers, cyber, intelligence, surveillance, and reconnaissance materiel readiness for systems—such as tactical radios and night vision goggles—and is therefore aligned with the Communications-Electronics Command.

Figure 3: Army and Marine Corps Depot Organizational Structure



Source: GAO analysis of Department of Defense (DOD) and service documentation. | GAO-20-401

Depot Customers

The Army and Marine Corps depots service a variety of warfighting and institutional customers. In the Army, for example, service officials stated that Army Forces Command, which is the largest Army command and the provider of expeditionary land forces, needs to ensure that its units are properly equipped with well-maintained weapon systems. To ensure this, the command works with units to turn in their equipment after deployment for refurbishment at the depots. Additionally, ASA (ALT) is a depot customer on behalf of Army Forces Command and other operational commands, and it works with the depots to upgrade and modernize weapon systems. In the Marine Corps, Marine Forces Command and Marine Forces Pacific also need to ensure that their units are properly equipped with well-maintained weapon systems. These commands work with their units to turn in their equipment to the depots for refurbishment. Program managers under Marine Corps Systems Command and Program Executive Officer Land Systems Marine Corps are the depots' customers on behalf of Marine Forces Command and Marine Forces Pacific, and they work with the depots to modernize Marine Corps equipment. Finally, both the Army and the Marine Corps depots conduct maintenance for customers from other U.S. military services, U.S. government agencies, and foreign nations that purchase U.S.-made weapon systems.

The Depot Maintenance Process

Depot maintenance is an action performed on end-items—such as vehicles, weapon systems, or other equipment, or their components—in the conduct of inspection, repair, overhaul, or modification or rebuilding of these items. Depot maintenance activities range in complexity from system inspection, to rapid removal and replacement of components, to the complete overhaul or rebuilding of a weapon system. Among other things, depot maintenance requires extensive industrial facilities, specialized tools and equipment, and uniquely experienced and trained personnel. Given the wide-ranging variety of items—in terms of type, size, and number—on which the Army and Marine Corps conduct maintenance, these services must engage in proactive and accurate planning. Such planning is intended to ensure the timely availability of welders, mechanics, electricians, engineers, and other specialized personnel; to ensure that facilities are appropriately equipped and configured; and to ensure that the correct spare parts are available to complete the maintenance work.

The depot maintenance process across both the Army and the Marine Corps generally involves three primary steps—planning, disassembly, and rebuilding:

- Planning occurs when the depots begin to plan the maintenance needed by a particular end item, which could be a weapon system (such as a Patriot missile system or an M1 Abrams tank) or a component (such as an engine or a brake assembly). Working with their customers, the depots identify the detailed time frames, parts, and components required for maintenance on the end item.
- Disassembly occurs once the depot receives the end item and is ready to begin maintenance on it. During this step, the depot workers inspect the end item and its components to determine, within the scope of work, the type and degree of repair required, or whether any of the parts require replacement. The depot workers may determine that they need to conduct different kinds of repairs based on the time that has passed, or how the warfighter has used the end item, since it last underwent maintenance. See figure 4 for examples of end item disassembly.

Figure 4: Examples of End Item Disassembly at Anniston Army Depot



Tank drive-system components awaiting repair



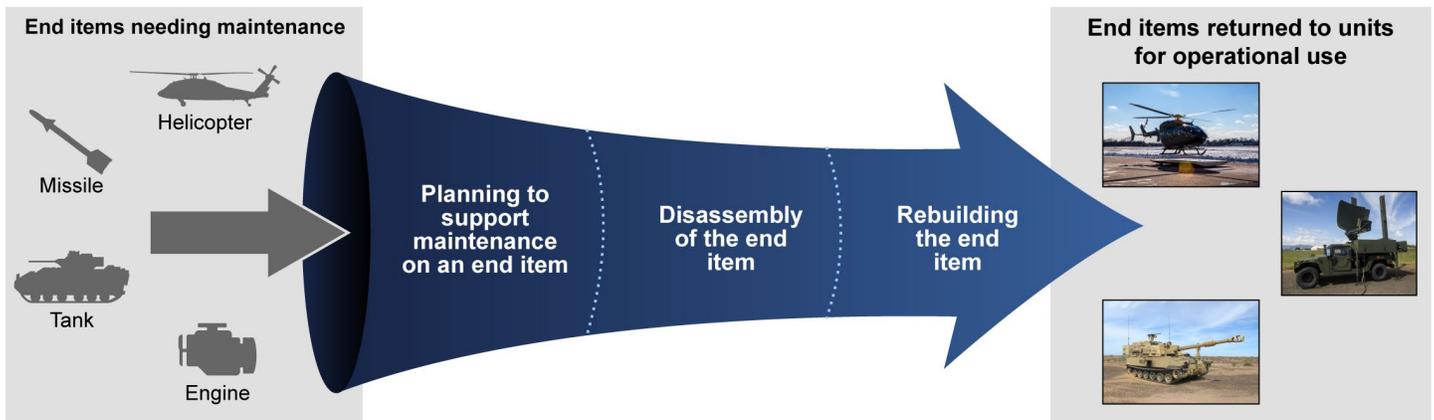
Ready for reassembly

Source: GAO. | GAO-20-401

- Rebuilding occurs following disassembly, when depot workers rebuild the end item with new and repaired parts. In general, the depot workers follow a sequential process when rebuilding the end item, and this necessitates the timely availability of new and repaired parts to ensure efficient reassembly. Once depot workers rebuild the end item, they also test it and validate its use by a military unit.

See figure 5 for a summary of the depot maintenance process.

Figure 5: Depot Maintenance Process



Source: GAO analysis of Department of Defense documents. | GAO-20-401

Depot Maintenance Planning

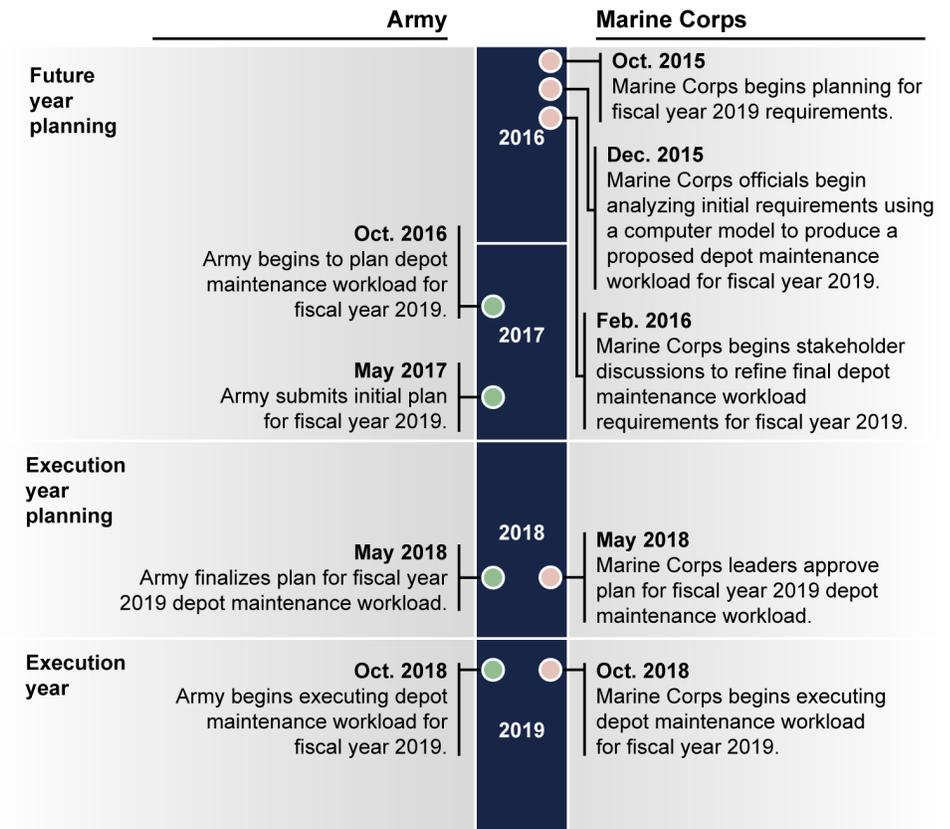
In order to carry out these responsibilities related to the depot maintenance process, the Army and Marine Corps begin to plan for the amount and type of maintenance work their depots will receive several years in advance of the work. Officials from both services explained that depots and their major commands generate projections for the amount and type of maintenance work they will conduct from workload forecasting systems. These projections are based on trends related to previous depot work, and on discussions with the depots' customers about the maintenance work to be conducted.

According to service officials, the Army and Marine Corps update these plans for future maintenance work annually, in an effort to make the plans more accurate as the fiscal year in which the work will be conducted approaches. Specifically, as shown in figure 6 below, Army and Marine Corps processes for planning depot maintenance for fiscal year 2019 consisted of various steps and customer coordination that began at least 2 fiscal years prior to the time when the maintenance work actually occurred. The planning processes for both services are based on budgeting and planning procedures set forth in DOD's *Financial Management Regulation*.¹⁹ The results of each service's depot maintenance planning process are incorporated into the larger DOD future years' defense planning, programming, and budgeting processes.

¹⁹Volumes 2A and 2B provide specific guidance on budget formulation and presentation. DOD 7000.14-R *Financial Management Regulation* (2020).

The Army and Marine Corps repeat the depot maintenance planning process each fiscal year.

Figure 6: Timeline for Development of Army and Marine Corps Planning for Fiscal Year 2019 Depot Maintenance Workload



Source: GAO analysis of Army and Marine Corps information. | GAO-20-401

GAO's Prior Work on Depot Maintenance

Our prior work has identified multiple challenges that can affect depot performance, including many associated with planning, such as having the right facilities and having personnel with the right skills, as shown in figure 7.²⁰

²⁰See [GAO-19-242](#) and [GAO-19-51](#). For a list of depot-related reports, see the Related GAO Products page at the end of this report.

Figure 7: Challenges Identified by GAO That Can Affect Department of Defense Depot Performance



Source: GAO. | GAO-20-401

Specifically, we reported in April 2019 that the condition of the DOD depot facilities was poor and the age of equipment was generally past its useful life, and that the military services did not consistently track the effect of these conditions on depot performance. To address these challenges, we recommended that DOD improve its collection of data on the effects that facility and equipment condition have on depot performance, among other things. DOD concurred and stated that, in general, the Service Chiefs for the Army, Navy, Air Force, and Marine Corps would ensure that their respective materiel commands take actions to implement the recommendations for their services. As of May 2020, the services had not taken actions to implement these recommendations.

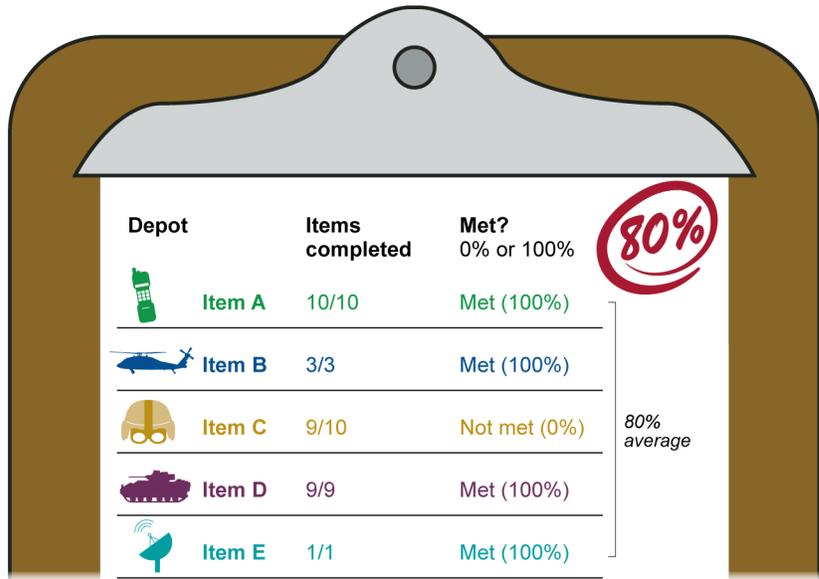
Also, in December 2018 we reported on depot workforce challenges, such as hiring personnel in a timely manner and providing inexperienced personnel with the training necessary to become proficient in skilled operations. According to DOD officials at that time, those workforce challenges contributed to delays in the maintenance of some weapon systems. To address those workforce challenges, we recommended that the military services assess the effectiveness of the actions they had taken to maintain critical skills in the depot workforce. DOD concurred, and it stated that each of the four services would take action to assess the effectiveness of the hiring, training, and retention programs at their respective depots, shipyards, fleet readiness centers, and air logistics complexes. As of November 2019, Navy officials reported that they were in the process of collecting information to assess those programs.

The Army Reported Completing Most of Its Planned Maintenance, but Challenges Exist in Improving Metrics for Measuring Depot Performance

The Army Reported Meeting Most of Its Maintenance Goals for Fiscal Years 2018 and 2019, but the Metric Used for This Reporting Has a Key Limitation

The Army reported that, on average, it met most of its goals for conducting maintenance for fiscal years 2018 and 2019. Specifically, during this time period, the Army reported that, on average across all five depots, it met its monthly maintenance goals for approximately 91 percent of the systems on which it had planned to complete maintenance. To determine this, the Army designates each item as either having met or not having met the depot's monthly maintenance goal for that item. The Army then calculates the overall percentage of the items within the depot that have met their monthly maintenance goals, and this figure constitutes the depot's Performance to Promise (P2P) percentage. P2P is the Army's primary enterprise-wide metric for assessing depot performance, and, according to AMC officials, the Army's goal is to meet all of its monthly maintenance goals on 100 percent of its items—that is, 100 percent P2P—which means completing maintenance on all the items for which it had planned to complete maintenance, in a given time period. Figure 8 depicts the way in which the Army calculates P2P, or completion of maintenance goals, for a depot.

Figure 8: Sample Calculation of Maintenance Goal Completion for an Army Depot



Source: GAO analysis of Army data. | GAO-20-401

For individual Army depots for fiscal years 2018 and 2019, the Army reported some variability in meeting the 100 percent goal for P2P. For example, Red River Army Depot, which repairs tactical wheeled vehicles, reported that it had met its maintenance goals on about 94 percent of the systems on which it had planned to conduct maintenance in fiscal year 2018, and about 98 percent in fiscal year 2019. Corpus Christi Army Depot, which repairs and overhauls helicopters and aviation-related engines and components, reported that it had met its maintenance goals on about 76 percent of the systems it had scheduled in fiscal years 2018 and 2019. See table 1 below for details on each depot’s average rate of maintenance completion for scheduled items for fiscal years 2018 and 2019.

Table 1: Rates of Maintenance Goal Completion for Scheduled Items by Army Depot for Fiscal Years 2018 to 2019, in Percent

	Fiscal year 2018	Fiscal year 2019	Example of major end items associated with each depot
Anniston Army Depot	94.3	96.5	Tracked and wheeled combat vehicles
Corpus Christi Army Depot	75.7	75.9	Helicopters, aviation engines, and components
Letterkenny Army Depot	92.3	93.8	Missile systems
Red River Army Depot	93.6	97.5	Tactical wheeled vehicles
Tobyhanna Army Depot	93.0	94.9	Electronic systems
Overall Average	89.8	91.7	

Source: GAO analysis of Army data. | GAO-20-401

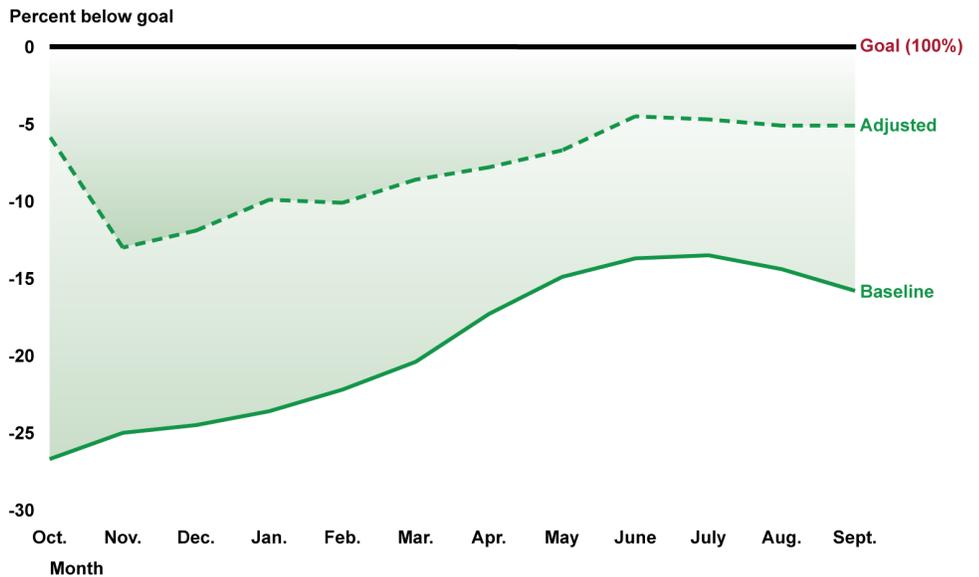
Although the Army reported that it had met its maintenance goals on about 91 percent of its scheduled systems on average, the Army has identified some limitations associated with its key metric, P2P. According to Army officials, the P2P metric captures the percentage of items within a depot that met their monthly maintenance goals, but it does not measure against the original monthly maintenance goals. Instead, these officials stated, depots may adjust the original maintenance goals, based on the previous month’s performance or changes in customer needs, and it is these adjusted goals that the Army uses to calculate P2P. As a result, P2P does not compare actual performance against the original goals baselined at the beginning of the fiscal year.

Army officials recognized the need for P2P baselining as a way to better assess how well the service is planning its maintenance work. As a result, Army officials stated, in fiscal year 2019 the depots began manually tracking a metric called “Frozen P2P,” which provides a fixed baseline by tracking actual performance against the original maintenance schedule.²¹ When compared against the monthly average adjusted P2P, the monthly average baselined P2P for fiscal year 2019 showed a difference ranging between 8 and 21 percentage points; in all cases, the average adjusted P2P showed depot performance to be more favorable than did the baselined P2P. Figure 9 shows the Army’s goal of 100 percent P2P and the percent variance from that goal for the monthly average adjusted P2P across all Army depots for fiscal year 2019, as well as for the monthly average baselined P2P across all Army depots for fiscal year 2019.

²¹In this report we refer to Frozen P2P as “baselined P2P” or “baselined depot performance.”

According to AMC officials, that was the first year in which the baselined P2P data were available.

Figure 9: Percent Variance from Goal for Average Adjusted and for Baselined Depot Performance across Army Depots, Fiscal Year 2019



Source: GAO analysis of Army data. | GAO-20-401

Note: Baselined depot performance data for Corpus Christi and Letterkenny Army Depots were unavailable for October 2018.

Army Is Developing a Metrics Initiative to Address Other Limitations but Faces Challenges in Coordinating This Effort with Depots

In addition to Army officials identifying the lack of a baseline schedule against which to measure performance and establishing a baselined P2P metric to address that limitation, the Army has identified and is working to address other P2P limitations. Army officials stated that P2P's other limitations include limited visibility into performance details, a nonstandard method of calculation, and an absence of archiving. In part to address these limitations, AMC is developing new metrics for the Army organic industrial base (OIB) that will include a series of performance metrics and a visual dashboard for Army officials to use to monitor depot

performance.²² Below is a description of these P2P limitations and the ways in which AMC intends to address them:

- **Limited visibility into the details of depot performance.** The P2P metric does not provide visibility into the specific details behind monthly depot performance because, according to Army officials, monthly maintenance goals are assessed as either met or not met, regardless of how close the depot was to completing maintenance on the planned items. As a result, the P2P metric does not measure the number of items for which the depot completed maintenance, but rather the percentage of overall items that met the goal of 100 percent. For example, officials from the Army's Aviation and Missile Command, which manages Corpus Christi Army Depot, stated that the P2P metric understated that depot's performance in fiscal years 2018 and 2019. Although Corpus Christi Army Depot's P2P average for each of those years was approximately 76 percent, the officials indicated that the depot did not complete maintenance on a relatively small number of items, which drove their overall average P2P down. However, these depot officials stated that, when looking at the total number of items the depot worked on (instead of the number of goals met) in this same time period, Corpus Christi Army Depot completed maintenance on an average of 95 percent of planned items in fiscal years 2018 and 2019.

To address this limitation, AMC officials stated that the visual dashboard they are developing is intended to enable officials to drill down from strategic metrics—such as P2P—to operational or tactical metrics, as needed, to help them better pinpoint the causes of poor performance and therefore to develop solutions. For example, AMC officials stated that if the P2P metric shows a particular depot as not meeting its goal, then officials will be able to review a related operational metric, such as one called “First Pass Yield,” which identifies whether the depot is experiencing high rates of rework. AMC officials added that, if needed, officials could obtain more detailed information about the depot's performance by drilling down further to another operational metric, such as one called “Route Accuracy,”

²²The Army's organic industrial base is composed of resource providers, acquisition and sustainment planners, and manufacturing and maintenance performers at depots, as well as at manufacturing arsenals and ammunition plants. The Army's organic industrial base maintenance depots included in this review are key components of the overall defense industrial base.

which assesses the duration of a maintenance item's route through that depot.

- **Nonstandard calculation of metric.** Army officials have stated that AMC does not have a standardized method of calculating the P2P metric. They stated that, instead, they manually calculate P2P using data recorded in an Army system used by the depots—the Logistics Modernization Program (LMP).²³ This means that different methods at the AMC or depot level can result in different numbers, which then have to be reconciled. For example, AMC officials explained that AMC may decide to exclude data related to foreign military sales from their P2P calculations, while depots that conduct more work for foreign countries may decide to include this work in their own P2P calculations. However, AMC reported that, as part of the ongoing metrics initiative, it is defining what data must be included in or excluded from P2P calculations for all depot stakeholders, and that this definition will become official AMC policy.
- **Lack of data archiving.** AMC and depot officials stated that the Army does not archive the LMP data used to calculate P2P. According to Army officials, in the absence of such archived data, depot officials track historical P2P outside of LMP, and AMC officials contact them or the Life Cycle Management Commands (LCMC) to confirm or reconcile historical P2P trends. However, AMC officials acknowledged that tracking historical P2P data would be useful for purposes of trend analysis. Therefore, according to these officials, AMC intends to archive the output of some metrics—including P2P—for at least a 5-year period, as part of the ongoing metrics initiative. The officials said that they are in the process of determining how, and to what extent, they will achieve this.

As part of the Army's stated effort to address these P2P limitations through its metrics initiative, AMC officials said they requested that LCMCs and subordinate installations identify key stakeholders from among their personnel who have working knowledge of OIB metrics and related data, and make them available to support AMC's metrics development team and metrics-related workshops. AMC officials also stated that they have thus far included these depot stakeholders in the initiative, and will continue to do so. However, we found that the depot stakeholders we interviewed were uncertain as to how, or whether, AMC

²³LMP is an Army enterprise resource planning system that supports industrial operations conducted by AMC at its life-cycle management commands and its maintenance, manufacturing, and storage sites.

will incorporate their input to meet the goals of the metrics initiative. For example:

- Stakeholders from three of the five depots reported some uncertainty in relation to a November 2019 metrics workshop with AMC. At this workshop, AMC presented stakeholders, including those at the depots, with 22 of the planned 66 metrics that AMC had developed, according to Army officials. Because AMC had already developed the metrics, these depot stakeholders expressed initial uncertainty about their role in the workshop. These depot stakeholders stated that they eventually provided input on the metrics during the workshop, but were uncertain as to how, or whether, AMC would incorporate their input into the metrics. Officials from two of the five depots, however, stated that AMC had added some exceptions to the way in which metrics would be tracked as a result of their input at the November workshop, which AMC officials confirmed.
- Stakeholders from three of the five depots also reported that they did not know how AMC would incorporate the input that they provided at a February 2020 workshop, which, according to AMC, was intended to discuss data sources of the metrics. Specifically, according to these depot stakeholders, they learned at this workshop that the metrics initiative may result in metrics that are not beneficial for the depots, but they did not know whether AMC officials understood this or would address their concerns. These depot stakeholders stated that to populate the metrics dashboard AMC may use a set of data that are different from those used by the depots to conduct daily maintenance work. These depot stakeholders said they were therefore concerned that once AMC launches the metrics dashboard, senior leaders may not fully understand the data and may reach out to the depots with questions about them. According to officials from all five depots, if AMC bases the metrics on a different set of data from those used by the depots, then the depots may have to devote additional resources to understanding the AMC metrics data and answering related questions.

Moreover, the depot stakeholders we interviewed were also concerned about how or whether AMC will incorporate their input into the ongoing metrics initiative because of their experience with prior initiatives. An example of such a previous initiative is a new reporting tool within LMP—known as the Workload Planning and Reporting tool—that AMC is developing to take the place of a separate information system that produces management reports, including P2P reporting. Although AMC initially consulted with the depots about the requirements for this tool, AMC and depot officials stated that AMC began online construction of the

new reporting tool without further input from the depots during this online construction. Depot stakeholders stated that, as a result of this lack of participation, they were unable to use the initial online version of the tool to pull key data from the appropriate data sources. Conversely, AMC officials stated that during review of the initial online version of the tool, the depots identified some areas for improvement that were not significant enough to warrant an implementation delay. According to Army officials, AMC is continuing to work on corrections while the tool is operational and intends to rely solely on this new tool by September 2020.

Finally, according to Army officials, AMC is undertaking an aggressive schedule to complete the ongoing metrics initiative that may make it challenging for AMC to incorporate the input of the depot stakeholders. Both AMC and depot officials noted that from November 2019 through February 2020 AMC incorporated the depots' input into the development of the first phase of the new metrics framework, which so far has included review of 22 metrics over a 4-month period. However, AMC officials noted that they plan to review and document the remaining 44 metrics by October 2020, and plan to have the final metrics dashboard ready for senior leaders to use by early 2021. AMC officials stated that they plan to continue including the depots in the metrics initiative, and they expressed confidence in their ability to meet this timeline, but acknowledged that it will be challenging.

Given their uncertainty as to how and whether AMC will incorporate depot input into the initiative, and given the aggressive timeline, officials from all five depots expressed concerns that AMC may not continue to take into account their input when developing and finalizing the metrics for the organic industrial base. These depot officials expressed concerns that consequently, without their input, the metrics may not include the details needed for senior leaders to understand key challenges, and may therefore require depots to respond to regular requests for additional information.

Army guidance states that the Army is to rely on effective teams to perform tasks, achieve objectives, and accomplish missions, and that a key to achieving effective teamwork is having cooperative or coordinated effort toward a common goal by sharing knowledge and building consensus.²⁴ This guidance also states that team leaders whose teams

²⁴Army, ATP 6-22.6, *Army Team Building* (Oct. 30, 2015).

are under pressure to achieve an outcome by a specific time should, among other things, get team members to provide input on what the goals should be and how to perform tasks. In addition, the guidance states that techniques for effective team leaders to follow include providing a process outline or standard operating procedures.

Moreover, iterative and ongoing communication is called for by the *Standards for Internal Control in the Federal Government*.²⁵ Those standards state that management should use quality information to achieve its objectives, and that management should collect quality information by engaging with stakeholders through iterative and ongoing processes and in a timely manner. In addition, leading collaboration practices we have identified in our prior work include establishing mutually reinforcing or joint strategies to enhance and sustain collaboration.²⁶

However, AMC has not developed procedures to ensure that it will incorporate depot stakeholder input through iterative and ongoing processes as part of a cooperative effort toward a common goal. Without this, the depot stakeholders may not be prepared to contribute in the best possible way to achieve that common goal. Moreover, without such procedures, it may be difficult—given AMC’s aggressive timeline—to ensure that depot stakeholders provide input into all metrics, rather than a subset of them, as well as provide input into how AMC intends to use all metrics together to provide an assessment of depot performance. Consequently, AMC may not develop depot maintenance-related metrics that are beneficial for helping officials at all levels—AMC, LCMC, and depot—to assess and improve depot performance, and may not fully address the known limitations of P2P.

²⁵GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

²⁶[GAO-06-15](#) and [GAO-12-1022](#).

Army Depots Have Been Responsive to Changes in Customer Needs, but Face Planning and Analytical Challenges in Minimizing These Changes

Depots Have Been Responsive to Frequently Changed Customer Maintenance Needs

The Army identified a key challenge to meeting the depots' goals for conducting maintenance during fiscal years 2018 and 2019, but it has not yet fully addressed this challenge. Even as the Army reported meeting most of its goals for fiscal years 2018 and 2019, we found that doing so required the five Army depots to be responsive to near-constant changes to their maintenance schedules. In fiscal year 2018, 59 percent of the original maintenance schedule changed throughout the year, and in fiscal year 2019, 56 percent changed. For example, our analysis of Army data showed that Anniston Army Depot received 49 reconnaissance vehicles in fiscal year 2018, even though it did not plan to conduct maintenance on any reconnaissance vehicles that fiscal year. Also, our analysis found that Red River Army Depot had plans to conduct maintenance on 142 High Mobility Multipurpose Wheeled Vehicles for the Marine Corps in fiscal year 2018; however, plans changed, and the Army depot did not maintain any of these vehicles for the Marine Corps in fiscal year 2018.

We found that changes to scheduled maintenance occur for a variety of reasons, such as parts shortages and lack of asset availability, which accounted for 18 percent and 17 percent of changes to scheduled maintenance, respectively. However, our analysis found that the majority of these changes—61 percent—occurred as a result of customers altering their original maintenance needs. For example:

- Officials at U.S. Army Communications-Electronics Command, which oversees Tobyhanna Army Depot, noted that Army Forces Command established a list of 20 priority weapon systems halfway through fiscal year 2017. This list included satellites, radar sets, and various communications equipment. Command and depot officials stated that, in response, they replaced some of their planned maintenance work

with work on these high priority systems, hiring additional staff with specialized skills to do so.

- Additionally, in fiscal year 2017 the Army announced an expansion of its armored brigade combat team forces, creating a need for additional tracked vehicles. This increase entailed additional maintenance work on M1 Abrams tanks at Anniston Army Depot (see figure 10), which maintains tracked combat vehicles, to make these additional tracked vehicles available for the Army units. Anniston depot officials said they had to prioritize the vehicles for the armored brigade combat teams over other vehicles already planned for maintenance. This resulted in unplanned work that carried over into fiscal year 2018 and, subsequently, fiscal year 2019.²⁷ The increase also meant that the depot had to move skilled labor to this prioritized work, according to Anniston Army Depot officials. They stated that it also resulted in a lack of parts to conduct the new maintenance work. When depot workers conducted this new work, they used parts they had originally ordered for other vehicles, and as a result, Anniston Army Depot experienced parts shortages when the workers later conducted maintenance on those other vehicles, according to depot officials.

²⁷Carryover is funded maintenance work that a depot did not complete by the end of the fiscal year and must complete in subsequent fiscal years. See [GAO-19-452](#), in which we reported on the challenges the depots face with regard to excess carryover, which may reflect an inefficient use of resources and may tie up funds that could be used for other priorities.

Figure 10: M1 Abrams Tanks at Anniston Army Depot



Source: GAO. | GAO-20-401

Army Faces Planning and Analytical Challenges to Minimizing Changes to Its Planned Depot Maintenance Work

Lack of Army Guidance Has Led to Inefficient Advanced Planning for Army Depot Maintenance Work

We identified two key challenges related to minimizing the number of customer changes to the Army's planned depot maintenance work: (1) inefficient planning that occurs prior to the year in which maintenance is conducted, which leads to unplanned work; and (2) an incomplete understanding of the causes for the changes that occur during the year in which maintenance is being conducted.

We found that the Army does not have guidance that establishes time frames for depot customers to submit their depot maintenance needs to the depots, resulting in inefficient planning. Army depot officials said they rely on receiving accurate information from their customers in order to plan and schedule the maintenance, a process that starts 2 years in advance of the planned maintenance. Such planning is important, according to Army officials, to ensure that the depots are able to obtain sufficient parts, that they are able to align their facilities and equipment, and that skilled personnel are available.

It is difficult for the depots to make necessary plans when their customers do not submit their maintenance needs on time. Each year, the depots develop their proposed budgets for the following fiscal year based on the maintenance work the depots plan to perform. The depots submit these proposed budgets to AMC by the end of May. However, according to

depot officials, they have to finalize this budget submission before all of their customers have submitted their final depot maintenance needs for the upcoming fiscal year. When customers do not submit their needs in time, or when they change their needs after the May deadline, the depots may need to adapt their plans in order to carry out the unplanned maintenance. According to depot officials, such unplanned work may lead to cascading changes to maintenance schedules for other weapon systems, and may result in maintenance work that carries over into future fiscal years.

Officials responsible for developing and managing the depots' maintenance schedules told us that they reach out to their customers between January and March each year to confirm the customers' depot maintenance needs, but that not all customers respond and provide updated maintenance needs prior to the depots' budget submission deadline. We found that the depots' customers are not responsive, in part, because the customers have different (or no) timelines for submitting their maintenance needs. Specifically:

- ASA (ALT) is a customer responsible for procuring and upgrading weapon systems and platforms on behalf of Army Forces Command and the rest of the operational force, such as brigade combat teams, combat aviation brigades, and other warfighting formations. ASA (ALT) pays for this work using procurement and research development, test, and evaluation funds, and it may identify its needs to the depots at any time of the year, without any specific timeline.²⁸
- LCMCs manage the maintenance and sustainment of Army weapon systems on behalf of Army Forces Command and the rest of the operational force. They pay for this work using operation and maintenance funds, and Army officials said they do not consistently update and finalize their needs until a planning summit in the summer—after the depots have finalized their budget estimate submissions, in May.²⁹

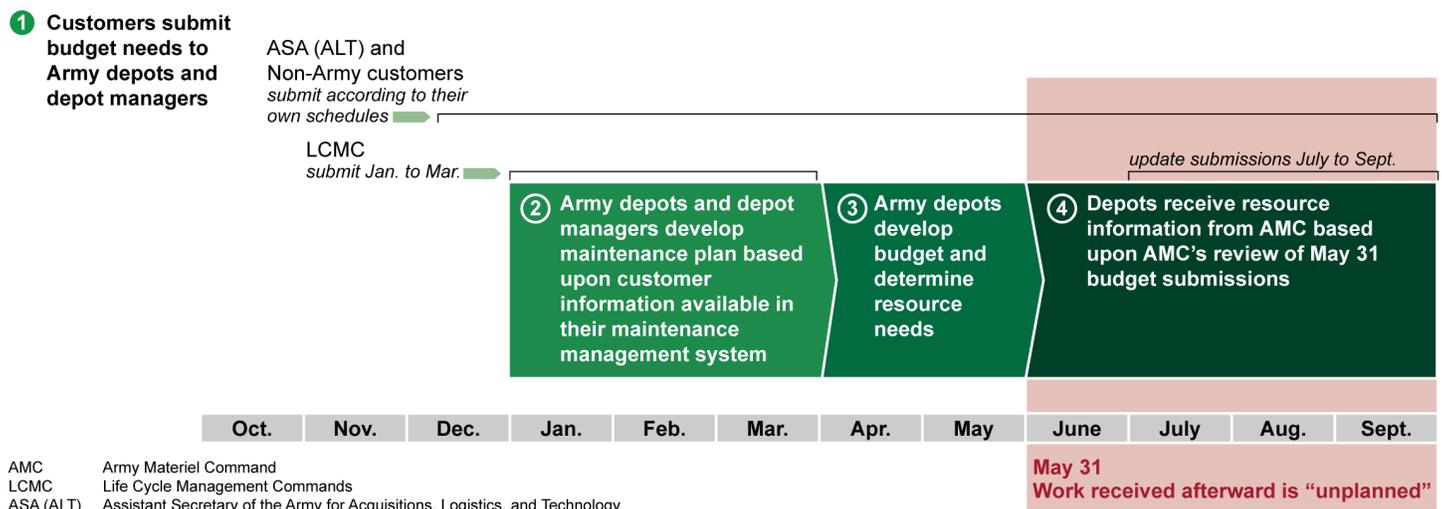
²⁸Procurement appropriations fund investment in end items for operational use or inventory and include the cost of fabricating and installing additions or modifications to existing user items. Research, development, test, and evaluation appropriations fund research, development, and test and evaluation efforts performed by contractors and government installations to develop equipment, materiel, or computer application software, along with its test and evaluation phases.

²⁹Operations and Maintenance appropriations fund expenses such as maintenance services, civilian salaries, travel, minor construction projects, operating military forces, training and education, and depot maintenance.

- The Air Force, Navy, Marine Corps, other U.S. government agencies, and foreign nations that purchase U.S.-made weapon systems also do not consistently submit their most up-to-date maintenance needs on time or with a sufficient level of detail, according to Army officials. Officials responsible for depot planning further noted that they often have to reach out to non-Army customers multiple times prior to the budget submission in order to get accurate maintenance information.

Figure 11 depicts the timelines for planning depot maintenance work for the Army’s different customers.

Figure 11: Army Processes for Planning Depot Maintenance Work



Source: GAO analysis of Army information. | GAO-20-401

Poorly synchronized planning has led to millions of dollars in unplanned work. For example, according to an analytical effort undertaken at the request of the Army Organic Industrial Base Corporate Board, responding to ASA (ALT) customers who identified their needs after the depots had submitted their budgets resulted in \$318 million in unplanned work for

fiscal year 2020.³⁰ Additionally, managers for Anniston Army Depot said that 2 weeks before fiscal 2020 began, an ASA (ALT) customer reduced an order for converting Joint Assault Bridges from 41 items to 28 items, leading to a \$30 million decrease in Anniston's budgeted work for fiscal year 2020.³¹

According to Army guidance to the depots for accepting maintenance work, the depots and their managers are to do what they can to assist customers in assuring that they have identified all known maintenance needs and other changes in maintenance plans and are taking appropriate action.³² Additionally, Army policy on materiel maintenance says that all depot maintenance customers, regardless of the source of funds, should put their needs for depot maintenance on weapon systems into the Army's computer system for planning its maintenance work, where applicable.³³ Finally, according to defense acquisition guidance, those responsible for acquiring weapon systems for the Army and planning for and conducting their maintenance and repair—including Army depots, ASA (ALT) depot customers, and LCMC depot customers—must work closely together to adapt to changing circumstances as needed, and to identify and resolve issues as early as possible.³⁴

We found that the Army is taking steps to better synchronize its timelines when planning its depot maintenance work for fiscal year 2021. For example, as a result of the analytical effort undertaken for the Army Organic Industrial Base Corporate Board, ASA (ALT) customers have taken steps to identify their maintenance needs at the Army depots for fiscal years 2021 and 2022 before the depots finalize their budgets, and

³⁰The Army Organic Industrial Base Corporate Board provides strategic planning oversight and direction, as well as policy recommendations, to the Army organic industrial base. It also provides guidance, direction, and resources to ensure continuous improvement of organic industrial base metrics. The board is comprised of key Army officers and senior civilians, including but not limited to the Army Deputy Chief of Staff, G4 (chairperson), officials from ASA (ALT), Army Materiel Command, Army National Guard, Army Reserve, and Army Forces Command.

³¹The Joint Assault Bridge provides heavy-assault-bridging capability to the Army, specifically to provide methods of moving M1 Abrams tanks.

³²AMC Regulation 750-55, *Maintenance of Supplies and Equipment: U.S. Army Materiel Command Organic Industrial Base (OIB) Operations Management* (May 16, 2019).

³³Army Regulation 750-1, *Maintenance of Supplies and Equipment: Army Materiel Maintenance Policy* (Oct. 28, 2019).

³⁴DOD Instruction 5000.02T, *Operation of the Defense Acquisition System* (Jan. 7, 2015) (incorporating Change 7, April 21, 2020).

officials told us that the Army plans to establish a deadline for ASA (ALT) customers in Army policy. Additionally, Army officials said they initially planned to have LCMC customers review and prioritize their long-term maintenance needs by May 2020, which would bring the planning timelines into closer alignment; however, as of March 2020, this schedule had been delayed until mid-summer. Finally, AMC officials stated that they are considering a proposal for the AMC commander to reach out to both Army and non-Army customers early in the year and again in early summer to emphasize the critical nature of timely updates to the depots of their maintenance needs.

Although the Army has taken these steps to better synchronize its timelines, we found that the Army has not developed or promulgated guidance to the depots' ASA (ALT) or LCMC customers that would synchronize the Army's timelines for planning depot maintenance, so that the Army could incorporate customer needs into the depots' planning before the depots finalize their budget estimate submissions. As a result, the planned timelines for the depots' budgets and for depot customers to submit their needs could be subject to change in the future, particularly as Army leadership changes. In addition, Army officials said that AMC has not provided its non-Army customers with guidance to ensure that all of the depots have updated maintenance needs in sufficient detail in a timely way. Without guidance that helps ensure better synchronization of the Army's timelines for planning depot maintenance among Army customers and that clarifies these timelines to non-Army customers, the depots lack reasonable assurance that they have sufficient time and resources to have the necessary parts, workforce, and equipment in place to conduct maintenance in a timely manner.

Lack of a Systematic Analysis of the Cause of Customer Changes Has Led to Incomplete Understanding of Customers' Changing Needs

The Army has undertaken some efforts to help the depots manage risk and better plan their work by reducing variability in the depots' maintenance schedules. However, AMC has not systematically analyzed the causes of the depots' customers' changes. For example, AMC officials said that the depots and LCMCs try to minimize the number of changes to planned maintenance work by inspecting equipment before it arrives at the depots. Specifically, an AMC official said that the Tank-Automotive and Armaments Command operates the Combat Vehicle Evaluation program to identify tanks, High Mobility Multipurpose Wheeled Vehicles, and other vehicles that will need major depot repairs at Anniston or Red River Army Depots. The Army has similar programs for rotary wing aircraft and communications and electronics equipment. In this way, the depots are better able to anticipate the maintenance required, according to AMC officials.

In addition, the depots use the Commanders' Critical Information Requirements (CCIR) process to report to AMC any spare parts shortages that will lead to a pause in maintenance work. This process has identified thousands of instances in which spare parts availability has resulted in maintenance delays. However, AMC and depot officials stated that AMC and the Defense Logistics Agency (DLA) currently use the CCIR process to address only the most urgent shortages that have already resulted in paused maintenance or will result in paused maintenance in 30 days if not resolved.³⁵

Our review found that even with these processes in place, the depots still face a large number of changes to their planned maintenance work. We found that AMC has several analytical efforts under way to better understand changing customer needs; however, each effort is focused on a specific issue and has limitations. For example:

- AMC officials said that AMC is currently reviewing the CCIR process, which officials have described as labor-intensive, to identify process improvements and reduce the backlog of unresolved parts shortages. This review produced a proposal to establish an analytical capability to help the Army with earlier identification of potential parts shortages. This proposed effort is intended to analyze the causes of parts shortages, which is one key reason for changes to planned depot maintenance work. According to Army data, 18 percent of schedule changes in fiscal years 2018 and 2019 were caused by parts shortages. However, AMC has not yet made a decision whether to implement this proposal or, if so, who would conduct the analysis.
- AMC has conducted a business case analysis on the costs and benefits of DLA's assuming retail storage, supply, and distribution functions at Army depots, which we previously recommended to increase supply chain efficiencies and effectiveness in support of maintenance at Army depots. However, AMC has not yet used the results of this business case analysis to make a decision on the degree to which DLA should manage these functions at Army depots, which we also previously recommended.³⁶ As of February 2020, the Army was waiting for the results of a separate defense-wide reform

³⁵Our analysis of AMC data showed that, as of November 2019, 49 percent of reports—or 1,095 out of 2,233 CCIR reports—were for spare parts shortages that had already resulted in paused maintenance. An additional 32 percent of CCIR reports—or 721 out of 2,233 CCIR reports—were for spare parts shortages that will stop work in 30 days.

³⁶See [GAO-16-450](#).

effort before deciding whether to transfer any of these functions to DLA.³⁷ Nonetheless, this effort focuses on one key reason for changes to planned depot maintenance work: that is, parts shortages.

- Finally, as noted earlier, the Army is in the process of developing new metrics to measure depot performance. AMC officials said that, as part of this effort, the Army plans to refine metrics to continue tracking the reasons for changes to planned depot maintenance work. According to AMC officials, they plan to use the visual dashboard containing the new metrics to identify current performance issues as well as options for improvement. However, the officials said that the Army does not intend to capture historical trends in the reasons for variability in the depots' planned maintenance work or to systematically analyze these trends to identify causes.

According to DOD guidance, DOD maintenance programs should include sufficient analytic capability for identifying needed adjustments, and should adopt business practices and quality management processes to continuously improve maintenance operations and maintenance production, achieve cost savings, and realize reductions in reducing process times.³⁸ We have previously reported that evaluation studies—which are systematic studies that use research methods to address specific questions about program performance—can provide valuable supplements to ongoing performance reporting, explaining the reason why organizations did not meet performance goals or assessing whether one approach is more effective than another approach.³⁹

In contrast, the Army's ongoing and planned analyses and efforts, although helpful, may be insufficient to identify and address the causes of changing customer needs. AMC's individual analytical efforts are narrowly

³⁷According to an official with the Office of the Deputy Assistant Secretary of Defense for Logistics and a January 2020 report to Congress, this DOD-wide reform effort includes an ongoing initiative to transfer all remaining supply, storage, and distribution missions to DLA, completing a Base Realignment and Closure 2005 recommendation. This initiative expands DLA's responsibilities to support Army and Marine Corps industrial sites, in addition to Navy shipyards. Air Force and Naval aviation supply, storage, and distribution functions have already been consolidated under DLA. See DOD, *Report to Congress: FY2021 Defense Wide Review* (January 2020).

³⁸DOD Directive 4151.18, *Maintenance of Military Materiel* (Mar. 31, 2004) (incorporating Change 1, Aug. 31, 2018).

³⁹GAO, *Program Evaluation: Strategies to Facilitate Agencies' Use of Evaluation in Program Management and Policy Making*, [GAO-13-570](#) (Washington, D.C.: June 26, 2013).

focused on specific issues, and they do not systematically examine the reasons for changes in planned maintenance across the depots. Moreover, the Army's OIB Corporate Board, which is authorized by Army guidance to establish forums and study or working groups and to resolve issues associated with organic industrial base enterprise policies, guidance, programs, and processes, has not directed that such an analysis be performed.⁴⁰ Because the Army has not undertaken a recurring, comprehensive, and systematic analysis to objectively identify trends and causes behind changes in depot maintenance schedules, AMC lacks a deeper understanding of why there are frequent changes to planned maintenance work. ASA (ALT) officials noted that unless there is analysis of the changes to depots' planned maintenance work, it will be difficult to determine how much change is acceptable in the Army's maintenance system. Without a study that includes a recurring, comprehensive, and systematic analysis, the Army is poorly positioned to identify and implement actions that address longstanding challenges to depot maintenance performance.

**Marine Corps
Reported That It
Generally Completed
Its Planned
Maintenance, but It
Has Not Fully
Baselined Its Key
Performance Metric
and Is Addressing
Challenges Related
to Changing
Customer Needs**

⁴⁰AR 750-1.

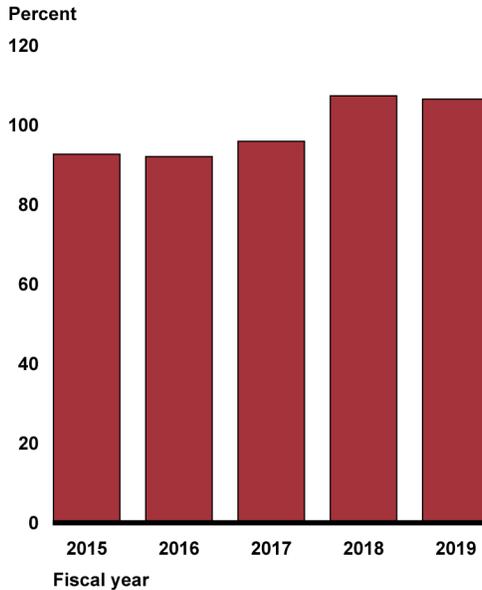
Marine Corps Reported It Generally Met Its Yearly Depot Maintenance Goals, but the Metric Used for This Reporting Has a Key Limitation

Our analysis of Marine Corps data shows that for fiscal years 2015 through 2019, the Marine Corps reported that it generally met its yearly depot maintenance goals and experienced some variability in executing its monthly maintenance schedule. However, we found that the Marine Corps has not yet fully baselined its key metric for measuring depot performance against planned goals. Consequently, the Marine Corps cannot fully assess how well it planned depot maintenance work, and its reported performance against that plan is unclear.

Marine Corps Reported That It Has Generally Met Yearly Depot Performance Goals but Has Experienced Monthly Variability

The Marine Corps' key metric for assessing depot maintenance performance—known as Production to Plan—is calculated by comparing the actual number of systems that were maintained in a given time period with the number of systems originally planned to be maintained in that time period. According to a June 2019 Marine Corps Logistics Command briefing, the Marine Corps' goal is to complete 100 percent of its depot maintenance as planned each year. In fiscal years 2015 and 2016, the Marine Corps reported that it had completed maintenance on about 92 percent of the items for which it had originally planned maintenance. For fiscal year 2017, the Marine Corps reported completing maintenance on almost 96 percent of the items originally planned, and in fiscal years 2018 and 2019, the Marine Corps reported that it had completed work on more items—about 107 percent—than originally planned. Figure 12 shows the percentage of items that the Marine Corps maintained from fiscal years 2015 through 2019.

Figure 12: Percentage of Marine Corps Item Maintenance Completed, Fiscal Years 2015 through 2019



Source: GAO analysis of Marine Corps data. | GAO-20-401

Note: Percentages exceeding 100 percent indicate that the Marine Corps completed maintenance work on more items than planned in that fiscal year.

Like the Army, the Marine Corps has experienced variability in meeting its planned goals from month to month. According to Marine Corps officials and our analysis of Marine Corps data for fiscal year 2019, this variability in meeting planned goals occurred for various reasons, including changing customer needs, parts shortages, assets or items being unavailable in time to begin planned maintenance, and lack of capacity or capability to conduct maintenance on new work. One example of this monthly variability is that while the Marine Corps reported 26 maintenance schedule changes in October 2018 due to items not arriving at the depots in time to begin planned maintenance, the service reported only five schedule changes for the same reason in December 2018. Similarly, in October 2018 the Marine Corps reported that 35 schedule changes were caused by the depots lacking parts to conduct the work, but in January 2019 there were no changes requested due to parts issues affecting the depot's schedule. Marine Corps officials stated that they are often finalizing their depot maintenance schedule in the first month of the fiscal year, resulting in greater variability between the schedule of October and the schedules of later months.

Marine Corps Has Not Fully Baselined Its Performance Metric

According to our analysis of the fiscal year 2019 data and to Marine Corps officials, one key reason for the variability is that the service's customers change their original maintenance needs throughout the year. Customers can change these original maintenance needs for various reasons, such as a Marine Corps command's communicating new priorities that necessitate funding changes or quantity changes to planned maintenance. For example, Marine Corps officials told us of an instance in 2019 wherein Marine Forces Command communicated a new priority to the depots—to assist with repairs on optical sights, which are typically repaired by a commercial entity.⁴¹ In order to meet this new demand, the depots changed their maintenance schedules to delay all planned repairs on a similar system and instead provided support to the commercial entity to maximize the repair of the optical sights for Marine Forces Command. Marine Corps officials stated that they plan to conduct the repair of the other system in 2021.

Since 2018 the Marine Corps has changed the way in which it measures depot performance, but we found that the service has not yet included all of its planned work in its Production to Plan metric. Like the Army's P2P metric, the Marine Corps' Production to Plan metric compares actual performance against goals that are adjusted on a monthly basis during the year in which maintenance is being conducted. As a result, Marine Corps officials stated that the depots are unable to effectively assess how well they have planned maintenance work, because they do not track their actual work directly back to the original annual schedule. To address this issue, in 2018 the Marine Corps began developing a new metric—baseline Production to Plan—which is intended to measure the actual number of items for which maintenance was completed in a given fiscal year as compared with the original number of items scheduled for maintenance at the beginning of that fiscal year.

However, the Marine Corps has yet to fully establish this baseline Production to Plan metric because the Marine Corps has not developed a fully baselined schedule. Specifically, in its first attempts to develop a baseline schedule for fiscal years 2018 and 2019, Marine Corps officials stated that they did not factor all planned depot work into this schedule, and as a result the actual number of items being worked on often exceeded what was originally planned in certain months. Without a fully baselined schedule, according to Marine Corps officials, to assess how

⁴¹Optical sights are lightweight attachments to rifles that help Marines hit their targets. According to Marine Corps officials, the Marine Depot Management Command typically relies on a commercial entity for repair of these optical sights.

well they originally planned their maintenance work they currently compare the adjusted monthly goals against the original monthly goals established at the beginning of the fiscal year.

Our schedule assessment guide includes a best practice for maintaining a baseline schedule, and it states that doing so is essential to effective management as part of an integrated master schedule.⁴² Specifically, this guide notes that program performance is to be measured, monitored, and reported against the baseline schedule, and that the schedule should be continually monitored so as to reveal when forecasted completion dates differ from baseline dates and whether schedule variances affect downstream work. Moreover, DOD's user guide for preparing integrated master plans and schedules states that the plan and schedules should provide a systematic approach to program planning, scheduling, and execution.⁴³ Marine Corps officials told us that they are trying to include additional categories of work in their baseline maintenance schedule at the start of future fiscal years, which in turn will enable them to establish a fully baselined Production to Plan metric. For example, Marine Corps officials told us that they plan to include all depot-level reparable into their baseline schedule starting in fiscal year 2021, and that they are continuing their efforts to include other customers' work, such as non-Marine Corps work, in future years' baseline schedules. Doing so will allow the Marine Corps to establish a baselined Production to Plan metric and therefore to better assess its performance against its planned depot maintenance work. Doing so will also allow senior leaders to better identify and mitigate the causes and effects of any unfavorable performance.

Marine Corps Is Undertaking Efforts to Minimize the Number of Changes to Its Planned Maintenance Schedule

Even as the Marine Corps works to improve its key depot performance metric, it is undertaking efforts to minimize changes to its planned maintenance schedule. According to our analysis and discussions with Marine Corps officials, the Marine Corps is undertaking several efforts to minimize the number of customer changes to planned depot maintenance work. These efforts address two categories of customer changes: (1) changes that affect planning prior to the year in which maintenance is

⁴²GAO, *Schedule Assessment Guide: Best Practices for Project Schedules* [GAO-16-89G](#) (Washington, D.C.: December 2015).

⁴³DOD, *Integrated Master Plan and Integrated Master Schedule Preparation and Use Guide*, v. 9 (Oct. 21, 2005).

Initiatives to Improve Planning
Prior to the Year in Which
Maintenance Is Conducted

conducted; and (2) changes that occur during the year in which scheduled depot maintenance occurs.

The Marine Corps has undertaken two initiatives to improve its planning for future maintenance work. Such planning occurs before the year in which the maintenance is conducted. According to officials, the Marine Corps intends that these initiatives will help to minimize the number of changes to planned maintenance work that occur during the year of maintenance.

First, the Marine Corps has revised its Enterprise Lifecycle Maintenance Process (ELMP)—the service’s centralized process for determining and reviewing its depot maintenance work needs—to improve maintenance planning for internal Marine Corps customers, such as Marine Corps forces.⁴⁴ The revised ELMP is intended to enable accurate calculation of the customers’ needs, and to apply budgetary constraint to these needs, thereby producing objective, data-driven analysis for decision making. According to Marine Corps officials, the Marine Corps began implementing this revised ELMP when planning for fiscal year 2019 depot maintenance work. While the guidance reflecting this revised process has not yet been finalized, Marine Corps officials stated that it is not expected to change and that they will issue the revised guidance for this process in late 2020. Marine Corps officials also stated that using the revised ELMP has helped to provide more stability in their depot planning process because it helps stakeholders better support and defend the budgeting and planning for Marine Corps systems sustainment, and it allows senior leaders to more effectively make budget trade-offs for the coming fiscal year. Unlike the Army’s, the Marine Corps’ funding is aligned through ELMP with depot planning needs.

Second, the Marine Corps is coordinating with non-ELMP and non-Marine Corps customers to obtain updates on their needs earlier and in writing, so that depots can more accurately plan maintenance work across the fiscal year.⁴⁵ For example, for the depot maintenance work that will be conducted in fiscal year 2021, Marine Corps officials told us they plan to obtain a signed letter of intent with the Air Force stating that any cost

⁴⁴Not all internal Marine Corps customers go through the ELMP process for their depot maintenance work. Some provide direct funding to the Marine Corps depots to support their needs.

⁴⁵Marine Corps depots conduct maintenance work for non-Marine Corps customers such as the Army, Air Force, and commercial entities.

Initiatives to Address Changes during the Year in Which Maintenance Is Conducted

incurred by the Marine Corps for any canceled depot maintenance work will be borne by the customer. According to Marine Corps officials, this will help deter the Air Force from making unnecessary changes to its committed orders for maintenance work. Marine Corps officials stated that they are also considering using similar letters of intent for other Marine Corps work that does not go through ELMP, such as from Marine Corps Systems Command,⁴⁶ but are focusing on depot-level reparable work first.⁴⁷ According to Marine Corps officials, Marine Corps Logistics Command will eventually produce guidance for non-Marine Corps customers detailing the process—including timelines and source of funding—that will help customers more clearly communicate their maintenance needs in time for the Marine Corps to conduct planning before depot maintenance occurs.

In addition, the Marine Corps has analyzed the reasons for the changes to its planned depot maintenance work that occur during the year of maintenance. According to Marine Corps officials, this approach has been systematic and enterprise-wide, and it has included the following:

- Establishing a working group to assess its processes for sending assets to the depots in order to address a lack of asset availability as a reason for changes to planned work. The goal of this working group is to establish a formal process within the Marine Corps scheduling system for tracking and managing the timing of the assets arriving at the depots and planning the start of depot maintenance work on them so as prevent or minimize delays.
- Establishing a working group to determine the causes of capacity issues that are causing changes to planned work and to identify solutions. The goal of the working group is to create a visual data dashboard that depicts all depot maintenance work, which will help the Marine Corps better determine needed man-hours and schedule the workforce more accurately.

⁴⁶Marine Corps Systems Command is a supporting activity reporting directly to the Commandant of the Marine Corps whose mission is to serve as the Department of the Navy systems command for Marine Corps ground weapon programs, among others.

⁴⁷A depot-level reparable is an item that is generally more cost-effective to repair and reuse than to dispose of and replace by procuring a new item. Additionally, the work to repair the item requires a skill level, tooling, and facilities associated with depot maintenance.

-
- Conducting a business case analysis assessing the costs and benefits to be incurred by transferring retail supply, storage, and distribution functions at the Marine Corps depots to DLA, as we previously recommended.⁴⁸ The Marine Corps intends this to address spare parts-related challenges that contribute to changes to planned maintenance work. Marine Corps officials stated that under this agreement they will have better forecasting and demand-planning capabilities because DLA will know what parts the Marine Corps needs, earlier. According to Marine Corps officials, they intend to have a memorandum of agreement with DLA in place by 2022.

Conclusions

Although the Army and Marine Corps reported having met most of their maintenance goals in recent years, both services experienced variability in meeting planned maintenance goals from month to month during fiscal year 2019. Both services are also improving their performance metrics in order to better manage depot maintenance. The Army's initiative to develop a new performance metrics framework shows promise, but Army depot officials told us that they have significant concerns about how and whether AMC is factoring in their input when developing the new metrics. It is particularly important that AMC develop procedures to ensure that it will incorporate depot stakeholder input into the new metrics framework for the Army's organic industrial base through iterative and ongoing processes. Doing so will allow the Army to develop maintenance-related metrics that are beneficial for helping officials at all levels—AMC, LCMC, and depot—to assess and improve depot performance. Moreover, the Marine Corps does not yet have a complete baseline to accurately measure the effectiveness of its planning for depot maintenance. Establishing a complete baseline will allow the Marine Corps to better assess how well it has planned its depot maintenance work by comparing this plan against actual performance.

Both the Marine Corps and the Army have taken steps to plan and execute depot maintenance more efficiently and effectively. The Marine Corps has undertaken several efforts to revise its depot maintenance planning process, and to analyze and address the reasons for changing customer needs. The Army has taken steps to synchronize its depot planning timelines to better align resources and requirements. However, developing guidance for depot customers to synchronize these timelines would better position Army depots to make decisions based on the most accurate information possible, as early as possible. Additionally, systematically analyzing the causes of changing customer needs would

⁴⁸[GAO-16-450](#).

help the Army identify why its depots experience such variability in their workload. This, in turn, would better position the Army to identify specific solutions for reducing such unplanned changes.

Recommendations for Executive Action

We are making a total of five recommendations—four recommendations to the Secretary of the Army and one recommendation to the Commandant of the Marine Corps.

The Secretary of the Army should ensure that the Commander, Army Materiel Command, develops procedures to help ensure that it will incorporate depot stakeholder input into the new metrics framework for the Army's organic industrial base through iterative and ongoing processes. (Recommendation 1)

The Commandant of the Marine Corps should ensure that the Marine Corps Logistics Command establishes a complete baseline schedule, which includes all planned depot maintenance work for the fiscal year, against which to measure performance. (Recommendation 2)

The Secretary of the Army should ensure that the Commander, Army Materiel Command, develops guidance that synchronizes the Army's timelines for required inputs from Army depot maintenance customers who use funds from the Procurement; Research, Development, Test, and Evaluation; and Operations and Maintenance budgets with the depots' timelines for development of their finalized budget estimate submissions to AMC. (Recommendation 3)

The Secretary of the Army should ensure that the Commander, Army Materiel Command, provides its non-Army customers with guidance that will help ensure that the depots have all updated maintenance needs in sufficient detail from non-Army customers prior to the depots' finalized budget estimate submissions to AMC. (Recommendation 4)

The Secretary of the Army should ensure that the Army Organic Industrial Base Corporate Board oversees a study that includes a recurring, comprehensive, and systematic analysis of Army depot data to identify trends and causes behind changes in depot maintenance schedules; and that it uses this analysis to recommend actions to reduce unplanned maintenance work, as appropriate and necessary. (Recommendation 5)

Agency Comments

We provided a draft of this report to DOD for review and comment. In written comments on a draft of this report, DOD concurred with all five of our recommendations and provided additional information about ongoing

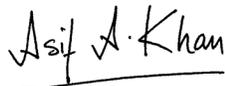
and planned Army and Marine Corps actions to address our recommendations. DOD's comments are reprinted in their entirety in appendix I. DOD also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Defense, the Secretary of the Army, 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 any questions about this report, please contact Diana Maurer at (202) 512-9627 or maurerd@gao.gov, or Asif A. Khan at (202) 512-9869, or khana@gao.gov. Contact points for our Office 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 II.



Diana Maurer
Director, Defense Capabilities and Management



Asif Khan
Director, Financial Management and Assurance

List of Committees

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

The Honorable Richard C. Shelby
Chairman
The Honorable Dick Durbin
Ranking Member
Subcommittee on Defense
Committee on Appropriations
United States Senate

The Honorable Adam Smith
Chairman
The Honorable Mac Thornberry
Ranking Member
Committee on Armed Services
House of Representatives

The Honorable Pete Visclosky
Chairman
The Honorable Ken Calvert
Ranking Member
Subcommittee on Defense
Committee on Appropriations
House of Representatives

Appendix I: Comments from the Department of Defense



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

29 June 20

SUSTAINMENT

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

Dear Ms. Maurer:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-20-401, "MILITARY DEPOTS: Army and Marine Corps Need to Improve Efforts to Address Challenges in Measuring Performance and Planning Maintenance Work," dated May 22, 2020 (GAO Code 103454). The Department concurs with the draft report as written, including all five recommendations.

Sincerely,

A handwritten signature in black ink, appearing to read "W. Jordan Gillis", is positioned above the printed name.

W. Jordan Gillis

Appendix I: Comments from the Department of Defense



DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-4
500 ARMY PENTAGON
WASHINGTON, DC 20310-0500

11 JUNE 2020

DALO-MPS

MEMORANDUM THRU ASSISTANT SECRETARY OF THE ARMY (ACQUISITION,
LOGISTICS AND TECHNOLOGY)

FOR DEPUTY ASSISTANT SECRETARY OF DEFENSE (MATERIEL READINESS)

SUBJECT: Government Accountability Office Draft Report (GAO-20-401) Military Depots: Army and Marine Corps Need to Improve Efforts to Address Challenges in Measuring Performance and Planning Maintenance Work

1. This is in response to the U.S. Government Accountability Office's Draft Report GAO-20-401 Military Depots: Army and Marine Corps Need to Improve Efforts to Address Challenges in Measuring Performance and Planning Maintenance Work.
2. The Army concurs. We offer the following comments that highlight the progress we have made:
 - a. Recommendation 1: Ensure that the Commander, Army Materiel Command (AMC) develop procedures to help ensure that it will incorporate depot stakeholder input into the new metrics framework for the Army's organic industrial base through iterative and ongoing processes.

Comment: Throughout the initiative to develop a new OIB metrics framework, AMC has continually sought and considered stakeholder input. Over 32 SMEs contributed to the effort to define, develop and prepare to implement over 65 Strategic, Operational, and Tactical level measures and metrics to assist all levels of the Army enterprise to manage and support the mission of the OIB. The input received enabled the enterprise team to provide one of the most robust sets of functional and technical specifications ever provided to developers supporting the effort. AMC is committed to continuing its collaboration with the Life Cycle Management Commands (LCMCs), Depots, Arsenals, and Ammunition plants as AMC continues to refine, implement and continually assess the new metrics framework. Lastly, AMC will conduct training at the LCMC and OIB sites once the OIB metrics framework is finalized.

- b. Recommendation 3: Ensure that the Commander, AMC develop guidance that synchronizes the Army's timelines for required inputs from Army depot maintenance customers who use funds from the Procurement; Research, Development, Test and Evaluation; and Operations and Maintenance budget with the depots' timeline for development of their finalized budget estimate submissions to AMC.

Appendix I: Comments from the Department of Defense

DALO-MPS

SUBJECT: Government Accountability Office Draft Report (GAO-20-401) Military Depots: Army and Marine Corps Need to Improve Efforts To Address Challenges in Measuring Performance and Planning Maintenance Work

Comment: In March 2020, AMC established an improved OIB workloading review process to ensure all critical information is obtained and validated in time for Budget Estimate Submission (BES) development. The improved OIB workloading review process synchronizes plans with all LCMCs, OIB installations, OIB customers, (including Inter-service and other government/non-government agencies), and supply chain partners, (including DLA).

c. Recommendation 4: Ensure that the Commander, AMC provide its non-Army customers with guidance that will help ensure that the depots have all updated maintenance needs in sufficient detail from non-Army customers prior to the depots' finalized budget estimate submissions to AMC.

Comment: AMC's recently established improved OIB work-loading review process involves all OIB customers. It ensures that the depots have all the data they require to finalize their budget estimates, including updated, detailed information on maintenance needs from non-Army customers. Working with the other Services and OSD, AMC is developing a proposal to move the current Depot Maintenance Inter-Service Agreement and other planning efforts from the 4th quarter to the 2nd quarter, which will enable the workload planning data to be incorporated into BES processes and provide an additional 4-to-6 months of workload planning time for all stakeholders.

d. Recommendation 5: Ensure that the Army Organic Industrial Base Corporate Board oversees a study that includes a recurring, comprehensive, and systematic analysis of Army depot data to identify trends and causes behind changes in depot maintenance schedules and to use this analysis to recommend action to reduce unplanned maintenance work, as appropriate and necessary.

Comment: The Army's Organic Industrial Base Corporate Board (OIBCB) recently initiated a comprehensive and systematic assessment to identify the appropriate operational and strategic metrics and governance actions necessary to support OIB readiness. The OIBCB assessment was designed to identify gaps and look for opportunities to improve workload planning data, to improve overall execution of customer workload. This assessment will look at current year execution and 1-2 years out to enable the OIB to become more predictive in out-year planning and execution. The OIBCB assessment complements on-going efforts at AMC to analyze the trends and causes of depot maintenance schedule changes and the resulting metrics and revised governance processes will synchronize planning efforts and improve visibility for workload planning.

**Appendix I: Comments from the Department of
Defense**

DALO-MPS

SUBJECT: Government Accountability Office Draft Report (GAO-20-401) Military
Depots: Army and Marine Corps Need to Improve Efforts To Address Challenges in
Measuring Performance and Planning Maintenance Work

The implemented metrics will provide a recurring governance review at the strategic
level. The assessment and action plan are due to be completed by September 2020 for
implementation implemented by 2d quarter, fiscal year 2021.

5. The point of contact is Ms. Anita Raines, (703) 614-0811, or email:
anita.m.raines.civ@mail.mil.

v/r - 
DUANE A. GAMBLE
Lieutenant General, GS
Deputy Chief of Staff, G-4

GAO DRAFT REPORT DATED MAY 22, 2020
GAO-20-401 (GAO CODE 103454)

“MILITARY DEPOTS: ARMY AND MARINE CORPS NEED TO IMPROVE EFFORTS
TO ADDRESS CHALLENGES IN MEASURING PERFORMANCE AND PLANNING
MAINTENANCE WORK”

UNITED STATES MARINE CORPS COMMENTS
TO THE GAO RECOMMENDATION

RECOMMENDATION 2: The Commandant of the Marine Corps should ensure that the Marine Corps Logistics Command establish a complete baseline schedule, which includes all planned depot maintenance work for the fiscal year, against which to measure performance.

USMC RESPONSE:

The Marine Corps concurs with GAO recommendation #2.

Significant effort has already taken place to establish a baseline schedule. Beginning in 2018, the baseline schedule was developed utilizing only Marine Corps Military Equipment (ME) - commonly recognized as major end items - workload, which we capture in our Enterprise Lifecycle Maintenance Process (ELMP). Beginning in FY20, a process was established to manage Depot Level Repairable (DLR) workload in a similar manner. As a result, the FY20 baseline Master Work Schedule (MWS) included some DLR workload. While DLRs were introduced in the FY20 baseline, FY21 baseline schedule was established to incorporate all ME and DLRs.

Following the same model used for major end items and DLR workload, we are taking deliberate steps to add other customers' workload to that baseline plan. The end state will be a comprehensive baseline schedule that predicts accurate requirements from which we can measure actual performance. As changes to the baseline MWS are made, each change has a unique reason code assigned to it. While unknown variabilities exists within any schedule, this improved capability to track, measure, and report changes enables the Command to reduce cost and schedule variability that ultimately increases warfighting readiness and customer satisfaction.

Q
12/6

Appendix II: GAO Contacts and Staff Acknowledgments

GAO Contacts

Diana Maurer, (202) 512-9627, or maurerd@gao.gov; and Asif A. Khan, (202) 512-9869, or khana@gao.gov.

Staff Acknowledgments

In addition to the contacts named above, Kevin O’Neill (Assistant Director), Roger Stoltz (Assistant Director), Gabrielle Carrington (Analyst-in-Charge), Kerry Burgott, Felicia Lopez, Keith McDaniel, Sheila Miller, Bethann E. Ritter Snyder, Michael Silver, Tristan T. To, and Cheryl Weissman made key contributions to this report.

Related GAO Products

Military Depots: DOD Can Benefit from Further Sharing of Best Practices and Lessons Learned. [GAO-20-116](#). Washington, D.C.: January 20, 2020.

Depot Maintenance: DOD Should Adopt a Metric That Provides Quality Information on Funded Unfinished Work. [GAO-19-452](#). Washington, D.C.: July 26, 2019.

Military Depots: Actions Needed to Improve Poor Conditions of Facilities and Equipment That Affect Maintenance Timeliness and Efficiency. [GAO-19-242](#). Washington, D.C.: April 29, 2019.

DOD Depot Workforce: Services Need to Assess the Effectiveness of Their Initiatives to Maintain Critical Skills. [GAO-19-51](#). Washington, D.C.: December 14, 2018.

Depot Maintenance: DOD Has Improved the Completeness of Its Biennial Core Report. [GAO-19-89](#). Washington, D.C.: November 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.

Depot Maintenance: Executed Workload and Maintenance Operations at DOD Depots. [GAO-17-82R](#). Washington, D.C.: February 3, 2017.

Depot Maintenance: Improvements to DOD's Biennial Core Report Could Better Inform Oversight and Funding Decisions. [GAO-17-81](#). Washington, D.C.: November 28, 2016.

Army Working Capital Fund: Army Industrial Operations Could Improve Budgeting and Management of Carryover. [GAO-16-543](#). Washington, D.C.: June 23, 2016.

Defense Inventory: Further Analysis and Enhanced Metrics Could Improve Service Supply and Depot Operations. [GAO-16-450](#). Washington, D.C.: June 9, 2016.

GAO's Mission

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

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through our website. Each weekday afternoon, GAO posts on its [website](#) newly released reports, testimony, and correspondence. You can also [subscribe](#) to GAO's email updates to receive notification of newly posted products.

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <https://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [Twitter](#), and [YouTube](#).
Subscribe to our [RSS Feeds](#) or [Email Updates](#). Listen to our [Podcasts](#).
Visit GAO on the web at <https://www.gao.gov>.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact FraudNet:

Website: <https://www.gao.gov/fraudnet/fraudnet.htm>

Automated answering system: (800) 424-5454 or (202) 512-7700

Congressional Relations

Orice Williams Brown, Managing Director, WilliamsO@gao.gov, (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548

Public Affairs

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

Strategic Planning and External Liaison

James-Christian Blockwood, Managing Director, spel@gao.gov, (202) 512-4707, U.S. Government Accountability Office, 441 G Street NW, Room 7814, Washington, DC 20548

