United States Government Accountability Office

Report to the Committee on Oversight and Government Reform, House of Representatives

February 2018

HEAVY EQUIPMENT

Selected Agencies Should Improve Guidance for Purchases and Leases

GAO-18-295

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GAO Highlights

Highlights of GAO-18-295, a report to the Committee on Oversight and Government Reform, House of Representatives

Why GAO Did This Study

Federal agencies use heavy equipment such as cranes and forklifts to carry out their missions, but there is no government-wide data on federal agencies' acquisition or management of this equipment.

GAO was asked to review federal agencies' management of heavy equipment. This report, among other objectives, examines: (1) the number, type, and costs of heavy equipment items that are owned by 20 federal agencies and (2) the heavy equipment that selected agencies recently acquired as well as how they decided whether to purchase or lease this equipment.

GAO collected heavy equipment inventory data as of June 2017 from the 24 agencies that have chief financial officers responsible for overseeing financial management. GAO also selected three agencies (using factors such as the heavy equipment fleet's size) and reviewed their acquisitions of and guidance on heavy equipment. These agencies' practices are not generalizable to all acquisitions but provide insight into what efforts these agencies take to acquire thousands of heavy equipment items. GAO also interviewed officials at the three selected agencies.

What GAO Recommends

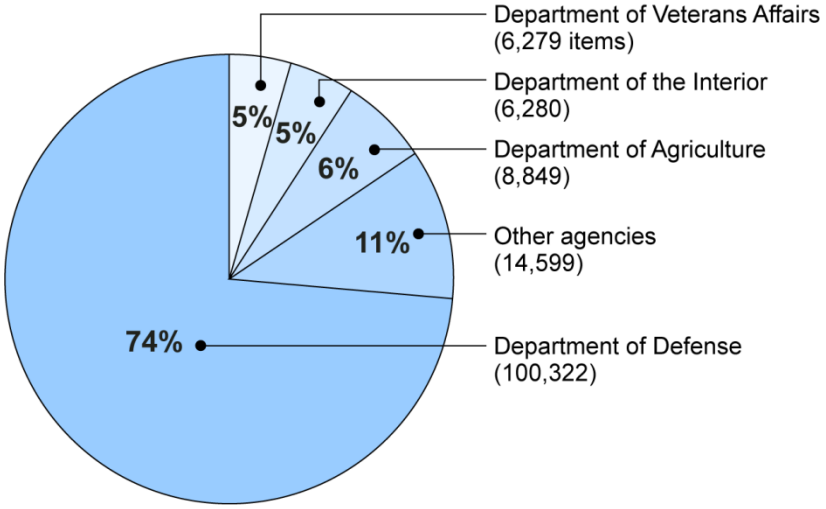
The Department of the Interior and the Air Force should clarify the circumstances in which lease-versus-purchases analyses for heavy equipment acquisitions are to be conducted and documented. The Departments of the Interior and Defense concurred with these recommendations.

View GAO-18-295. For more information, contact Lori Rectanus at (202) 512-2834 or rectanusl@gao.gov.

What GAO Found

Of the 24 agencies GAO reviewed, 20 reported owning over 136,000 heavy equipment items such as cranes, backhoes, and forklifts, and spending over $7.4 billion (in 2016 dollars) to acquire this equipment. The remaining 4 agencies reported that they do not own any heavy equipment.

Number and Percentage of Heavy Equipment Items Owned by 20 Agencies, as of June 2017



Source: Agencies that reported heavy equipment inventory data. | GAO-18-295

The three selected agencies GAO reviewed in-depth—the Air Force within the Department of Defense (DOD), and the Fish and Wildlife Service and the National Park Service within the Department of the Interior (Interior)—spent about $360 million to purchase about 3,500 heavy equipment assets in calendar years 2012 through 2016 and over $5 million to lease heavy equipment from fiscal years 2012 through 2016. Officials from all three agencies stated that they consider mission needs and the availability of equipment leases when deciding whether to lease or purchase heavy equipment. Federal regulations provide that agencies should consider whether it is more economical to lease or purchase equipment when acquiring heavy equipment, and federal internal control standards require that management clearly document all transactions in a manner that allows the documentation to be readily available for examination. However, in reviewing selected leases and purchases of heavy equipment from these three agencies, GAO found that officials did not consistently conduct or document lease-versus-purchase analyses. Officials at the Air Force and Interior said that there was a lack of clarity in agency policies about when they were required to conduct and document such analyses. Without greater clarity on when lease-versus-purchase analyses should be conducted and documented, these agencies may not be spending funds on heavy equipment effectively.

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Abbreviations

CFO Act	Chief Financial Officers Act
FAR	Federal Acquisition Regulation
FAST	Federal Automotive Statistical Tool
FBMS	Financial Business Management System
FPDS-NG	Federal Procurement Data System–Next Generation
FWS	Fish and Wildlife Service
GSA	General Services Administration
NPS	National Park Service

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

February 27, 2018

The Honorable Trey Gowdy
Chairman
The Honorable Elijah E. Cummings
Ranking Member
Committee on Oversight and Government Reform
House of Representatives

Federal agencies use a variety of heavy equipment—such as cranes, backhoes, and forklifts—to carry out their missions. This type of equipment can cost over $2 million per item. There is no government-wide information on how much heavy equipment agencies own and there are no requirements for agencies to report on their ownership, use, or cost of this equipment.[1] This is in part due to the lack of a generally accepted definition of heavy equipment. As the government continues to seek opportunities to reduce costs, it is important to understand how agencies determine the need for heavy equipment and how their methods may affect the cost of their heavy equipment fleet.

You asked us to identify data on federally owned heavy equipment and agencies' efforts to manage utilization of their heavy equipment. This report addresses:

- the number, type, and cost of heavy equipment items that are owned by 20 federal agencies;
- the heavy equipment items that selected agencies have recently acquired and how agencies decided whether to purchase or lease this equipment; and
- how selected agencies manage the utilization of their heavy equipment.

To identify the number, type, and cost of heavy equipment owned by federal agencies, we first developed a definition of heavy equipment for the purposes of our review. Specifically, we identified 12 federal supply classes in which the majority of items are self-propelled equipment and include items such as backhoes, cranes, excavators, tractors, and

[1]For the purposes of this report, federally owned heavy equipment under the custody and control of an agency are referred to as "owned" heavy equipment.

warehouse trucks.[2] The selected federal supply classes do not include classes specific to passenger vehicles and combat and tactical items, as these items are generally not considered to be heavy equipment. We validated our selection of federal supply classes with agency officials we interviewed, who agreed that the selected classes are generally considered to be heavy equipment. We then contacted the personal property managers at each of the 24 agencies covered by the Chief Financial Officers Act (CFO Act) and requested data on each agency's heavy equipment inventory.[3] We received inventory data from 20 of the 24 agencies either at the department level or from different components within the agency, depending on how the data were maintained. Officials at four agencies—the Department of Education, the Department of the Treasury, the General Services Administration (GSA), and the Small Business Administration—indicated that the agency does not own heavy equipment. We did not verify the data or responses received, but did review the data for inconsistencies and removed outliers; the results of our data collection effort are used only for descriptive purposes and are not generalizable beyond the 24 CFO Act agencies. We found these data to be sufficiently reliable for our purposes. For a complete list of agencies that responded to our data collection effort, as well as information on whether they reported at the departmental level, see appendix I.

To determine the heavy equipment items that selected agencies recently acquired and how these agencies decided whether to purchase or lease this equipment, we identified agencies that reported the highest obligations for construction and/or heavy equipment in Federal

[2]Federal supply classes, which are widely used in agencies' inventory data, are used in the Federal Procurement Data System–Next Generation (FPDS-NG), which collects procurement data across the federal government. The selected federal supply classes are: (1) Earth Moving and Excavating Equipment (3805); (2) Cranes and Crane Shovels (3810); (3) Mining, Rock Drilling, Earth Boring, and Related Equipment (3820); (4) Road Clearing, Cleaning, and Marking Equipment (3825); (5) Miscellaneous Construction Equipment (3895); (6) Warehouse Trucks and Tractors, self-propelled (3930); (7) Low Speed, Full Tracked Tractors (2410); (8) Wheeled Tractors (2420); (9) High Speed, Full Tracked Tractors (2430); (10) Soil Preparation Equipment (3710); (11) Harvesting Equipment (3720); and (12) Airfield Specialized Trucks and Trailers (1740).

[3]The CFO Act established chief financial officers to oversee financial management activities at certain executive departments and agencies, which are often referred to collectively as CFO Act agencies. Pub. L. No. 101-576 (Nov. 15, 1990), codified at 31 U.S.C. § 901.

Procurement Data System-Next Generation (FPDS-NG).[4] We then identified additional factors such as spending on leases and a mix of civilian and military departments. Through this process, we selected the departments of Defense and the Interior for further review. Working with department officials, we selected three agencies within those two departments that had the highest number of heavy equipment items based on their inventory data, among other criteria: the U.S. Air Force (Air Force), the Fish and Wildlife Service (FWS), and the National Park Service (NPS). For each agency, we used data from our data collection effort to determine what heavy equipment the agency had purchased in calendar years 2012 through 2016 and requested data on heavy equipment leased in fiscal years 2012 through 2016. We obtained and reviewed these three selected agencies' guidance documents on acquiring heavy equipment and reviewed eight heavy equipment acquisitions from the three selected agencies to determine if the acquisitions followed relevant guidance and *Standards for Internal Control in the Federal Government*.[5] To select these acquisitions, we randomly selected two purchases each from the Air Force, NPS, and FWS as well as two leases each from the Air Force and FWS, for a total of ten acquisitions.[6] During our review, Interior identified guidance from 2013 on lease-versus-purchase analysis. We excluded one FWS lease and one NPS purchase from our analysis because they occurred prior to the issuance of this guidance. As a result, we reviewed a total of eight acquisitions. Any findings from our review of the selected agencies and analysis of these procurement decisions are not generalizable within each department or across the federal government. However, these acquisitions provide examples of these three agencies' practices in deciding whether to lease or purchase heavy equipment.[7]

[4]In reviewing FPDS-NG data, we focused on items in federal supply group 38, Construction, Mining, Excavating, and Highway Maintenance Equipment, which agency officials indicated were the most common type of heavy equipment.

[5]See GAO, *Standards for Internal Control in the Federal Government*, GAO-14-704G (Washington, D.C., September 2014). The Federal Managers' Financial Integrity Act of 1982 requires GAO to prescribe standards for internal control in government. See 31 U.S.C. § 3512(c).

[6]We did not select any leases from NPS because NPS was unable to provide data on leased heavy equipment in a timely manner.

[7]We reported in 2012 on the extent to which selected agencies perform lease-versus-purchase analyses for equipment. See GAO, *Air Force and Interior Can Benefit from Additional Guidance When Deciding Whether to Lease or Purchase Equipment*, GAO-12-281R (Washington, D.C.: Feb. 7, 2012).

To determine how the three selected agencies managed the utilization of their heavy equipment, we reviewed the selected agencies' policies and interviewed agency officials from each of the three agencies to determine whether each agency has guidance for managing heavy equipment. For those agencies with guidance for managing heavy equipment, we reviewed the guidance to determine if and how selected agencies measured and documented heavy equipment utilization. For more information about our scope and methodology, see appendix II.

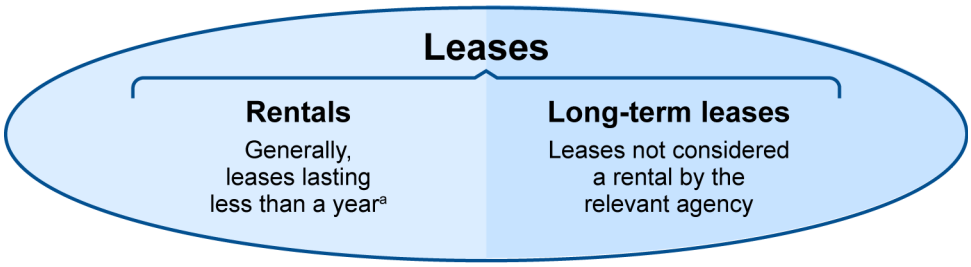
We conducted this performance audit from October 2016 to February 2018 in accordance with generally accepted government auditing standards Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions 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

Acquiring Heavy Equipment

Agencies generally acquire equipment from commercial vendors and through GSA, which contracts for the equipment from commercial vendors. In acquiring heavy equipment from a commercial vendor or GSA, agencies can purchase or lease the equipment. Generally, agencies use the term "lease" to refer to acquisitions that are time-limited and therefore distinct from purchases. The term "lease" is used to refer to both long-term and short-term leases. For example, the three agencies we reviewed in-depth use the term "rental" to refer to short-term leases of varying time periods. According to Air Force officials, they define rentals as leases that are less than 120 days while FWS and NPS officials said they generally use the term rental to refer to leases that are a year or less. For the purposes of this report, we use the term "rental" to refer to short-term leases defined as rentals by the agency and "long-term lease" to refer to a lease that is not considered a rental by the agency. (See fig. 1.)

Figure 1: Use of the Terms "Lease," "Rental," and "Long-term Lease"



Source: GAO analysis. | GAO-18-295

[a]According to Fish and Wildlife Service and National Park Service officials, they generally define rentals as leases for less than a year; the Air Force defines rentals as less than 120 days.

In 2013, GSA began offering heavy equipment through its Short-Term Rental program, which had previously been limited to passenger vehicles, in part to eliminate ownership and maintenance cost for infrequently used heavy equipment. Under this program, agencies can request a short-term equipment rental (less than a year) from GSA, and GSA will work with a network of commercial vendors to provide the requested heavy equipment.

Heavy Equipment Reporting, Data, and Acquisition Requirements

Unlike for some other types of federal property,[8] there are no central reporting requirements for agencies' inventories of heavy equipment. However, each federal agency is required to maintain inventory controls for its property, which includes heavy equipment.[9] Agencies maintain inventory data through the use of agency-specific databases, and each agency can set its own requirements for what data are required and how these data are maintained. For example, while an agency may choose to maintain data in a headquarters database, it could also choose to maintain data at the local level. As another example, an agency may

[8]Federal agencies are required to report quarterly data on owned aircraft to the Federal Aviation Interactive Reporting System, and data on the federal passenger vehicle fleet to the Federal Automotive Statistical Tool. 41 C.F.R. § 102-33.390; 41 C.F.R. § 102-34.335. This information is aggregated to produce annual reports on federal agencies' ownership and use of aircraft and passenger vehicles. We reported on federal agencies' reported inventory, use, and cost of owned aircraft in October 2016 and on federally owned passenger vehicles in April 2017. See GAO, *Reported Inventory, Use, and Cost of Federally Owned Aircraft*, GAO-17-73R (Washington, D.C.: Oct. 31, 2016) and GAO, *Federally Owned Vehicles: Agencies Should Improve Processes to Identify Underutilized Vehicles,* GAO-17-426 (Washington, D.C.: Apr. 25, 2017).

[9]40 U.S.C. § 524(a).

decide to track and maintain data on the utilization of its heavy equipment (such as the hours used) or may choose not to have such data or require any particular utilization levels.

The Federal Acquisition Regulation (FAR) governs the acquisition process of executive branch agencies when acquiring certain goods and services, including heavy equipment. Under the FAR, agencies should consider whether to lease equipment instead of purchasing it based on several factors. Specifically, the FAR provides that agency officials should evaluate cost and other factors by conducting a "lease-versus-purchase" analysis before acquiring heavy equipment.[10] Additionally, DOD's regulations require its component agencies to prepare a justification supporting lease-versus-purchase decisions if the equipment is to be leased for more than 60 days.[11]

Twenty Agencies Own Over 136,000 Pieces of Heavy Equipment, at an Acquisition Cost of Over $7.4 Billion

Agencies Report Owning Over 136,000 Pieces of Heavy Equipment of Various Types

Twenty agencies reported data on their owned heavy equipment, including the (1) number, (2) types, (3) acquisition year, and (4) location of agencies' owned heavy equipment in their inventories as of June 2017.[12]

[10]48 C.F.R. § 7.401.

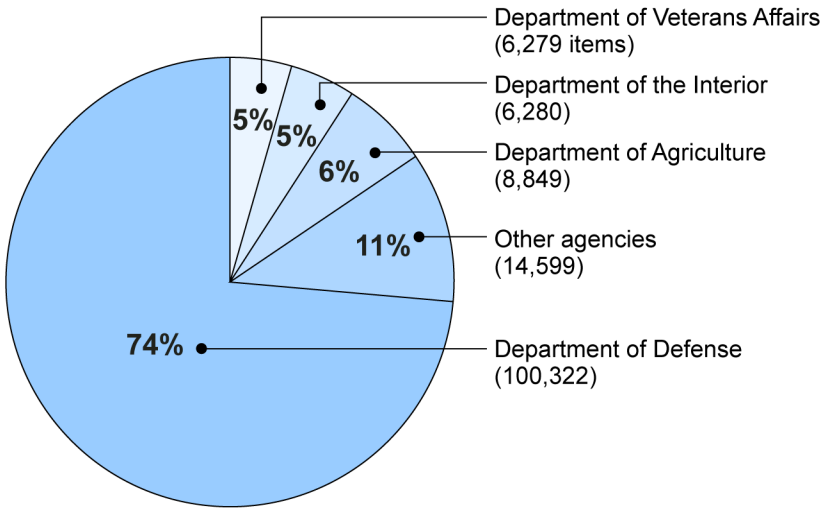
[11]48 C.F.R. § 207.401.

[12]Five agencies provided data that included 234 assets that were acquired after June 2017.

Number

The 20 agencies reported owning over 136,000 heavy equipment items.[13] DOD reported owning most of this heavy equipment—over 100,000 items, about 74 percent. (See app. I for more information on agencies' ownership of these items.) The Department of Agriculture reported owning the second highest number of heavy equipment items—almost 9,000 items, about 6 percent. (See fig. 2.) Four agencies—the Nuclear Regulatory Commission, the Department of Housing and Urban Development, the Office of Personnel Management, and the Agency for International Development—reported owning five or fewer heavy equipment items each.

Figure 2: Number and Percentage of Heavy Equipment Items Owned by 20 Agencies as of June 2017



Source: Agencies that reported heavy equipment inventory data. | GAO-18-295

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

[13]Two agencies reported owning heavy equipment for the primary purpose of loaning these items to non-federal entities. Specifically, the Department of Agriculture reported it loans 2,500 of its almost 9,000 heavy equipment items to state foresters to support wildland and rural firefighting and to state and county extension services, accredited veterinary colleges, and other non-federal organizations to further cooperative agricultural research. Additionally, the Department of Labor reported it loans 963 of its over 1,800 heavy equipment items to non-federal entities to administer apprenticeship training programs.

Type

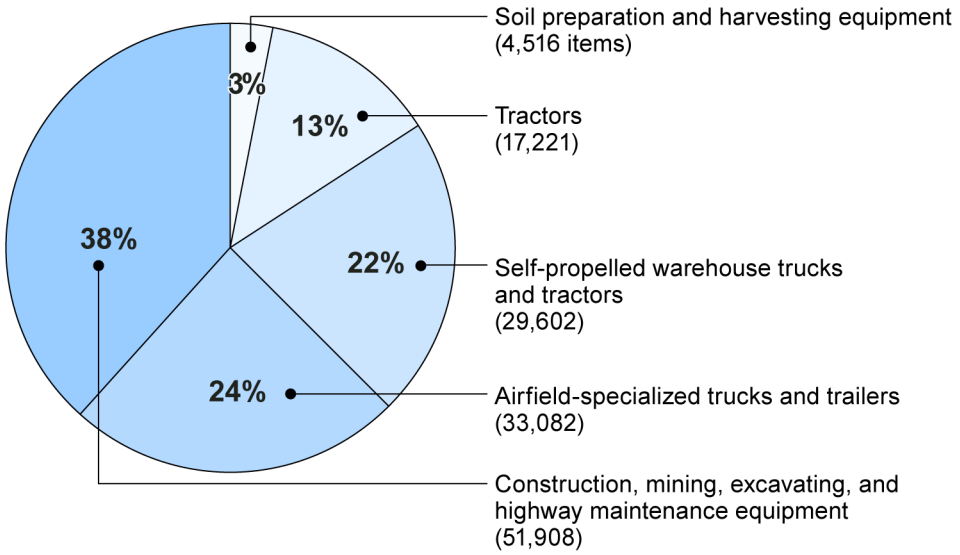
The 20 agencies reported owning various types of heavy equipment, such as cranes, backhoes, and road maintenance equipment in five categories: (1) construction, mining, excavating, and highway maintenance equipment; (2) airfield-specialized trucks and trailers; (3) self-propelled warehouse trucks and tractors; (4) tractors; and (5) soil preparation and harvesting equipment.[14]

- Thirty-eight percent (almost 52,000 items) were in the construction, mining, excavating, and highway maintenance category (see fig. 3). Fifteen of the 20 agencies reported owning at least some items in this category.
- Twenty-four percent (over 33,000 items) were in the airfield-specialized trucks and trailers category, generally used to service and re-position aircraft on runways. DOD reported owning 99 percent (over 32,000) of these items, while 9 other agencies, including the Department of Labor and the National Aeronautics and Space Administration, reported owning the other one percent (317 items).
- Twenty-two percent (over 29,000 items) were in the self-propelled warehouse trucks and tractors category, which includes equipment such as forklift trucks. All 20 agencies reported owning at least one item in this category, and five agencies—the Agency for International Development, Department of Housing and Urban Development, the Environmental Protection Agency, the Nuclear Regulatory Commission, and the Office of Personnel Management—reported owning only items in this category.

(For additional information on agencies' ownership of heavy equipment in various categories, see app. I.)

[14]For information on how the categories of heavy equipment we use in this section link to the 12 federal supply classes we identified as heavy equipment, see appendix II.

Figure 3: Types of Heavy Equipment Owned by 20 Agencies, as of June 2017



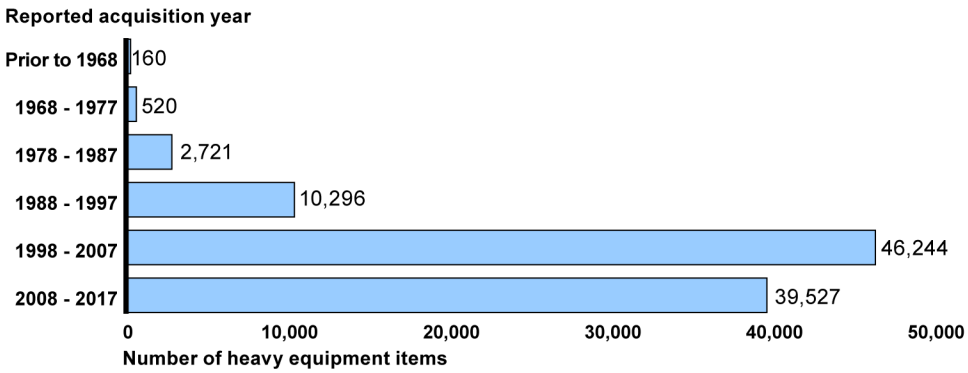
Source: Agencies that reported heavy equipment inventory data. | GAO-18-295

Acquisition Year

The twenty agencies reported acquiring their owned heavy equipment between 1944 and 2017, with an average of about 13 years since acquisition (see fig. 4).[15] One heavy equipment manager we interviewed reported that a dump truck can last 10 to 15 years, whereas other types of equipment can last for decades if regularly used and well-maintained.

[15]These data do not include acquisition years for almost 37,000 heavy equipment items because the agency did not report acquisition years.

Figure 4: Reported Acquisition Years of Heavy Equipment Items Owned by 20 Agencies, as of June 2017



Source: Agencies that reported heavy equipment inventory data. | GAO-18-295

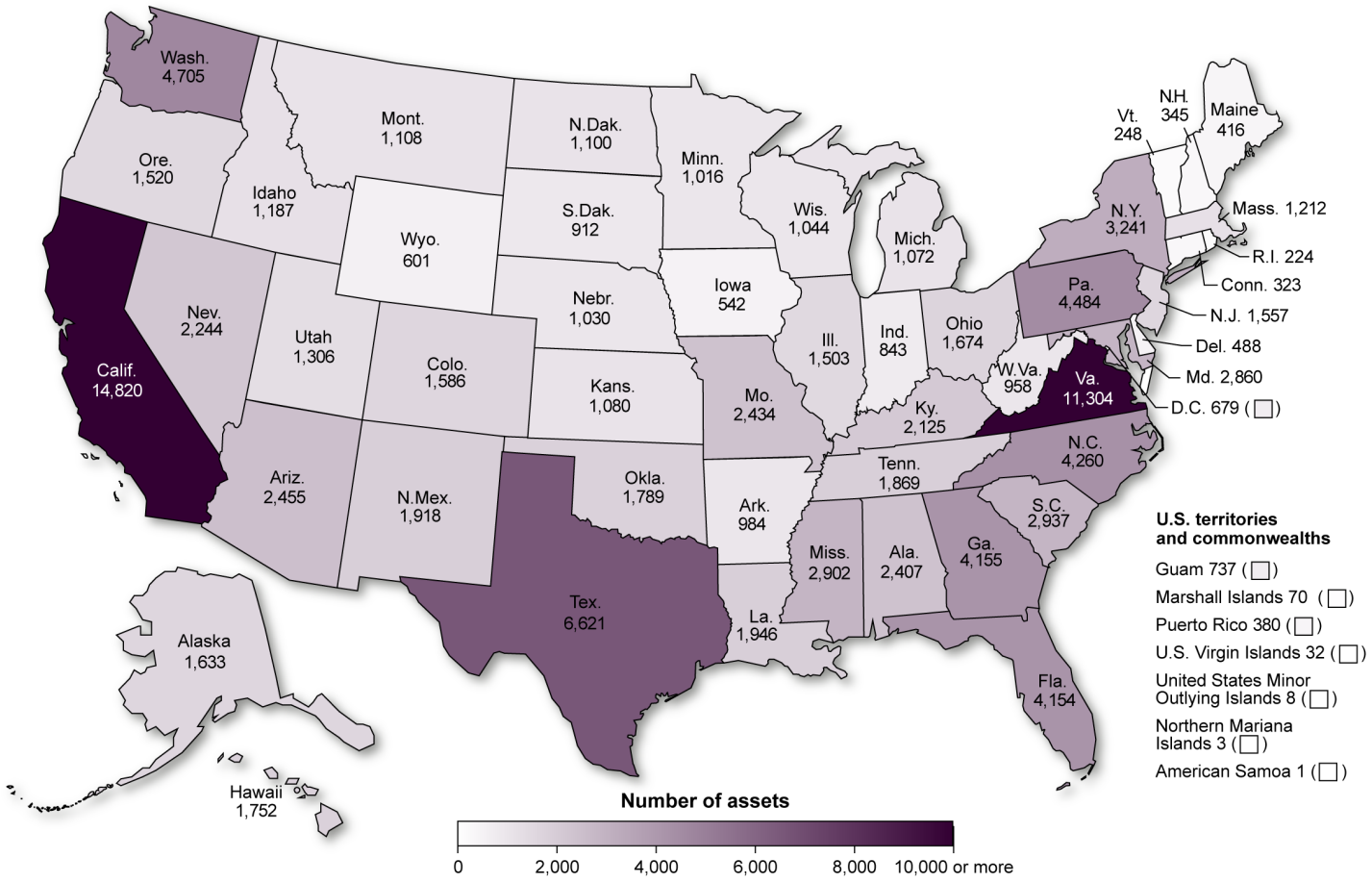
Note: This figure does not include information on almost 37,000 items for which the agencies did not report an acquisition year.

Location

The 20 agencies reported that over 117,000 heavy equipment items (86 percent) were located within the United States or its territories.[16] Of these, about one-fifth (over 26,000) were located in California and Virginia, the two states with the most heavy equipment (see fig. 5).

[16]For some agencies, "location" may not be the physical location of the equipment. For example, according to Navy officials, an item owned by the Navy may be assigned to a base in Norfolk, but may actually be aboard a ship that is at sea. The location information reported herein is the location of the unit to which items are assigned.

Figure 5: Number of Heavy Equipment Items Owned by 20 Agencies by Location, as of June 2017



Source: Agencies that reported heavy equipment inventory data and Map Resources. I GAO-18-295

Note: Of the over 117,000 heavy equipment items that the 20 agencies reported were located domestically, they did not report location information for 853 items.

Of the equipment located outside of the United States and its territories, 94 percent was owned by the Department of Defense. The rest was owned by the Department of State (714 items in 141 countries from Afghanistan to Zimbabwe) and the National Science Foundation (237 items in areas such as Antarctica).

Agencies Reported Spending Over $7.4 Billion to Purchase Heavy Equipment, Although Actual Costs Were Greater Than Reported

The twenty agencies reported spending over $7.4 billion in 2016 dollars to acquire the heavy equipment they own (see table 1).[17] However, actual spending was higher because this inflation-adjusted figure excludes over 37,000 heavy equipment items for which the agencies did not report acquisition cost or acquisition year, or both. Without this information, we could not determine the inflation-adjusted cost and therefore did not include the cost of these items in our calculation. The Army owns almost all of these items, having not reported acquisition cost or acquisition year, or both, for 36,589 heavy equipment items because, according to Army officials, the data were not available centrally but may have been available at individual Army units and would have been resource-intensive to obtain.[18]

[17]Total costs were calculated using original acquisition costs adjusted to 2016 dollars. In nominal terms, the total acquisition costs are about $5.8 billion.

[18]The Army reported a total nominal cost of about $2.9 billion without providing acquisition years for these items. The remaining 700 items for which acquisition cost, acquisition year, or both, were not reported are owned by three other DOD components and nine other agencies. For example, the Department of Agriculture was unable to report acquisition age or cost data for some items because the information was not always tracked in the legacy inventory system and therefore unavailable when the agency imported legacy data into its current inventory system.

Table 1: Number and Acquisition Costs of Heavy Equipment Owned by 20 Agencies, as of June 2017 (Dollars in Millions)

Agency	Number of Items	Total cost (in millions of 2016 dollars)[a]
Department of Defense	100,322	$5,297
Department of Agriculture	8,849	$404
Department of the Interior	6,280	$580
Department of Veterans Affairs	6,279	$134
Department of Energy	5,543	$528
Department of Justice	2,312	$66
Department of Labor	1,815	$143
Department of Homeland Security	1,474	$44
National Aeronautics and Space Administration	1,124	$73
Other agencies	2,331	$160
Total	**136,329**	**$7,430**

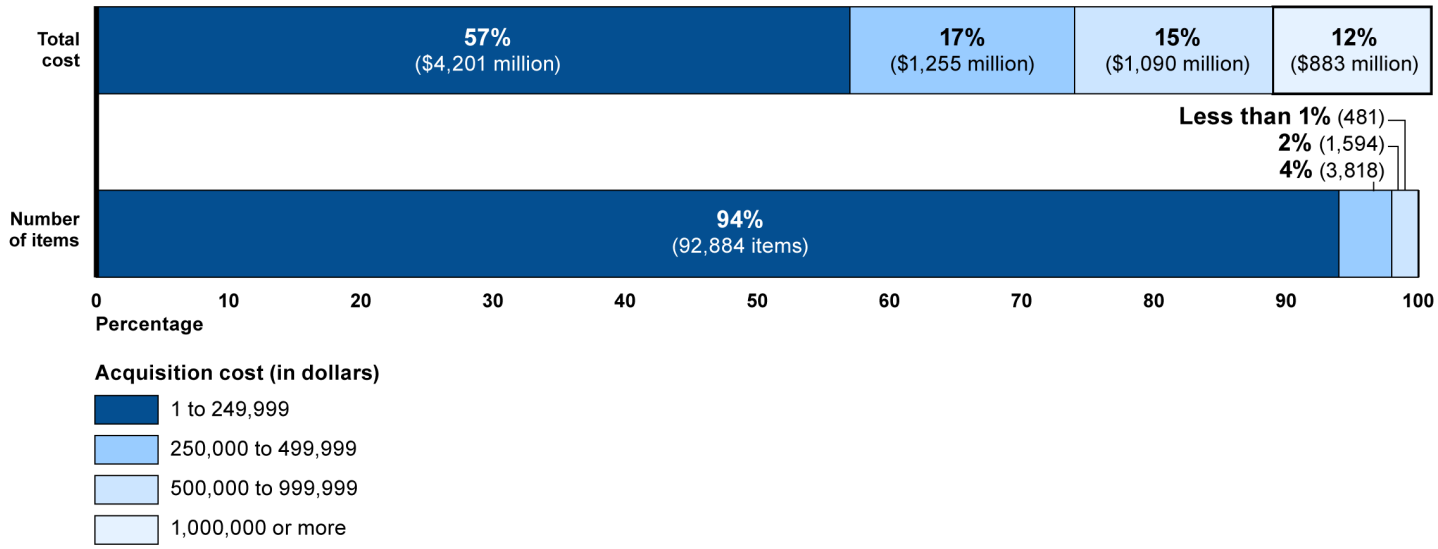
Source: Agencies that reported heavy equipment inventory data. I GAO-18-295

[a]Total costs in this table were calculated using original acquisition costs adjusted to 2016 dollars. Original acquisition cost of the equipment may have been incurred by other federal agencies; for example, the Department of Labor acquired almost all of their reported equipment at no cost via the GSAXcess program after the equipment was declared excess by other federal agencies. The total cost does not include the cost of 37,289 items because the agencies could not provide the acquisition cost or acquisition year, or both, of those items, which is needed to determine the cost in 2016 dollars. Some 36,600 of these items are owned by the Department of Defense. In nominal terms, the total original acquisition cost for the items included in the adjusted dollar amount is approximately $5.8 billion.

The heavy equipment items reported by the 20 agencies ranged in acquisition cost from zero dollars to over $2 million in 2016 dollars, with an average acquisition cost in 2016 dollars of about $78,000, excluding assets with a reported acquisition cost of $0. Of the items which we adjusted to 2016 dollars and for which non-zero acquisition costs were provided:

- 94 percent cost less than $250,000 and accounted for 57 percent of the total adjusted acquisition costs (See fig. 6.)
- 6 percent of items cost more than $250,000 and accounted for 43 percent of the adjusted acquisition costs. (See fig. 6.)

Figure 6: Acquisition Cost Ranges of Heavy Equipment Items Owned by 20 Agencies as of June 2017, in 2016 Dollars



Source: Agencies that reported heavy equipment inventory data. I GAO-18-295

Note: This figure does not include over 37,000 items for which agencies did not provide acquisition cost, acquisition year, or both, as both variables are needed for inflation adjustments. Percentages may not add to 100 percent due to rounding.

High-cost items included a $779,000 hydraulic crane acquired by the National Aeronautics and Space Administration in 1997 ($1.2 million in 2016 dollars), a $1.4 million ultra-deep drilling simulator acquired by the Department of Energy in 2009 ($1.6 million in 2016 dollars), and several $2.2 million well-drilling machines acquired by the Air Force in 2013 ($2.3 million in 2016 dollars).

Three Selected Agencies Purchased Almost 3,500 Pieces of Heavy Equipment in Calendar Years 2012 through 2016, but Did Not Consistently Document Lease-Versus-Purchase Analyses

Air Force, FWS, and NPS Purchased Almost 3,500 Pieces of Heavy Equipment in Calendar Years 2012 through 2016; Limited Information Is Available on Leases

In calendar years 2012 through 2016, the Air Force, FWS, and NPS purchased almost 3,500 pieces of heavy equipment through GSA and private vendors at a total cost of about $360 million to support mission needs. (See table 2.) These agencies also spent over $5 million on long-term leases and rentals during this time period.

Table 2: The Air Force's, Fish and Wildlife Service's, and National Park Service's Heavy-Equipment Item Purchases and Acquisition Costs for Calendar Years 2012–2016

Agency	Number of Items Purchased	Cost of Purchased Items ($ in millions)
Air Force	2,663	$ 301
Fish and Wildlife Service	348	$ 32
National Park Service	471	$ 27
Total	**3,482**	**$ 360**

Source: Agencies that reported heavy equipment inventory data. I GAO-18-295

Note: Costs may not add to total due to rounding.

The Air Force spent over $300 million to purchase over 2,600 heavy equipment assets in calendar years 2012 through 2016 that were used to support and maintain its bases globally. For example, according to Air Force officials, heavy equipment is often used to maintain runways and service and reposition aircraft on runways. While the majority of Air Force heavy equipment purchased in this time period is located in the United

States, 41 percent of this heavy equipment is located outside the United States and its territories in 17 foreign countries to support global military bases.

The Air Force could not provide complete information on its heavy equipment leases for fiscal years 2012 through 2016.[19] Specifically, the Air Force provided data on 33 commercial heavy equipment leases that were ongoing as of August 2017 but could not provide cost data for these leases because this information is not tracked centrally.[20] Additionally, the Air Force could not provide any data on leases that occurred previously because, according to Air Force officials, lease records are removed from the Air Force database upon termination of the lease. Officials said that rentals are generally handled locally and obtaining complete data would require a data call to over 300 base contracting offices. Air Force officials stated that rentals are generally used in unique situations involving short-term needs such as responding to natural disasters. For example, following Hurricane Sandy, staff at Langley Air Force Base in Virginia used rental equipment to clean up and repair the base. Although Air Force did not provide complete information on rentals, data we obtained from GSA's Short-Term Rental program indicated that Air Force rented heavy equipment in 46 transactions not reflected in the Air Force data we received totaling over $3.7 million since GSA began offering heavy equipment through its Short-Term Rental program, which had previously been limited to passenger vehicles, in part program in 2013.

FWS spent over $32 million to purchase 348 heavy equipment assets from calendar years 2012 through 2016. FWS used its heavy equipment to maintain refuge areas throughout the United States and its territories, including maintaining roads and nature trails. FWS also used heavy equipment to respond to inclement weather and natural disasters. Most of the heavy equipment items purchased by FWS were in the construction, mining, excavating, and highway maintenance equipment category and include items such as excavators, which were used for moving soil, supplies, and other resources.

FWS officials reported that they did not have any long-term leases for any heavy equipment in fiscal years 2012 through 2016 because they

[19]The Air Force considers rentals to be leases that are shorter than 120 days and long-term leases to be leases that are 120 days or longer.

[20]The data provided included both long-term leases and rentals.

encourage equipment sharing and rentals to avoid long-term leases whenever possible.[21] FWS officials provided data on 228 rentals for this time period with a total cost of over $1 million. Information regarding these rentals is contained in an Interior-wide property management system, the Financial Business Management System (FBMS). FWS officials told us that they have not rented heavy equipment through GSA's program because they have found lower prices through local equipment rental companies.

NPS spent over $27 million to purchase 471 heavy equipment assets from calendar years 2012 through 2016. NPS uses heavy equipment—located throughout the United States and its territories—to maintain national parks and respond to inclement weather and natural disasters. For example, NPS used heavy equipment such as dump trucks, snow plows, road graders, and wheel loaders to clear and salt the George Washington Memorial Parkway in Washington, D.C., following snow and ice storms. Most of the heavy equipment items purchased by NPS were in the construction, mining, excavating, and highway maintenance equipment category and include items such as excavators, which are used for moving soil, supplies, and other resources.

NPS reported spending about $360,000 on 230 long-term leases and rentals in fiscal years 2012 through 2016, not including rentals through GSA's Short-Term Rental program, which had previously been limited to passenger vehicles, in part program. As with FWS, NPS leases and rentals are contained in FBMS, which is Interior's property management system. Data we obtained from GSA's Short-Term Rental program, which had previously been limited to passenger vehicles, in part program indicated that NPS rented heavy equipment in 26 transactions totaling over $200,000 since GSA began offering heavy equipment through its Short-Term Rental program, which had previously been limited to passenger vehicles, in part program in 2013, for a potential total cost of over $560,000 for these long-term leases and rentals.

[21]FWS considers long-term leases to be leases that last a year or longer.

Selected Agencies Did Not Consistently Conduct and Document Lease-versus-Purchase Analyses

As mentioned earlier, the FAR provides that executive branch agencies seeking to acquire equipment should consider whether it is more economical to lease equipment rather than purchase it and identifies factors agencies should consider in this analysis, such as estimated length of the period that the equipment is to be used, the extent of use in that time period, and maintenance costs.[22] This analysis is commonly referred to as a lease-versus-purchase analysis. While the FAR does not specifically require that agencies document their lease-versus-purchase analyses, according to federal internal control standards, management should clearly document all transactions and other significant events in a manner that allows the documentation to be readily available for examination and also communicate quality information to enable staff to complete their responsibilities.[23]

As discussed below, we found that most acquisitions we reviewed from FWS, NPS, and the Air Force did not contain any documentation of a lease-versus-purchase analysis. Specifically, officials were unable to provide documentation of a lease-versus-purchase analysis for six of the eight acquisitions we reviewed. FWS officials were able to provide documentation for the other two. Officials told us that a lease-versus-purchase analysis was not conducted for five of the six acquisitions and did not know if such analysis was conducted for the other acquisition. According to agency officials, the main reason why analyses were not conducted or documented for these six acquisitions is that the circumstances in which such analyses were to be performed or documented were not always clear to FWS, NPS, and Air Force officials.

Interior

In addition to the FAR, Interior has agency guidance stating that bureaus should conduct and document lease-versus-purchase analyses. This July 2013 guidance—that FWS and NPS are to follow—states that requesters of equipment valued at $15,000 or greater should perform a lease-versus-purchase analysis when requesting heavy equipment. According to the

[22]The FAR provides that agencies should consider factors including: (1) estimated length of the period that the equipment is to be used and the extent of use in that period; (2) financial and operating advantages of alternative types and makes of equipment; (3) cumulative rental payments for the estimated period of use; (4) net purchase price; (5) transportation and installation costs; (6) maintenance and other service costs, and (7) potential obsolescence of the equipment because of imminent technological improvements. 48 C.F.R. § 7.401.

[23]See GAO, *Standards for Internal Control in the Federal Government*. GAO-14-704G (Washington, D.C., September, 2014).

guidance, this analysis should address criteria in the FAR and include a discussion of the financial and operating advantages of alternate approaches that would help contracting officials determine the final appropriate acquisition method. At the time the guidance was issued, Interior also provided a lease-versus-purchase analysis tool to aid officials in conducting this analysis. Additionally, in April 2016, Interior issued a policy to implement the July 2013 guidance. The 2016 policy clarifies that program offices are required to complete Interior's lease-versus-purchase analysis tool and provide the completed analysis to the relevant contracting officer.

Within Interior, bureaus are responsible for ensuring that procurement requirements are met, including the requirements and directives outlined in Interior's 2013 guidance and 2016 policy on lease-versus-purchase analyses, according to agency officials. Within FWS, local procurement specialists prepare procurement requests and ensure that procurement requirements are met and that all viable options have been considered. Regional equipment managers review these procurement requests, decide whether to purchase or lease the requested equipment, and prepare the lease-versus-purchase analysis tool if the procurement specialist has indicated that it is required. Within NPS, local procurement specialists are responsible for ensuring that all procurements adhere to relevant requirements and directives, including documenting the lease-versus-purchase analysis.

Of the three FWS heavy equipment acquisitions we reviewed for which the 2013 Interior guidance was applicable, one included a completed lease-versus-purchase analysis tool; one documented the rationale for purchasing rather than leasing, although it did not include Interior's lease-versus-purchase analysis tool; and one did not include any documentation related to a lease-versus-purchase analysis. (See table 3.)

Table 3: Fish and Wildlife Service's (FWS) Heavy Equipment Acquisitions, Lease-versus-Purchase Documentation Provided, and Explanations

Heavy Equipment Acquisition	Documentation Provided	Explanations
Purchase of backhoe, 2016 ($108,397)	Interior's lease-versus-purchase analysis tool.	FWS completed the Interior lease-versus-purchase analysis tool and determined that purchasing the backhoe would be more economical than leasing
Purchase of backhoe, 2015 ($105,151)	Documented rationale for purchasing rather than leasing but did not use Interior's lease-versus-purchase analysis tool.	FWS documented its rationale for purchasing rather than leasing the backhoe, including the fact that heavy equipment leases are unavailable in the remote Alaska location where it was needed.
Rental of excavator and services, 2016 ($19,800)	None	FWS officials said that rentals of this dollar amount do not require a lease-verses-purchase analysis based on Interior guidance.

Source: FWS officials and GAO analysis of contract documentation provided by FWS. I GAO 18-295

Regarding the acquisition for which no documentation of a lease-versus-purchase analysis was provided—a 12-month lease of an excavator and associated labor costs for over $19,000—FWS officials initially told us that a lease-versus-purchase analysis was not required because the equipment lease was less than $15,000, and Interior's guidance required a lease-versus-purchase analysis for procurements of equipment valued at $15,000 or greater. However, we found the guidance did not specify whether the $15,000 threshold includes the cost of labor. We also found that Interior's guidance did not specify if a lease-versus-purchase analysis was required if the total cost of a rental is less than the purchase price. FWS officials acknowledged that Interior guidance is not clear and that it would be helpful for Interior to clarify whether these leases require a lease-versus-purchase analysis.

NPS officials were unable to provide documentation of a lease-versus-purchase analysis for the single heavy equipment acquisition we reviewed—the purchase of a wheeled tractor in 2015 for $43,177. According to these officials, they could not do so because of personnel turnover in the contracting office that would have documented the analysis.[24] In addition, they told us that they believe that such analyses are not always completed for heavy equipment acquisitions because responsibility for completing these analyses is unclear. Specifically, they told us that it was unclear whether the responsibility lies with the official

[24]NPS officials could not provide data on their heavy equipment leases until the end of our review. As a result, we were unable to select NPS lease contracts for review.

requesting the equipment, the contracting personnel who facilitate the acquisition, or the property personnel who manage inventory data. However, when we discussed our findings with Interior and NPS officials, NPS officials were made aware of the 2016 Interior policy that specifically requires program offices—the officials requesting the equipment—to complete the lease-versus-purchase analysis and provide documentation of this analysis to the contracting officer. As a result, NPS officials told us at the end of our review that program office officials will now be required to complete the lease-versus-purchase analysis tool and document this analysis.

Air Force

According to Air Force officials responsible for managing heavy equipment, financial or budget personnel at individual bases are responsible for conducting lease-versus-purchase analyses, also called economic analyses, to support purchase and lease requests. Air Force fleet officials told us that they then review these requests from a fleet perspective, considering factors such as whether the cost information provided in the request is from a reputable source, expected maintenance costs, and whether a requesting base has the capability to maintain the requested equipment. However, they said they do not check to ensure that a lease-versus-purchase analysis was completed or review the analysis. Equipment rentals can be approved at individual bases.

In our review of four Air Force heavy equipment acquisitions, we found no instances in which Air Force officials documented a lease-versus-purchase analysis (see table 4).

Table 4: Air Force Heavy Equipment Acquisitions, Lease-versus-Purchase Documentation Provided, and Explanations

Heavy Equipment Acquisition	Documentation Provided	Explanations
Purchase of forklift, 2013 ($16,797)	None	Air Force officials stated that this forklift was purchased to replace old equipment, which was originally acquired in 1997. Air Force officials were unable to provide lease-versus-purchase documentation conducted at that time. Air Force officials provided market research comparing lease and purchase costs for the forklift in August 2017, but this research was performed in August 2017 and not in 2013 when the item was purchased.
Purchase of forklift, 2013 ($194,675)	None	Air Force officials stated that this forklift was purchased to replace old equipment, which was originally approved in 2005. Air Force officials were unable to provide lease-versus-purchase documentation conducted at that time. Air Force officials provided market research comparing lease and purchase costs for the forklift in August 2017, but this research was performed in August 2017 and not in 2013 when the item was purchased.
Lease of loader scooper, 2015 ($38,400)	None	Air Force officials stated that because this equipment was for U.S. Central Command, where requirements are driven by mission needs in the Middle East, a lease-versus-purchase analysis was not required.
Lease of excavator crawler, 2016 ($66,000)	None	Air Force officials stated that the lease was permissible because they had an authorization to purchase this equipment approved in 2014, but because the Air Force vehicle procurement program has been underfunded, they have not been able to purchase the item and were permitted to lease the item instead. The Air Force leased an excavator crawler under this authorization four times between February 2014 and March 2017 for a total of almost 5 months at a total cost of over $200,000. Air Force officials are unsure when the required item will be procured, but the authorization is the second procurement priority in fiscal year 2018.

Source: Air Force officials and GAO analysis of contract documentation provided by Air Force. I GAO 18-295

For the acquisitions that we reviewed, Air Force officials told us they did not believe a lease-versus-purchase analysis was required because the new equipment was either replacing old equipment that was previously approved or could be deployed. Accordingly, the Air Force purchased two forklifts in 2013 without conducting lease-versus-purchase analyses because the forklifts were replacing old forklifts that were authorized in 1997 and 2005. Furthermore, Air Force officials told us that both of these forklifts could be deployed and indicated that lease-versus-purchase analyses are not required for deployable equipment. However, the Air Force does not have guidance that describes the circumstances that

require either a lease-versus-purchase analysis or documentation of the rationale for not completing such analysis.[25]

Although we identified several instances in which officials in the three selected agencies did not document lease-versus-purchase analyses, officials from these agencies stated that they consider mission needs and equipment availability, among other factors, when making these decisions. For example, Air Force officials told us following Hurricane Sandy, staff at Langley Air Force Base in Virginia used rental equipment to clean and repair the base because the equipment was needed immediately to ensure the base could meet its mission. Moreover, availability of heavy equipment for lease or rental, which can be affected by factors such as geography and competition for equipment, is a key consideration. For example, FWS officials told us that the specialized heavy equipment sometimes needed may not be available for long-term lease or rent in remote areas such as Alaska and the Midway Islands, so the agency purchases the equipment. In addition, some agency officials told us that they may purchase heavy equipment even if that equipment is needed only sporadically if there is likely to be high demand for rental equipment. For example, following inclement weather or a natural disaster, demand for certain heavy equipment rentals can be high and equipment may not be available to rent when it is needed.

While we recognize that mission needs and other factors are important considerations, without greater clarity regarding when to conduct or document lease-versus-purchase analyses, officials at FWS, NPS, and Air Force may not be conducting such analyses when appropriate and may not always make the best acquisition decisions. These agencies could be overspending on leased equipment that would be more cost-effective if purchased or overspending to purchase equipment when it would be more cost-effective to lease or rent. Moreover, without documenting decisions on whether to purchase or lease equipment, they lack information that could be used to inform future acquisition decisions for similar types of equipment or projects.

[25]Air Force has guidance stating that officials should follow instructions in Office of Management and Budget's Circular A-94, which states that a lease-versus-purchase analysis is required for capital assets with a fair market value over $1 million.

Air Force and FWS Periodically Assess Heavy Equipment Utilization; NPS Does Not But Is Developing Guidance to Do So

Air Force guidance requires that fleet managers collect utilization data for both vehicles and heavy equipment items, such as the number of hours used, miles traveled, and maintenance costs.[26] The Air Force provided us with utilization data for over 18,000 heavy equipment items and uses such data to inform periodic base validations. Specifically, Air Force officials said that every 3 to 5 years each Air Force base reviews the on-base equipment to ensure that the installation has the appropriate heavy equipment to complete its mission and reviews utilization data to identify items that are underutilized.[27] If heavy equipment is considered underutilized, the equipment is relocated—either moved to another location or sent to the Defense Logistics Agency for reuse or transfer to another agency. According to Air Force officials the Air Force has relocated over 700 heavy equipment items based on the results of the validation process and other factors such as replacing older items and agency needs since 2014.

Similarly, FWS guidance for managing heavy equipment utilization sets forth minimum utilization hours for certain types of heavy equipment and describes requirements for reporting utilization data. FWS provided us with utilization data on over 3,000 heavy equipment items. According to officials, condition assessments of heavy equipment are required by FWS guidance every 3 to 5 years. According to FWS officials, condition assessments inform regional-level decision making about whether to move equipment to another FWS location or dispose of the equipment.

In contrast, NPS does not require the collection of utilization data to evaluate heavy equipment use and does not have guidance for managing heavy equipment utilization. However, NPS officials told us that they recognize the need for such guidance. NPS officials shared with us draft guidance that they have developed, which would require collection of utilization data for heavy equipment such as hours or days of usage each month. According to NPS officials, they plan to send the guidance to the NPS policy office for final review in March 2018. Until this guidance is completed and published, NPS is taking interim actions to manage the utilization of its heavy equipment. For example, NPS officials stated that they have asked NPS locations to collect and post monthly utilization

[26] *Air Force Instruction 24-302*.

[27] The base validation process is broadly applicable to all vehicles, and Air Force considers heavy equipment to be vehicles for the purposes of conducting base validations, according to Air Force officials.

data, discussed the collection of utilization data at fleet meetings, and distributed job aids to support this effort. During the course of our review, NPS officials provided us with some utilization data for about 1,400 of the more than 2,400 NPS heavy equipment items. Specifically, for the 1,459 heavy equipment items for which NPS provided utilization data, 541 items had utilization data for each month. For the remaining 918 items, utilization data were reported for some, but not all months.

Conclusions

The federal government has spent billions of dollars to acquire heavy equipment. There is no requirement that agencies report on the inventory of this equipment, as there is no standard definition of heavy equipment. When deciding how to acquire this equipment, agencies' should conduct a lease-versus-purchase analysis as provided in the FAR, which is a critical mechanism to ensure agencies are acquiring the equipment in the most cost-effective manner. Because FWS, NPS and the Air Force were unclear when such an analysis was required, they did not consistently conduct or document analyses of whether it was more economical to purchase or lease heavy equipment. In the absence of clarity on the circumstances in which lease-versus-purchase analyses for heavy equipment acquisitions are to be conducted and documented, the agencies may not be spending funds on heavy equipment cost-effectively.

Recommendations for Executive Action

We are making two recommendations—one to the Air Force and one to the Department of the Interior.

- The Secretary of the Air Force should develop guidance to clarify the circumstances in which lease-versus-purchase analyses for heavy equipment acquisitions are to be conducted and documented. (Recommendation 1)
- The Secretary of the Interior should further clarify in guidance the circumstances in which lease-versus-purchase analyses for heavy equipment acquisitions are to be conducted and documented. (Recommendation 2)

Agency Comments

We provided a draft of this report to the Departments of Agriculture, Defense, Energy, Homeland Security, Housing and Urban Development, the Interior, Justice, Labor, State, and Veterans Affairs; General Services Administration; National Aeronautics and Space Administration; National Science Foundation; Nuclear Regulatory Commission; Office of Personnel Management; and U.S. Agency for International Development.

The departments of Agriculture, Energy, Homeland Security, Housing and Urban Development, Justice, State and Veterans Affairs, as well as the General Services Administration, National Aeronautics and Space Administration, National Science Foundation, Nuclear Regulatory Commission, Office of Personnel Management; and U.S. Agency for International Development did not have comments. The Department of Labor provided technical comments, which we incorporated as appropriate. In written comments, reproduced in appendix III, the Department of Defense stated that it concurred with our recommendation and plans to issue a bulletin to Air Force contracting officials. In written comments, reproduced in appendix IV, the Department of the Interior stated that it concurred with our recommendation and plans to implement it.

If you or members of your staff have any questions about this report, please contact me at (202) 512-2834 or RectanusL@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Major contributors to this report are listed in appendix V.

Lori Rectanus
Director, Physical Infrastructure

Appendix I: Table of 20 Agencies' Heavy Equipment Inventories by Category, as of June 2017

Table 5: Agencies' Owned Heavy Equipment by Category, as of June 2017

Agency	Airfield-Specialized Trucks and Trailers	Tractors	Soil Preparation and Harvesting Equipment	Construction, Mining, Excavating, and Highway Maintenance Equipment	Self-Propelled Warehouse Trucks and Tractors	Total
Department of Agriculture	**37**	**2,473**	**2,518**	**2,088**	**1,733**	**8,849**
Agricultural Marketing Service	.	-	1	1	3	5
Agricultural Research Service	1	881	1,668	161	175	2,886
Animal and Plant Health Inspection Service	2	67	6	20	66	161
Departmental Management	.	-	-	-	14	14
Farm Service Agency	.	-	-	-	9	9
Forest Service	25	842	389	1,291	846	3,393
National Agricultural Statistics Service	.	-	3	-	.	3
National Institute of Food and Agriculture	9	548	86	483	604	1,730
Natural Resources Conservation Service	.	135	354	132	13	634
Office of Chief Information Officer	.	-	11	-	.	11
Rural Development	.	-	-	-	3	3
Department of Commerce	**.**	**37**	**13**	**60**	**195**	**305**
National Institute of Standards and Technology	.	22	3	28	48	101
National Oceanic and Atmospheric Administration	.	13	9	31	91	144
National Technical Information Service	.	0	0	0	15	15
U.S. Census Bureau	.	2	1	1	41	45
Department of Defense	**32,765**	**9,409**	**644**	**38,973**	**18,531**	**100,322**
Air Force	4,272	908	0	6,127	7,685	18,992
Army	3,280	7,206	332	25,771	.	36,589
Defense Logistics Agency	.	.	.	.	4,309	4,309
Marine Corps	.	0	0	2,224	.	2,224
Navy	25,081	682	2	2,319	6,308	34,392
U.S. Army Corps of Engineers	132	613	310	2,532	229	3,816

Agency	Airfield-Specialized Trucks and Trailers	Tractors	Soil Preparation and Harvesting Equipment	Construction, Mining, Excavating, and Highway Maintenance Equipment	Self-Propelled Warehouse Trucks and Tractors	Total
Department of Energy	**7**	**429**	**318**	**1,864**	**2,925**	**5,543**
Bonneville Power Administration	.	95	-	243	134	472
Office of Energy Efficiency and Renewable Energy	.	4	7	6	27	44
Office of Environmental Management	.	106	98	316	533	1,053
National Training Center	.	-	-	-	3	3
Naval Reactors	.	8	-	22	137	167
National Nuclear Security Administration	6	61	28	540	1,153	1,788
Office of Fossil Energy	.	22	28	44	52	146
Office of Legacy Management	.	-	-	4	1	5
Office of Nuclear Energy	.	21	8	145	191	365
Office of Science	1	42	131	208	557	939
Savannah River Operations Office	.	13	9	69	24	115
Southwestern Power Administration	.	20	-	-	6	26
Western Area Power Administration	.	37	9	267	107	420
Department of Health and Human Services	**.**	**204**	**9**	**50**	**156**	**419**
Centers for Medicare and Medicaid Services	.	-	-	-	4	4
Food and Drug Administration	.	6	-	-	15	21
Indian Health Service	.	198	9	50	50	307
National Institutes of Health	.	-	-	-	57	57
Office of Emergency Management	.	-	-	-	2	2
Program Support Center	.	.	.	.	28	28
Department of Homeland Security	**45**	**330**	**2**	**291**	**806**	**1,474**
Customs and Border Protection	.	0	0	120	326	446
Federal Emergency Management Agency	.	1	0	44	167	212

Agency	Airfield-Specialized Trucks and Trailers	Tractors	Soil Preparation and Harvesting Equipment	Construction, Mining, Excavating, and Highway Maintenance Equipment	Self-Propelled Warehouse Trucks and Tractors	Total
Federal Law Enforcement Training Center	.	6	0	112	146	264
Immigration and Customs Enforcement	.	8	0	0	2	10
Science and Technology Directorate	.	1	2	5	7	15
Transportation Security Administration	.	0	0	0	31	31
United States Citizenship and Immigration Services	.	0	0	0	31	31
United States Coast Guard	45	277	0	10	96	428
United States Secret Service	.	37	0	0	.	37
Department of Housing and Urban Development	**.**	**-**	**-**	**-**	**4**	**4**
Department of the Interior	**7**	**2,147**	**374**	**3,456**	**296**	**6,280**
Bureau of Indian Affairs	.	44	4	672	2	722
Bureau of Land Management	1	91	286	302	138	818
Bureau of Reclamation	2	13	1	31	19	66
Bureau of Safety and Environmental Enforcement	.	-	-	1	.	1
Fish and Wildlife Service	2	1,016	29	1,504	32	2,583
National Park Service	1	983	54	925	105	2,068
U.S. Geological Survey	1	-	-	21	.	22
Department of Justice	**21**	**382**	**451**	**586**	**872**	**2,312**
Bureau of Prisons	9	360	436	500	603	1,908
Federal Bureau of Investigation	12	22	15	86	243	378
U.S. Marshals Service	-	-	-	-	26	26
Department of Labor	**109**	**229**	**79**	**965**	**433**	**1,815**
Employment and Training Administration	.	55	4	652	59	770
Job Corps	109	174	75	313	366	1,037
Mine Safety and Health Administration	.	-	-	-	6	6
Office of the Assistant Secretary for Administration and Oversight	.	-	-	-	2	2

Agency	Airfield-Specialized Trucks and Trailers	Tractors	Soil Preparation and Harvesting Equipment	Construction, Mining, Excavating, and Highway Maintenance Equipment	Self-Propelled Warehouse Trucks and Tractors	Total
Department of State	**.**	**137**	**1**	**167**	**575**	**880**
Department of Transportation	**4**	**54**	**1**	**108**	**64**	**231**
Federal Aviation Administration	3	43	1	73	40	160
Federal Highway Administration	.	1	-	4	2	7
Federal Railroad Administration	1	3	-	12	4	20
Maritime Administration	.	-	-	2	15	17
National Highway Traffic Safety Administration	.	-	-	1	.	1
Saint Lawrence Seaway Development Corporation	.	7	-	16	3	26
Department of Veterans Affairs	**.**	**1,230**	**102**	**2,968**	**1,979**	**6,279**
National Cemeteries Administration	.	66	2	130	25	223
Staff	.	2	-	-	37	39
Veterans Benefits Administration	.	-	-	-	2	2
Veterans Health Administration	.	1,162	100	2,838	1,915	6,015
Environmental Protection Agency	**.**	**-**	**-**	**-**	**48**	**48**
National Aeronautics and Space Administration	**83**	**50**	**2**	**184**	**805**	**1,124**
National Science Foundation	**4**	**110**	**2**	**136**	**86**	**338**
National Radio Astronomy Observatory	.	3	-	25	19	47
National Optical Astronomy Observatory	.	8	-	11	17	36
Ligo Observatory	.	-	-	-	6	6
Arctic Research Program	3	5	1	16	4	29
Incorporated Research Institutions for Seismology	.	-	-	4	.	4
United States Antarctic Program	.	93	1	75	33	202
SRI International – AMISR	.	-	-	1	.	1
SRI International – ARECIBO Observatory	.	-	-	1	1	2

Agency	Airfield-Specialized Trucks and Trailers	Tractors	Soil Preparation and Harvesting Equipment	Construction, Mining, Excavating, and Highway Maintenance Equipment	Self-Propelled Warehouse Trucks and Tractors	Total
University Corporation for Atmospheric Research	1	1	-	3	6	11
Nuclear Regulatory Commission	**.**	**-**	**-**	**-**	**5**	**5**
Office of Personnel Management	**.**	**-**	**-**	**-**	**1**	**1**
Social Security Administration	**.**	**-**	**-**	**12**	**87**	**99**
United States Agency for International Development	**.**	**-**	**-**	**-**	**1**	**1**
Grand Total	**33,082**	**17,221**	**4,516**	**51,908**	**29,602**	**136,329**

Source: Agencies that reported heavy equipment inventory data. | GAO-18-295

Note: "Agencies" refers to the 20 CFO Act agencies that provided data in response to our data collection effort.

Appendix II: Objectives, Scope, and Methodology

This report addresses: (1) the number, type, and cost of heavy equipment items that are owned by the 24 CFO Act agencies; (2) the heavy equipment items selected agencies have recently acquired and how selected agencies decided to purchase or lease this equipment; and (3) how selected agencies manage the utilization of their heavy equipment.

To identify the number, type, and cost of heavy equipment owned by federal agencies, we first interviewed officials at the General Services Administration to determine whether there were government-wide reporting requirements for owned heavy equipment and learned that there are no such requirements. We then obtained and analyzed data on agencies' spending on equipment purchases and leases from the Federal Procurement Data System–Next Generation (FPDS-NG), which contains government-wide data on agencies' contracts. However, in reviewing the data available and identifying issues with the reliability of the data, we determined that data on contracts would not be sufficient to answer the question of what heavy equipment the 24 CFO Act agencies own. We therefore conducted a data collection effort to obtain heavy equipment inventory information from the 24 CFO Act agencies, which are the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, Housing and Urban Development, the Interior, Justice, Labor, State, Transportation, the Treasury, and Veterans Affairs; Environmental Protection Agency; General Services Administration; National Aeronautics and Space Administration; National Science Foundation; Nuclear Regulatory Commission; Office of Personnel Management; Small Business Administration; Social Security Administration; and Agency for International Development.

Because there is no generally accepted definition of heavy equipment, we identified 12 federal supply classes in which the majority of items are self-propelled equipment but not passenger vehicles or items that are specific to combat and tactical purposes, as these items are generally not considered to be heavy equipment. (See table 5.) We then vetted the appropriateness of these selected supply classes with Interior, FWS, NPS, and Air Force agency officials, as well as with representatives from a fleet management consultancy and a rental company, and they generally agreed that items in selected federal supply classes are considered heavy equipment. Federal supply classes are used in FPDS-NG and are widely used in agencies' inventory systems. Overall, about 90 percent of the heavy equipment items that agencies reported were assigned a federal supply class in the agency's inventory data. In

discussing heavy equipment categories in the report, we use the category titles below.

Table 6: Selected Federal Supply Classes and GAO Category Titles

Federal Supply Class	Federal Supply Class Title	GAO Category Title
1740	Airfield Specialized Trucks and Trailers	Airfield Specialized Trucks and Trailers
2410	Low Speed, Full Tracked Tractors	Tractors
2420	Wheeled Tractors	
2430	High Speed, Full Tracked Tractors	
3710	Soil Preparation Equipment	Soil Preparation and Harvesting Equipment
3720	Harvesting Equipment	
3805	Earth Moving and Excavating Equipment	Construction, Mining, Excavating, and Highway Maintenance Equipment
3810	Cranes and Crane Shovels	
3820	Mining, Rock Drilling, Earth Boring, and Related Equipment	
3825	Road Clearing, Cleaning, and Marking Equipment	
3895	Miscellaneous Construction Equipment	
3930	Warehouse Trucks and Tractors, self-propelled	Self-propelled Warehouse Trucks and Tractors

Source: Federal Procurement Data System Product and Service Codes Manual and GAO analysis. I GAO-18-295

To identify points of contact at the 24 CFO Act agencies, we obtained GSA's list of contact information for agencies' national utilization officers, who are agency property officers who coordinate with GSA. As a preliminary step, we contacted these individuals at each of the 24 CFO Act agencies and asked them to either confirm that they were the appropriate contacts or provide contact information for the appropriate contact and to inform us if they do not own heavy equipment. Officials at 4 agencies—Department of Education, Department of the Treasury, General Services Administration, and Small Business Administration—indicated that the agency did not own any items in the relevant federal supply classes. Officials at 16 of these agencies indicated that they would be able to respond on a departmental level because the relevant inventory data are maintained centrally, while officials at 4 agencies indicated that we would need to obtain responses from officials at some other level because the relevant inventory data are not maintained centrally. (See table 7 for a list of organizations within the 20 CFO Act agencies that indicated they own relevant equipment and responded to our data collection effort.)

Table 7: List of 44 Organizations That Responded to GAO's Data Collection Effort on Heavy Equipment

Department of Agriculture	*Within Department of Health and Human Services*
Department of Commerce	Centers for Medicare and Medicaid Services
Within Department of Defense	Food and Drug Administration
Air Force	Indian Health Services
Army	National Institutes of Health
Army Corps of Engineers	Office of Emergency Management
Defense Logistics Agency	Program Support Center
Marine Corps[a]	Department of Homeland Security
Navy[a]	Department of Housing and Urban Development
Within Department of Energy	Department of the Interior
Bonneville Power Administration	*Within Department of Justice*
Headquarters Fleet	Bureau of Prisons
National Nuclear Security Administration*	Federal Bureau of Investigation
National Training Center	U.S. Marshals Service
Naval Reactors	Department of Labor
Office of Energy Efficiency and Renewable	Department of State
Energy	Department of Transportation
Office of Environmental Management*	Department of Veterans Affairs
Office of Fossil Energy*	Agency for International Development
Office of Legacy Management	Environmental Protection Agency
Office of Nuclear Energy*	National Aeronautics and Safety Administration
Office of Science*	National Science Foundation
Southwestern Power Administration	Nuclear Regulatory Commission
Western Area Power Administration	Office of Personnel Management
	Social Security Administration

Source: GAO's data collection effort on agencies' owned heavy equipment. | GAO-18-295

Note: This list does not include the four agencies—Department of Education, General Services Administration, Small Business Administration, and Department of the Treasury—that indicated that they do not own any heavy equipment.

[a]Indicates organizations that submitted multiple responses because requested data are tracked in different inventory systems. For example, the Marine Corps provided separate responses from components such as Marine Corps Systems Command and Installation and Logistics.

After identifying contacts responsible for agencies' heavy-equipment inventory data, we prepared data collection instruments for requesting information on heavy equipment and tested these documents with representatives from 4 of the 20 CFO Act agencies that indicated they own heavy equipment to ensure that the documents were clear and logical and that respondents would be able to provide the requested data and answer the questions without undue burden. These agency representatives were selected to provide a variety of spending on federal supply group 38 equipment as reported in FPDS-NG, civilian and military

agencies, and different levels at which the agency would be responding to the data collection effort (e.g., at the departmental level or at a sub-departmental level).

Our data collection instrument requested the following data on respondent organizations' owned assets in 12 federal supply classes as of June 2017:

Table 8: Requested Data Variables and Descriptions in GAO's Data Collection Effort on Heavy Equipment

Data Variable	Description
Federal supply class	4-digit federal supply class
Asset type	Type of asset
Acquisition date	Date asset was acquired
Original acquisition cost	Original cost of asset acquisition
Current value	For capitalized assets only, current value of asset as of June 2017
State	State or territory where asset is located, for assets in the United States or its territories
Country	Country where asset is located, if located outside of the United States and its territories
FAST-reported	Whether asset is reported in the General Service Administration's Federal Automotive Statistical Tool (FAST)
Loaner assets	*(Only asked if respondents indicated they loaned out assets to other non-federal entities) Whether asset's primary use is being loaned to non-federal entities.*

Source: GAO data collection effort. I GAO-18-295

Respondents provided data on original acquisition costs in nominal terms, with some acquisitions occurring over 50 years ago. In order to provide a fixed point of reference for appropriate comparison, we present in our report inflation-adjusted acquisition costs using calendar year 2016 as the reference. To adjust these dollar amounts for inflation, we used the Bureau of Labor Statistic's *Producer Price Index by Commodity for Machinery and Equipment: Construction Machinery and Equipment (WPU112)*, compiled by the Federal Reserve Bank of St. Louis. We conducted the data collection effort from July 2017 through October 2017 and received responses from all 20 agencies that indicated they own heavy equipment.[1] In order to assess the reliability of agencies' reported data, we collected and reviewed agencies' responses regarding descriptions of their inventory systems, frequency of data entry, agency uses of the data, and agencies' opinions on potential limitations of the use

[1]Five agencies provided data that included 234 assets that were acquired after June 2017.

of their data in our analysis. We conducted some data cleaning, which included examining the data for obvious errors and eliminating outliers. We did not verify the data or responses received; the results of our data collection effort are used only for descriptive purposes and are not generalizable beyond the 24 CFO Act agencies. Based on the steps we took, we found these data to be sufficiently reliable for our purposes.

To determine the heavy equipment items that selected agencies recently acquired and how these agencies decided whether to purchase or lease this equipment, we first used data from the FPDS-NG to identify agencies that appeared to have the highest obligations for construction or heavy equipment, or both, and used this information, along with other factors, to select DOD and Interior. At the time, in the absence of a generally accepted definition of heavy equipment, we reviewed data related to federal supply group 38—construction, mining, excavating, and highway maintenance equipment—because (1) we had not yet defined heavy equipment for the purposes of our review; (2) agency officials had told us that most of what could be considered heavy equipment was in this federal supply group; and (3) our analysis of data from usaspending.gov showed that about 80 percent of spending on items that may be considered heavy equipment were in this federal supply group. In meeting with officials at these departments, we learned that agencies within each department manage heavy equipment independently, so we requested current inventory data for Interior bureaus and the DOD military departments and selected three agencies that had among the largest inventories of construction and/or heavy equipment at the time, among other criteria: the U.S. Air Force (Air Force); the Fish and Wildlife Service (FWS); and the National Park Service (NPS). We then used information from our data collection effort—which included the number, type, cost, acquisition year and other data elements—to determine heavy equipment items that these agencies acquired during 2012 through 2016. We interviewed agency officials to determine what lease data were available from the three selected agencies. We assessed the reliability of these data with agency official interviews and reviewed the data for completeness and potential outliers. We determined that the data provided were sufficiently reliable for the purposes of documenting leased and rental heavy equipment. We also obtained data from GSA's Short-Term Rental program, which had previously been limited to passenger vehicles, in part program for August 2012, when the first item was rented under this program, to February 2017, when GSA provided the data. We used these data to identify selected agencies' rentals of heavy equipment

through GSA's Short-Term Rental program, which had previously been limited to passenger vehicles, in part program and associated costs.[2] We interviewed officials from GSA's Short-Term Rental program to discuss the program history as well as the reliability of their data on these rented heavy equipment items. We determined that the data were sufficiently reliable for our purposes.

To determine how the three selected agencies decide whether to purchase or lease heavy equipment, we interviewed fleet and property managers at these selected agencies and asked them to describe their process for making these decisions as well as to identify relevant federal and agency regulations and guidance. We reviewed relevant federal and agency regulations and guidance regarding how agencies should make these decisions, including: *Federal Acquisition Regulation*, Office of Management Budget's *A-94*, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, *Defense Federal Acquisition Regulation Supplement*, *Air Force Manual 65-506*, *Air Force Guidance Memorandum to Air Force Instruction 65-501*, and Interior's *Guidance On Lease Versus Purchase Analysis and Capital Lease Determination for Equipment Leases*. We also reviewed the *Standards for Internal Control in the Federal Government* for guidance on documentation as well as past GAO work that reviewed agencies' lease-versus-purchase analyses.[3]

To determine whether the three selected federal agencies documented lease-versus-purchase decisions for selected acquisitions and adhered to relevant agency guidance, we selected and reviewed a non-generalizable sample of 10 heavy equipment acquisitions—two purchases each from the Air Force, FWS, and NPS, and two leases each from the Air Force and FWS. Specifically, we used inventory data obtained through our data collection effort, described above, to randomly select two heavy equipment purchases from each selected agency using the following criteria:

[2]FWS has not rented heavy equipment from the GSA Short-Term Rental program.

[3]GAO, *Air Force and Interior Can Benefit from Additional Guidance When Deciding Whether to Lease or Purchase Equipment*, GAO-12-281R (Washington, D.C.: Feb. 7, 2012).

- calendar years 2012 through 2016;[4]
- the two federal supply classes most prevalent in each selected agency's heavy equipment inventory, as determined by the data collection effort described above; and[5]
- for NPS and FWS, acquisition costs of over $15,000.[6]

In addition, we used lease data provided by the Air Force and FWS to randomly selected two heavy equipment leases per agency. Because NPS could not provide data on heavy equipment leases, we did not select or review any NPS lease decisions. To select the Air Force and FWS leases we used the following criteria:

- fiscal years 2012 through 2016;[7]
- for the Air Force, which included federal supply classes in the lease data provided, the two federal supply classes most prevalent in the lease data and[8] for FWS, which did not include federal supply class in the lease data provided, the two federal supply classes most prevalent in the purchase data; and
- for FWS, leases over $15,000.[9]

After selecting these acquisitions, we determined that one FWS lease and one NPS purchase we selected pre-dated Interior's 2013 guidance on lease-versus-purchase analysis and excluded these acquisitions from our analysis for a total of eight acquisitions. In reviewing agencies' documentation related to these acquisitions, we developed a data collection instrument to assess the extent to which agencies documented

[4]We used the acquisition year data from our data collection effort to determine calendar year.

[5]For FWS and NPS, the most common federal supply classes were wheeled tractors (2420) and earth moving and excavating equipment (3805). For Air Force, the most common federal supply classes were airfield specialized trucks and trailers (1740) and warehouse trucks and tractors, self-propelled (3930).

[6]We chose this acquisition value threshold for NPS and FWS because Interior's guidance regarding lease-versus-purchase analyses is specific to acquisitions above this threshold.

[7]Air Force lease and FWS rental data were reported by fiscal year.

[8]For Air Force leased equipment, the most common federal supply classes were road clearing and cleaning equipment (3825) and earth moving excavating equipment (3805).

[9]We chose this dollar threshold for FWS because Interior's guidance regarding lease-versus-purchase analyses is specific to acquisitions above this threshold.

lease-versus-purchase analyses and, in the case of FWS and NPS, adhered to relevant Interior guidance. We supplemented our review of these acquisition decisions with additional information by interviewing officials at the three selected agencies and requesting additional information to understand specific circumstances surrounding each procurement. Our findings are not generalizable across the federal government or within each selected department.

To determine how selected agencies manage heavy equipment utilization, we interviewed officials at the three selected agencies to identify departmental and agency-specific guidance and policies and to determine whether utilization requirements exist. We reviewed guidance identified by these officials, including Interior and Air Force vehicle guidance, both of which apply to heavy equipment, and FWS's *Heavy Equipment Utilization and Replacement Handbook*.[10] We also compared their practices to relevant *Standards for Internal Control in the Federal Government*. For the selected agencies with guidance for managing heavy equipment—Air Force and FWS—we reviewed the guidance to determine if and how selected agencies measured and documented heavy equipment utilization. For example, we reviewed whether selected agencies developed reports for managing heavy equipment utilization such as Air Force validation reports and FWS conditional assessment reports. We also reviewed Air Force, FWS, and NPS utilization data for heavy equipment but we did not independently calculate or verify the utilization rate for individual heavy equipment items because each heavy equipment item (backhoe, forklift, tractor, etc.,) has different utilization requirements depending on various factors such as the brand, model, or age of equipment.[11] However, we did request information about agency procedures to develop and verify utilization rates. We assessed the reliability of the utilization data with agency official interviews and a review of the data for completeness and potential outliers. We determined that the data were sufficiently reliable for the purposes of providing evidence of utilization data collection for heavy equipment assets.

We also visited the NPS George Washington Memorial Parkway to interview equipment maintenance officials regarding the procurement and management of heavy equipment and to document photos of heavy

[10]Interior guidance is applicable to FWS and NPS agencies.

[11]NPS had limited information on utilization rates for about 1,400 heavy equipment items of the over 2,400 heavy equipment inventory.

equipment. We selected this site because of its range of heavy equipment and close proximity to the Capital region.

We conducted this performance audit from October 2016 to February 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix III: Comments from the Department of Defense

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

ACQUISITION
AND SUSTAINMENT

FEB 12 2018

Ms. Lori Rectanus
Director, Physical Infrastructure
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Ms. Rectanus:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-18-295, "HEAVY EQUIPMENT: Selected Agencies Should Improve Guidance for Purchases and Leases" dated January 11, 2018 (GAO Code 101212).

Detailed comments on the report recommendations are enclosed.

Sincerely,

Nancy L. Spruill

Nancy L. Spruill
Director
Acquisition Resources & Analysis

Enclosure:
As stated

GAO Draft Report Dated January 11, 2018
GAO-18-295 (GAO CODE 101212)

"HEAVY EQUIPMENT: SELECTED AGENCIES SHOULD IMPROVE GUIDANCE FOR PURCHASES AND LEASES"

DEPARTMENT OF DEFENSE COMMENTS TO THE GAO RECOMMENDATION

RECOMMENDATION 1: The Government Accountability Office (GAO) recommends that the Secretary of the Air Force should develop guidance to clarify the circumstances in which lease-versus-purchase analysis for heavy equipment acquisitions are to be conducted and documented.

DoD RESPONSE: Concur. The guidance to govern lease-versus-purchase analysis currently exists and can be found in Federal Acquisition Regulation 7.401(b), Defense Federal Acquisition Regulation Supplement 207.401, Defense Procurement and Acquisition Policy website, Policy Office of Management and Budget Circular A-94, AFMAN 65-506, and AFI 64-501. Training on lease-versus-purchase e analysis has been developed by the Air Force and can be found on the Defense Procurement and Acquisition Policy website at: https://www.acq.osd.mil/dpap/ccap/cc/jcchb/HTML/Topical/lease_purchase.html. This training ensures analysis regarding the projected costs and benefits of various ownership or leasing options are completed as part of the acquisition planning process.

Air Force Contracting plans to issue a What's New in Air Force Contracting bulletin to serve as a reminder for Air Force contacting professionals. This bulletin will provide a direct link to the training and resources available. The publishing of this bulletin is to be completed no later than March 2, 2018.

Appendix IV: Comments from the Department of Interior

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

FEB 12 2018

Ms. Lori Rectanus
Director, U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Rectanus:

Thank you for providing the Department of the Interior (Department) the opportunity to review and comment on the draft Government Accountability Office (GAO) report entitled, *Heavy Equipment: Selected Agencies Should Improve Guidance for Purchases and Leases* (GAO 18-295). We appreciate GAO's review of federal agencies' management of heavy equipment.

The Department concurs with the recommendation issued by GAO that the Secretary of the Interior further clarify in guidance the circumstances in which lease-versus-purchase analysis for heavy equipment acquisitions are to be conducted and documented.

The Department plans to develop and issue guidance to clarify the circumstances in which lease-versus-purchase analyses for heavy equipment acquisitions are to be conducted and documented.

If you have any questions, please contact Megan Olsen, Director, Office of Acquisition and Property Management of at Megan_Olsen@ios.doi.gov.

Sincerely,

Scott J. Cameron
Principal Deputy Assistant Secretary
for Policy, Management and Budget
Exercising the Authority of the Assistant Secretary
for Policy, Management and Budget

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Lori Rectanus, (202) 512-2834 or RectanusL@gao.gov

Staff Acknowledgments

In addition to the individual named above, John W. Shumann (Assistant Director), Rebecca Rygg (Analyst in Charge), Nelsie Alcoser, Melissa Bodeau, Terence Lam, Ying Long, Josh Ormond, Kelly Rubin, Crystal Wesco, and Elizabeth Wood made key contributions to this report.