

# ARMY WORKING CAPITAL FUND FISCAL YEAR 2021 BUDGET ESTIMATES



SUBMITTED TO CONGRESS FEBRUARY 2020

---

Front Cover Photograph:

Soldiers test M1A2 Abrams Main Battle Tanks during a live-fire accuracy screening test.

---

# Table of Contents

## ARMY OVERVIEW

Background	1
AWCF Activity Groups	5
Budget Highlights	6
Fund Balance with Treasury	10
Capital Budget	15

## SUPPLY MANAGEMENT OPERATING BUDGET

Introduction	16
Budget Highlights	22
Appropriations	29
Exhibits	31

## INDUSTRIAL OPERATIONS OPERATING BUDGET

Introduction	42
Budget Highlights	54
Appropriations	61
Minimum Capital Investment for Certain Depots and Arsenals	62
Exhibits	63

## CAPITAL BUDGET

Introduction	77
Supply Management Exhibits	79
Industrial Operations Exhibits	82



Paratroopers fire 105mm artillery rounds with an M119A3 Howitzer

The estimated cost of this report for the Department of Defense (DOD) is approximately \$60,695 for Fiscal Year 2020. This includes \$899 in expenses and \$61,594 in DOD labor.

All photographs in this document were obtained from official U.S. Department of Defense web sites.



# Army Civilian Corps Creed

I am an Army civilian – a member of the Army team.

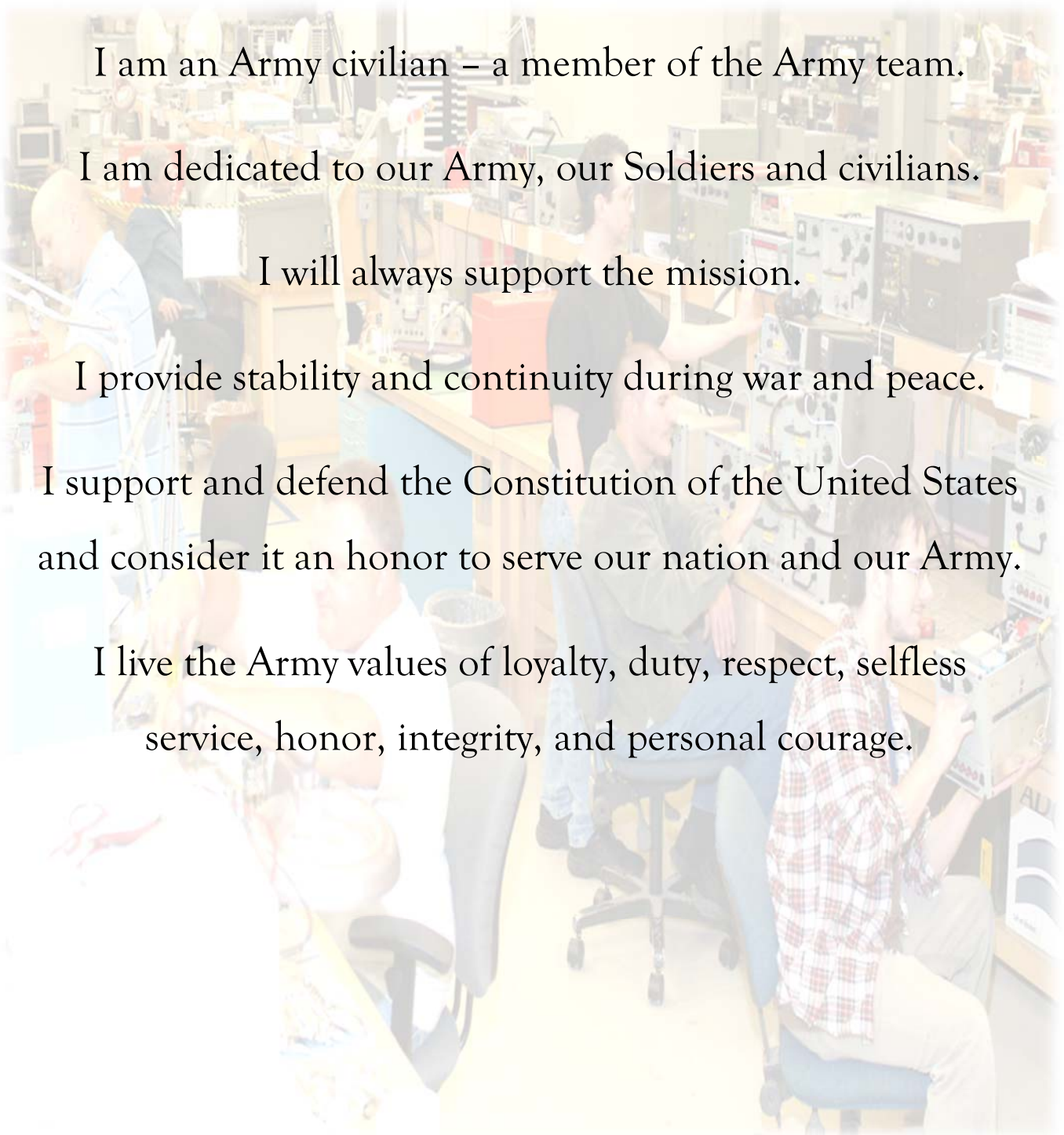
I am dedicated to our Army, our Soldiers and civilians.

I will always support the mission.

I provide stability and continuity during war and peace.

I support and defend the Constitution of the United States and consider it an honor to serve our nation and our Army.

I live the Army values of loyalty, duty, respect, selfless service, honor, integrity, and personal courage.



# Army Overview

## Background

Working capital funds were established by Congress to more effectively control and account for the cost of programs and work performed in the Department of Defense. Under the provisions of Title 10 United States Code, § 2208, the Secretary of Defense may establish working capital funds to finance inventories of supplies and industrial-type activities that provide common services such as repair, manufacturing, or remanufacturing. Unlike profit-oriented commercial businesses, the revolving fund's goal is to break even by returning any monetary gains to appropriated fund customers through lower rates or collecting any monetary losses from customers through higher rates. Revolving fund prices are generally stabilized or fixed during the year of execution to protect customers from unforeseen fluctuations that would impact their ability to execute the programs approved by Congress.

The basic tenet of the revolving fund structure is to create a customer-provider relationship between military operating units and support organizations. This relationship is designed to make managers of the Army Working Capital Fund (AWCF) and decision-makers at all levels more aware of costs for goods and services.



Supplies are dropped to deployed U.S. Soldiers

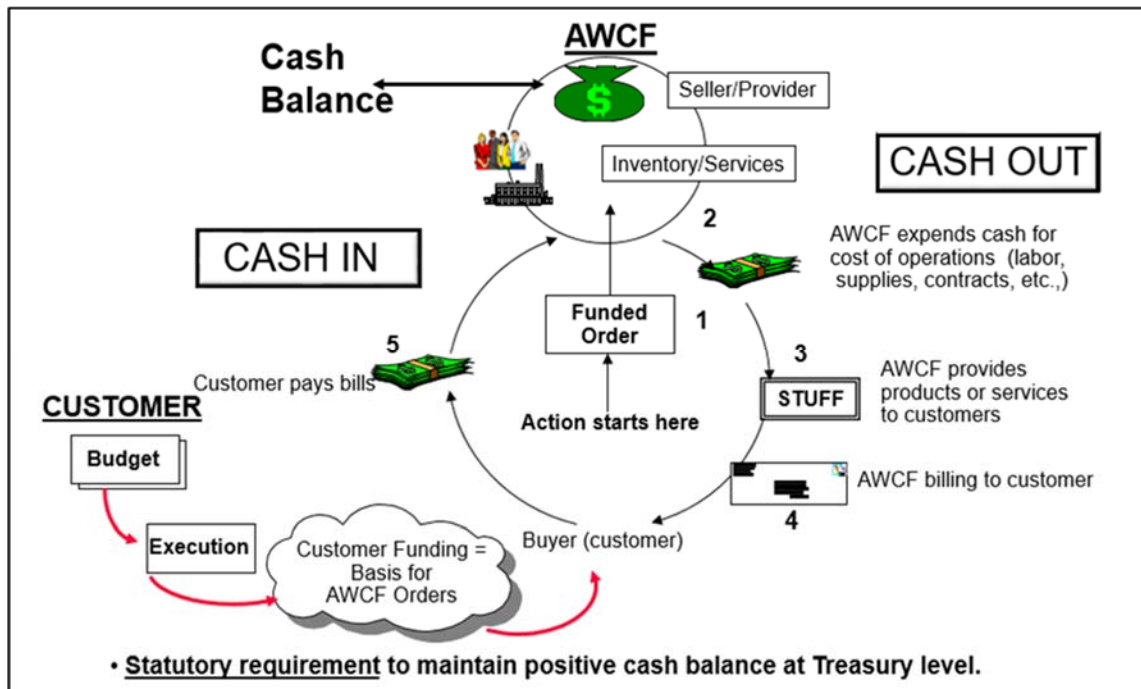
The Army's revolving fund activities evolved from two separate types of funds. The first type, known as the Stock Fund, procured spare parts in volume to either sell to customers or hold in inventory. The second type, known as the Industrial Fund, provided industrial services to customers, such as depot maintenance, munitions and weapon systems component manufacturing, and ammunition storage. Both types of revolving funds were financed primarily by reimbursements from customer appropriated accounts.

Figure 1 on the next page shows the interaction between customers' appropriated funds, AWCF business operations, and cash. Customer appropriated funding is synchronized with AWCF workload forecasts during budget development. During the year of execution, appropriated fund customers



submit funded orders (1) to AWCF providers requesting services (repair, overhaul, or manufacturing) or supplies (spare or repair parts). This obligates appropriated funds. In step 2, AWCF Supply Management purchases inventory for resale to customers. Also in step 2, Industrial Operations orders materiel and hires labor, supporting the projected workload (CASH OUT). In step 3, the customer receives the completed product or service and a bill (4) for payment. The customer pays the AWCF (5) for the materiel or services (CASH IN). Proper pricing of inventory and services, and accurately forecasting workload allows a balance between CASH OUT and CASH IN. Variance between these actions results in either a gain or loss of AWCF cash. Gains are returned to customers through lower future prices while losses are recouped through higher future prices.

Figure 1 - AWCF Cash Process



## Introduction

The FY 2021 AWCF budget is aligned with the National Defense Strategy and supports the Army's vision to provide U.S. land forces with readiness and lethality, enabling the Army to Compete, Deter, and Win in ground combat against any adversary. The AWCF directly supports the materiel readiness of operating units.

The revolving fund structure encourages cost-effectiveness, flexibility, and adaptability to meet changing workload requirements in the year of execution. It also supports full cost visibility and full cost recovery while protecting appropriated fund customer accounts from year of execution price changes. The AWCF consists of the Supply Management and Industrial Operations activity groups, with operations spanning across seventeen cities and local areas within fourteen states. The exact locations are shown in each business activity's portion of the budget. The AWCF activities disbursed approximately \$12.1 billion in FY 2019 to maintain the readiness and sustainability of military equipment.

## Performance Measures

Key financial measures are net operating result, accumulated operating result, and unit cost.

The net operating result (NOR) represents the difference between revenue and expenses within a fiscal year. Accumulated operating result (AOR) represents the summation of all operating gains or losses since activity group inception along with any prior period adjustments. Prices and rates are set at a level that brings the accumulated gains and losses to zero over the budget cycle. The unit cost is a metric primarily used in the Supply Management activity group to relate operating costs to each dollar of sales. It is measured by dividing gross operating cost (the sum of total obligations, depreciation expense, and credit) by gross sales. Adjusting the unit cost determines how much obligation authority may be distributed based on gross sales.



A 30mm Stryker infantry carrier vehicle conducts a tactical road march

In addition to financial measures (NOR, AOR, and unit cost), operational measures assess how well the financial inputs reflected in the AWCF budget support Army strategic goals and operational readiness. Operational measures include productive yield (an indicator of whether direct labor employees can



support projected workload) and stock availability (a measure of the ability of AWCF inventory to fill a customer's requisition). These are identified within each activity group's narrative.

## Logistics Modernization Program

The Army's Logistics Modernization Program (LMP) provides a modernized logistics and finance solution that allows the U.S. Army Materiel Command (AMC) to provide world-class logistics readiness to Soldiers. LMP delivers a fully integrated suite of software and business processes, providing streamlined data on maintenance, repair and overhaul, finance, acquisition, spare parts, and materiel. It is the Army's core logistics information technology (IT) initiative, which meets the Army's IT logistics vision of transformation from legacy applications to a modernized logistics enterprise solution.

LMP manages approximately seven million transactions daily and is integrated with more than 80 DOD systems including interfaces with Army's other enterprise resource planning systems: Army Enterprise Systems Integration Program; Global Combat Support System-Army; and General Fund Enterprise Business Systems. LMP is currently used by more than 21,000 users at more than 50 Army and DOD locations. Enhancements and system changes continue to be applied to LMP to ensure compliance with statutory and regulatory requirements.



A U.S. infantryman pulls security next to an M2 Bradley Fighting Vehicle during a simulated training exercise





# Activity Groups

## Supply Management

The Supply Management activity group buys and manages spare and repair parts for sale to its customers, primarily Army operating units. The activity group is committed to supporting and building readiness for present and future challenges. The Army's equipment and operational readiness, and the strength to win the Nation's wars, are directly linked to the availability of spare parts. Supply Management administers spare parts inventory for Army managed items, Non-Army managed items (NAMI) and war reserve secondary items (WRSI). It also maintains a protected inventory of spares in Army Prepositioned Stocks (APS), which is released to support deploying combat units. The Life Cycle Management Commands assigned to the Army Materiel Command manages the Supply Management activity, which consists of four major commodity groups: aviation and missile; communications-electronics; tank-automotive and armament; and NAMI. The war reserve stocks contain materiel from all commodity groups. As new equipment is added to the Army's operational and training forces, new spare parts are also scheduled for inclusion in the Supply Management inventory.

## Industrial Operations

The Industrial Operations activity group provides the Army an organic industrial capability to: conduct depot level maintenance, repair and upgrade; produce munitions and large caliber weapons; and store, maintain, and demilitarize materiel for all branches of DOD. Industrial Operations is comprised of thirteen government owned and operated installation activities, each with unique core competencies. These include five hard-iron maintenance depots, three arsenals, two munitions production facilities, and three storage sites. Although comprised of diverse organic industrial capabilities, the preponderance of workload and associated estimates in the Industrial Operations budget submission relate to depot level maintenance, repair, and upgrade. The complex operational environment continues to place tremendous demands on equipment, resulting in higher usage rates than in routine peacetime operations. The Industrial Operations activities play an integral role in resetting equipment as it retrogrades from combat operations.



Abrams tanks and Bradley vehicles are stored in a warehouse storage site



The Army's equipment Reset program is defined as a set of actions restoring equipment to a level of pre-deployment capability commensurate with a unit's future mission. Army equipment reset will replace<sup>1</sup>, recapitalize<sup>2</sup>, or repair<sup>3</sup> equipment to meet 10/20 maintenance standards and operational requirements. The Industrial Operations activity group is involved with both the recapitalization and repair efforts. The budget incorporates depot workload assumptions associated with the Reset program (Overseas Contingency Operations funding) and peacetime training operations.

# Budget Highlights

## Overview

The FY 2021 budget represents a business plan that supports Soldier and weapon systems readiness for both peacetime training and wartime operating requirements. The AWCF budget supports the Army's plans to maintain and strengthen unit readiness. The Army's training objective in FY 2021 continues restoration of core capabilities and balances operational capability and flexibility across the Army to meet the National Defense Strategy. The Army resources all active component ground units to conduct Decisive Action training and achieve the highest training readiness levels attainable based on available resources.

The adequacy and predictability of resources is critical for accurately forecasting and executing workload. OPTEMPO assumptions assist in the development of the budget request, but as changes to these assumptions materialize, the projections for the AWCF can change significantly. To offset this risk, both activity groups will be able to adapt to changing workload forecasts, constraining or expanding costs as necessary. The Supply Management budget request includes variability target to support spares replacement for any surge in customer demands above projected levels. The Industrial Operations activity group budget request includes a mix of permanent, temporary, and term-

---

<sup>1</sup> The purchase of new equipment to replace battle losses, worn-out or obsolete equipment, and critical equipment deployed and left in theater, but needed for homeland defense, homeland security, and other critical missions.

<sup>2</sup> A rebuild effort that extends the equipment's useful life by returning it to a near zero-mile/zero-hour condition with either the original performance specifications or with upgraded performance specifications.

<sup>3</sup> A repair or overhaul effort that returns the equipment's condition to the Army standard. It includes the Special Technical Inspection and Repair (STIR) program for aircraft.



appointment employees, in addition to contract labor, to better respond to unanticipated increases or decreases in new orders.

## Personnel

The AWCF civilian personnel posture reflects an overall decrease in FY 2021 end strength. Changes to personnel levels are discussed within the narrative of each activity group. Civilian and military end strength and civilian full time equivalents are shown in the following table.

Table 1 - Personnel

	FY 2019	FY 2020	FY 2021
<b>Supply Management</b>			
<i>Civilian End Strength</i>	1,966	2,131	2,068
<i>Full Time Equivalents</i>	1,966	2,131	2,068
<i>Military End Strength</i>	2	2	2
<b>Industrial Operations</b>			
<i>Civilian End Strength</i>	20,158	21,195	21,115
<i>Full Time Equivalents</i>	19,681	21,109	21,158
<i>Military End Strength</i>	23	24	24
<b>Total</b>			
<i>Civilian End Strength</i>	22,124	23,326	23,183
<i>Full Time Equivalents</i>	21,647	23,240	23,226
<i>Military End Strength</i>	25	26	26

## Revenue and Expenses

Revenue is an indicator of the combined volume of work completed by the AWCF activity groups. Expenses identify the cost of goods and services produced or sold. Both revenue and expenses are expected to decrease in the budget year based on workload. Major expense drivers include cost of goods sold for Supply Management and the cost of labor and materiel consumed in Industrial Operations. Table 2 and Chart 1 show revenue and expenses for Supply Management and Industrial Operations.

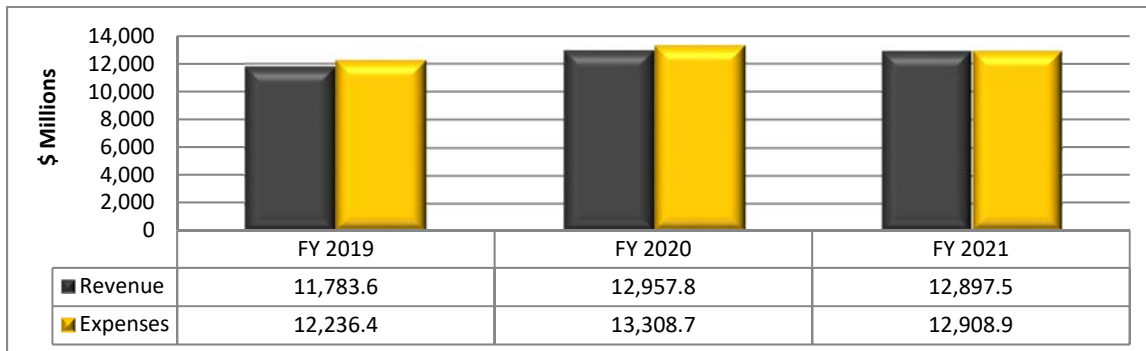


Table 2 - Revenue and Expenses

(\$ Millions)	FY 2019	FY 2020	FY 2021
<b>Revenue</b>			
<i>Supply Management</i>			
Gross Sales	9,460.7	10,188.3	10,238.2
Less Credit	2,406.6	2,167.2	2,183.3
Net Supply Management	7,054.2	8,021.1	8,054.9
<i>Industrial Operations</i>			
Total Revenue	11,783.6	12,957.8	12,897.5
<b>Expenses</b>			
<i>Supply Management</i>			
Supply Management	7,295.7	8,176.8	7,911.9
<i>Industrial Operations</i>			
Total Expenses	12,236.4	13,308.7	12,908.9

Note: Total revenue above does not include appropriated funds for war reserve secondary items as shown on the Supply Management exhibit Fund 14, *Revenue and Costs*. Numbers may not add due to rounding.

Chart 1 - Revenue and Expenses



## Net and Accumulated Operating Results

Financial performance is measured by comparing actual results to goals. The goal of the AWCF is to break even over time. Army considers several factors when determining the accumulated operating result (AOR) amount to return in the rates. Returning a large positive AOR balance in one year may cause the rates to drop significantly in that year and increase significantly in the following year. In addition, the Army reviews the cash balance and the projected balance for the budget year to determine if sufficient cash exists to return the gain to the customers. In FY 2021, Supply Management activity rate includes a positive cash surcharge of \$48.2 million to offset costs from the purchase of inventory in support of Authorized Stockage List (ASL) requirements in FY 2019. The Industrial Operations activity received approval to defer the return of \$263.8 million of AOR for future rate stabilization as workload decreases. Table 3 shows the net and accumulated operating results for both Supply



Management and Industrial Operations. Details can be found under the NOR and AOR section for each business area.

Table 3 - Operating Results

(\$ Millions)	FY 2019	FY 2020	FY 2021
<b>Supply Management</b>			
<i>Net Operating Result</i>	(241.5)	(155.6)	143.1
<i>Prior Year AOR</i>	254.1	12.6	(143.1)
<i>Accumulated Operating Result</i>	12.6	(143.1)	0.0
<b>Industrial Operations</b>			
<i>Net Operating Result</i>	(71.4)	(48.9)	(83.9)
<i>Deferred AOR</i>	0.0	0.0	(263.8)
<i>Accumulated Operating Result</i>	396.6	347.7	0.0
<i>Note: Numbers may not add due to rounding</i>			

## Customer Rates

Each activity group has a unique rate structure. The Supply Management activity group adds a cost recovery rate (CRR) to the price of inventory items sold to recoup operating costs. Typical cost categories within the CRR include civilian pay, distribution depot costs, transportation costs, other Defense bills associated with supply operations, and costs of replacing inventory losses. The Industrial Operations activity group sets customer rates on a direct labor hour basis. The hourly composite rate recovers all costs, both direct and overhead. Activity group rates are stabilized so that the customer's buying power is protected from price swings during the year of execution. Table 4 shows the Supply Management composite cost recovery rates and the Industrial Operations composite direct labor hour rates.

Table 4 - Customer Rates

	FY 2019	FY 2020	FY 2021
<b>Supply Management</b>	13.3%	11.0%	15.6%
<b>Industrial Operations</b>	\$155.28	\$155.28	\$155.28



## Customer Rate Change

The Supply Management customer rate change is expressed as the change in overhead costs weighted by sales revenue. Table 5 shows the customer rate change for both business areas.

Table 5 - Price Change to Customer

	FY 2019	FY 2020	FY 2021
<b>Supply Management</b>	0.4%	(0.1%)	4.1%
<b>Industrial Operations</b>	0.0%	0.0%	0.0%

## Fund Balance with Treasury

The Defense Working Capital Fund (DWCF) Fund Balance with Treasury, account symbol 97X4930, is subdivided at the Treasury into five sub-numbered Treasury accounts. The Army's account is 97X4930.001. The current balance of funds with Treasury is equal to the amount at the beginning of the fiscal year plus the cumulative fiscal-year-to-date amounts of collections, appropriations, and transfers-in minus the cumulative fiscal-year-to-date amounts of disbursements, withdrawals, and transfers-out. The AWCF is required to maintain a positive cash balance to prevent an Anti-deficiency Act violation under Title 31, United States Code, § 1517(a), *Prohibited obligations and expenditures*. Unlike appropriated funds, the AWCF cash balance is not equal to outstanding obligations. Cash on hand at Treasury must be sufficient to pay bills when due and should remain sufficient to support operational requirements plus six months of capital investment program disbursements.

The operational requirement may include any positive accumulative operating result returned to customers, cash equal to undisbursed direct appropriations, and a commodity/market adjustment. In preparation for daily cash visibility at the Department of Treasury, Army studied weekday cash transactions from the Logistics Modernization Program (LMP). This study identified a pattern of multiple disbursement cycles before a collection cycle. The operational cash requirement also includes risk mitigation factors to ensure sufficient cash is available for these cycles.

The cash balance is primarily affected by cash generated from operations but the balance is also impacted by appropriations, transfers, and withdrawals. Maintaining a proper cash balance is dependent on setting rates to recover full costs, including prior year losses, and accurately projecting workload.



## Cash from Operations

The day-to-day operations of the fund consume and replenish cash. The FY 2021 cash plan includes all expected collections and disbursements from the operations of both the Supply Management and Industrial Operations activity groups, including appropriations and transfers. Chart 2 displays collections and disbursements from operations, however does not include appropriations and transfers. The projected change in collections and disbursements from FY 2020 to FY 2021 is due to a combination of collecting more overhead from customers through positive cash surcharge and disbursing less due to total obligations decreasing.

Chart 2 - Cash from Operations

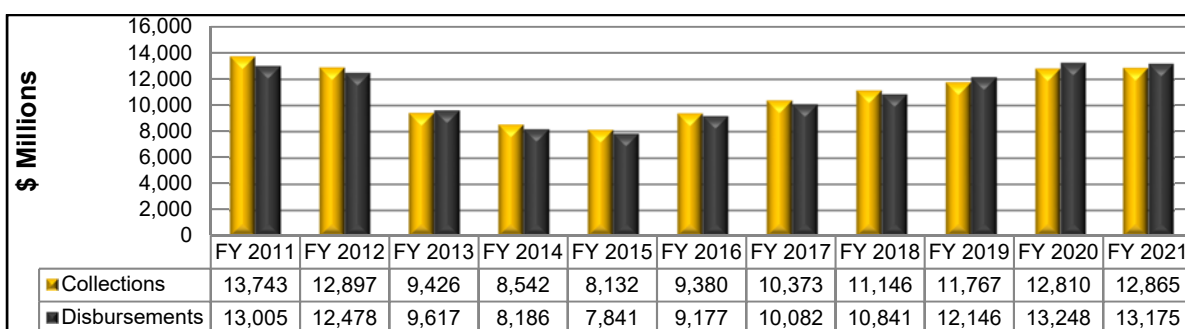
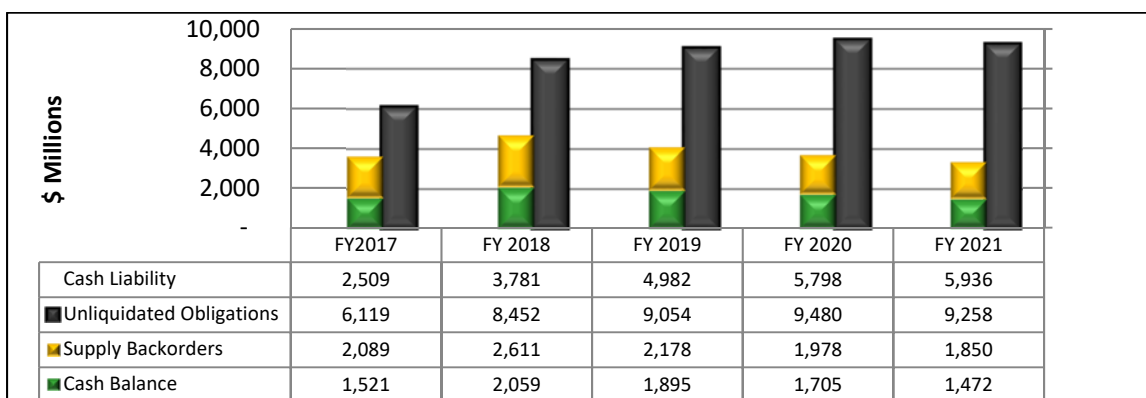


Chart 3 displays the potential risk to the AWCF cash balance through FY 2021 due to unliquidated obligations (ULOs). ULOs represent the dollar value of material and services ordered but not yet received by the AWCF. ULOs will result in future disbursements, reducing cash. There is increased risk to cash when ULOs are high even though collections from backorders mitigate a portion of this risk. Fund managers must maintain a sufficient cash balance to cover future disbursements as the material and services are delivered. The AWCF has experienced a large increase to ULOs since FY 2017 due to significant increases in material obligations supporting the Army's readiness objectives.

Chart 3 – Cash Liability



## Appropriations

Table 6 displays the requested AWCF Direct Appropriations broken out by type. The Supply Management Activity (SMA) is requesting War Reserve Secondary Items to purchase secondary items for Army Prepositioned Stocks (APS) and Inventory Augmentation. The Overseas Contingency Operations (OCO) requests support activities participating in European Deterrence Initiative (EDI). For further explanation on these requested Direct Appropriations see the Supply Management Activity section.

The Industrial Operations (IO) activity is requesting Industrial Mobilization Capacity for costs associated with maintaining facilities to meet surge capacity needed for mobilization or war. For further explanation on IO Direct Appropriations request please see the Industrial Operations section.

Table 6 – Appropriations

<b>(\$ Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>War Reserve Secondary Items</b>	<b>89.1</b>	<b>52.2</b>	<b>44.3</b>
<i>Base Funding</i>	79.2	32.1	24.2
<i>Overseas Contingency Operations</i>	9.9	20.1	20.1
<b>Industrial Mobilization Capacity</b>	<b>59.0</b>	<b>57.5</b>	<b>32.6</b>
<i>Base Funding</i>	59.0	57.5	32.6
<i>Overseas Contingency Operations</i>	0.0	0.0	0.0
<b>Arsenal Sustainment Initiative</b>	<b>99.0</b>	<b>129.0</b>	<b>0.0</b>
<i>Base Funding</i>	99.0	129.0	0.0
<i>Overseas Contingency Operations</i>	0.0	0.0	0.0
<b>Digital Manufacturing Pilot Program</b>	<b>0.0</b>	<b>9.0</b>	<b>0.0</b>
<i>Base Funding</i>	0.0	9.0	0.0
<i>Overseas Contingency Operations</i>	0.0	0.0	0.0
<b>Total Appropriated Funds</b>	<b>247.1</b>	<b>247.7</b>	<b>76.8</b>
<i>Base Funding</i>	237.2	227.6	56.7
<i>Overseas Contingency Operations</i>	9.9	20.1	20.1

Note 1: The Overseas Contingency Operations (OCO) funding requested is for Enduring Requirements (\$20.1 million). OCO for Enduring Requirements are enduring in-theater and in-CONUS costs that will likely remain after combat operations cease, but have previously been funded in OCO. FY19 values reflect direct appropriation obligations.





## Cash Management Plan

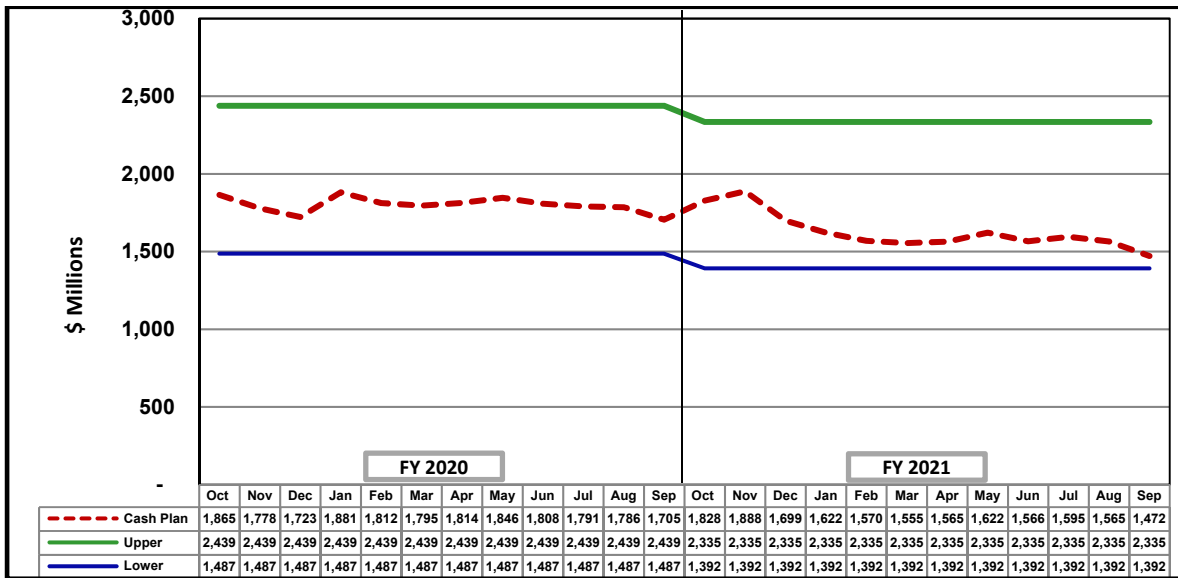
The AWCF cash requirement is established using a process, based on four primary elements: 1) rate of disbursements; 2) range of operations; 3) risk mitigation; and 4) cash reserves. This method is known as the “Four Rs” and the elements are explained below:

- 1) **Rate of Disbursements** – The rate of disbursements varies within the Army’s two activity groups; thus an optional calculation was used to derive the average amount disbursed between collection cycles.
- 2) **Range of Operations** – The range of operations are derived using the difference between the highest and lowest expected monthly cash level in the preceding fiscal year.
- 3) **Risk Mitigation** – The risk mitigation element includes a factor for operational volatility and the supply management pricing/credit policy. Operational volatility is based on multiple disbursement cycles before a collection cycle. A factor is also included for risk mitigation supporting the Army’s recent return to standard pricing and credit.
- 4) **Cash Reserves** – The cash reserves includes the amount of positive accumulated operating results planned to be returned to the customers; unliquidated disbursements for capital investments; direct appropriations; a commodity/market price adjustment; and an amount to cover the minimum required capital investment.

Chart 4 shows the projected monthly cash balances for FY 2020 and FY 2021. This chart demonstrates how the afore mentioned cash from operations and appropriations effect the cash balance, as well as where the projected ending balance falls within the upper and lower operating range. The FY 2021 Customer Prices have been set to achieve a cash balance within the operating range.



Chart 4 - Cash Management Plan



## End of Year Cash Balance

Table 7 shows total collections, disbursements, appropriations, transfers, and ending cash balances. The FY 2021 budget includes a cash plan based on projected operational and capital disbursements, collections, and direct appropriations. Upper and lower operational range cash requirements have been identified to measure the sufficiency of cash. The FY 2021 cash balance is projected to be within the upper and lower operational requirements. Although no advance billings are included in the budget submission, the Supply Management rate includes a cash surcharge that will collect losses of \$48.2 million to customers in FY 2021.

Table 7 - Cash Balance

(\$ Millions)	FY 2019	FY 2020	FY 2021
<i>Disbursements</i>	12,146.4	13,247.6	13,174.9
<i>Collections</i>	11,767.4	12,810.1	12,865.0
<i>Net Outlays from Operations</i>	379.0	437.5	309.9
<i>Direct Appropriations</i>	264.4	247.7	76.8
<i>Transfers In</i>	0.0	0.0	0.0
<i>Transfers Out</i>	50.0	0.0	0.0
<i>Total Net Outlays</i>	164.6	189.8	233.1
<b><i>Ending Cash Balance</i></b>	<b>1,894.6</b>	<b>1,704.8</b>	<b>1,471.7</b>
<i>Upper Operating Range</i>	2,439.9	2,438.7	2,334.7
<i>Lower Operating Range</i>	1,551.0	1,486.5	1,392.0



# Capital Budget

The AWCF activities develop and maintain operational capabilities by acquiring or replacing production equipment, executing minor construction projects, and developing software. New equipment is acquired to replace obsolete and unserviceable equipment, modernize production and maintenance processes, and eliminate environmental hazards. The cost of capital projects is recouped through capital investment recovery included in customer rates. Unlike the operating budget which contains the annual operating costs of each activity, the capital budget justifies the purchase of assets that equal or exceed a unit cost of \$250,000 and have a useful life of two or more years.

A more in-depth discussion and detailed exhibits are provided in the Capital Budget section. Table 8 summarizes the AWCF capital investment program request.

Table 8 - Capital Budget

<b>(\$ Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Supply Management</b>	32.7	21.7	20.3
<b>Industrial Operations</b>	68.8	82.7	70.7
<i>Total Capital Budget</i>	101.5	104.4	90.9
<i>Total Capital Cash Outlays</i>	106.1	100.7	99.0



# Supply Management

## Introduction

The Supply Management activity group operates in a business-like environment by relying on sales revenue rather than appropriations to finance continuing operations. This enterprise uses contract authority to procure and repair spare parts. As suppliers deliver equipment components, the Army Working Capital Fund (AWCF) expends cash and places spare parts in inventory to await customer demands. Filled customer demands result in the collection of sales revenue, which replenishes cash. The Supply Management enterprise synchronizes rates and budget assumptions with Army appropriated funding requests in support of Soldier and weapon systems readiness. The bulk of demands originate from Operation and Maintenance, Army customers, who primarily request spare parts to maintain combat equipment readiness for the Army operating forces.

### **Mission:**

*Provide the Army with inventory management of spare and repair parts supporting equipment sustainment, operational readiness, and combat capability.*

The Army prices spare parts based on the most recent acquisition cost from a commercial vendor, or the most recent repair cost from a contract or organic source of repair. The price of each item includes a surcharge known as the cost recovery rate (CRR), to recover the cost of AWCF operations. The intent of the CRR is to:

- Recover the activity's overhead costs such as payroll, supplies, contracts, storage, transportation, and depreciation
- Maintain a sufficient cash corpus to cover disbursements
- Break even over time

The core financial measures for Supply Management are the net operating result (NOR) and accumulated operating result (AOR). The NOR measures the activity's gain or loss within a single fiscal year, and is used to monitor how closely the activity performs compared to its budget. The AOR measures the activity's accumulated gains and losses since the fund's inception. Rates are set during budget development to break even by bringing the AOR to zero over a budget cycle. This method returns accumulated gains through reduced rates and recovers accumulated losses through increased rates. The cash management section describes the impact of cash balance analysis on rate setting. The unit cost is another core financial measure, and relates operating costs to each dollar



of sales. The unit cost can be set at, above, or below 1.0 depending on projected sales volume; the unit cost section discusses this metric.

## Efficiencies and Business Process Improvements

Cost efficiency is an inherent attribute of the AWCF. The revolving fund construct promotes total cost visibility, full cost recovery, and fosters a business-like, competitive atmosphere. Although commercial businesses focus on their bottom line profit, the Supply Management activity focuses on the unit cost and other indicators to gauge the efficiency of the operation. Supply Management activities continue to emphasize the control of overhead costs also known as logistics operations (LOGOPS).

Army Materiel Command (AMC) continues proactive measures of reducing inventory through the Sales and Operations Planning (S&OP) process initiated in FY 2013. The S&OP process allows management better oversight and improves the supply chain review process and financial planning. The supply chain review process has shifted from the legacy review of inventory by segmentations to total inventory holdings. The S&OP decisions and action plans align to established strategic goals and are executed through the Army's supply action module, Material Requirements Planning (MRP), in the Logistics Modernization Program (LMP). Army's current focus is on improving inventory turns, establishing new inventory reduction goals, and reducing forecast errors. AMC also facilitates quarterly reviews of unserviceable assets to better assess the need to repair rather than initiating new procurement.

## Inventory Management

In FY 2016, the Army changed the methodology used to calculate inventory requirements from a quarterly stratification of inventory report known as STRAT to a monthly Supply Chain Planning and Reporting Tool (SCPRT). The movement to SCPRT aligns reporting requirements with the Army's Enterprise Resource Planning (ERP) system, Logistics Modernization Program (LMP). This change leverages LMP's Material Requirements Planning (MRP) module using backwards planning of requirements, improves accuracy of forecasting, and better supports Warfighter requirements.

Army continuously takes proactive measures ensuring forecasted inventory meets future demands. Army reviews and validates requirement levels versus inventory levels maintaining focus on buying and repairing items needed by customers, and not retaining excess inventory.



## Functional Description

The Supply Management activity group buys and manages an operating inventory of Army-managed and non-Army managed spare and repair parts for sale to its customers, primarily Army operating units. The activity group also maintains a protected inventory of spares in Army Prepositioned Stocks (APS) released in support of deploying combat units. The AWCF operating inventory is stored and maintained primarily at more than 200 supply support activities (SSA). SSA management includes, but is not limited to, stocking the items needed for customer readiness, monitoring performance metrics, and conducting inventories. Inventory is managed at national and below national levels as described below:

- National Level - consists of life cycle management commands, depots, and arsenals. Materiel may be Army managed or non-Army managed meaning the source of supply may be Department of the Army, another Service, or another Department of Defense activity. Typically, SSAs request and receive materiel from the national level.
- Below National Level:
  - Tactical – under the control of Sustainment Brigade Commanders. These SSAs provide spares supporting the immediate needs of combat and combat support battalions and companies. The quantity of inventory items is limited to an amount capable of transport by unit organic vehicles or aircraft.
  - Installation - under the control of the Logistics Readiness Centers (LRC). These activities provide a means to retrograde unneeded materiel from tactical SSA to meet other Army requirements. They also stock back-up inventory to meet tactical units' requirements that exceed storage capacity. When deployed to a contingency theater of operations, tactical activities receive back-up support from a theater distribution center established by the deployed force command to centrally receive, redistribute, and retrograde spares as required.

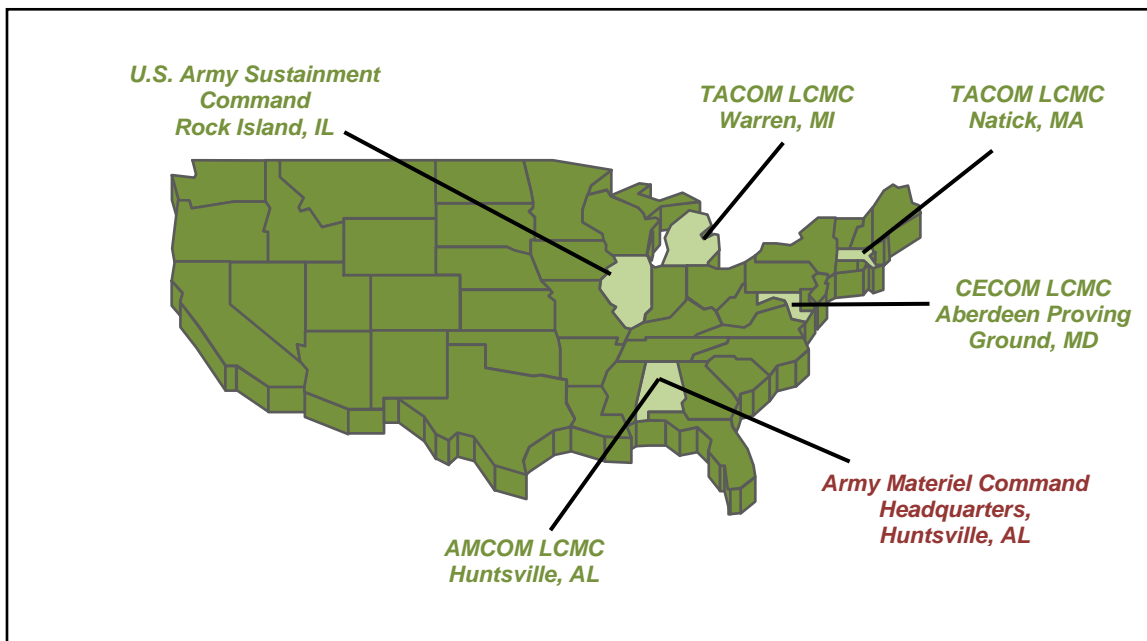
AWCF Army Prepositioned Stock (APS) is protected inventory located in the United States, Europe, South Korea, Kuwait, and aboard ships afloat off Guam and Diego Garcia. This prepositioned war reserve materiel is protected inventory and released to deploying units performing combat, peacekeeping, or other contingency operations.



## Activity Group Composition

Figure SM 1 below displays the locations of Headquarters, Army Materiel Command (AMC), each Life Cycle Management Command (LCMC), and the Army Sustainment Command. The AMC mission is complex and ranges from developing sophisticated weapon systems, to advancing research, to maintaining, and distributing spare parts. Three core competencies encompass AMC's mission: acquisition excellence, logistics power projection, and technology generation and application. AMC works closely with industry, colleges and universities, the other Services, and other government agencies developing, buying, and maintaining state-of-the-art materiel for Army.

Figure SM 1 - Supply Management locations



The LCMCs, assigned to AMC, manage the activity group. Each LCMC acquires and manages consumable supplies and spare parts for distinct categories of weapon systems. The Army Sustainment Command acquires and maintains the Army Prepositioned Stocks, which contain materiel from each LCMC.



The mission of the Tank-automotive and Armaments Command (TACOM) LCMC includes developing, acquiring, equipping, and sustaining ground and support systems for Soldiers and other joint operations through the integration of effective and timely acquisition, logistics, and technology. The TACOM LCMC item managers support a diverse set of product lines through their life cycles, ranging from tracked combat and wheeled tactical vehicles, armaments, and watercraft, to Soldier-specific gear and biological/chemical equipment. Major weapon systems supported include the M1 Abrams Tank, M2 Bradley Fighting Vehicle, Mine Resistant Ambush Protected (MRAP) vehicle, High Mobility Multipurpose Wheeled Vehicle (HMMWV), and Stryker family of vehicles. TACOM LCMC is also responsible for providing clothing and heraldry products to Soldiers, units, and veterans. Included in TACOM LCMC is a small retail business of high demand non-Army managed items (NAMI). TACOM LCMC Headquarters activities are located at Detroit Arsenal in Warren, Michigan and U.S. Army Soldier Systems Center in Natick, Massachusetts. In FY 2021, TACOM LCMC has an authorized level of 713 civilian personnel.



A High Mobility Artillery Rocket Systems (HIMARS) during a large-scale mobility exercise

The Communications-Electronics Command (CECOM) LCMC mission is to develop, provide, integrate, and sustain command, control, communications, computers, intelligence, surveillance, and reconnaissance capabilities for the Army. CECOM LCMC Headquarters activity is located at Aberdeen Proving Ground, Maryland. In FY 2021, CECOM has an authorized level of 781 civilian personnel.



A soldier prepares a Satellite Transportable Terminal (STT) during a field training exercise





The mission of the Aviation and Missile Command (AMCOM) LCMC includes



Soldiers jump out of a UH-60 Black Hawk helicopter as part of a U.S. Army Reserves Competition

developing, acquiring, fielding, and sustaining aviation, missile, and unmanned vehicle systems, ensuring readiness with seamless transition to combat operations. Major weapon systems supported include the AH-64 Apache, UH-60 Black Hawk, CH-47 Chinook, Multiple Launch Rocket System, and Patriot missile. AMCOM LCMC Headquarters activity is located at Redstone Arsenal in Huntsville, Alabama and has operational control of all aviation logistics management functions at Fort Rucker, Alabama, home of the Army Aviation Center. In FY 2021, AMCOM has

an authorized level of 481 civilian personnel.

The mission of the Army Sustainment Command (ASC) mission includes synchronizing distribution and sustainment of materiel to and from the field. Army Prepositioned Stocks are acquired and maintained as a part of this mission. These stocks include combat equipment, supplies, and humanitarian mission stocks at worldwide land and sea-based positions. ASC is located at Rock Island Arsenal, Illinois.



# Budget Highlights

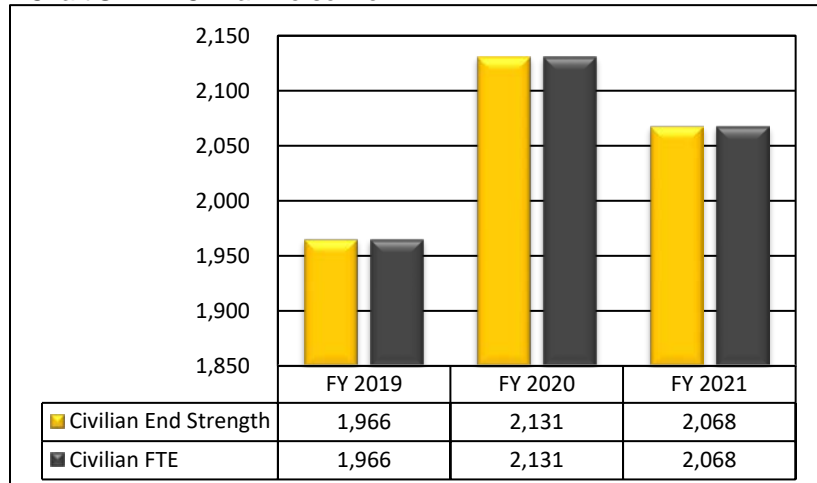
## Assumptions

The FY 2021 budget represents a business plan that supports Soldier and weapon systems readiness for both peacetime training and wartime operating requirements. The budget supports the Army's plans to maintain and strengthen unit readiness. The Army's training objective in FY 2021 continues restoration of core capabilities and balances operational capability and flexibility across the Army to meet the National Defense Strategy. The Army resources all active component ground units to conduct Decisive Action training and achieve the highest training readiness levels attainable based on available resources. If OPTEMPO levels exceed budget estimates during the year of execution, variability target is included in the budget to ensure supply contract authority is available to remain ready and responsive to changing operational requirements. Variability target is further discussed in the Operating Contract Authority section.

## Personnel

The personnel end strength reflects actual execution in FY 2019 and authorized levels in FY 2020 and FY 2021. In FY 2020, FTEs are projected to increase as a result of hiring initiatives. Personnel levels include secondary item managers, logistics management specialists, and general and administrative support positions. Military end strength in FY 2021 is two.

Chart SM 1 – Civilian Personnel



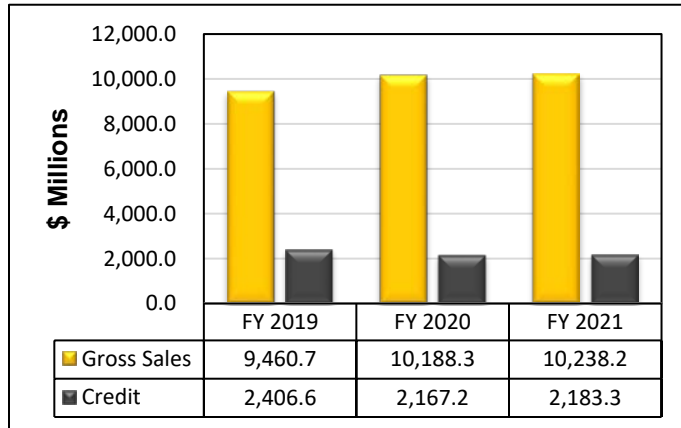
## Sales

Sales and credit reflect increased OPTEMPO activity and customer funding associated with requirements for home station training. Sales reflect income from operations and do not include direct appropriations for war reserve materiel.



Chart SM 2 reflects actual execution in FY 2019 and projected levels in FY 2020 and FY 2021. FY 2021 sales are projected to level-off from FY 2020 sales as the Army's training strategy stabilizes after the increases in previous years. Several exhibits display Sales: Fund 14, *Revenue and Costs*; Fund 11, *Source of New Orders and Revenue*; and SM 1, *Supply Management Summary* (sales net of credit).

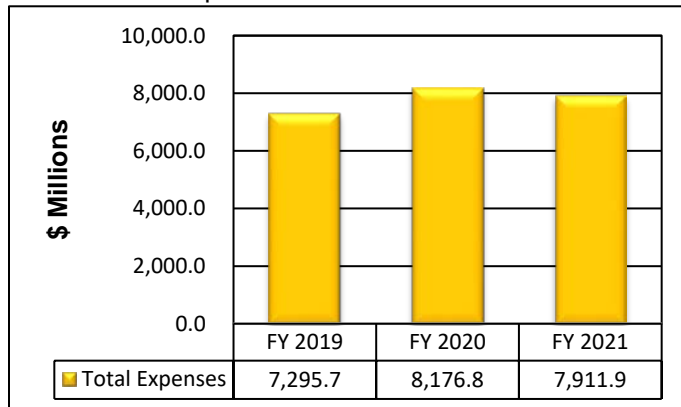
Chart SM 2 – Gross Sales



## Expenses

Expenses consist of materiel and operational costs. The decrease in projected FY 2021 expenses is attributed to lower cost of goods sold. Operational costs for salary, contracts, and materiel and supplies remain steady. Expenses are displayed on exhibit Fund 14, *Revenue and Costs*.

Chart SM 3 – Expenses

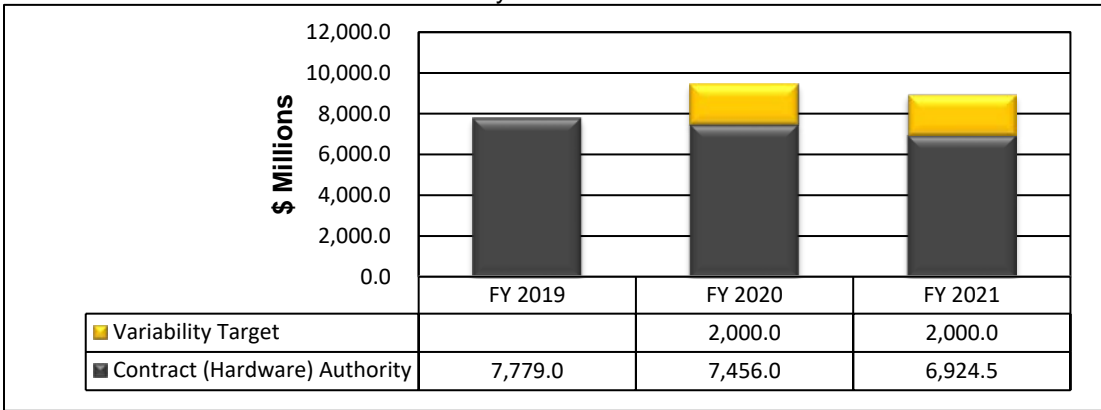


## Operating Contract Authority (Hardware)

The budget requests operating contract authority for the acquisition, repair, and replenishment of spare parts. FY 2021 contract authority requirements are lower than in FY 2020 as the activity has previously acquired inventory to meet increased FY 2020 and FY 2021 customer demand. Variability target is included in the budget to ensure supply contract authority is available to respond rapidly to unexpected variances in costs or customer demands during the year of execution. Operating contract authority is displayed on exhibit SM 1, *Supply Management Summary* and SM 3b, *Operating Requirements by Weapon System*.



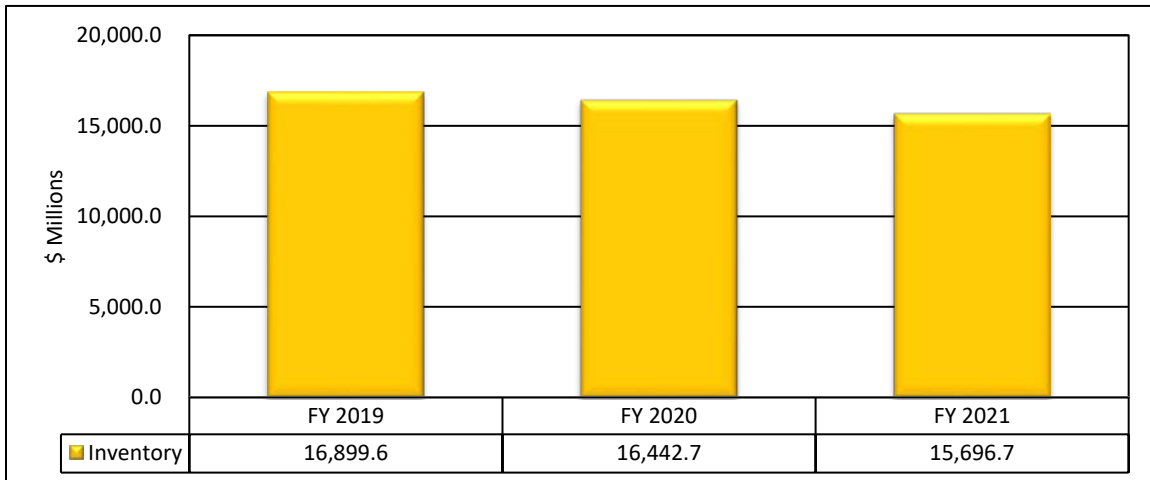
Chart SM 4 – Hardware Contract Authority



## Inventory

Inventory values shown in chart SM 5 below, include operational inventory, carcasses awaiting repair, inventory required beyond the budget year, economic and contingency retention stock, and secondary items included in war reserve. Spares inventory levels are sufficient to ensure high stock availability for war efforts. Supply Management will continue to reduce inactive inventory and dispose of dormant stock, lowering inventory levels in FY 2021. Inventory is displayed on exhibit SM 4, *Inventory Status*.

Chart SM 5 – Inventory



## Operating Results

The net operating result (NOR) represents the difference between revenue and expenses within a fiscal year. The accumulated operating result (AOR) represents the summation of all operating gains and losses since activity group inception along with any prior period adjustments. AWCF operates on a break-even basis during the budget cycle. In the next budget cycle, Supply Management will evaluate its AOR projections, cash position, and impact on future rates to determine the amount of AOR to recover. NOR and AOR are displayed on exhibit Fund 14, *Revenue and Costs*.

Table SM 1 - Operating Results

(\$ Millions)	FY 2019	FY 2020	FY 2021
Net Operating Result	(241.5)	(155.6)	143.1
Prior Year AOR	254.1	12.6	(143.1)
Accumulated Operating Result	12.6	(143.1)	0.0

## Cost Recovery Rate

The Supply Management cost recovery rate (CRR) is set to recover full costs and adjust for gains and losses. Typical costs recovered include civilian pay, distribution depot costs, transportation costs, other Defense bills associated with supply operations, and costs of replacing inventory washouts. The FY 2021 CRR includes a cash surcharge of \$48.2 million to offset costs from the augmentation of inventory in support of Authorized Stockage List (ASL) requirements in FY 2019. The price change to customer is the change in overhead costs weighted by the change in sales volume.

Table SM 2 – Cost Recovery Rate and Price Change

	FY 2019	FY 2020	FY 2021
Cost Recovery Rate (CRR)	13.3%	11.0%	15.6%
Price Change to Customer	0.4%	-0.1%	4.1%

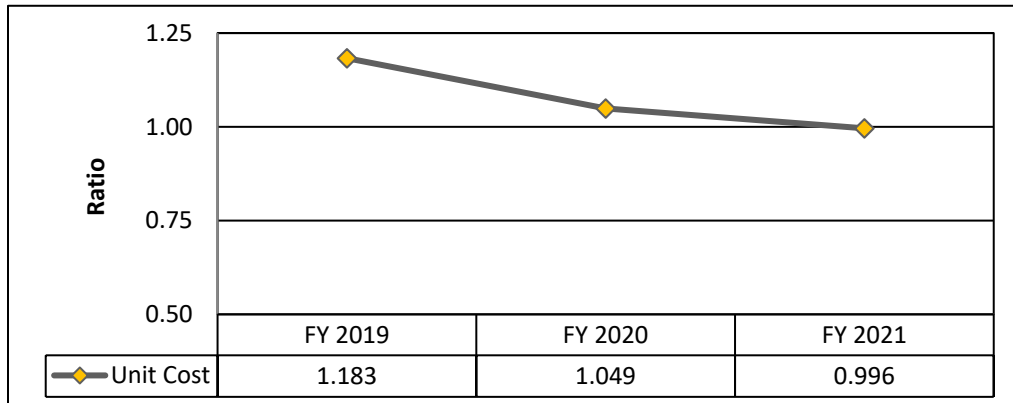
## Unit Cost

The unit cost is a metric relating operating cost to each dollar of sales. Unit cost is calculated by dividing gross operating costs (the sum of total obligations and credit) plus depreciation by gross sales. As recommended in Government Accountability Office (GAO) report 10-480, Army continues to evaluate and adjust the unit cost as necessary to support contingency operations. A unit cost below 1.0 means that the



enterprise is reducing inventory by selling and not replenishing thus reducing contract authority requirement. A unit cost above 1.0 means the Army is purchasing inventory in anticipation of future need based upon inventory management forecasts. As the Army approaches a unit cost of 1.0, this indicates the AWCF inventory is approaching a level consistent with customer demands. Chart SM 6 shows unit cost for FY 2019 through FY 2021.

Chart SM 6 - Unit Cost

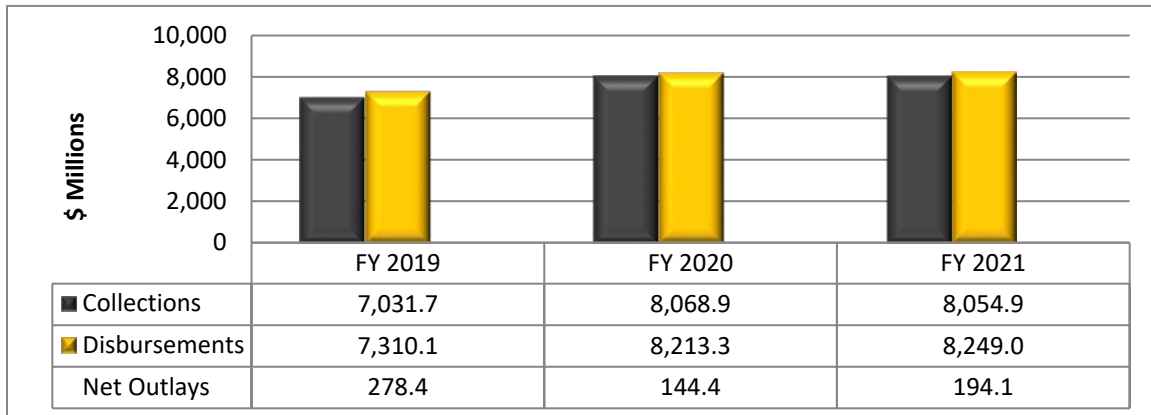


$$\text{Unit cost} = \frac{\text{Obligations} + \text{Credit} + \text{Depreciation expense}}{\text{Gross sales}}$$

## Collections, Disbursements, and Outlays

Collections are projected based on sales and changes in accounts receivable. Disbursements are projected based on monthly operating expenses, changes in accounts payable, and Capital Investment Program obligations.

Chart SM 7 – Cash Management

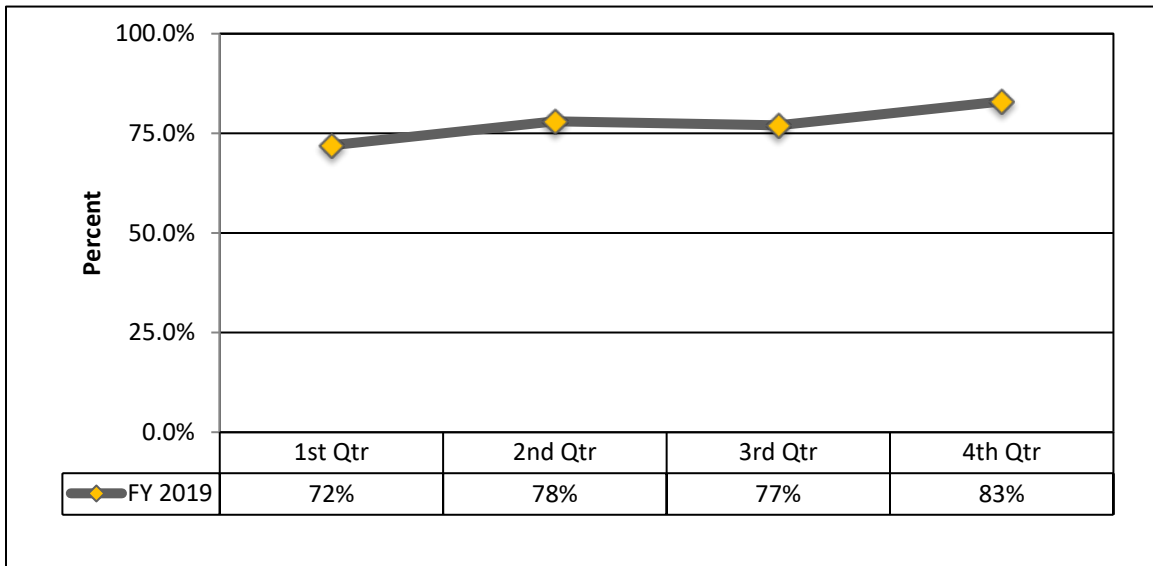


# Performance Measurement

## Stock Availability

Supplying and maintaining Army’s equipment remain key components of readiness. The stock availability (SA) goal is a primary performance measure indicating the ability of the supply system to fill requisitions. The Army’s goal is 85 percent of customer demands fulfilled immediately. SA is administered through adequate funding of hardware, proper management of the supply chain, and reliable oversight of materiel stockage requirements. Chart SM 8 displays SA at the end of each quarter below the 85 percent goal in FY 2019. Army’s shift in training strategy has required a shift in supply planning and prioritization. The Army is working to make corrections to its planning and execution to ensure requirements are met and SA returns to the performance expectation of 85 percent.

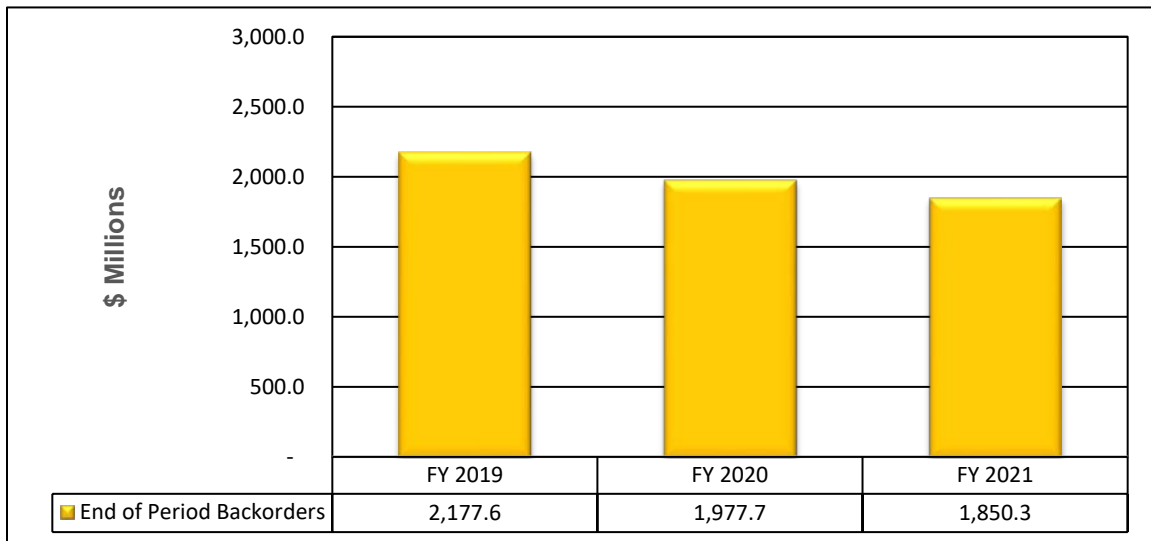
Chart SM 8 – Stock Availability (SA)



## Customer Backorders

Backorders are expected to decrease through FY 2021 due to increased sales. Customer backorders for the end of each fiscal year are displayed on exhibit Fund 11, *Source of New Orders and Revenue*.

Chart SM 9 – Customer Backorders



## Supply Management Workload

Table SM 3 below displays Supply Management workload drivers. The increases in requisitions received and issues completed are based on deployed force activity assumptions.

Table SM 3 - Supply Management Workload

Supply Management Workload	FY 2019	FY 2020	FY 2021
Items Managed	119,972	119,990	119,532
Requisitions Received	791,721	839,565	803,668
Issues Completed	504,082	819,190	770,916
Procurement Receipts	88,424	61,611	58,468
Contracts Awarded	11,758	12,692	11,719

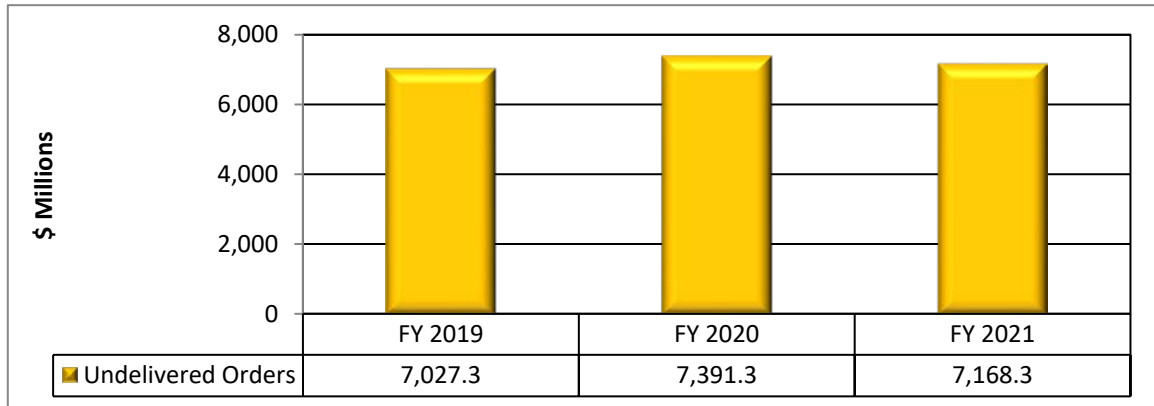




## Undelivered Orders

Undelivered orders represent goods and services ordered, but not yet received by AWCF. A sufficient cash balance is required to pay suppliers upon receipt of these orders. As shown in the chart below, undelivered orders are projected to decrease in FY 2021 due to reduced materiel orders.

Chart SM 10 - Undelivered Orders



## Appropriations

War reserve equipment positioned without secondary items would significantly jeopardize Army's ability to complete its combat missions successfully. The secondary items purchased for war reserves support important combat weapon systems such as M2 Bradley Fighting Vehicle, artillery howitzers, rocket launchers, High Mobility Multipurpose Wheeled Vehicles (HMMWV), and Mine Resistant Ambush Protected (MRAP) Vehicles. FY 2020 Overseas Contingency Operations (OCO) funding of \$20.1 million for War Reserve Secondary Item (WRSI) packets will support new APS-2 static unit sets in Europe to include an Armored Brigade Combat Team (ABCT) and a Medical set. FY 2021 OCO funding of \$20.1 million for WRSI ASL requirements supports the initial builds of a second ABCT in APS-2. SM 4, *Inventory Status* and SM 6, *War Reserve Materiel* exhibits displays War Reserve inventory. Exhibit Fund 14, *Revenue and Costs* displays requested Appropriations.



Table SM 4 - Appropriations

<b>(\$ Millions)</b>	<b>FY 2019 Actuals</b>	<b>FY 2020 Enacted</b>	<b>FY 2021 Request</b>
<b>War Reserve Secondary Items</b>	<b>89.1</b>	<b>52.2</b>	<b>44.3</b>
<i>Base Funding</i>	79.2	32.1	24.2
<i>Overseas Contingency Operations<sup>1</sup></i>	9.9	20.1	20.1
<b>Total Appropriated Funds</b>	<b>89.1</b>	<b>52.2</b>	<b>44.3</b>

Note 1: The Overseas Contingency Operations (OCO) funding requested is for Enduring Requirements (\$20.1 million). OCO for Enduring Requirements are enduring in-theater and in-CONUS costs that will likely remain after combat operations cease, but have previously been funded in OCO.

***War reserve secondary items improve Army's ability to meet global missions by sustaining the deployed combat force until CONUS-based re-supply commences.***



**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**Revenue and Costs  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<b>Revenue</b>			
AMI Sales	7,680.8	8,229.3	8,220.5
NAMM Sales	1,777.2	1,957.0	2,015.7
AMC MOB Sales	2.8	2.0	2.0
<b>Total Gross Sales</b>	<b>9,460.7</b>	<b>10,188.3</b>	<b>10,238.2</b>
<b>Credit and Allowances</b>	<b>2,406.6</b>	<b>2,167.2</b>	<b>2,183.3</b>
<b>Net Sales</b>	<b>7,054.2</b>	<b>8,021.1</b>	<b>8,054.9</b>
<b>Other Income</b>			
War Reserve-Secondary Items	89.1	52.2	44.3
Inventory Augmentation - Spares - Base	0.0	0.0	0.0
Inventory Augmentation - Spares - OCO	0.0	0.0	0.0
<b>Total Income</b>	<b>7,143.3</b>	<b>8,073.4</b>	<b>8,099.2</b>
<b>Costs</b>			
<b>Cost of Materiel Sold from Inventory</b>			
AMI	4,465.7	4,928.8	4,624.6
NAMM	1,775.2	1,955.0	2,013.7
AMC MOB	2.8	2.0	2.0
<b>Total Cost of Materiel Sold from Inventory</b>	<b>6,243.6</b>	<b>6,885.8</b>	<b>6,640.3</b>
Inventory Losses/Obsolescence	49.8	230.7	225.2
<b>Salaries and Wages Total</b>			
	238.8	293.0	303.6
Military Personnel Compensation & Benefits	0.2	0.1	0.1
Civilian Personnel Compensation & Benefits	238.5	292.9	303.5
Travel & Transportation of Personnel	2.3	2.6	2.7
Materiel & Supplies (For Internal Operations)	0.3	1.4	1.4
Equipment	0.7	1.6	1.7
Other Purchases from Revolving Funds	355.0	297.3	305.9
Transportation of Things	81.8	83.7	86.0
Capital Investment Recovery (CIR) - Capital	45.1	44.4	33.3
Printing and Reproduction	3.9	4.0	4.0
Advisory and Assistance Services	38.0	44.6	48.6
Audit Readiness (memo entry)	2.6	5.8	6.0
Financial Statement Audit (memo entry)	2.9	8.0	11.5
Rent, Communication, Utilities & Misc. Charges	0.8	0.4	0.4
Other Purchased Services	235.6	287.3	258.8
<b>Total Expenses</b>	<b>7,295.7</b>	<b>8,176.8</b>	<b>7,911.9</b>
<b>Operating Result</b>	<b>(152.4)</b>	<b>(103.4)</b>	<b>187.3</b>
Less Recovery of Prior Year Pricing Discrepancies	0.0	0.0	0.0
Other Changes Affecting NOR			
Less Direct Funding	(89.1)	(52.2)	(44.3)
Adjustment for Non-Recoverable Expense	0.0	0.0	0.0
<b>Net Operating Result</b>	<b>(241.5)</b>	<b>(155.6)</b>	<b>143.1</b>
Prior Year AOR	254.1	12.6	(143.1)
Non-Recoverable AOR	0.0	0.0	0.0
<b>Accumulated Operating Result</b>	<b>12.6</b>	<b>(143.1)</b>	<b>0.0</b>

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**Supply Management Summary  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<b>1. New Orders</b>			
<b>a. Orders from DOD Components:</b>			
Department of Army			
Operation & Maintenance, Army	6,502.5	6,874.5	7,069.8
Operation & Maintenance, ARNG	771.8	894.9	875.9
Operation & Maintenance, AR	181.0	195.1	188.6
<b>Subtotal, O&amp;M Army:</b>	<b>7,455.3</b>	<b>7,964.6</b>	<b>8,134.3</b>
Industrial Operations Business	762.5	752.1	715.7
Procurement Appropriations	189.8	217.8	220.5
RDT&E	33.9	33.5	32.5
All Other Army	15.3	11.5	11.7
<b>Subtotal, Department of the Army:</b>	<b>8,456.6</b>	<b>8,979.6</b>	<b>9,114.7</b>
Other Services (List by Appropriation)			
Department of Navy	64.5	64.5	65.6
Department of Air Force	204.4	234.7	235.2
US Marine Corps	112.1	114.8	108.8
Other Department of Defense	106.9	144.8	145.8
<b>Subtotal, Other DOD Services:</b>	<b>488.0</b>	<b>558.7</b>	<b>555.4</b>
<b>b. Total DOD</b>	<b>8,944.6</b>	<b>9,538.4</b>	<b>9,670.1</b>
<b>c. Other Orders:</b>			
Other Federal Agencies	11.7	10.7	10.7
Trust Fund	0.0	0.0	0.0
Non Federal Agencies	9.9	12.2	12.6
Foreign Military Sales	451.4	427.1	417.4
<b>Subtotal, Other Orders:</b>	<b>473.0</b>	<b>450.0</b>	<b>440.7</b>
<b>1. Total New Orders</b>	<b>9,417.6</b>	<b>9,988.4</b>	<b>10,110.8</b>
<b>2. Carry-In Orders (Back Orders From Prior Years)</b>	<b>2,220.7</b>	<b>2,177.6</b>	<b>1,977.7</b>
<b>3. Total Gross Orders</b>	<b>11,638.4</b>	<b>12,166.0</b>	<b>12,088.5</b>
<b>4. Carry-Out Orders (-)</b>	<b>2,177.6</b>	<b>1,977.7</b>	<b>1,850.3</b>
<b>5. Total Sales</b>	<b>9,460.7</b>	<b>10,188.3</b>	<b>10,238.2</b>
<b>6. Credit and Allowances (-)</b>	<b>2,406.6</b>	<b>2,167.2</b>	<b>2,183.3</b>
<b>7. Net Sales</b>	<b>7,054.2</b>	<b>8,021.1</b>	<b>8,054.9</b>

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**Supply Management Summary  
(\$ in Millions)**

			Obligation Targets		
	Net Customer Orders	Net Sales	Operating (Contract Authority)	Direct Appropriation - Mobilization	Total
<b>Non-Army Managed Items (NAMI)</b>					
<i>FY 2019</i>	1,661.5	1,775.2	1,742.9	0.0	1,742.9
<i>FY 2020</i>	1,955.5	1,955.0	1,955.0	0.0	1,955.0
<i>FY 2021</i>	2,014.2	2,013.7	2,013.7	0.0	2,013.7
<b>Army Managed Items (AMI)</b>					
<i>FY 2019</i>	5,346.8	5,276.2	6,035.9	11.6	6,047.4
<i>FY 2020</i>	5,863.7	6,064.1	5,499.0	34.2	5,533.2
<i>FY 2021</i>	5,911.3	6,039.2	4,908.8	21.5	4,930.3
<b>AMC Mobilization</b>					
<i>FY 2019</i>	2.8	2.8	0.3	77.5	77.8
<i>FY 2020</i>	2.0	2.0	2.0	18.0	20.0
<i>FY 2021</i>	2.0	2.0	2.0	22.8	24.8
<b>Total Hardware</b>					
<i>FY 2019</i>	<b>7,011.1</b>	<b>7,054.2</b>	<b>7,779.0</b>	<b>89.1</b>	<b>7,868.1</b>
<i>FY 2020</i>	<b>7,821.2</b>	<b>8,021.1</b>	<b>7,456.0</b>	<b>52.2</b>	<b>7,508.2</b>
<i>FY 2021</i>	<b>7,927.5</b>	<b>8,054.9</b>	<b>6,924.5</b>	<b>44.3</b>	<b>6,968.8</b>
<i>Cost of Operations (LOGOPS)</i>					
<i>FY 2019</i>			957.2		957.2
<i>FY 2020</i>			1,016.8		1,016.8
<i>FY 2021</i>			1,012.2		1,012.2
<i>Enterprise Software Initiative</i>					
<i>FY 2019</i>			0.0		0.0
<i>FY 2020</i>			25.0		25.0
<i>FY 2021</i>			25.0		25.0
<b>Total Operating Authority</b>					
<b>FY 2019</b>	<b>7,011.1</b>	<b>7,054.2</b>	<b>8,736.2</b>	<b>89.1</b>	<b>8,825.3</b>
<b>FY 2020</b>	<b>7,821.2</b>	<b>8,021.1</b>	<b>8,497.8</b>	<b>52.2</b>	<b>8,550.0</b>
<b>FY 2021</b>	<b>7,927.5</b>	<b>8,054.9</b>	<b>7,961.7</b>	<b>44.3</b>	<b>8,006.0</b>

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**Supply Management Summary  
(\$ in Millions)**

	Net Customer Orders	Net Sales	Operating (Contract Authority)	Obligation Targets	
				Direct Appropriation - Mobilization	Total
<i>Total Capital Obligations (CIP)</i>					
FY 2019			32.7		32.7
FY 2020			21.7		21.7
FY 2021			20.3		20.3
<i>Variability Target</i>					
FY 2019			0.0		0.0
FY 2020			2,000.0		2,000.0
FY 2021			2,000.0		2,000.0
<b>Target Total</b>					
<b>FY 2019</b>	<b>7,011.1</b>	<b>7,054.2</b>	<b>8,768.8</b>	<b>89.1</b>	<b>8,857.9</b>
<b>FY 2020</b>	<b>7,821.2</b>	<b>8,021.1</b>	<b>10,519.5</b>	<b>52.2</b>	<b>10,571.7</b>
<b>FY 2021</b>	<b>7,927.5</b>	<b>8,054.9</b>	<b>9,982.0</b>	<b>44.3</b>	<b>10,026.3</b>
<b>Direct Appropriations</b>					
<i>Mobilization - War Reserve Materiel (Base)</i>					
FY 2019				79.2	<b>79.2</b>
FY 2020				32.1	<b>32.1</b>
FY 2021				24.2	<b>24.2</b>
<i>Mobilization - Army Prepositioned Stock (OCO)</i>					
FY 2019				9.9	<b>9.9</b>
FY 2020				20.1	<b>20.1</b>
FY 2021				20.1	<b>20.1</b>
<i>Other - Augmentation Spares (Base)</i>					
FY 2019					<b>0.0</b>
FY 2020					<b>0.0</b>
FY 2021					<b>0.0</b>
<i>Other - Augmentation Spares (OCO)</i>					
FY 2019					<b>0.0</b>
FY 2020					<b>0.0</b>
FY 2021					<b>0.0</b>
<b>TOTAL DIRECT APPROPRIATIONS</b>					
<b>FY 2019</b>				<b>89.1</b>	<b>89.1</b>
<b>FY 2020</b>				<b>52.2</b>	<b>52.2</b>
<b>FY 2021</b>				<b>44.3</b>	<b>44.3</b>

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**Operating Requirements by Weapon System  
(\$ in Millions)**

Weapon System	FY 2019		FY 2020		FY 2021	
	Obligations	NMCRS <sup>1</sup>	Obligations	NMCRS <sup>1</sup>	Obligations	NMCRS <sup>1</sup>
AH-64, Apache	428.2	4.0%	568.1	10.0%	484.4	10.0%
CH-47D, Chinook	135.2	3.0%	239.4	10.0%	244.9	10.0%
UH-60, Black Hawk	1,137.3	4.0%	1,085.7	10.0%	1,090.9	10.0%
OH-58D, Kiowa Warrior	4.0	0.0%	3.9	10.0%	5.3	10.0%
Other Aviation	460.1	NA	92.6	N/A	10.3	N/A
MLRS	18.3	0.0%	11.6	<10.0%	16.9	<10.0%
Patriot	168.8	0.0%	161.6	<10.0%	233.5	<10.0%
Other Missile	55.3	NA	76.0	N/A	31.8	N/A
Firefinder	2.6	0.0%	0.6	<10.0%	0.7	<10.0%
Night Vision Goggles	38.8	0.0%	52.6	<10.0%	45.2	<10.0%
SINCGARS	39.0	0.0%	28.0	<10.0%	29.9	<10.0%
Other Communications Electronics	607.9	NA	546.6	N/A	587.4	N/A
FMTV	41.8	7.0%	64.0	<10.0%	29.3	<10.0%
HEMTT	28.0	6.0%	14.0	<10.0%	10.2	<10.0%
HMMWV	115.9	8.0%	78.8	<10.0%	70.2	<10.0%
M109, Paladin	65.8	14.0%	28.0	<10.0%	25.9	<10.0%
M198, Towed Howitzer	41.2	11.0%	23.0	<10.0%	7.0	<10.0%
M1A1, Abrams Tank	679.1	16.0%	727.5	<10.0%	648.7	<10.0%
M1A2, Abrams Tank (SEP)	163.1	13.0%	36.3	<10.0%	41.6	<10.0%
M2/M3, Bradley Fighting Vehicle	333.6	12.0%	198.2	<10.0%	202.5	<10.0%
Stryker	239.7	16.0%	230.1	<10.0%	242.8	<10.0%
Other Tank - Automotive & Armament	1,232.4	NA	1,232.5	N/A	849.4	N/A
<b>Subtotal:</b>	<b>6,035.9</b>		<b>5,499.0</b>		<b>4,908.8</b>	
NAMM Hardware Contract Authority	1,742.9		1,955.0		2,013.7	
AMC-MOB Hardware Contract Authority	0.3		2.0		2.0	
<b>Total:</b>	<b>7,779.0</b>		<b>7,456.0</b>		<b>6,924.5</b>	

Note 1: Non Mission Capable Rate Supply (NMCRS) represents the percent of time a weapon system is not mission capable due to lack of critical spare parts. The AWCF goals for NMCRS are: at or below 10% for ground and at or below 25% for aircraft. FY 2019 is actual data. FY 2020 and FY 2021 are the Army's goal for total weapon system readiness.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**Inventory Status  
(\$ in Millions)**

FY 2019	TOTAL	Demand Based	Mobilization	Non-Demand Based
1. Inventory BOP	18,421.1	13,939.3	1,984.4	2,497.3
2. BOP Inventory Adjustments				
A. Reclassification (Memo)	0.0	20.5	(20.5)	0.0
B. Price Change Amount (Memo)	4.9	4.9	0.0	0.0
C. Adj. Inventory BOP	18,426.0	13,964.7	1,963.9	2,497.3
3. Receipts at LAC	4,505.0	4,452.6	52.4	0.0
4. Sales (Total from Schedule 6)	9,460.7	9,460.7	0.0	0.0
5. Inventory Adjustments				
A. Capitalization (+ or -)	(111.3)	26.2	(34.7)	(102.7)
B. Returns from Customers for Credit	4,485.6	4,485.6	0.0	0.0
C. Returns from Customers Without Credit	1,521.1	193.0	0.0	1,328.1
D. Returns to Suppliers (-)	(46.6)	(17.7)	0.0	(28.9)
E. Transfers to Property Disposal (-)	(870.7)	(54.3)	0.0	(816.4)
F. Issues/Receipts wo Reimbursements (+ or -)	(172.5)	(0.4)	0.0	(172.1)
G. Other	(1,376.3)	(1,072.9)	(287.4)	(16.1)
H. Total Adjustments	3,429.3	3,559.6	(322.1)	191.9
6. Inventory EOP	16,899.6	12,516.2	1,694.2	2,689.2
7. Inventory EOP (MAC)	16,899.6	12,516.2	1,694.2	2,689.2
A. Economic Retention (Memo)				328.7
B. Contingency Retention (Memo)				1,321.8
C. Potential DoD Reutilization (Memo)				1,038.7
8. Inventory on Order EOP (Memo)	7,027.3	6,941.0	86.3	0.0

**Narrative:** Column "Non-Demand Based" includes inventory that stratifies beyond the budget year, economic and contingency retention stock, and inventory excess to the approved acquisition objective.



**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**Inventory Status  
(\$ in Millions)**

FY 2020	TOTAL	Demand Based	Mobilization	Non-Demand Based
1. Inventory BOP	16,899.6	12,516.2	1,694.2	2,689.2
2. BOP Inventory Adjustments				
A. Reclassification (Memo)	0.0	5.0	(5.0)	0.0
B. Price Change Amount (Memo)	0.0	0.0	0.0	0.0
C. Adj. Inventory BOP	16,899.6	12,521.2	1,689.2	2,689.2
3. Receipts at LAC	5,092.7	5,033.5	59.2	0.0
4. Sales (Total from Schedule 6)	10,188.3	10,186.3	2.0	0.0
5. Inventory Adjustments				
A. Capitalization (+ or -)	(101.9)	4.3	0.0	(106.3)
B. Returns from Customers for Credit	4,008.0	4,008.0	0.0	0.0
C. Returns from Customers Without Credit	1,621.8	637.1	0.0	984.7
D. Returns to Suppliers (-)	(48.7)	(15.0)	0.0	(33.7)
E. Transfers to Property Disposal (-)	(876.5)	(150.0)	(17.9)	(708.6)
F. Issues/Receipts wo Reimbursements (+ or -)	(169.5)	0.0	0.0	(169.5)
G. Other	205.6	213.8	(79.2)	70.9
H. Total Adjustments	4,638.8	4,698.2	(97.0)	37.6
6. Inventory EOP	16,442.7	12,066.6	1,649.4	2,726.8
7. Inventory EOP (MAC)	16,442.7	12,066.6	1,649.4	2,726.8
A. Economic Retention (Memo)				333.3
B. Contingency Retention (Memo)				1,340.2
C. Potential DoD Reutilization (Memo)				1,053.2
8. Inventory on Order EOP (Memo)	7,391.3	7,349.8	41.6	0.0

**Narrative:** Column "Non-Demand Based" includes inventory that stratifies beyond the budget year, economic and contingency retention stock, and inventory excess to the approved acquisition objective.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**Inventory Status  
(\$ in Millions)**

FY 2021	TOTAL	Demand Based	Mobilization	Non-Demand Based
1. Inventory BOP	16,442.7	12,066.6	1,649.4	2,726.8
2. BOP Inventory Adjustments				
A. Reclassification (Memo)	0.0	5.0	(5.0)	0.0
B. Price Change Amount (Memo)	0.0	0.0	0.0	0.0
C. Adj. Inventory BOP	16,442.7	12,071.6	1,644.4	2,726.8
3. Receipts at LAC	5,339.0	5,293.4	45.6	0.0
4. Sales (Total from Schedule 6)	10,238.2	10,236.2	2.0	0.0
5. Inventory Adjustments				
A. Capitalization (+ or -)	(96.8)	4.0	0.0	(100.8)
B. Returns from Customers for Credit	3,970.7	3,970.7	0.0	0.0
C. Returns from Customers Without Credit	1,547.8	642.0	0.0	905.8
D. Returns to Suppliers (-)	(50.4)	(15.0)	0.0	(35.4)
E. Transfers to Property Disposal (-)	(866.1)	(150.0)	(13.8)	(702.3)
F. Issues/Receipts wo Reimbursements (+ or -)	(166.0)	0.0	0.0	(166.0)
G. Other	(186.1)	(178.3)	(47.0)	39.2
H. Total Adjustments	4,153.1	4,273.5	(60.7)	(59.6)
6. Inventory EOP	15,696.7	11,402.3	1,627.2	2,667.2
7. Inventory EOP (MAC)	15,696.7	11,402.3	1,627.2	2,667.2
A. Economic Retention (Memo)				326.0
B. Contingency Retention (Memo)				1,310.9
C. Potential DoD Reutilization (Memo)				1,030.2
8. Inventory on Order EOP (Memo)	7,168.3	7,124.2	44.2	0.0

**Narrative:** Column "Non-Demand Based" includes inventory that stratifies beyond the budget year, economic and contingency retention stock, and inventory excess to the approved acquisition objective.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**WAR RESERVE MATERIAL (WRM)  
STOCKPILE (\$ in Millions)**

<b>FY 2019</b>	<b>Total</b>	<b>WRM Protected</b>	<b>WRM Other</b>
1. Inventory BOP	1,984.4	1,984.4	0.0
2. Price Change	0.0	0.0	0.0
3. Reclassification	(21.0)	(21.0)	0.0
4. Inventory Changes			
a. Receipts	52.4	52.4	0.0
(1) Purchases	52.4	52.4	0.0
(2) Returns from Customer	0.0	0.0	0.0
b. Issues	0.0	0.0	0.0
(1) Sales	0.0	0.0	0.0
(2) Returns to Suppliers	0.0	0.0	0.0
(3) Disposals	0.0	0.0	0.0
c. Adjustments	(322.1)	(322.1)	0.0
(1) Capitalizations	(34.7)	(34.7)	0.0
(2) Gains and losses	0.0	0.0	0.0
(3) Other Adjustments	(287.4)	(287.4)	0.0
5. Inventory EOP	1,694.2	1,694.2	0.0
<b>STOCKPILE COSTS</b>			
1. Storage	0.0		
2. Manage	0.0		
3. Maintenance/Other	0.0		
Total Costs	0.0		
<b>WRM BUDGET REQUEST (OBLIGATIONS AT COST)</b>			
1. Additional WRM	89.1		
2. Replenishment WRM	0.3		
3. Repair WRM	0.0		
4. Assemble/Disassemble	0.0		
5. Other	0.0		
Total Request	89.4		
AMC MOB	0.3		

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**WAR RESERVE MATERIAL (WRM)  
STOCKPILE (\$ in Millions)**

<b>FY 2020</b>	<b>Total</b>	<b>WRM Protected</b>	<b>WRM Other</b>
1. Inventory BOP	1,694.2	1,694.2	0.0
2. Price Change	0.0	0.0	0.0
3. Reclassification	(5.0)	(5.0)	0.0
4. Inventory Changes			
a. Receipts @ standard	59.2	59.2	0.0
(1) Purchases	59.2	59.2	0.0
(2) Returns from Customer	0.0	0.0	0.0
b. Issues @ standard	(15.9)	(15.9)	0.0
(1) Sales	2.0	2.0	0.0
(2) Returns to Suppliers	0.0	0.0	0.0
(3) Disposals	(17.9)	(17.9)	0.0
c. Adjustments @ standard	(79.2)	(79.2)	0.0
(1) Capitalizations	0.0	0.0	0.0
(2) Gains and losses	0.0	0.0	0.0
(3) Other Adjustments	(79.2)	(79.2)	0.0
5. Inventory EOP	1,649.4	1,649.4	0.0
<b>STOCKPILE COSTS</b>			
1. Storage	0.0		
2. Manage	0.0		
3. Maintenance/Other	0.0		
Total Costs	0.0		
<b>WRM BUDGET REQUEST (OBLIGATIONS AT COST)</b>			
1. Additional WRM	52.2		
2. Replenishment WRM	2.0		
3. Repair WRM	0.0		
4. Assemble/Disassemble	0.0		
5. Other	0.0		
Total Request	54.2		
AMC MOB	2.0		

**EXHIBIT SM-6  
WAR RESERVE MATERIAL**

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Supply Management**

**WAR RESERVE MATERIAL (WRM)  
STOCKPILE (\$ in Millions)**

<b>FY 2021</b>	<b>Total</b>	<b>WRM Protected</b>	<b>WRM Other</b>
1. Inventory BOP	1,649.4	1,649.4	0.0
2. Price Change	0.0	0.0	0.0
3. Reclassification	(5.0)	(5.0)	0.0
4. Inventory Changes			
a. Receipts @ standard	45.6	45.6	0.0
(1) Purchases	45.6	45.6	0.0
(2) Returns from Customer	0.0	0.0	0.0
b. Issues @ standard	(11.8)	(11.8)	0.0
(1) Sales	2.0	2.0	0.0
(2) Returns to Suppliers	0.0	0.0	0.0
(3) Disposals	(13.8)	(13.8)	0.0
c. Adjustments @ standard	(47.0)	(47.0)	0.0
(1) Capitalizations	0.0	0.0	0.0
(2) Gains and losses	0.0	0.0	0.0
(3) Other Adjustments	(47.0)	(47.0)	0.0
5. Inventory EOP	1,627.2	1,627.2	0.0
<b>STOCKPILE COSTS</b>			
1. Storage	0.0		
2. Manage	0.0		
3. Maintenance/Other	0.0		
Total Costs	0.0		
<b>WRM BUDGET REQUEST (OBLIGATIONS AT COST)</b>			
1. Additional WRM	44.3		
2. Replenishment WRM	2.0		
3. Repair WRM	0.0		
4. Assemble/Disassemble	0.0		
5. Other	0.0		
Total Request	46.3		
AMC MOB	2.0		

**EXHIBIT SM-6  
WAR RESERVE MATERIAL**

# Industrial Operations

## Introduction

The Industrial Operations activity group is comprised of thirteen government-owned and operated installation activities, each with unique core competencies. Industrial Operations promotes business-like behavior by relying on revenue from customers instead of direct appropriations to finance continuing operations. Customers purchase services from Industrial Operations activities. These services include, but are not limited to, repairing and upgrading equipment, producing weapons and munitions, and storing and demilitarizing materiel. The goal for the Industrial Operations activity is to generate enough revenue to recover the full cost of operations while breaking even over the long term.

The core financial measures for Industrial Operations are the net operating result (NOR) and accumulated operating result (AOR). The NOR measures the activity's gain or loss within a single fiscal year and is used to monitor how closely the activity performs compared to its budget. The AOR measures the activity's accumulated gains and losses since the fund's inception. Rates are set during budget development to break even by bringing the AOR to zero over a budget cycle. This method returns accumulated gains through reduced rates and recovers accumulated losses through increased rates. The rates are set to:

- Recover the activity's costs such as payroll, supplies, contracts, equipment, inventory, depreciation, and maintenance
- Maintain a sufficient cash corpus to cover operating disbursements and six months of capital disbursements
- Break even over time
- Maintain a stable and foreseeable cost of doing business
- Reduce large fluctuations to the customer

The Industrial Operations activity relies heavily on customers funded by direct appropriations to support its operations. The activity synchronizes rates and budget assumptions with the appropriated funding levels of its customers. Reductions to customer appropriated funding requests impact the business by adversely affecting workloading decisions and projected staffing levels and may also affect equipment readiness of supported customers.

### ***Mission:***

- ***Provide an organic industrial capability to conduct depot level repair and upgrade***
- ***Produce munitions and large caliber weapons***
- ***Store, maintain, and demilitarize materiel for the Department of Defense***



## Efficiencies and Business Process Improvements

Cost efficiency is an inherent attribute of the AWCF. The revolving fund construct promotes total cost visibility, full cost recovery, and fosters a business-like, competitive atmosphere. In the same way that commercial businesses focus on their bottom line profit, Industrial Operations (IO) activities focus on their Net Operating Result and other indicators to gauge the efficiency of their operations. To increase efficiency and maintain their competitive edge, Industrial Operations activities have been fully engaged in cost-cutting and business process improvement initiatives for many years. Industrial Operations customers ultimately garner the benefit of these efficiencies through reduced turn-around times, lower prices, and increased throughput. Examples of these initiatives include:



Workers at Letterkenny Army Depot clean a frame before beginning overhaul work

- **Continuous Process Improvement (CPI)**: The Army Materiel Command (AMC) has been aggressively embracing the concepts of Continuous Process Improvement (CPI) since 2002. CPI is an overarching concept, using many improvement tools, including Lean, Lean Six Sigma (LSS), Value Engineering (VE), Quality Management, and others, to positively impact manufacturing, maintenance, storage, distribution, and those military operations executing these critical missions. AMC's Industrial Operations (IO) has 25 certified Lean Six Sigma Master Black Belts. Additionally, the Army Quality management mission now falls under AMC. The CPI and Quality management missions have been integrated, developing a program synergy which is mutually advantageous to both product and process improvements, as well as Army Quality program requirements. These CPI efforts resulted in LSS and VE financial benefits in excess of \$6 billion since FY 2007. These benefits come in the form of hard savings from budgeted programs, cost avoidances, and increased capacity (e.g. improved throughput), improving overall Army readiness. The IO activities either re-invest the financial benefits or pass them on to their customers in future budgets through lower rates.
- **International Organization for Standardization (ISO)**: ISO is a worldwide federation of national standards bodies that independently audit and certify companies and organizations for conformance with established



standards. The Industrial Operations activities currently hold 23 ISO certifications for Quality Management Systems, International Aerospace Quality Systems, Environmental Management Systems, and Occupational Safety and Health Administration Systems. AMC is in the process of adopting ISO 45001, the world's first international standard for occupational health and safety geared toward senior management. ISO 45001 has the ultimate goal of helping businesses provide a healthy and safe working environment for their employees and everyone else who visits the workplace. Currently, TYAD is the only installation ISO 45001 certified.

- **Adaptable Workforce Structure**: IO activities employ an adaptable workforce structure to maintain flexibility in response to shifting workload requirements. Activities adjust the size of their workforce through the use of contractor, term, and temporary personnel to accommodate changes in workload.
- **Safety Improvements** : Safety is a high priority throughout AMC and leads to better morale, increased productivity and reduced operational costs. IO activities continue to participate in the Occupational Safety and Health Administration (OSHA) Voluntary Protection Program (VPP) and currently have five IO activities with an OSHA VPP Star<sup>4</sup> rating. These include CAAA, LEAD, MCAAP, TYAD and RRAD. VPP participants must maintain an effective safety and health management system that meets rigorous performance-based criteria and requires a total written commitment from labor to work safely.
- **Enterprise Resource Planning (ERP) Solutions**: The Logistics Modernization Program (LMP), an ERP solution, provides AMC and the Army with new and improved capabilities for logistics management and better cost performance while setting the stage for auditability. It provides real time updates and improved visibility of maintenance, production, and financial data when compared with legacy batch processes. It streamlines material/parts requisitioning and asset movements between Defense Logistics Agency (DLA) and the depots, improves visibility and accountability for inventory, improves collaboration in program planning, and shortens the time to accept and negotiate programs between the Life Cycle Management Commands (LCMCs), depots, and customers.
- **Energy and Water Savings Programs**: AMC has instituted a command wide policy to identify performance standards to reduce consumption of

---

<sup>4</sup> The Star Program is designed for exemplary worksites with comprehensive, successful safety and health management systems. Companies in the Star Program have achieved injury and illness rates at or below the national average of the respective industries.





energy and water resources, achieve energy security, and comply with DOD goals and objectives. Savings are being realized through the use of advanced metering programs, energy management and control systems, and implementation of energy conservation measures. Longer term energy savings are expected from renewable energy sources. IO activities use a variety of funding sources for energy projects which reduce energy consumption, improve energy efficiency, and increase energy security. Available funding sources include: AWCF IO, Energy Conservation Investment Program (ECIP), and third-party financing via Energy Savings Performance Contracts (ESPC) and Utility Energy Services Contracts (UESC).

## Functional Description

The AWCF Industrial Operations includes five depots, three arsenals, two munitions production facilities, and three storage sites. These sites perform the following mission functions:

- Provides depot level maintenance, repair, and modernization of weapon systems and component parts
- Manufactures, renovates, and demilitarizes materiel
- Produces munitions and large caliber weapons
- Performs a full range of ammunition maintenance services for DOD and U.S. allies
- Performs ammunition receipt, storage, and issue functions

In addition to the mission functions, ten of the thirteen activities provide installation base support for both internal operations and tenant activities. Corpus Christi Army Depot and Crane Army Ammunition Activity are tenants on Navy installations. The Rock Island Arsenal-Joint Manufacturing and Technology Center (RIA-JMTC) receives installation base support from the Army Installation Management Command (IMCOM) which, effective 1 March 2019, became a major subordinate command of Army Materiel Command (AMC).



Industrial Operations activities collaborate with the private sector through formal public-private partnership agreements to perform work or utilize facilities and equipment. Under authority granted by Title 10, United States Code, § 2474, these partnerships create opportunities for both the public and private sectors by capitalizing on each other's strengths and efficiencies. The benefits to the Army and its customers include: leveraging capacity; sustaining core maintenance capabilities; sharing of overhead costs; and enhancing technical expertise in the workforce. The benefits to private industry include access to specialized facilities, equipment and processes, and stimulating local economies. Current public-private partnership agreements are held with companies such as the Boeing Company, General Dynamics Land Systems, Sikorsky Aircraft Corporation, and Honeywell International.



Pine Bluff Arsenal employee seals M819 81mm red phosphorus smoke mortars on a Load Pack and Assemble production line

The five hard-iron maintenance depots (Anniston, Corpus Christi, Letterkenny, Red River, and Tobyhanna) and Pine Bluff Arsenal, Rock Island Arsenal-Joint Manufacturing and Technology Center, Sierra Army Depot, Tooele Army Depot, and Watervliet Arsenal are designated as Centers of Industrial and Technical Excellence (CITE) for the performance of core<sup>5</sup> maintenance workload in support of DOD and foreign allies. The CITE designation provides authority under Title 10, United States Code, § 2474 to partner with and lease facilities to industry on programs relating to core maintenance and technical expertise.

The Shingo Prize, administered by the Jon M. Huntsman School of Business at Utah State University, is the premier award for operational excellence world-wide. Since FY 2005, the Army Materiel Command has received 32 Shingo Prizes for various programs at its depots and arsenals, including eight at Red River Army Depot, seven at Tobyhanna Army Depot, nine at Letterkenny Army Depot, three at the Rock Island Arsenal-Joint Manufacturing and Technology Center, two at Anniston Army Depot and one at Corpus Christi Army Depot. This award recognizes industry leaders who promote world-class business and manufacturing processes that enable on-time delivery and customer satisfaction.

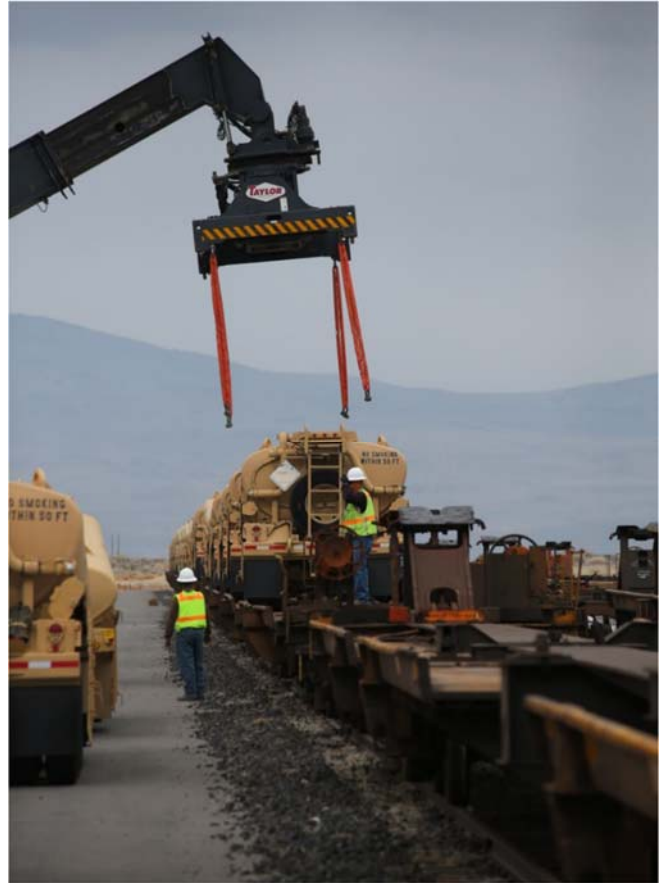
---

<sup>5</sup> Title 10, United States Code, § 2464. Core Logistics Capabilities - Government-owned and Government-operated equipment and facilities required to ensure a ready and controlled source of technical competence and resources necessary to ensure effective and timely response to a mobilization, national defense contingency situations, and other emergency requirements.



On-site examiners conduct Shingo Prize evaluations and score the following areas:

- Cost improvement
- Partnering practices
- Quality and results
- Innovation and development
- Environmental practices
- Vision and strategy
- Leadership & Empowerment
- Continuous improvement

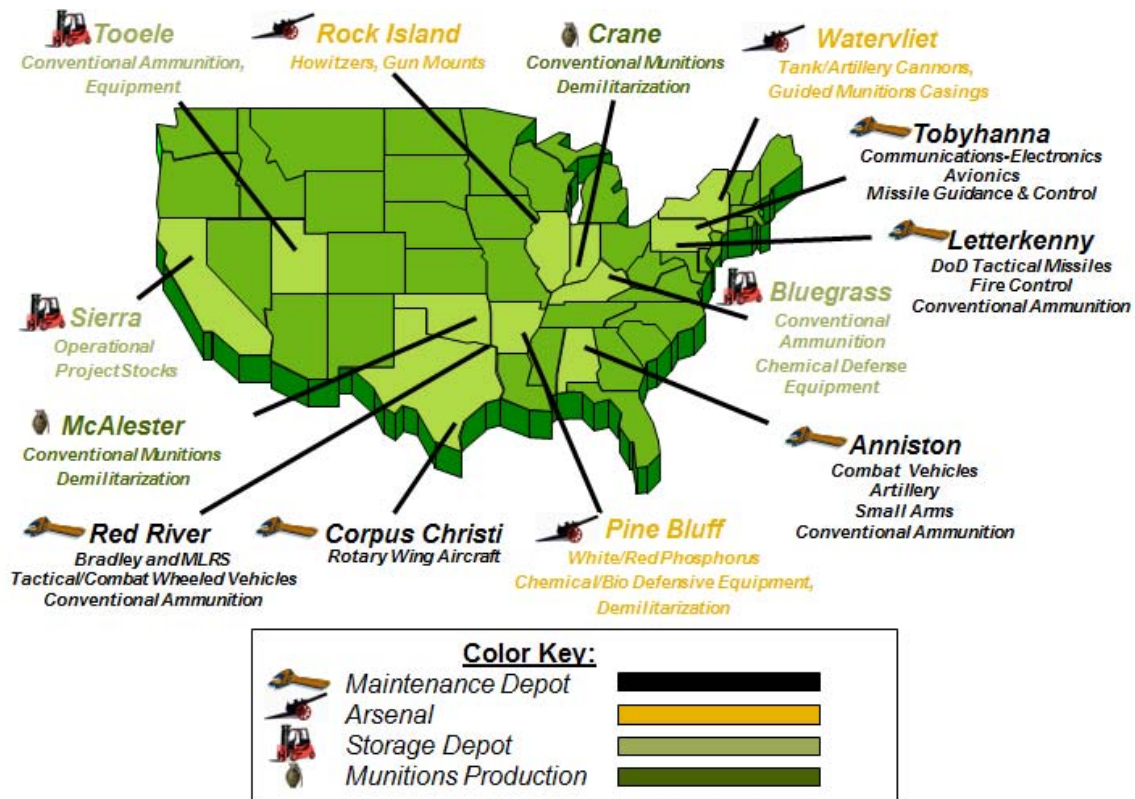


Fuel tankers are being loaded on to railcars for shipping at Sierra Army Depot



# Activity Group Composition

Figure IO 1 - Industrial Operations Activity Group Composition



**Army Materiel Command** is located in Huntsville, Alabama and serves as the management command for the Industrial Operations activity group. Installations or activities in this group fall under the direct command and control of the Life Cycle Management Commands each aligned in accordance with the nature of its mission. The following are descriptions of the Industrial Operations activities and their major core mission functions.

## Anniston Army Depot (ANAD)

**Location:** Anniston, Alabama

**2019 Workforce:** 3,077



**Description:** A vital part of the community since opening in 1941, the depot's annual economic impact is estimated to be \$1.0 billion and indirectly supports over 25,000 jobs in the Anniston area. It is the only Army depot capable of performing maintenance on both heavy and light-tracked combat vehicles (with the exception of the Bradley), and their components. ANAD is the Center of Industrial and Technical Excellence (CITE) for ground combat vehicles, assault bridging, small arms as well as towed and



self-propelled artillery systems, and rail equipment and non-tactical generators. Combat vehicles include the M1 Abrams Tank, M113 Family of Vehicles (FOV), Stryker FOV, M109 Paladin, Field Artillery Ammunition Support Vehicle (FAASV), M88 Recovery Vehicles, Joint Assault Bridge (JAB), Assault Breacher Vehicle (ABV), Armored Vehicle Launched Bridge (AVLB), and M9 Armored Combat Earthmover. The depot is actively engaged in the Reset of equipment returning from operations in Southwest Asia, to include performing maintenance on individual and crew-served weapons. As an Army and Department of Defense leader in Public-Private Partnership efforts since 1993, the depot has established more than 80 different partnerships with industry leaders, utilizing agreements such as direct sales, work share, and facility use.

## Blue Grass Army Depot (BGAD)

**Location:** Richmond, Kentucky

**2019 Workforce:** 881



**Description:** BGAD is a Strategic Mobility Power Projection ammunition depot with the mission to receive, store, issue, renovate, modify, maintain, and demilitarize conventional munitions for all DOD Services. BGAD stores and manages all Army Special Operations Forces ammunition. The depot is DOD's primary center for surveillance, receipt, storage, issue, testing, and minor repair of Individual Protection Chemical Defense Equipment. Additionally, BGAD maintains an Industrial Services capability providing receipt, storage, cutting, and fabrication of raw materials and metal parts for high visibility programs such as the Mine Resistant Ambush Protected (MRAP) family of vehicles. Anniston Munitions Center, located at Anniston Army Depot, is under the command and control of BGAD and serves as a multifunctional production facility, primary missile storage and maintenance depot, and as a storage and demilitarization depot for other conventional ammunition items.

## Corpus Christi Army Depot (CCAD)

**Location:** Corpus Christi, Texas

**2019 Workforce:** 2,794



**Description:** CCAD returns Army rotary wing aircraft and components to full service with uncompromising quality, at the lowest cost possible in the shortest amount of time. CCAD supports the Joint Warfighter (Army, Marines, Navy, and Air Force) Department of Homeland Security and partner nations through the Department of State. CCAD leads the Army Aviation accident investigation processes with subject matter expertise and reliable laboratory analysis anywhere in the world by a team of highly skilled artisans who assess, evaluate and repair forward deployed aircraft and components to include depot forward capabilities. The depot supports Active, Reserve and National Guard Soldiers in their



maintenance skills development with hands-on experience under the watchful eyes of depot artisans. Designated as the Center of Industrial and Technical Excellence for rotary wing aircraft, CCAD supports the Apache, Black Hawk, Chinook, Kiowa, and Pave Hawk helicopters as well as Unmanned Aerial Vehicles (UAV).

## Crane Army Ammunition Activity (CAAA)

**Location:** Crane, Indiana

**2019 Workforce:** 1,044



**Description:** CAAA is a Strategic Mobility Platform located in Crane, Indiana offering logistical support in receiving, storing, shipping, and surveillance of munitions. As a Munitions Center of Excellence, CAAA is the producer of pyrotechnic candle loads for mortar and artillery illumination in both the visible and infrared spectrums. CAAA supports the Navy with the production and renovation of advanced countermeasures for aircraft, and large caliber gun ammunition. Production and renovation capabilities include loading (cast and press) bombs and other munitions, missile warhead pressing, and a large variety of munitions components and assemblies. CAAA also has extensive demilitarization capabilities including steam out, high pressure washout, open burn/open detonation, and white phosphorous conversion. The CAAA machine center fabricates tools, dies, fixtures, gauges, production equipment and components. Commencing in FY 2018, rail operations at Naval Support Activity (NSA) Crane will be assumed by CAAA based on mission realignment. Letterkenny Munitions Center (LEMC), located on Letterkenny Army Depot in Chambersburg, Pennsylvania is under the command of CAAA. LEMC is also a Strategic Mobility Platform for both conventional ammunition and missile support. LEMC performs testing and minor repair for the Army Tactical Missile System and Guided Multiple Launch Rocket Missile systems, as well as several Air Force and Navy missile families. LEMC conducts demilitarization research and development, resource recovery and reutilization for missiles, container repair, and renovation of conventional munitions.

## Letterkenny Army Depot (LEAD)

**Location:** Chambersburg, Pennsylvania

**2019 Workforce:** 1,422



**Description:** LEAD performs maintenance, modification, storage, and demilitarization operations on tactical missiles and ammunition. It has unique tactical missile repair capabilities supporting a variety of DOD missile systems including the Patriot and its ground support and radar equipment. LEAD is the designated Center of Industrial and Technical Excellence for air defense and tactical missile ground support equipment. In addition, it supports repair maintenance on a multitude of generators. LEAD also



supports integration of Force Provider Soldier Support systems and provides installation support to attached organizations and assigned operating facilities.

## McAlester Army Ammunition Plant (MCAAP)

**Location:** McAlester, Oklahoma

**2019 Workforce:** 1,815



**Description:** MCAAP is located on 45,000 acres in southeastern Oklahoma. It has six ammunition production, maintenance and renovation complexes and is a major ammunition storage site for all branches of the Armed Forces. Additionally, the plant has nearly 2,300 storage magazines and six million square feet of covered explosive storage space. MCAAP produces and renovates conventional ammunition, bombs, warheads, rockets, missiles, and ammunition-related components; performs engineering and product assurance in support of production; and receives, stores, ships, demilitarizes, and disposes of conventional and missile ammunition and related items.

## Pine Bluff Arsenal (PBA)

**Location:** Pine Bluff, Arkansas

**2019 Workforce:** 661



**Description:** With a local economic impact exceeding \$140 million annually, PBA produces, renovates, and stores more than 70 different conventional ammunition products ranging in caliber from 40 mm to 175 mm. Specialties include production of munitions containing payloads for smoke, non-lethal, riot control, incendiary, illumination, and infrared uses. Designated the Center of Industrial and Technical Excellence for Chemical and Biological Defense Equipment, PBA provides maintenance, upgrade, storage, and mission support for various mobile and powered Soldier support systems. PBA has strengthened its expertise by forming Public-Private Partnerships with mission related entities in the ammunition and chemical biological defense business sectors.

## Red River Army Depot (RRAD)

**Location:** Texarkana, Texas

**2019 Workforce:** 1,799



**Description:** RRAD's mission is to conduct ground combat and tactical systems sustainment maintenance operations, and related support services worldwide for the Army, other DOD components, and allied nations. RRAD is the Center of Industrial and Technical Excellence for the Bradley Fighting Vehicle (BFV), Multiple Launch Rocket System (MLRS), Tactical Wheeled Vehicles (light, medium, heavy, all



size trailers), Small Emplacement Excavator (SEE), and rubber products. Other supported systems include Army boats and bridges, cranes, material handling equipment, egress trainers, and a multitude of secondary items such as engines and transmissions. Red River Army Depot (RRAD) continues to support high levels of production for the Mine Resistant Ambush Protected (MRAP) All Terrain, Cougar, and MaxxPro vehicles to support fielding schedules for TACOM and the Marine Corps. RRAD specializes in forward deployment of maintenance operations in support of U.S. and allied military operations, and will project training and operations in support of Foreign Military Sales. The depot continuously engages in best business practices and process improvements designed to maximize quality throughput at optimal cost. RRAD supports operational transformation in alignment with its strategic plan with an eye to flexible solutions that will attract future business.

### Rock Island Arsenal-Joint Manufacturing and Technology Center (RIA-JMTC)

**Location:** Rock Island Arsenal, Illinois

**2019 Workforce:** 1,058



**Description:** RIA-JMTC is a heavy-metal manufacturer that specializes in artillery, weapon components, armor and mobile maintenance systems. RIA-JMTC is currently producing the M997A3 Ambulance, Line of Communication Bridge (prototype), Metalworking and Machining Shop Set, and manufacturing artillery parts, gun mounts, recoil mechanisms, small arms repair parts, aircraft weapon sub-systems, and weapons simulators. RIA-JMTC is the only multi-purpose and vertically integrated metal manufacturer in DOD and is a designated Center for Industrial and Technical Excellence for mobile maintenance systems, Add-on-Armor design, development, and prototype fabrication, and foundry operations. The center possesses the unique technical expertise and equipment to manufacture high quality and sustainable products. In May 2019 RIA-JMTC reached initial operating capability as the Center of Excellence for Advanced and Additive Manufacturing. FY2020 Enactment includes \$9M congressional add for pilot program to partner with Digital Manufacturing and Design Innovation Institute (DMDII) to drive the digital future of manufacturing within Army.

### Sierra Army Depot (SIAD)

**Location:** Herlong, California

**2019 Workforce:** 1,277



**Description:** SIAD is a recognized multi-functional installation that provides rapid expeditionary logistics support and long-term sustainment solutions to the Army and the Joint Force. SIAD is designated by the Department of the Army as the Center for Industrial Technical Excellence (CITE) for all Petroleum and Water





Distribution Systems (PAWS). In addition, SIAD is the redistribution point for containers of secondary items returning from Southwest Asia, and provides equipment receipt and asset visibility for these items. SIAD has also been designated as the Army's main consolidation and redistribution center for the Clothing Management Office (CMO) to perform Brigade-level Organizational Clothing and Individual Equipment Reset operations. These unique operations clearly provide a readiness and operational value to the Army and the Nation through management and controlled redistribution of equipment to meet urgent demands and support to deploying Soldiers.

## Tobyhanna Army Depot (TYAD)

**Location:** Tobyhanna, Pennsylvania

**2019 Workforce:** 2,972



**Description:** TYAD is designated as the Center of Industrial and Technical Excellence for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR), electronics, avionics, and missile guidance and control. TYAD's capabilities include full-spectrum logistics support for electronics sustainment, overhaul and repair, fabrication and manufacturing, engineering design and development, systems integration, technology insertion, modification, Foreign Military Sales, and Global Field support to our Joint Warfighters. The depot is also actively engaged in the Reset of equipment returning from operations in Iraq and Afghanistan. It provides installation support to attached organizations and assigned operating facilities.

## Tooele Army Depot (TEAD)

**Location:** Tooele, Utah

**2019 Workforce:** 465



**Description:** TEAD provides America's joint fighting forces with munitions and Ammunition Peculiar Equipment (APE) in support of military missions before, during, and after any contingency. The depot receives, stores, issues, renovates, modifies, maintains, and destroys conventional munitions for all of DOD. TEAD is designated as the Center of Industrial and Technical Excellence for APE. TEAD has assumed Command and Control over the APE function that is performed at McAlester, OK. This function will be a satellite of TEAD but remain located in McAlester and named Ammunition Equipment Satellite (AES). AES was integrated into LMP beginning in FY 2017. TEAD is the life cycle engineering depot for design, development, manufacturing and fielding of munitions systems and APE throughout the world.



## Watervliet Arsenal (WVA)

**Location:** Watervliet, New York

**2019 Workforce:** 741



**Description:** WVA produces armaments, mortars, recoilless rifles, howitzers and is recognized as the premier cannon-maker for the Army. This includes all life cycle support elements from research and development through prototype, manufacturing, testing support, legacy system support, and technical expertise. The guns manufactured at WVA provide the firepower for the Army's main battlefield tank, the M1A1 Abrams. WVA has established several unique and valuable partnerships with manufacturing industries resulting in increased workload, absorption of excess capacity, industry supplied capital improvements, cost sharing, and has recently gained American Bureau of Ship Building certification for WVA's forging process.

# Budget Highlights

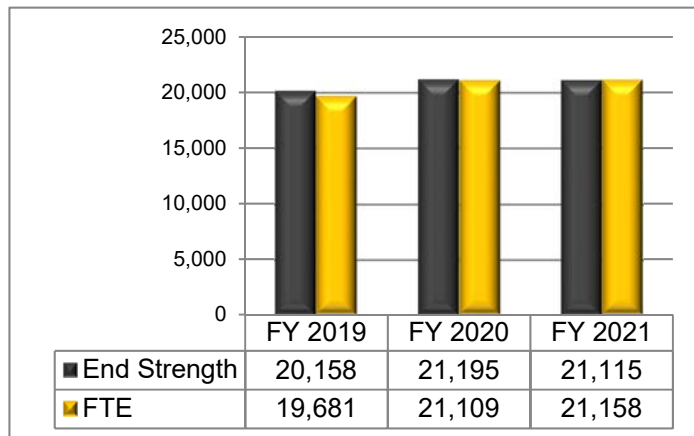
## Assumptions

This submission represents a business plan that supports equipment readiness requirements and assumes continued efforts in Overseas Contingency Operations. The budget reflects workload assumptions developed in coordination with customers that support both baseline and Reset requirements and incorporates historical trend analysis when developing future workload requirements. However, as unit rotations and weapon system delivery schedules shift, annual projections can change significantly between when budgets are developed and actual maintenance occurs. To offset these risks, the Industrial Operations activity remains poised to increase or decrease output in order to accommodate customers' changing requirements.

## Personnel

Civilian end-strength represents the number of personnel employed at the end of each fiscal year. Full time equivalents represent the manpower level of effort necessary to accomplish the projected workload on an annual basis. The Industrial Operations labor pool includes a mix of permanent, temporary, and

Chart IO 1 - Civilian Personnel (excludes contractors)

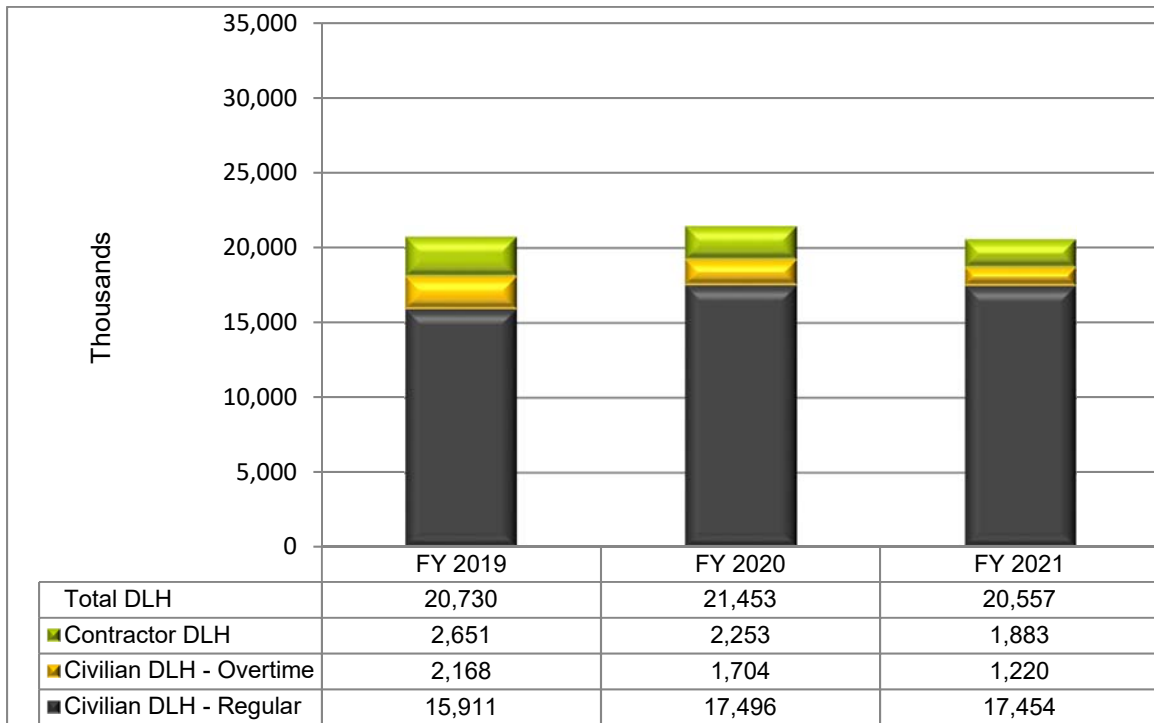


term-appointed employees, in addition to contract labor, which allow for workforce flexibility to accommodate changing requirements.

Maintaining a trained and ready workforce is critical to this labor intensive business. Industrial Operations activities engage in various workforce revitalization efforts to include interns, apprenticeship programs and a Pathways program which offers clear paths to Federal internships for students from high school through post-graduate school and to careers for recent graduates. Due to the specialized nature of the work and skill level requirements, training may require two to three years before an employee is able to perform specific tasks without supervision. In addition to civilian personnel, 24 military personnel are assigned to Industrial Operations (IO) activities in FY 2021.

## Direct Labor Hour (DLH)

Chart IO 2 - Direct Labor Hours



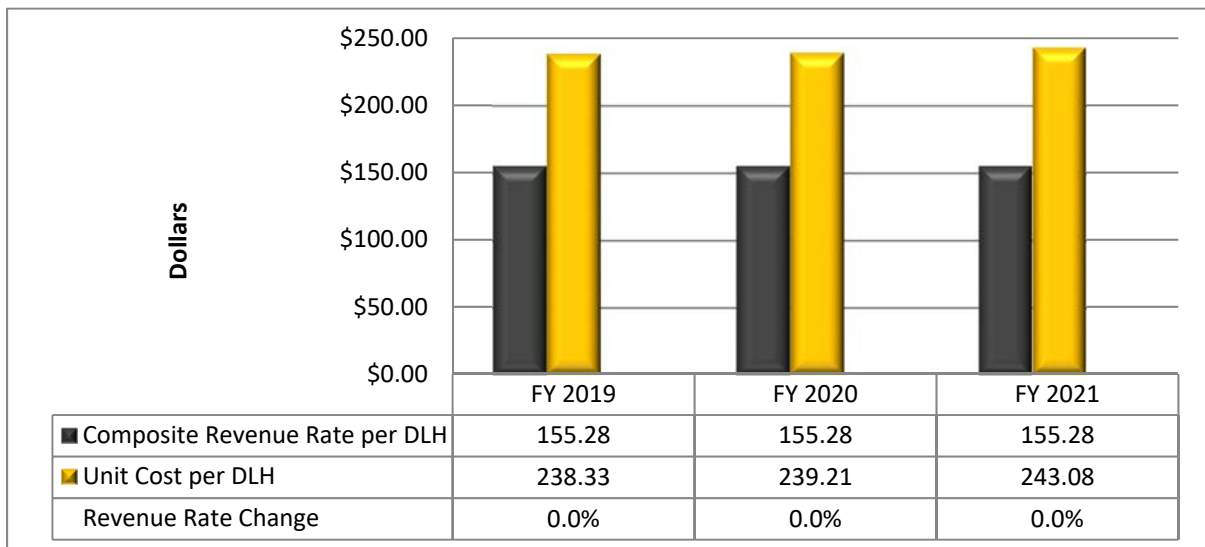
Total direct labor hours represent the number of hours required to complete the Industrial Operations direct mission workload. Direct labor hours remain relatively stable from year to year as workload received from previous years is completed. IO activities remain prepared to increase overtime and contractor DLHs in the event workload estimates increase.



## Direct Labor Hour Rate

The composite revenue rate is an aggregate hourly rate established in the budget cycle and used to price rate-stabilized workload. It is comprised of direct labor and material costs, overhead costs (mission indirect and non-mission indirect costs), and accumulated operating result adjustments that are designed to return gains or recover losses. In contrast to rate-stabilized workload, cost reimbursable workload represents workload that is prototype in nature or has very little repair history. It is not included in the stabilized rate calculation until sufficient repair information has been established. Due to new weapon systems in the Armys inventory and modernization efforts the majority of the workload at the depots is cost reimbursable and not burdened with the return or gain of prior years profits or losses. The composite revenue rate calculation is complex and influenced by several factors: 1) commodity mix of the workload planned (labor intensive, material intensive or both); 2) the amount of gains to be returned or losses to be recovered over the budget years; 3) the amount of stabilized direct labor hours available to return gains or recover losses; and 4) the number of total direct labor hours available to distribute overhead cost (stabilized and non-stabilized workload). A change to the composite revenue rate directly affects the total revenue and new order values for the budget year. The FY 2021 composite revenue rate is \$155.28 and is set to return \$83.9 million of prior year accumulated operating result (AOR). Unlike the composite revenue rate, which is adjusted for AOR and applied to new rate stabilized workload, the unit cost per direct labor hour represents total costs of work performed on both prior year and current year orders. The unit cost does not include adjustments for AOR. The return of operating gains to customers causes the revenue rate to be lower than unit cost.

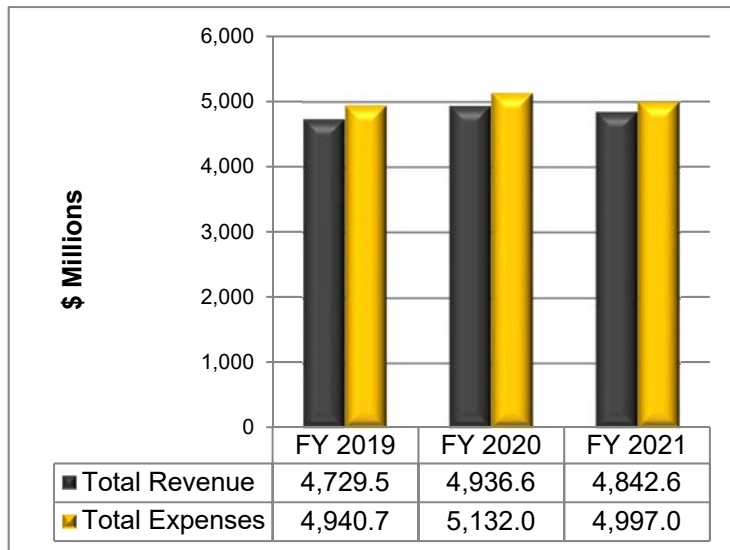
Chart IO 3 - Direct Labor Hour Rate



## Revenue and Expenses

The Industrial Operations revenue amount represents earnings from work performed on customer equipment. Total expenses cover full costs, including material, labor, storage, and other direct or indirect costs associated with the products or services being provided. Revenue and expense projections in FY 2021 remain high as the installations work off prior year work as well as new orders. Revenue in each year reflects the return of operational gains back to customers. Revenue and expenses are displayed in more detail on Exhibit Fund 14, *Revenue and Costs*.

Chart IO 4 - Revenue and Costs



## Operating Result

The Net Operating Result (NOR) represents the difference between revenue and expenses within a fiscal year. The recoverable NOR in FY 2019 and FY 2020 includes \$99 million and \$129 million respectively in direct appropriations provided to maintain competitive rates at the three arsenals. In addition, in FY 2019, FY 2020 and FY 2021 the recoverable NOR includes \$59 million, \$57.5 million, and \$32.6 million respectively for Industrial Mobilization Capacity (IMC) for costs associated with maintaining facilities to meet surge capacity needed for mobilization or war. The Army also received \$9 million in FY 2020 for a pilot program for partnership with digital manufacturing institute efforts in conjunction with Rock Island Arsenal- Joint Manufacturing and Technology Center. The Accumulated Operating Result (AOR) represents the summation of all operating gains or losses since activity group inception along with any prior period adjustments. The Industrial Operations business received approval from the Office of the Under Secretary of Defense (OUSD) Comptroller to defer the return of \$263.8 million of AOR for future rate stabilization when workload decreases. Without the direct appropriations mentioned above, the operational AOR at the end of FY 2021 is -\$122.2 million. The Recoverable NOR, Deferred AOR, and AOR are displayed in the following table and on Exhibit Fund 14, *Revenue and Costs*.



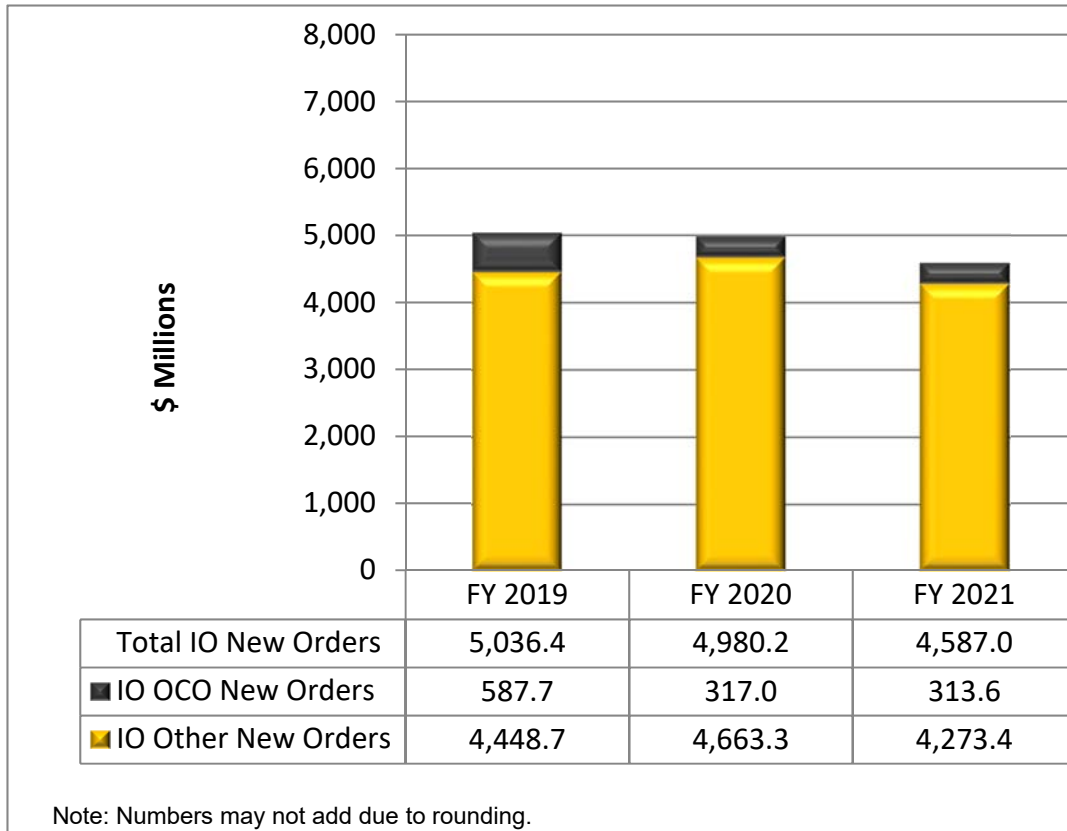
Table IO 1 - Operating Results

(\$ Millions)	FY 2019	FY 2020	FY 2021
Recoverable Net Operating Result	(71.4)	(48.9)	(83.9)
Deferred Accumulated Operating Result	0.0	0.0	(263.8)
Accumulated Operating Result	396.6	347.7	0.0

## New Orders

Industrial Operations activities develop workload projections based on close coordination with customers and their delivery schedule requirements. With fluid requirements and fiscal uncertainty, accurately predicting workload two to three years in advance has proven difficult. This budget includes workload assumptions associated with base program requirements and anticipated Reset workload included in the Overseas Contingency Operations (OCO) request. The Reset program ensures Army equipment is restored to a level of combat capability commensurate with a unit's future mission. The projected workload in FY 2021 is commensurate with customer projections and budgeted depot maintenance requirements. Exhibit Fund 11, *Source of New Orders and Revenue*, displays total new order estimates by fund category.

Chart IO 5 - New Orders



## Carryover

Carryover, or unfilled orders, represents the dollar value of the production orders (parts, labor, and overhead) that have been ordered and funded by customers but not completed by the industrial activities at the end of each fiscal year. Carryover leads to better planning, better decision making, and cost efficiencies at the depots and arsenals. It provides lead time to assemble necessary workforce skill sets, to establish supply chains, and to coordinate workload routing. Carryover also prevents production line stoppages and ensures the activities have funded work to provide a smooth transition between fiscal years.

The Army is focused on further reducing carryover by leveraging policy and process improvements aimed at increasing production, improving customer-provider communication, and strengthening controls over the acceptance of new orders. These initiatives were developed in response to the Government Accountability Office's FY 2013 carryover audit recommendations.<sup>6</sup> The policy for accepting new workload requires:

- The customer and the executing industrial activity to assess the availability of skilled labor to execute the workload
- The viability of the supply chain and availability of parts
- The availability of tools and equipment needed during production
- The availability of unserviceable assets
- The scheduled requirements per month
- The availability of funding to support the production

All AWCF activities have fully implemented and indoctrinated this criteria for accepting new orders.

Additionally, Army program acquisition managers are required to identify organic procurement funded requirements to the appropriate Life Cycle Management Command (LCMC) no later than the end of the first quarter of the year of execution. The Army's goal is to ensure procurement funded depot maintenance workloads are inducted into the depots no later than the end of the second quarter of the fiscal year. This will reduce orders placed late in the fiscal year that increase carryover.

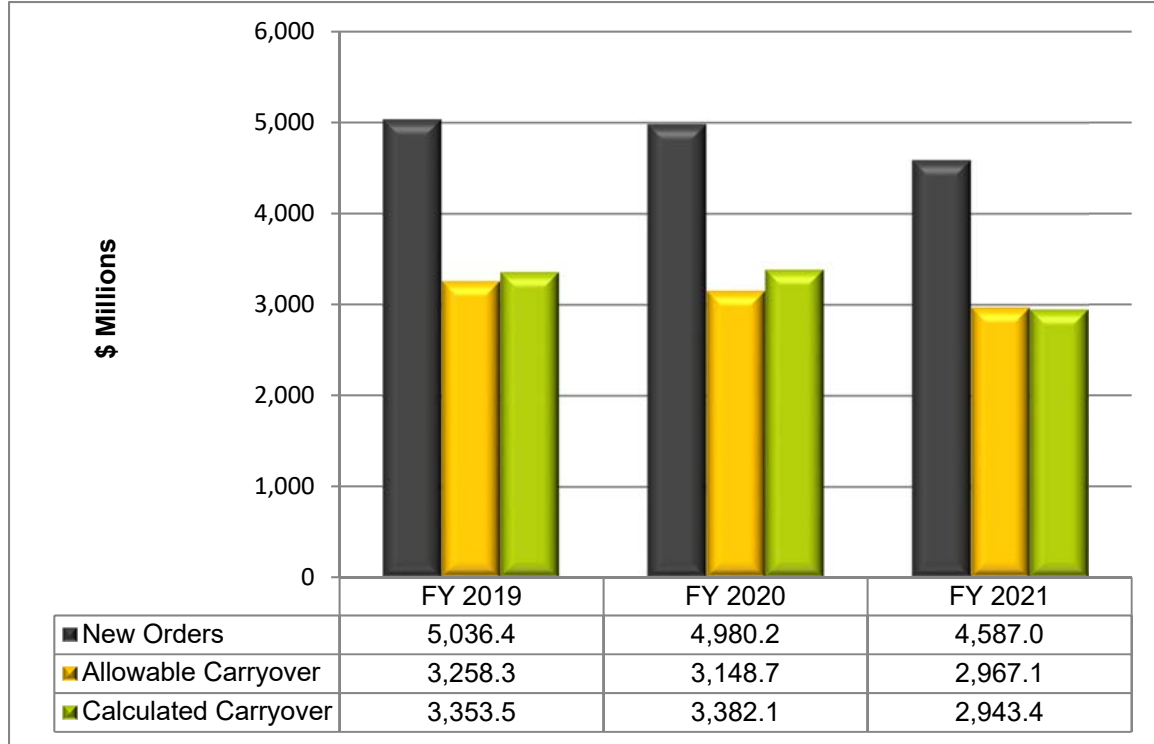
Army leadership is committed to monitoring carryover and production goals on a recurring basis through senior leader forums and quarterly Organic Industrial Base Corporate Boards. The Army plans to reduce carryover by \$553.5 million at the end of FY 2021. Carryover is displayed on Exhibit Fund 11, *Source of New Orders and Revenue*, and Exhibit Fund 11a, *Carryover Reconciliation*.

---

<sup>6</sup> U.S. Government Accountability Office, *Army Industrial Operations: Budgeting and Management of Carryover Could Be Improved*, GAO-13-499 (Washington, DC, 2013).



Chart IO 6 - New Orders and Carryover



## Performance Measurements

Performance measurements and goals for the Industrial Operations activity group include Recoverable Net Operating Result (NOR) and Productive Yield. FY 2019 actual results and projections for FY 2020 and FY 2021 are shown in the following table.

Table IO 2 - Performance Measurements

Measurements/Goals	FY 2019	FY 2020	FY 2021
Recoverable Net Operating Result	(71.4)	(48.9)	(83.9)
Productive Yield	1,543	1,570	1,571

The customer rates in the budget return prior year gains, as reflected by the negative NOR, and also preserves \$263.8 million of Accumulated Operating Result (AOR) for future rate stabilization.

Productive Yield represents the average number of regular direct labor hours for each full time equivalent position involved in production and is an indicator of whether direct labor employees can support projected workload. The historical goal for productive yield has been 1,615 direct labor hours per work position and represents total available work hours after holidays, leave, and training are removed. The productive yield projections for FY 2020 and FY 2021 are within expected parameters.





## Appropriations

The Industrial Operations (IO) activity received Direct Appropriations of \$99 million during FY 2019 and \$129 million in FY 2020 to maintain competitive rates at the Army’s arsenals. The Army also received \$9 million in FY 2020 for a pilot program for partnership with digital manufacturing institute efforts in conjunction with Rock Island Arsenal- Joint Manufacturing and Technology Center. In FY 2019, FY 2020, and FY 2021 the Army requests \$59.0 million, \$57.5 million, and \$32.6 million for Industrial Mobilization Capacity for costs associated with maintaining facilities to meet surge capacity needed for mobilization or war. Industrial Mobilization Capacity (IMC) funding sustains industrial base equipment required for mobilization that is idle for more than 80 percent in any one month but used at least once during the year. Army Organic Industrial base (OIB) workload has steadily declined over the past ten years resulting in some equipment being utilized at these lower rates. The Army requires IMC funding to sustain this equipment, enabling the OIB to rapidly surge in support of a future mobilization.

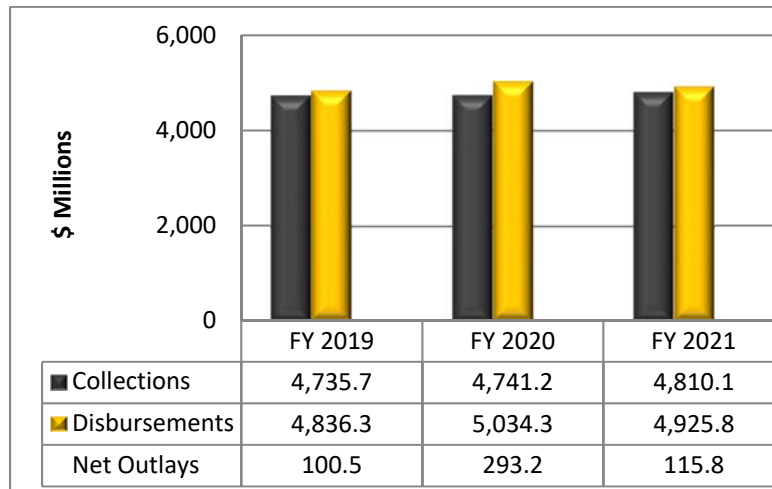
Table IO 3 – Appropriations

(\$ Millions)	FY 2019 Actuals	FY 2020 Enacted	FY 2021 Request
Arsenal Sustainment Initiative	99.0	129.0	0.0
Digital Manufacturing Pilot Program	0.0	9.0	0.0
Industrial Mobilization Capacity	59.0	57.5	32.6
<b>Total Appropriated Funds</b>	<b>158.0</b>	<b>195.5</b>	<b>32.6</b>

## Collections, Disbursements, and Outlays

Chart IO 7 - Cash Management

Collections are calculated based on projected revenue and changes in accounts receivable. Disbursements are projected based on monthly operating expenses, changes in accounts payable, and Capital Investment Program



obligations. Net outlays reflect the return of accumulated operating result to customers. Beginning in FY 2016, collections and disbursements between the

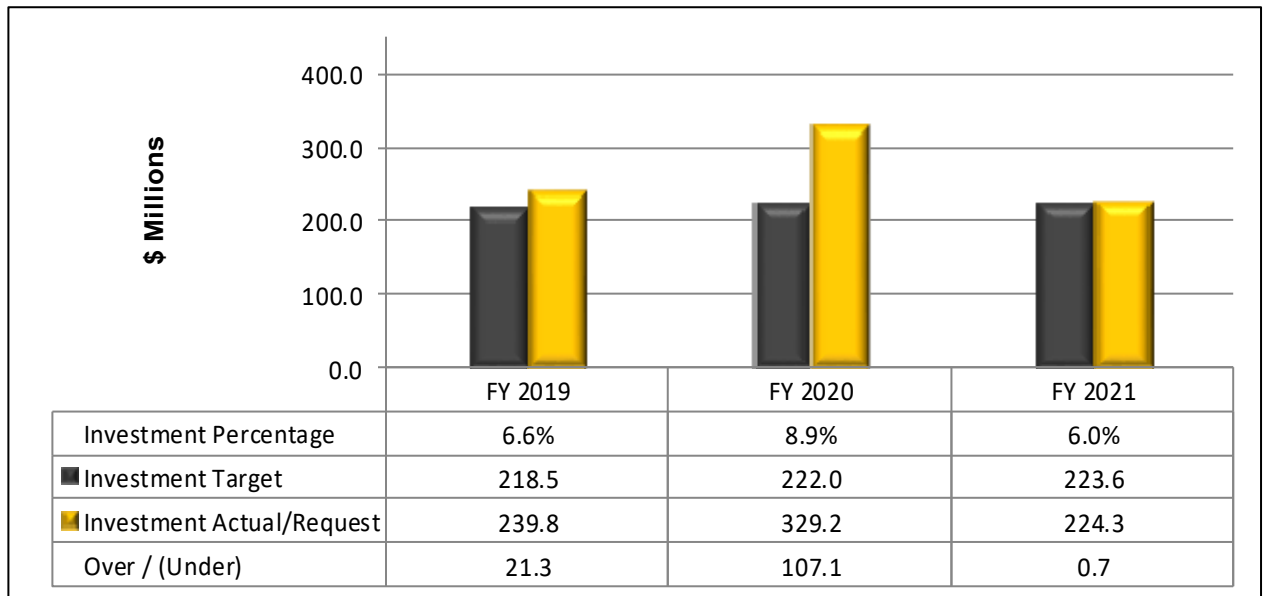


Industrial Operations and Supply Management activity groups will process for all internal work performed.

## Minimum Capital Investment for Certain Depots and Arsenals

The National Defense Authorization Acts for FY 2007, FY 2009, and FY 2012 require the five Army maintenance depots (Anniston, Red River, Letterkenny, Tobyhanna, and Corpus Christi), the three arsenals (Rock Island, Pine Bluff, and Watervliet) and Tooele Army Depot to invest the equivalent of at least six percent of funded workload.

Chart IO-8 – Minimum Capital Investment



The chart displays the total investment target and total investment amount planned. Since the minimum capital investment became law, the Army has invested over \$3.9 billion, representing an average of 6.8 percent of revenue spent on capabilities and infrastructure. Industrial Operations (IO) activities review future production and infrastructure requirements and project return on investment when developing capital budgets. The Army is committed to investing six percent in each year. Exhibit Fund 6, *Depot Maintenance 6% Capital Investment* provides investment details by category for each activity.



**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Revenue and Costs  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<b>Revenue</b>			
Gross Sales:	4,571.5	4,741.2	4,810.1
Operations	4,401.8	4,569.5	4,656.1
Depreciation excluding Major Construction	169.7	171.6	153.9
Other Income (DWCF Direct Appropriation)	158.0	195.5	32.6
<b>Total Income:</b>	4,729.5	4,936.6	4,842.6
<b>Costs</b>			
Salaries and Wages:	1,913.7	1,996.9	2,017.4
Military Personnel Compensation & Benefits	4.0	3.6	3.6
Civilian Personnel Compensation & Benefits	1,909.7	1,993.4	2,013.8
Travel & Transportation of Personnel	32.2	33.0	31.0
Materials & Supplies (For Internal Operations)	1,824.4	1,793.6	1,691.9
Equipment	115.6	85.3	68.9
Other Purchases from Revolving Funds	115.3	101.4	101.8
Transportation of Things	9.1	8.5	8.7
Depreciation	169.7	171.6	153.9
Printing and Reproduction	0.6	1.9	1.9
Advisory and Assistance Services	72.6	65.0	68.7
Rent, Communication, Utilities, & Misc. Charges	92.2	118.2	99.8
Other Purchased Services	595.3	756.4	753.1
<b>Total Costs:</b>	4,940.7	5,132.0	4,997.0
<b>Operating Result</b>	(211.2)	(195.3)	(154.4)
Other Changes Affecting NOR:	139.9	146.4	70.5
Non-Recoverable Expenses (Unfunded Costs)	88.1	79.2	70.5
Non-Recoverable Expenses (FRM)	51.7	67.2	0.0
<b>Recoverable Net Operating Result</b>	(71.4)	(48.9)	(83.9)
Other Changes Affecting AOR			
a. AOR Beginning of Year (Unadjusted)	468.0	396.6	347.7
b. +/- Prior Year Adjustments			
c. Equals AOR BOY (Adjusted)	468.0	396.6	347.7
d. +/- Net Operating Result	(71.4)	(48.9)	(83.9)
e. Deferred AOR			(263.8)
f. Equals Recoverable AOR EOP	396.6	347.7	

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Source of New Orders and Revenue  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<b>1. New Orders</b>			
a. Orders from DoD Components:			
Department of Army			
Operations & Maintenance, Army	1,660.5	1,607.0	1,454.3
Operations & Maintenance, ARNG	106.1	159.9	154.0
Operations & Maintenance, AR	36.0	49.7	43.9
Subtotal, O&M:	1,802.6	1,816.5	1,652.2
Aircraft Procurement	58.1	63.0	44.4
Missile Procurement	38.4	21.4	24.6
Weapons & Tracked Combat Vehicles	437.5	305.9	292.1
Procurement of Ammunition	170.3	273.9	204.5
Other Procurement	306.5	307.9	277.0
Subtotal, Procurement:	1,010.9	972.1	842.6
RDTE	31.4	39.2	32.7
BRAC	0.0		
Family Housing	1.3	0.6	0.6
Military Construction	0.0	0.0	0.0
Chem Agents & Munitions Dest, Army	14.3	4.2	5.4
Other	0.4	0.5	0.5
Subtotal, Other Army:	47.4	44.5	39.1
Subtotal, Department of Army:	2,860.8	2,833.1	2,534.0
Department of Air Force O&M	90.7	124.7	132.3
Department of Air Force Investment	114.4	125.9	120.6
Department of Navy O&M	30.8	20.3	21.4
Department of Navy Investment	23.3	42.3	39.6
US Marines O&M	141.5	125.1	100.0
US Marines Investment	19.1	4.1	6.6
Other Department of Defense	130.0	158.3	109.1
Subtotal, Other DoD Services:	550.0	600.7	529.5

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Source of New Orders and Revenue  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
b. DWCF:			
Industrial Operations, Army	29.9	21.1	20.0
Supply Management, Army	1,191.0	1,073.4	1,138.5
Supply Management, Air Force	39.1	49.5	57.3
Supply Management, Navy	22.7	34.3	17.3
Supply Management, Marine Corps	4.6	27.5	11.6
DECA	0.1	0.0	0.0
DFAS	0.4	0.5	0.5
DISA	2.0	0.1	0.1
DLA	30.0	21.0	30.2
TRANSCOM	0.0	0.7	0.7
Other	0.0	0.0	0.0
Subtotal, DWCF:	1,319.8	1,228.1	1,276.2
c. Total DoD	4,730.6	4,661.9	4,339.7
d. Other Orders:			
Other Federal Agencies	3.9	4.0	2.4
Foreign Military Sales	154.6	158.3	123.8
Nonappropriated	0.8	0.4	2.4
Non-Federal Agencies	146.6	155.7	118.7
Subtotal, Other Orders:	305.8	318.3	247.2
<b>Total New Orders:</b>	5,036.4	4,980.2	4,587.0
<b>2. Net Carry-in Orders</b>	3,560.1	3,710.8	3,694.6
<b>3. Total Gross Orders</b>	8,596.5	8,691.0	8,281.6
<b>4. Revenue (-)</b>	4,571.5	4,741.2	4,810.1
<b>5. Accounting Adjustments to Unfilled Orders (-)</b>	0.0	0.0	0.0
<b>6. FMS, BRAC, Other Federal, and Non-Federal orders (-)</b>	493.2	402.5	382.0
Crash Damage	50.2	18.2	12.6
4th Qtr Other Service Wkld	128.1	147.0	133.5
<b>7. Funded Carry-over</b>	3,353.5	3,382.1	2,943.4
<b>8. Allowable Carry-over</b>	3,258.3	3,148.7	2,967.1
<b>9. Over/(Under) Allowable Carry-over</b>	95.2	233.4	(23.7)

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Carryover Reconciliation  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
1. Gross Carry-In	3,804.5083	4,025.0	3,949.9
Adjustments to Prior Year Orders	(244.4)	(314.2)	(255.2)
Net Carry-In	3,560.1	3,710.8	3,694.6
2. Revenue (Gross Sales)	4,571.5	4,741.2	4,810.1
3. New Orders	5,036.4	4,980.2	4,587.0
4. Exclusions:			
FMS	154.6	158.3	123.7
BRAC	0.0	0.0	0.0
Other Federal Depts & Agencies	3.9	4.0	2.4
Non-Federal and Others	147.4	156.0	120.8
Crash Damage	30.7	0.0	0.0
4th Qtr Other Service Wkld	128.1	147.0	133.5
5. Orders for Carryover Calculation	4,571.8	4,514.9	4,206.6
2nd Yr Orders for Carryover Calculation	1,003.2	1,167.8	1,144.4
6. Weighted Composite Outlay Rate	41.3%	44.9%	45.2%
2nd Yr Weighted Composite Outlay Rate	42.6%	43.4%	42.3%
7. Carryover Rate	58.7%	55.1%	54.8%
2nd Yr Carryover Rate	57.4%	56.6%	57.7%
8. Allowable Carryover (1st Year Outlay Rate)	2,682.7	2,488.3	2,306.6
Prior Year 2nd Yr Outlay Rate	575.6	660.4	660.5
Total Allowable Carryover	3,258.3	3,148.7	2,967.1
9. Balance of Customer Orders at Year End	4,025.0	3,949.9	3,471.5
10. Exclusions:			
FMS	405.4	290.4	239.1
BRAC	0.0	0.0	0.0
Other Federal Depts & Agencies	4.5	6.5	5.4
Non-Federal and Others	83.2	105.6	137.5
Crash Damage	50.2	18.2	12.6
4th Qtr Other Service Wkld	128.1	147.0	133.5
11. Calculated Carryover	3,353.5	3,382.1	2,943.4

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Changes in the cost of Operations  
(\$ in Millions)**

	<u>Costs</u>
<b>FY 2019 Actual</b>	<b>4,940.7</b>
<b>FY 2020 Estimate in President's Budget</b>	<b>4,947.1</b>
<b>Pricing Adjustments</b>	<b>26.4</b>
FY 2019 Pay Raise	22.5
-Civilian Personnel	22.4
-Military Personnel	0.0
Materials and Supplies	9.0
Other	(5.1)
<b>Productivity Initiatives and Other Efficiencies</b>	
Lean Program	12.7
Value Engineering Program	13.2
Reinvestment of Lean savings (-)	(25.8)
<b>Program Changes</b>	<b>158.5</b>
Labor	86.4
Travel	1.8
Material	(65.6)
Equipment	25.3
Transportation	(1.0)
Depreciation	6.3
Advisory and Assistance Services	36.1
Other Purchased Services	49.9
Other	19.3
<b>FY 2020 Current Estimate</b>	<b>5,132.0</b>
<b>Pricing Adjustments</b>	<b>89.6</b>
FY 2020 Pay Raise	30.5
-Civilian Personnel	30.4
-Military Personnel	0.1
Materials and Supplies	35.9
Other	23.2
<b>Productivity Initiatives and Other Efficiencies</b>	
Lean Program	15.6
Value Engineering Program	7.2
Reinvestment of Lean savings (-)	(22.8)
<b>Program Changes</b>	<b>(224.5)</b>
Labor	(10.1)
Travel	(2.6)
Material	(137.6)
Equipment	(18.2)
Transportation	0.0
Depreciation	(17.7)
Advisory and Assistance Services	2.3
Other Purchased Services	(18.4)
Other	(22.3)
<b>FY 2021 Budget Estimate</b>	<b>4,997.0</b>

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Material Inventory Data  
(\$ in Millions)**

FY 2019			
	<u>Total</u>	<u>Mobilization</u>	<u>Operating</u>
Material Inventory BOP	858.7		858.7
<u>Purchases</u>			
A. Purchases to Support Customer Orders (+)	1,541.9		1,541.9
B. Purchase of long lead items in advance of customer orders (+)	11.4		11.4
C. Total Purchases	1,553.3		1,553.3
<u>Material Inventory Adjustments</u>			
A. Material Used in Maintenance (and billed/charged to customer orders) (-)	1,182.4		1,182.4
B. Disposals, theft, losses due to damages (-)	31.4		31.4
C. Other reductions (list) (-)	299.5		299.5
D. Total inventory adjustments	1,513.2		1,513.2
Material Inventory EOP	898.8		898.8
FY 2020			
	<u>Total</u>	<u>Mobilization</u>	<u>Operating</u>
Material Inventory BOP	898.8		898.8
<u>Purchases</u>			
A. Purchases to Support Customer Orders (+)	1,217.3		1,217.3
B. Purchase of long lead items in advance of customer orders (+)	20.0		20.0
C. Total Purchases	1,237.3		1,237.3
<u>Material Inventory Adjustments</u>			
A. Material Used in Maintenance (and billed/charged to customer orders) (-)	1,125.0		1,125.0
B. Disposals, theft, losses due to damages (-)	23.4		23.4
C. Other reductions (list) (-)	17.0		17.0
D. Total inventory adjustments	1,165.4		1,165.4
Material Inventory EOP	970.7		970.7
FY 2021			
	<u>Total</u>	<u>Mobilization</u>	<u>Operating</u>
Material Inventory BOP	970.7		970.7
<u>Purchases</u>			
A. Purchases to Support Customer Orders (+)	1,076.0		1,076.0
B. Purchase of long lead items in advance of customer orders (+)	20.0		20.0
C. Total Purchases	1,096.0		1,096.0
<u>Material Inventory Adjustments</u>			
A. Material Used in Maintenance (and billed/charged to customer orders) (-)	1,059.7		1,059.7
B. Disposals, theft, losses due to damages (-)	14.5		14.5
C. Other reductions (list) (-)	15.8		15.8
D. Total inventory adjustments	1,089.9		1,089.9
Material Inventory EOP	976.7		976.7



**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Depot Maintenance 6% Capital Investment Plan  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<u>Anniston Army Depot</u>			
Average Revenue for Investment	686.9	784.6	841.6
WCF Capital Investment Program			
Facilities/Work Environment	0.0	4.4	0.0
Equipment Modernization	5.7	13.8	1.0
Processes	4.2	1.9	1.4
Capital Investment Program	9.9	20.2	2.4
Operating Funds Investments			
Facilities/Work Environment	14.0	7.3	4.6
Equipment Modernization	7.5	14.7	5.2
Processes	1.6	2.1	2.1
Total Operating Funds	23.1	24.1	11.9
Appropriated Funding			
MILCON	0.0	0.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	4.9	13.2	6.8
Total Appropriated Funding	4.9	13.2	6.8
Actual/ Budgeted Investment	37.8	57.6	21.1
Required Investment	41.2	47.1	50.5
Investment Over / (Under) Required Amount	(3.4)	10.5	(29.4)
<u>Corpus Christi Army Depot</u>			
Average Revenue for Investment	842.8	805.8	798.8
WCF Capital Investment Program			
Facilities/Work Environment	0.0	1.0	0.0
Equipment Modernization	18.2	4.9	4.7
Processes	4.3	2.0	3.5
Capital Investment Program	22.5	7.9	8.3
Operating Funds Investments			
Facilities/Work Environment	4.2	12.9	10.5
Equipment Modernization	8.3	22.9	17.3
Processes	0.0	0.0	0.0
Total Operating Funds	12.5	35.8	27.8
Appropriated Funding			
MILCON	0.0	86.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	0.0	1.8	0.0
Total Appropriated Funding	0.0	87.8	0.0
Actual/ Budgeted Investment	35.0	131.5	36.1
Required Investment	50.6	48.3	47.9
Investment Over / (Under) Required Amount	(15.5)	83.1	(11.8)

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Depot Maintenance 6% Capital Investment Plan  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<u>Letterkenny Army Depot</u>			
Average Revenue for Investment	467.7	502.1	485.9
WCF Capital Investment Program			
Facilities/Work Environment	0.0	0.0	0.0
Equipment Modernization	0.0	1.4	10.6
Processes	1.5	0.7	0.5
Capital Investment Program	1.5	2.1	11.1
Operating Funds Investments			
Facilities/Work Environment	3.9	5.8	9.8
Equipment Modernization	1.1	2.5	1.5
Processes	1.4	2.8	2.8
Total Operating Funds	6.4	11.1	14.1
Appropriated Funding			
MILCON	0.0	0.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	0.0	6.0	9.9
Total Appropriated Funding	0.0	6.0	9.9
Actual/ Budgeted Investment	8.0	19.2	35.0
Required Investment	28.1	30.1	29.2
Investment Over / (Under) Required Amount	(20.1)	(10.9)	5.9
<u>Red River Army Depot</u>			
Average Revenue for Investment	641.1	581.2	510.9
WCF Capital Investment Program			
Facilities/Work Environment	0.7	0.0	0.0
Equipment Modernization	3.8	0.0	0.0
Processes	1.4	0.6	0.5
Capital Investment Program	5.8	0.6	0.5
Operating Funds Investments			
Facilities/Work Environment	8.2	6.7	5.5
Equipment Modernization	11.4	7.5	5.1
Processes	0.0	0.0	0.0
Total Operating Funds	19.6	14.2	10.6
Appropriated Funding			
MILCON	0.0	0.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	13.6	6.6	11.1
Total Appropriated Funding	13.6	6.6	11.1
Actual/ Budgeted Investment	39.0	21.4	22.2
Required Investment	38.5	34.9	30.7
Investment Over / (Under) Required Amount	0.6	(13.4)	(8.5)

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Depot Maintenance 6% Capital Investment Plan  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<u>Tobyhanna Army Depot</u>			
Average Revenue for Investment	594.7	587.3	607.9
WCF Capital Investment Program			
Facilities/Work Environment	0.0	0.7	0.0
Equipment Modernization	5.2	5.9	12.5
Processes	2.7	1.5	0.9
Capital Investment Program	7.9	8.2	13.4
Operating Funds Investments			
Facilities/Work Environment	19.2	9.4	6.3
Equipment Modernization	6.6	6.4	8.0
Processes	0.0	2.2	2.3
Total Operating Funds	25.8	18.1	16.6
Appropriated Funding			
MILCON	0.0	0.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	18.2	23.5	8.4
Total Appropriated Funding	18.2	23.5	8.4
Actual/ Budgeted Investment	51.8	49.8	38.4
Required Investment	35.7	35.2	36.5
Investment Over / (Under) Required Amount	16.1	14.5	1.9
<u>Pine Bluff Arsenal</u>			
Average Revenue for Investment	115.8	127.6	139.3
WCF Capital Investment Program			
Facilities/Work Environment	0.0	0.0	0.0
Equipment Modernization	0.0	8.9	0.0
Processes	0.5	0.2	0.2
Capital Investment Program	0.5	9.1	0.2
Operating Funds Investments			
Facilities/Work Environment	16.0	4.4	4.6
Equipment Modernization	0.7	0.5	0.5
Processes	0.0	0.0	0.0
Total Operating Funds	16.7	5.0	5.1
Appropriated Funding			
MILCON	0.0	0.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	0.0	3.6	14.9
Total Appropriated Funding	0.0	3.6	14.9
Actual/ Budgeted Investment	17.1	17.6	20.2
Required Investment	6.9	7.7	8.4
Investment Over / (Under) Required Amount	10.2	10.0	11.8

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Depot Maintenance 6% Capital Investment Plan  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<u>Rock Island Arsenal</u>			
Average Revenue for Investment	169.1	168.2	169.8
WCF Capital Investment Program			
Facilities/Work Environment	0.0	0.0	12.5
Equipment Modernization	6.6	0.0	4.2
Processes	1.1	0.5	0.4
Capital Investment Program	7.7	0.5	17.1
Operating Funds Investments			
Facilities/Work Environment	7.4	6.4	6.6
Equipment Modernization	1.2	2.0	2.0
Processes	0.0	0.0	0.0
Total Operating Funds	8.6	8.4	8.6
Appropriated Funding			
MILCON	0.0	0.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	0.0	0.0	0.0
Total Appropriated Funding	0.0	0.0	0.0
Actual/ Budgeted Investment	16.3	8.9	25.7
Required Investment	10.1	10.1	10.2
Investment Over / (Under) Required Amount	6.1	(1.2)	15.5
<u>Watervliet Arsenal</u>			
Average Revenue for Investment	64.9	84.8	113.1
WCF Capital Investment Program			
Facilities/Work Environment	0.8	2.0	0.0
Equipment Modernization	0.0	0.0	0.0
Processes	0.5	0.2	0.2
Capital Investment Program	1.3	2.2	0.2
Operating Funds Investments			
Facilities/Work Environment	16.6	14.1	6.0
Equipment Modernization	0.0	0.0	0.0
Processes	0.0	0.0	0.0
Total Operating Funds	16.6	14.1	6.0
Appropriated Funding			
MILCON	0.0	0.0	
Procurement	0.0	0.0	0.0
Operations & Maintenance	0.0	5.4	0.0
Total Appropriated Funding	0.0	5.4	0.0
Actual/ Budgeted Investment	17.9	21.6	6.2
Required Investment	3.9	5.1	6.8
Investment Over / (Under) Required Amount	14.0	16.5	(0.6)

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Depot Maintenance 6% Capital Investment Plan  
(\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<u>Tooele Army Depot</u>			
Average Revenue for Investment	58.2	58.9	59.7
WCF Capital Investment Program			
Facilities/Work Environment	0.0	0.0	0.0
Equipment Modernization	0.0	0.0	0.0
Processes	0.3	0.1	0.1
Capital Investment Program	0.3	0.1	0.1
Operating Funds Investments			
Facilities/Work Environment	0.9	0.5	0.5
Equipment Modernization	1.0	1.0	1.0
Processes	0.0	0.0	0.0
Total Operating Funds	1.9	1.4	1.4
Appropriated Funding			
MILCON	0.0	0.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	14.7	0.0	18.1
Total Appropriated Funding	14.7	0.0	18.1
Actual/ Budgeted Investment	16.8	1.5	19.6
Required Investment	3.5	3.5	3.6
Investment Over / (Under) Required Amount	13.4	(2.0)	16.0
<b><u>Total Army</u></b>			
<b>Average Revenue for Investment</b>	<b>3,641.3</b>	<b>3,700.5</b>	<b>3,726.8</b>
WCF Capital Investment Program			
Facilities/Work Environment	1.5	8.1	12.5
Equipment Modernization	39.5	34.9	33.0
Processes	16.3	7.9	7.6
Capital Investment Program	57.2	50.9	53.0
Operating Funds Investments			
Facilities/Work Environment	90.4	67.5	54.4
Equipment Modernization	37.7	57.5	40.6
Processes	3.1	7.1	7.2
Total Operating Funds	131.2	132.1	102.2
Appropriated Funding			
MILCON	0.0	86.0	0.0
Procurement	0.0	0.0	0.0
Operations & Maintenance	51.3	60.2	69.1
Total Appropriated Funding	51.3	146.2	69.1
Actual/ Budgeted Investment	239.8	329.2	224.3
Required Investment	218.5	222.0	223.6
Investment Over / (Under) Required Amount	21.3	107.1	0.7
Investment Percentage	6.6%	8.9%	6.0%

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Fuel Data**

FY 2019			
PRODUCT	FUEL PROCUREMENT		
	BARRELS (millions)	COST PER BARREL (\$)	EXTENDED PRICE (\$ millions)
AVGAS (CONUS)		\$141.96	
AVGAS (OCONUS)		\$559.86	
<b>Diesel Fuel:</b>			
Distillates- F76		\$126.00	
High Sulfur- DF1	0.001	\$125.16	0.166
Generic (High Sulfur)- DF2	0.000	\$112.56	0.014
Ultra Low Sulfur- DS1	0.003	\$128.10	0.377
Ultra Low Sulfur- DS2	0.020	\$120.96	2.430
Burner Grade- FS1	0.001	\$122.64	0.117
Burner Grade- FS2	0.002	\$108.36	0.221
Biodiesel- BDI	0.003	\$121.38	0.312
<b>Jet Fuel:</b>			
JP8 & JA1		\$125.16	
JAA	0.010	\$124.32	1.270
JP5	0.000	\$126.42	0.014
JPTS		\$194.46	
Kerosene- KS1	0.000	\$123.06	0.006
<b>Motor Gasoline:</b>			
Regular, Unleaded- MUR	0.009	\$122.64	1.081
Midgrade, Unleaded- MUM		\$129.36	
Premium, Unleaded- MUP		\$144.06	
Gasohol- GUM	0.000	\$129.36	0.000
Ethanol- E85	0.000	\$122.64	0.005
<b>Residual:</b>			
Burner Grade- FS4		\$79.38	
Residual (Burner Grade)- FS6		\$63.00	
FOR		\$39.90	
Bunkers Marine- MGO		\$129.36	
Bunkers Intermediate Grade- 180, 380		\$94.50	
Into Plane Jet Fuel- IAI, IAA, IAB, IP8		\$141.96	
Local Purchase Jet Fuel- NA1, NAA	0.000	\$153.30	0.032
Local Purchase Ground Fuel- NLS, NMU		\$131.04	
Propane	0.001	\$125.16	0.179
<b>TOTAL</b>	<b>0.051</b>		<b>6.223</b>

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Fuel Data**

FY 2020			
	FUEL PROCUREMENT		
PRODUCT	BARRELS (millions)	COST PER BARREL (\$)	EXTENDED PRICE (\$ millions)
AVGAS (CONUS)		\$141.96	
AVGAS (OCONUS)		\$559.86	
<b>Diesel Fuel:</b>			
Distillates- F76		\$126.00	
High Sulfur- DF1	0.001	\$125.16	0.160
Generic (High Sulfur)- DF2	0.000	\$112.56	0.013
Ultra Low Sulfur- DS1	0.001	\$128.10	0.126
Ultra Low Sulfur- DS2	0.020	\$120.96	2.425
Burner Grade- FS1	0.001	\$122.64	0.127
Burner Grade- FS2	0.003	\$108.36	0.327
Biodiesel- BDI	0.002	\$121.38	0.233
<b>Jet Fuel:</b>			
JP8 & JA1		\$125.16	
JAA	0.018	\$124.32	2.273
JP5	0.000	\$126.42	0.044
JPTS		\$194.46	
Kerosene- KS1		\$123.06	
<b>Motor Gasoline:</b>			
Regular, Unleaded- MUR	0.010	\$122.64	1.206
Midgrade, Unleaded- MUM		\$129.36	
Premium, Unleaded- MUP		\$144.06	
Gasohol- GUM		\$129.36	
Ethanol- E85	0.001	\$122.64	0.080
<b>Residual:</b>			
Burner Grade- FS4	0.001	\$79.38	0.070
Residual (Burner Grade)- FS6		\$63.00	
FOR		\$39.90	
Bunkers Marine- MGO		\$129.36	
Bunkers Intermediate Grade- 180, 380		\$94.50	
Into Plane Jet Fuel- IAI, IAA, IAB, IP8		\$141.96	
Local Purchase Jet Fuel- NA1, NAA	0.004	\$153.30	0.555
Local Purchase Ground Fuel- NLS, NMU		\$131.04	
Propane	0.002	\$125.16	0.256
<b>TOTAL</b>	<b>0.064</b>		<b>7.896</b>

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Fuel Data**

FY 2021			
	FUEL PROCUREMENT		
PRODUCT	BARRELS (millions)	COST PER BARREL (\$)	EXTENDED PRICE (\$ millions)
AVGAS (CONUS)		\$133.98	
AVGAS (OCONUS)		\$527.94	
<b>Diesel Fuel:</b>			
Distillates- F76		\$118.86	
High Sulfur- DF1	0.001	\$118.02	0.152
Generic (High Sulfur)- DF2	0.000	\$106.26	0.013
Ultra Low Sulfur- DS1	0.001	\$120.96	0.119
Ultra Low Sulfur- DS2	0.020	\$120.12	2.374
Burner Grade- FS1	0.001	\$115.50	0.120
Burner Grade- FS2	0.003	\$102.06	0.284
Biodiesel- BDI	0.002	\$114.24	0.227
<b>Jet Fuel:</b>			
JP8 & JA1		\$118.02	
JAA	0.019	\$117.18	2.171
JP5	0.000	\$119.28	0.042
JPTS		\$183.54	
Kerosene- KS1		\$115.92	
<b>Motor Gasoline:</b>			
Regular, Unleaded- MUR	0.009	\$115.50	1.085
Midgrade, Unleaded- MUM		\$121.80	
Premium, Unleaded- MUP		\$136.08	
Gasohol- GUM		\$121.80	
Ethanol- E85	0.001	\$115.50	0.078
<b>Residual:</b>			
Burner Grade- FS4	0.001	\$74.76	0.066
Residual (Burner Grade)- FS6		\$59.22	
FOR		\$39.90	
Bunkers Marine- MGO		\$122.22	
Bunkers Intermediate Grade- 180, 380		\$89.04	
Into Plane Jet Fuel- IAI, IAA, IAB, IP8		\$133.98	
Local Purchase Jet Fuel- NA1, NAA	0.004	\$144.90	0.560
Local Purchase Ground Fuel- NLS, NMU		\$123.48	
Propane	0.002	\$124.32	0.240
<b>TOTAL</b>	<b>0.064</b>		<b>7.533</b>



# Capital Budget

## Introduction

The primary goal of the Capital Investment Program (CIP) within the AWCF is to establish a capability for reinvestment in the infrastructure of business areas to improve product and service quality and timeliness, reduce costs, and foster state-of-the-art business operations. The CIP provides the framework for planning, coordinating, and controlling AWCF resources and expenditures to obtain capital assets. Included in the capital budget are the following types of assets: automated data processing equipment (ADPE); non-ADPE equipment; automated data processing software, whether internally or externally developed; and minor construction. The capital budget justifies the purchase of assets with a unit cost that is greater than or equal to \$250,000 and have a useful life of two or more years.

Headquarters, Army Materiel Command conducts a thorough vetting process to ensure capital projects deliver a positive return on investment and comply with strategic plans for each industrial facility. Capital projects within the Industrial Operations enterprise focus primarily on replacing and upgrading equipment, while the Supply Management enterprise focuses solely on software development in support of the Logistics Modernization Program.

Capital budget obligation authority is displayed on the following exhibits: Fund 9a, *Capital Investment Summary*; Fund 9b, *Capital Purchase Justification*; and Fund 9c, *Capital Budget Execution*.

The following table shows the Supply Management capital budget and associated cash outlays.

Table CIP 1- Supply Management Capital Budget

(\$ Millions)	FY 2019	FY 2020	FY 2021
Software	32.7	21.7	20.3
<i>Capital Cash Outlays</i>	35.6	26.8	22.1



The following table shows categories and respective values of the Industrial Operations capital budget and the projected capital cash outlays.

Table CIP 2 - Industrial Operations Capital Budget

<b>(\$ Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Equipment	39.2	41.4	37.5
ADPE & Telecommunications	5.1	7.0	8.3
Software	20.2	9.7	8.8
Minor Construction	4.4	24.6	16.0
<b>Total</b>	<b>68.8</b>	<b>82.7</b>	<b>70.7</b>
<i>Capital Cash Outlays</i>	<i>70.5</i>	<i>73.9</i>	<i>76.9</i>

*Note: Numbers may not add due to rounding*



**Army Working Capital Fund  
Fiscal year (FY) 2021 Budget Estimates  
Supply Management**

**Capital Investment Summary  
(\$ in Millions)**

Line No.	Item Description	FY 2019		FY 2020		FY 2021	
		QTY	Total Cost	QTY	Total Cost	QTY	Total Cost
00-02	<b>Software Development - Externally Developed</b>	1	32.665	1	21.696	1	20.318
	Logistics Modernization Program	1	32.665	1	21.696	1	20.318
	<b>TOTAL OBLIGATIONS*</b>		<b>32.665</b>		<b>21.696</b>		<b>20.318</b>
	<i>Total Capital Outlays</i>		35.644		26.849		22.063
	<i>Total Depreciation Expense</i>		45.068		44.408		33.312

\*Note: FY 2019 total of \$32.665M does not include the following:  
FY 2018 Army Price & Credit Tool (\$0.123M)

**Army Working Capital Fund  
Fiscal year (FY) 2021 Budget Estimates  
Supply Management**

**Capital Purchase Justification  
(\$ in Millions)**

<b>Line No. 00-02 Supply Management</b>	<b>Software Development - Externally Developed Logistics Modernization Program (LMP)</b>		
Item Description	FY 2019	FY 2020	FY 2021
<i>Logistics Modernization Program</i>	32.665	21.696	20.318
	<b>*Total</b>	<b>21.696</b>	<b>20.318</b>

\*Note: FY 2019 total of \$32.665M does not include the following: FY 2018 APACT \$0.123M.

*Narrative Justification*

LMP continues to require modernization enhancements to maintain superior supply chain functionality, supporting National Level Logistics. LMP Increment 1 was fully fielded in October 2010 and enhanced by LMP Increment 2's full deployment declaration in September 2016. These increments combine as the current LMP capability and is currently used by approximately 21,000 users at more than 50 Army locations worldwide, but is not yet integrated into overarching Army transformation efforts or extended into shop floor control activities. LMP is an enabler for the Army to achieve its commitment to having fully auditable AWCF financial statements. The LMP continues to seamlessly enhance the Enterprise Resource Planning (ERP) solution to achieve and meet compliance requirements and trading partner requirements.

Failure to fund LMP would prohibit AMC functional requirements from improving operations and put continuing financial compliance at risk. LMP will not be in compliance with Secretary of Defense directives. LMP may not be able to meet the all Federal, DOD, and Army milestones being developed in the Army Standard Line of Accounting implementation plan.

Total Asset Visibility - Contractor: In FY 2017-2021, LMP will design, develop, test, and begin deploying improvements to the existing inventory management processes for Army Working Capital Fund inventory held by Army contractors to improve the automated links with the contractor systems to improve the overall inventory accuracy and reduce manual efforts and address weaknesses identified by auditors to include the DoD Inspector General (A-2015-FMR-0217.000, D2014-D000FI-0138.000). No Economic Analysis is required as this is a directed audit compliance requirement.

In FY 2005, a Business Case Analysis was completed for the LMP and an updated Economic Analysis was completed and validated by the Office of the Deputy Assistant Secretary of the Army-Cost and Economics June 2008. It is available upon request. LMP Increment 2 Economic Analysis is also available upon request.

**Fiscal year (FY) 2021 Budget Estimates  
Supply Management**

**Capital Budget Execution  
(\$ in Millions)**

<b>FY</b>	<b>Major Category</b>	<b>Initial Request</b>	<b>Current Proj Cost</b>	<b>Approved Change</b>	<b>Explanation</b>
<b>2019</b>	<b>Software Development</b> <i>Logistics Modernization Program</i>	54.707	32.665	(22.042)	\$21.998M initially requested for LMP in FY 2019 is now on the CIP carryover list for FY 2020 and is included in the current project cost column.
	<i>Army Price &amp; Credit Tool</i>	3.400	0.000	(3.400)	\$3.400M will carryover into FY 2020. \$0.123M of carryin from FY 2018 obligated in FY 2019.
	<b>Total FY 2019</b>	<b>58.107</b>	<b>32.665</b>	<b>(25.442)</b>	
<b>2020</b>	<b>Software Development</b> <i>Logistics Modernization Program</i>	21.696	21.696	0.000	
	<b>Total FY 2020</b>	<b>21.696</b>	<b>21.696</b>	<b>0.000</b>	
<b>2021</b>	<b>Software Development</b> <i>Logistics Modernization Program</i>	20.318	20.318	0.000	
	<b>Total FY 2021</b>	<b>20.318</b>	<b>20.318</b>	<b>0.000</b>	

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Investment Summary  
(\$ in Millions)**

Line No.	Item Description	FY 2019		FY 2020		FY 2021	
		QTY	Total Cost	QTY	Total Cost	QTY	Total Cost
05-13	<b>NON- ADPE EQUIPMENT CAPABILITIES</b>	<b>16</b>	<b>39.166</b>	<b>18</b>	<b>41.409</b>	<b>15</b>	<b>37.503</b>
	- Replacement	4	8.831	10	27.314	8	29.043
	- Productivity	12	30.335	8	14.095	6	6.180
	- Environmental	0	0.000	0	0.000	1	2.280
	<b>ADPE &amp; Telecommunications Equipment</b>	<b>2</b>	<b>5.082</b>	<b>4</b>	<b>7.003</b>	<b>2</b>	<b>8.271</b>
19-01	- TYAD Zero Client	1	2.840	0	0.000	0	0.000
20-03	- Public Address/Visual Information System (PAVIS)	0	0.000	1	3.781	0	0.000
19-05	- Voice over Internet Protocol (VOIP)	1	2.242	1	1.396	0	0.000
20-01	- Storage Array	0	0.000	1	1.271	0	0.000
20-02	- Virtual Desktop Infrastructure Upgrade	0	0.000	1	0.555	0	0.000
21-01	- Virtual Desktop Infrastructure (VDI) Implementation	0	0.000	0	0.000	1	3.892
21-02	- Land Mobile Radio (LMR) Lifecycle Replacement	0	0.000	0	0.000	1	4.379
	<b>Software Development - Externally Developed</b>	<b>1</b>	<b>20.174</b>	<b>2</b>	<b>9.669</b>	<b>2</b>	<b>8.842</b>
00-02	- Logistics Modernization Program	1	20.174	1	9.390	1	6.753
20-03	- Common IFF Test Rack Calibration Software	0	0.000	1	0.279	0	0.000
21-03	- Upgrade of Server Room Control System (Software)	0	0.000	0	0.000	1	2.089
05-26	<b>MINOR CONSTRUCTION CAPABILITIES</b>	<b>5</b>	<b>4.387</b>	<b>16</b>	<b>24.634</b>	<b>6</b>	<b>16.041</b>
	- Replacement	2	1.361	2	1.963	0	0.000
	- Productivity	3	3.026	14	22.671	6	16.041
	<b>Total Obligations*</b>	<b>24</b>	<b>68.809</b>	<b>40</b>	<b>82.715</b>	<b>25</b>	<b>70.657</b>
	Total Capital Outlays		70.501		73.869		76.866
	Total Depreciation Expense		130.712		92.433		83.407

\*Note: FY 2019 total of \$68.809M does not include the following: FY 2012 Non-ADPE Equipment reprogramming (\$0.210M); FY 2016 Non-ADPE Equipment reprogramming (\$0.200M); FY 2018 Non-ADPE Equipment (\$15.341M); FY 2018 Minor Construction (\$1.250M)

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

<b>Line No. 05-13 Industrial Operations</b>	<b>Non - ADPE Equipment Capabilities Various Capital Equipment</b>		
Item Description	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<i>Various Capital Equipment - Replacement</i>	8.831	27.314	29.043
<i>Various Capital Equipment - Productivity</i>	30.335	14.095	6.180
<i>Various Capital Equipment - Environmental</i>	0.000	0.000	2.280
<b>Total</b>	<b>39.166</b>	<b>41.409</b>	<b>37.503</b>

***Narrative Justification***

This exhibit represents equipment purchases costing more than \$250K, which will improve the installations' efficiency or effectiveness through replacement, modification or addition of production and maintenance capability and compliance with new mission requirements. Equipment supports organic maintenance, overhaul, rebuild, reclamation, conversion, renovation, modification and repair programs.

Acquisition of this equipment improves productivity; increases capacity that cannot be met with current equipment; replaces unsafe, inoperable or unusable assets; and includes requirements for environmentally hazardous waste reduction or regulatory agency mandated requirements.

If not acquired, the impact would be reduced mission capability, cause failure to meet present and future workload requirements, increase man-hour expenditures, cause inability to meet production schedules, lead to excessive downtime, increase maintenance costs, and decrease accuracy and dependability.

Economic Analyses have been performed on individual projects when required and are available upon request.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

Line No. 19-01 Industrial Operations	ADPE & Telecommunications Equipment Tobyhanna Army Depot Zero Client		
Item Description	FY 2019	FY 2020	FY 2021
<i>Tobyhanna Army Depot (TYAD) Zero Client</i>	2.840	0.000	0.000
<b>Total</b>	<b>2.840</b>	<b>0.000</b>	<b>0.000</b>

***Narrative Justification***

Virtual desktop Infrastructure (VDI) replaces individual desktop PCs with zero-client hardware devices and includes the installation of a virtual desktop architecture in TYAD's network server room. Data storage capacity will be increased as will system memory and a virtual operating system installed. Throughout the depot, each desktop monitor and mouse are connected to a zero-client terminal which is connected to the network.

Zero-client - including the data room virtual operating system - costs less than desktop PCs, requires very little maintenance on either end, is extremely secure (for the most part immune to viruses), has individual terminals on personnel desks that consume significantly less energy than a desktop PC, and requires significantly less desk space than a PC.

Since everything is managed, stored and secured centrally, from the data center, thin clients eliminate the issues of installing, updating and patching applications, backing up files, or scanning for viruses on individual computers. Perhaps the most significant benefit of a zero-client architecture at TYAD is the elimination of a major concern for network security.

Without the investment in the zero-client, virtual desktop infrastructure, TYAD will continue to refresh individual desktop PC systems and associated operating systems and application software per the standard 4- to 5-year cycle, continually expend the time and expense to install and update software patches on individual desktop PCs along with continually scanning for viruses and backing up files, and will sustain the ever-present, ever-increasing concern for network security associated with desktop PC's.



**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

<b>Line No. 20-03 Industrial Operations</b>	<b>ADPE &amp; Telecommunications Equipment Public Address/Visual information System (PAVIS)</b>		
Item Description	FY 2019	FY 2020	FY 2021
Public Address/Visual Information System (PAVIS)	0.000	3.781	0.000
<b>Total</b>	<b>0.000</b>	<b>3.781</b>	<b>0.000</b>

***Narrative Justification***

The existing Public Address/Visual Information System (PAVIS) system is installed in 70 buildings at Tobyhanna Army Depot (TYAD) using an IED 500 Announcement Control System (ACS), which delivers paging to multiple unique zones. The project includes the Public Address (PA) Component of PAVIS only. An issue with the existing PAVIS system is its age (obsolescence), condition, reliability and the fact that it does not have some of the emergency alert features inherent in more modern announcement control (voice paging) systems. As a result of the lack of these features, the public address (paging) component of the system does not comply with current codes and regulations (National Fire Protection Agency, DoD Unified Facilities Criteria, etc.), designed to serve as a component of the required facility-wide Mass Notification System (MNS). Coupled with the depot's At Hoc text/e-mail alert messaging system, Big Voice and fire alarm system, the IED 500 ACS is a critical component of TYAD's MNS. Since there is no plausible means to upgrade the existing ACS system to meet current MNS requirements, TYAD has to replace the system or remain non-compliant in terms of regulatory requirements and put TYAD's facilities and personnel at risk of potential catastrophe during an emergency.

Integrated with the other emergency alert systems, a new public address component will provide TYAD with the capability to provide emergency notification to all personnel working on or visiting the depot. Augmenting the existing "Big Voice" speakers with additional outside speakers in all four quadrants of the depot will ensure full coverage for personnel working outside. Additional speakers will be located within the mission and administrative areas inside depot buildings including areas where cell phone usage is not permitted. A new PA system will have the capability of reaching all employees, contractors and personnel visiting the depot..

Without a new public address component, TYAD will be unable to notify personnel of emergency situations, local road closures, severe change in weather conditions, provide overhead paging for quick responses and mass notifications. Without an effective PA system, an emergency situation can escalate to a catastrophic change for harm, injury or even death of employees or severe damage or destruction of property.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

<b>Line No. 19-05 Industrial Operations</b>	<b>ADPE &amp; Telecommunications Equipment Voice Over Internet Protocol (VOIP)</b>		
Item description	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<i>Voice Over Internet Protocol (VOIP)</i>	2.242	1.396	0.000
<b>Total</b>	<b>2.242</b>	<b>1.396</b>	<b>0.000</b>

***Narrative Justification***

The analog telephone switch at Letterkenny Army Depot (LEAD) is over 20 years old and has reached end of life. Repair parts are becoming increasingly difficult to acquire.

LEAD expects to save significant man-hours and money with the installation of VOIP. The savings will be realized with less anticipated upkeep and reduced long distance utilizing Session Initiation Protocol (SIP).

The preferred alternative is to replace all existing equipment with JITC certified replacement. The recommended JITC certified VOIP equipment (Voice Over Internet Protocol) will maintain telephone traffic to all areas and keep LEAD compliant with all DOD policies and directives.

If a VOIP solution is not purchased and implemented, LEAD will continue to utilize a telephone switch in end of life status or will have to purchase a new analog telephone switch.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

Line No. 20-01 Industrial Operations	ADPE & Telecommunications Equipment Storage Array		
Item Description	FY 2019	FY 2020	FY 2021
Storage Array	0.000	1.271	0.000
<b>Total</b>	<b>0.000</b>	<b>1.271</b>	<b>0.000</b>

***Narrative Justification***

Corpus Christi Army depot (CCAD) has two primary storage solutions within the data center that store all of CCAD's data in support of our mission. These storage systems have reached their end of lifecycle and are no longer supported by the manufacturer. An additional storage system is located in a separate building that provides a hot site backup. This storage system has reached its end of lifecycle and will no longer be supported by the manufacturer after 2019. All data residing within the data center is automatically replicated to the hot site. Additionally, CCAD maintains a cold site backup at Joint Base San Antonio where all data at CCAD is replicated.

CCAD has a new requirement to expand video storage requirements for our Security Video Monitoring System (SVMS). Video is now stored on the same storage system as all other data. Given the technological advances in cameras and video technology, such as high definition, the storage requirement has increased dramatically. Currently, video can only be saved for approximately five days before it is overwritten. This is not adequate to meet our Security Division's requirement. If video is only saved for five days, by the time Security is notified of a possible investigation requirement, it is likely that the video no longer exists. Therefore, Security is requesting video be retained for 30 days. With the sensitive nature of the video, and its potential to be used in legal proceedings, it is necessary to ensure the integrity of potential evidence. In order to meet this requirement a separate storage system will be required.

The preferred alternative involves the purchase, installation, and configuration of three storage solutions. This solution includes the lifecycle replacement of the two storage solutions within the data center with one storage solution, the lifecycle replacement of the storage solution within our hot site, and the acquisition of a new storage solution to support SVMS.

Without funding, CCAD would be forced to continue the usage of existing storage solutions without support. This would be in conflict with Risk Management Framework security controls as well as increasing the risk of data loss if a failure is experienced within the storage solutions.

An Economic Analysis has been performed and is available upon request.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

Line No. 20-02	ADPE & Telecommunication Equipment		
Industrial Operations	Virtual Desktop Infrastructure Upgrade		
Item Description	FY 2019	FY 2020	FY 2021
<i>Virtual Desktop Infrastructure Upgrade</i>	0.000	0.555	0.000
<b>Total</b>	<b>0.000</b>	<b>0.555</b>	<b>0.000</b>

***Narrative Justification***

The Corpus Christi Army Depot (CCAD) hosts a Virtual Desktop Infrastructure (VDI) Environment that provides end users with a virtual desktop where all processing and storage takes place on servers that reside in CCAD's data center. Each virtual desktop consists of the latest Army Gold Master (AGM) running Microsoft (MS) Windows 7 with 2 Gigabytes (GB) of Random Access Memory (RAM) and required standard application software. The VDI provides failover capability, in the event of a failure, all VDI users would lose their existing virtual desktop. Logging in again would establish a new session on a different server and possibly at CCAD's hot site depending on the extent of the failure. CCAD must ensure compliance with all Information Assurance Vulnerability Alerts (IAVA) released by the United States Cyber Command (USCYBERCOM). CCAD is currently tracking 437 IAVAs that have been released in Fiscal Year 2017. The VDI allows us to maintain one master image for all virtual desktops, applying a patch to the master image replicates to all virtual desktops vice applying a patch to every physical device. This reduces man hours and increases our security posture. 7th Signal Command has implemented task order 150309-179 (enclosure 1) that requires implementation of MS Windows X64 bit architecture. U.S. Army Cyber Command and Second Army have issued operations order 2017-017 (enclosure 2) that requires implementation of Windows 10 no later than 31 Jan 2018. Computer systems with x64 version of Windows use more memory than hardware with a 32-bit version of Windows. In our current VDI environment, each virtual desktop consists of 2GB of RAM, moving to a Windows 10 X64 environment will require each virtual desktop to have 3GB of RAM to operate effectively. Our current VDI will not support the increased requirement.

Failure to fund would result in continued use of existing environment in its current configuration with 32bit Windows 7 operating system. Status quo is infeasible as CCAD would be in violation of the operation orders.

The preferred alternative involves the acquisition, installation, and configuration of additional servers to supplement the existing VDI environment. The preferred alternative will provide the memory resources to support the required X64 bit Windows 10 operating system. This alternative also increase CCAD Information Technology security posture given the efficient method of applying require security patches.

Without funding, CCAD would be forced to reduce the number of personnel utilizing the VDI by approximately 1,000 end users. This would in turn require us to purchase an equal amount of personal computers, which would increase the man hours required to maintain IAVA compliance and support the additional computers.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

Line No. 21-01	ADPE & Telecommunication Equipment		
Industrial Operations	Virtual Desktop Infrastructure (VDI) Implementation		
Item Description	FY 2019	FY 2020	FY 2021
<i>Virtual Desktop Infrastructure (VDI) Implementation</i>	0.000	0.000	3.892
<b>Total</b>	<b>0.000</b>	<b>0.000</b>	<b>3.892</b>

***Narrative Justification***

Letterkenny Army Depot (LEAD) currently life-cycles all depot workstations every three years in order to keep up with minimum system requirements for new and updated applications and operating systems. Imaging and deploying new workstations are labor intensive processes, and workstations are constantly subjected to the scanning and patching process. Information Assurance Vulnerability Management (IAVM) patching is a manual process that can be very time consuming and many times machines are non-compliant because they reject the patching. When this happens, onsite technicians must retrieve the workstation to go through manual reimaging. Physical machines quickly wear out due to being deployed in less than ideal industrial environments where they are constantly exposed to dust particulates and heat. There are constant issues with corruption of software and hardware failures that lead to down time for the customer and increased support time for service desk technicians.

LEAD expects to save significant time and money with the installation of a Virtual Desktop Infrastructure. While this project does have a high initial startup cost, savings are realized in the out years. As LEAD expands its virtual footprint, the Depot will realize savings through virtualization. As compared to traditional PC's, virtual desktops, or "Wyse Terminals", do not require reimaging and trouble tickets are significantly reduced. VDI allows for patching and scanning to be done on a, single, "root image" at one, centralized, location. Patching the "root image" with the latest security updates ensures every attached PC will also be protected. If a problem arises, only one, centralized system will need to be analyzed and repaired. Individual workstations will no longer need to be scanned and patched as new IAVMs are released. System Administrators will scan and patch the single image, then, propagate that image to the client terminals. The client terminal is completely solid state. No moving parts equates to a longer equipment life. The average life of a client terminal is about 6 years. A single PC is typically replaced twice within a six year period. Given the average PC costs approximately \$750, the government pays approximately \$1500 per user over that 6 year span. Conversely, a "Wyse Terminal" costs \$400 per unit. Over a period of 6 years, VDI saves the depot \$1100 per terminal. If the depot deploys 400 Wyse Terminals, the savings equates to \$440,000 every six years.

If a VDI solution is not purchased and implemented, LEAD will continue to life cycle 667 workstations annually to replace failing PCs and to replace PCs that no longer meet minimum system requirements to support the AGM and Office 2013. LEAD will continue to waste valuable time and money imaging, scanning, patching, supporting, and repairing physical workstations thus increasing our risk of security vulnerabilities.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

Line No. 21-02 Industrial Operations	ADPE & Telecommunication Equipment		
	Land Mobile Radio (LMR) Lifecycle Replacement		
Item Description	FY 2019	FY 2020	FY 2021
<i>Land Mobile Radio (LMR) Lifecycle Replacement</i>	0.000	0.000	4.379
<b>Total</b>	<b>0.000</b>	<b>0.000</b>	<b>4.379</b>

***Narrative Justification***

LMR is a system that consists of subscriber units (portable, mobile and base station radios as well as dispatch consoles) and site equipment (servers, data switches, routers, antennas, master repeaters and diagnostic tools) that allows First Responders, Emergency Operations, Public Works and Industrial Operations users to communicate. With specialized bridging equipment, the system also allows contact with County authorities in case of emergency. The current LMR system is the base for Letterkenny's approximately 450 subscriber units across the Depot and Depot Tenants. End of life for the subscriber units was 29 June 2017 according to Harris Products End of Life document ECR-8083D (1). Under the same document, the trunked repeaters have been discontinued with End of Service and Parts Support date of 31 January 2023. All of the system servers are also End of Life and well beyond the End of Service and Parts Support, which ended 23 March 2015. Letterkenny has been working with a third-party Contractor as well as the manufacturer to maintain the system. Currently, Letterkenny spends over \$102,000 a year in maintenance fees. .

LEAD expects to save significant man-hours in upkeep of the system when replaced. The updated system will be fully accredited, as well, ensuring LEAD's successful posture for the Continuity Of Operations Plan (COOP) currently in place. The proposed LMR system will have new features that will allow better system integration with local authorities. The new LMR system will also allow LEAD to recertify the system and apply all applicable Security Technical Implementation Guides (STIG)..

If LEAD is not granted permission to invest in a new LMR system, our First Responders, Emergency Operation and critical Public Works folks could possibly loose extremely valuable communications within the Depot, as well as with local authorities as the current systems reliable operation continues to decline with no support from the manufacturer.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

Line No. 00-02 Industrial Operations	Software Development - Externally Developed Logistics Modernization Program (LMP)		
	FY 2019	FY 2020	FY 2021
Item Description			
<i>Logistics Modernization Program</i>	20.174	9.390	6.753
<b>Total</b>	<b>20.174</b>	<b>9.390</b>	<b>6.753</b>

***Narrative Justification***

LMP continues to require modernization enhancements to maintain superior supply chain functionality, supporting National Level Logistics. LMP Increment 1 was fully fielded in October 2010 and enhanced by LMP Increment 2's full deployment declaration in September 2016. These increments combine as the current LMP capability and is currently used by approximately 21,000 users at more than 50 Army locations worldwide, but is not yet integrated into overarching Army transformation efforts. LMP is an enabler for the Army to achieve its commitment to having fully auditable AWCF financial statements. The LMP continues to enhance the Enterprise Resource Planning (ERP) solution to achieve and meet compliance requirements and trading partner requirements seamlessly.

Failure to fund LMP would prohibit AMC functional requirements from improving operations and put continuing financial compliance at risk. LMP will not be in compliance with Secretary of Defense directives. LMP may not be able to meet the all Federal, DOD, and Army milestones being developed in the Army Standard Line of Accounting implementation plan.

In FY 2005, a Business Case Analysis was completed for the LMP and an updated Economic Analysis was completed and validated by the Office of the Deputy Assistant Secretary of the Army-Cost and Economics June 2008. It is available upon request.

Tasks include technical upgrades, minor enhancements, compliance, auditability, and transition of services to new service providers. AWCF rules are followed to identify the appropriate color of money for these tasks. Specific audit related requirements to the industrial base include modernization efforts such as the Workload Planning and Reporting. Support of the cloud migration directive is now reflected as a budget requirement.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

<b>Line No. 20-03 Industrial Operations</b>	<b>Software Development - Externally Developed Common IFF Test Rack Calibration Software</b>		
Item Description	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<i>Common IFF Test Rack Calibration Software</i>	0.000	0.279	0.000
<b>Total</b>	<b>0.000</b>	<b>0.279</b>	<b>0.000</b>

***Narrative Justification***

The Common Identification Friend or Foe (IFF) Test Rack is used in combination with Versatile Depot Automatic Test Station (VDATS) test equipment to test the functioning of the AN/APX-118, -123 and -124 transponders. The workload is performed in the Transponder Section, Avionics Branch, Avionics & Sensors Division, D/C4ISR employing a Common IFF Test Rack and VDATS test system. A requirement for the instruments that make up the Common IFF Test Rack is to calibrate the instruments annually.

Currently, the only means to perform the calibration is to disassemble the test rack by removing all the interconnecting cables and wires between the instruments and the test fixture and replace the instruments with a “floater” set of calibrated instruments. The floater set of instruments is regularly transported to the Calibration Laboratory where they are manually calibrated and set aside in reserve until instruments in an IFF rack again require calibration.

Manually calibrating the instruments is not only time-consuming, but removing the interconnecting wires and cables creates the possibility that the wires and cables will be re-installed incorrectly, causing technicians to spend time troubleshooting potential reasons for equipment malfunctions. This process also leaves assets vulnerable to damage during transit, the manual calibration process or the test rack instrument replacement procedure.

Purchase of the calibration software algorithm will benefit the process of calibrating the instruments in the IFF Test Rack in the following ways:

- 1.) Automate the process in conjunction with the Portable Automated Test Equipment Calibrator (PATEC) and VDATS, with very little manual intervention
- 2.) Perform the calibration in significantly less time than the current process of replacing un-calibrated instruments with ones that are calibrated for test purposes

Tobyhanna Army Depot (TYAD) has already purchased a set of “floater” instruments so that regardless of how many Common IFF Rack/VDATS setups are in operation, there will always be a set of calibrated instruments in standby mode. However, over the course of the life of the project, instruments will fail and need to be replaced. Pursuing the new software will allow TYAD to use the existing standby “floater” set of instruments (costing more than the new software) as replacements/spares for those that fail during the normal course of operation of the test systems. Without the software, the Common IFF Test Rack will have to be disassembled to replace the un-calibrated instruments with the floater set and, these expensive instruments will still fail over time and will have to be replaced at some point during the duration of the transponder workload.



**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

<b>Line No. 21-03 Industrial Operations</b>	<b>Software Development - Externally Developed Upgrade of Server Room Control System (SW)</b>		
Item Description	FY 2019	FY 2020	FY 2021
<i>Upgrade of Server Room Control System (SW)</i>	0.000	0.000	2.089
<b>Total</b>	<b>0.000</b>	<b>0.000</b>	<b>2.089</b>

***Narrative Justification***

The existing Server Room Control System uses Automated Storage Retrieval System ASRS – Plus (software) to manage two HK4000 Unit Load Storage Retrieval Machines (SRMs), three HK750 Mini Load SRMs, and twenty-four Automated Ground Vehicles. This system controls the retrieving and storing of part's inventory from the ASRS pallet and pan based rack, supplying CCAD's kitting operations.

The preferred alternative involves the procurement, installation, and configuration of new Equipment Management System (EMS) software and recommended hardware. The goal is to restore CCAD's ASRS reliability and enhance its capability to function effectively. Anticipated Benefits: The following are high level benefits of the Dematic EMS Upgrade solution and the associated project implementation plan to fully restore system reliability, performance, maintainability and supportability:  
Computer system upgrades provide new computer system hardware/software and Dematic EMS system applications that are supportable and compatible with existing material handling system equipment, the LMP Host system, and functions required for ASRS management and material handling equipment control.

Without funding, CCAD would be forced to continue using the existing ASRS solutions with dwindling support. This would be in conflict with Risk Management Framework security controls as well as increasing the risk of productivity loss if a failure was experienced within the ASRS solution. Support for ASRS – Plus will eventually disappear (only two technical expertise are left with Dematic and they might soon retire). Without Dematic's technical expertise and support, needed service and maintainability will be almost impossible. Hence, it is imperative we switch to the Dematic's Equipment Management System, EMS software.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Purchase Justification  
(\$ in Millions)**

Line No. 05-26 Industrial Operations	Minor Construction Capabilities Various Minor Construction <\$2M		
Item Description	FY 2019	FY 2020	FY 2021
<i>Various Minor Construction Capabilities</i>			
<i>-Replacement</i>	1.361	1.963	0.000
<i>-Productivity</i>	3.026	22.671	16.041
<b>Total</b>	<b>4.387</b>	<b>24.634</b>	<b>16.041</b>

***Narrative Justification***

Various minor construction projects costing less than \$2M will improve the efficiency of the Industrial Operations through new, modernized additions to renovate existing facilities. The construction projects are additions or modifications to meet mission needs and improve the quality of life (safety/environmental concerns).

The projects will increase productivity and allow for quality of life improvements. Specifically, the efficiency of the mission work will improve with better plant layout, better electrical distribution, and improved lighting, heating, ventilation and air conditioning. The projects specific to quality of life improvements will improve worker morale and eliminate potential health and safety concerns.

If not approved, facility conditions will continue to decline, worker morale will decline, the work environment will erode, and worker safety and health will continue to be a major concern.

Economic Analyses have been performed on individual projects when required and are available upon request.

**Army Working Capital Fund  
Fiscal Year (FY) 2021 Budget Estimates  
Industrial Operations**

**Capital Budget Execution  
(\$ in Millions)**

<b>FY</b>	<b>Major Category</b>	<b>Initial Request</b>	<b>Current Projected Cost</b>	<b>Approved Change</b>	<b>Explanation</b>
<b>2019</b>	<b>Non-ADPE</b>	36.759	39.166	2.407	Increase due to addition of de-obligations. Prior year obs of \$15.750M not included in this total.
	<b>ADPE and Telcom</b>	3.037	5.082	2.045	Increase due to addition of de-obligations.
	<b>Software</b>	24.556	20.174	(4.382)	\$4.5M will carryover into FY 2020
	<b>Minor Construction</b>	14.402	4.387	(10.015)	Review of planned capital investments against capability required to support future customer orders resulted in the cancellation or reprogramming of various projects. Prior year obs of \$1.250M not included in this total.
	<b>Total FY 2019</b>	<b>78.754</b>	<b>68.809</b>	<b>(9.945)</b>	
<b>2020</b>	<b>Non-ADPE</b>	41.826	41.409	(0.417)	Review of planned capital investments against capability resulted in the cancellation of various projects.  A Public Address/Visual Information System (PAVIS) became a requirement for TYAD that had not previously been planned for FY 2020.
	<b>ADPE and Telcom</b>	3.220	7.003	3.783	
	<b>Software Development</b>	9.674	9.669	(0.005)	
	<b>Minor Construction</b>	29.600	24.634	(4.966)	Review of planned capital investments against capability required to support future customer orders resulted in the cancellation or reprogramming of various projects.
	<b>Total FY 2020</b>	<b>84.320</b>	<b>82.715</b>	<b>(1.605)</b>	
<b>2021</b>	<b>Non-ADPE</b>	37.503	37.503	0.000	
	<b>ADPE and Telcom</b>	8.271	8.271	0.000	
	<b>Software Development</b>	8.842	8.842	0.000	
	<b>Minor Construction</b>	16.041	16.041	0.000	
	<b>Total FY 2021</b>	<b>70.657</b>	<b>70.657</b>	<b>0.000</b>	

# The Army Values



Loyalty

Duty

Respect

Selfless Service

Honor

Integrity

Personal Courage

