The RAND Corporation’s three defense-related federally funded research and development centers (FFRDCs) help the U.S. government organizations responsible for national security meet challenges that call for both (1) sustained analytic attention from multidisciplinary teams over many years and (2) trust engendered by rigorous safeguards against conflicts of interest.

Through their enduring collaboration with defense policymakers, the three defense FFRDCs at RAND (see the box below) have developed unsurpassed expertise on issues of defense policy and interrelated technological, operational, and financial dimensions. Often, the FFRDCs apply this research capital by helping their Department of Defense (DoD) sponsors save the government money while solving national security problems. The list on page 2 illustrates projects that have helped save the government money or have the potential to do so. Subsequent pages contain summaries of the projects. (When publicly accessible documents are available, their references and links also appear.) These projects are representative of numerous analyses that have been conducted within RAND’s FFRDCs and have yielded similar benefits over the years. Together, the analyses account for billions of dollars in savings and cost avoidance.

**Ways That RAND Analyses Have Saved DoD Money**

RAND projects that have helped the government with cost savings and cost avoidance fall into three classes:

- Savings have been achieved or are ongoing.
- Savings have been projected and will accrue, assuming the government follows RAND’s recommendations.
- Savings have been enabled following RAND’s independent validation.
Recent Savings Achieved, Ongoing, Projected, or Validated by RAND Research

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NOTE: Dollar amounts are in nominal dollars current with the year of the study or savings. Some savings are thus underestimated in 2023 terms.

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### Savings Achieved or Ongoing

**Better Aligning Military Pay with the Civilian Market (2010–2020)**

$17 billion saved over ten years; potential to save billions more

In 2012, NDRI examined several options to help DoD realize savings in the military personnel budget without jeopardizing the United States’ ability to sustain a high-quality all-volunteer force. Among these options was a multiyear period of lower-than-usual increases in basic pay or a one-year freeze in basic pay. Over the period from 2014 to 2016, Congress acted to slow the increases in basic pay. The increases totaled 2.6 percentage points less than they otherwise would have been, and the lower resulting pay scales also implied lower subsequent basic pay costs. These ongoing reductions were forecast to generate an estimated cost savings of $17 billion over ten years, through 2021, according to the Congressional Budget Office. In 2018, NDRI updated its evaluation of the military compensation system and found that military pay substantially exceeded the benchmark used to set the level of miliary pay—about the 70th percentile of earnings for similar civilians, given the unusual demands and arduous nature of military service. Since retention continues to be strong, this finding suggests the continued potential to further slow pay growth on the order of billions of dollars annually. Although the tide is moving toward a pay increase for service members to address inflation and food insecurity, this research finds that, from a recruiting standpoint, increasing pay is the least cost-effective approach for addressing recruiting challenges.

*Setting the Level and Annual Adjustment of Military Pay*, Beth J. Asch et al., 2020, www.rand.org/t/RRA368-1
Cost-Effective Ways to Represent Adversary Capabilities in USAF Fighter Pilot Training (2022)

$110 million in cost avoidance

To train fighter pilots for combat, the U.S. Air Force (USAF) needs a fleet of aircraft that can mimic current and future adversary capabilities. But budgetary pressures have driven the USAF to reexamine how it meets the evolving demand for adversary air support. Air Combat Command asked PAF to analyze current and future demand for adversary air support; to evaluate supply options, including current USAF and contractor platforms; and to assess the cost-effectiveness of these options against specific training needs. PAF developed a framework to characterize the quality required for adversary air training and to evaluate various aircraft (and their associated costs) against these needs in multiple environments. Among other conclusions, researchers found that the commercial aircraft being used at Nellis Air Force Base was the lowest-value option for training missions required by the U.S. Air Force Warfare Center. In 2022, Air Combat Command canceled its contract with that commercial provider, thereby avoiding the remaining $110 million on the contract’s ceiling. Air Combat Command has since begun to use the more capable F-35A as an aggressor aircraft for training.

Fuel Reduction for the Mobility Air Forces (2015)

Up to $60 million per year in savings underway

Reducing aviation fuel use is an ongoing goal for military and civil operators, and Air Mobility Command has felt increasing pressure to further reduce fuel use by implementing and following known best practices. Although the USAF has achieved significant fuel reductions in recent years, it must continue to pursue cost-effective options to reduce fuel use. A PAF team considered 16 options for reducing fuel use and determined that 12 were cost-effective. However, about half of these had some negative implications. At 2015 fuel prices, six options were cost-effective and could be reasonably implemented: engine-out taxiing, always flying at optimum altitudes and speeds, continuing to reduce aircraft weight, reducing the use of aircraft auxiliary power units by using ground equipment instead, ensuring that loads are properly balanced, and installing microvanes on the C-130 fleet. Implementation of all these options is in various stages of progress. Together, they could save up to $60 million per year in fuel costs at 2015 fuel prices.

Improving Spare Parts Inventories for Army Brigade Combat Teams (2021)

$36 million annual savings ongoing; $24 million to $36 million additional annual savings projected

Historically, Army brigade combat teams (BCTs) independently determined their authorized stockage lists (ASLs)—the spare parts that units maintain to repair equipment damaged in training or operations. Maintaining ASLs established in this fashion led to significant variations in performance and relatively high costs, about $130 million annually. An Arroyo team developed a process for mathematically optimizing these ASLs that both improved performance and required only $10 million to fund. The reduction in inventory has lowered carrying costs by about 20 percent, or about $24 million annually. By leveraging the optimization algorithm to compute additional ASL updates (e.g., combat aviation brigades, Patriot batteries, and other active and Army National Guard units), the Army is likely to achieve similar reductions in obligation authority (e.g., 20 percent of $120 million per year, or $24 million annually). Approximately 50 percent of these savings are already underway, and the remaining 50 percent are projected with further expansion of this effort. The algorithm has also been applied to theater-level ASLs in both Europe and South Korea. Avoiding unnecessary inventory investment and workload going forward by reducing inventory churn will save $2 million to $4 million per year, depending on demand volumes in theater.
In an ongoing project, the Arroyo team has been applying a similar optimization algorithm to shop stocks in the Army’s ground BCTs. Simulations showed substantial improvement in performance, and the **reduced inventory carrying costs are expected to be in the range of $10 million to $20 million annually.**


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**Savings Projected**

**Cost-Effective Options for Armed Overwatch (2022)**

**Billions of dollars of savings in annual operating costs projected**

In 2020, U.S. Special Operations Command (SOCOM) asked NDRI to assess the cost-effectiveness of acquiring a new armed overwatch aircraft for intelligence, surveillance, and reconnaissance and attack missions. Researchers employed innovative methods of operational analysis, flight performance modeling, and cost analysis to evaluate the case for Congress to appropriate $3 billion for SOCOM to acquire 75 OA-1K armed overwatch aircraft. The assessment indicated that employing the OA-1K instead of existing aircraft in the DoD inventory would save billions of dollars in operating costs each year. As of 2023, for example, the USAF has a squadron of A-10 Thunderbolt II attack aircraft deployed to U.S. Central Command to support special operations forces fighting the Islamic State; if even just one detachment—four A-10s—were allocated to special operations forces at any given time, the annualized life-cycle and operating costs of that support would exceed $1 billion per year. The OA-1K requires less than a third of that amount for the same mission. SOCOM is currently fielding the OA-1K, which will free up conventional aircraft for other strategic priorities and, with enduring operations continuing in several combatant commands, provide essential air support to special operations forces for **billions of dollars less per year than DoD would otherwise have spent.**

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**Gaming Options to Reduce Military Personnel Costs While Ensuring a Ready Workforce (2023)**

**$500 million to more than $2 billion in potential annual savings**

The military personnel (MILPERS) budget provides financial resources to compensate active-duty personnel. This includes pay and allowances, health care and retirement pay accruals, and permanent-change-of-station travel. Since 2000, spending on MILPERS has grown steadily, while the cost of an airman has increased. The increased cost of personnel threatens to undermine the Department of the Air Force’s ability to field a ready workforce. The resulting growth in the MILPERS budget threatens to divert resources from modernization and sustainment efforts.

The USAF asked PAF to evaluate a variety of policy options that control personnel costs without increasing risks to mission or force. PAF designed and conducted a workforce futures policy game—Operation Retrenchment Specter—that simulates the monetary and nonmonetary effects of workforce and personnel policies in real time. Over 50 USAF participants competed to generate **novel options that were projected to yield annual savings ranging from $500 million to more than $2 billion.** Options included consolidating or eliminating organizations or functional communities, shifting to a more junior-grade mix, and converting officer positions to the enlisted force. These options revealed a fundamental trade space among cost, workforce size, and experience. Although the options are still in the formative phase, they provide a basis for developing future actions to limit MILPERS costs.


Using Operational Contract or Host Nation Support to Reduce the Cost of Prepositioning War Reserve Materiel in Europe (2020)

$575 million to over $1 billion in potential up-front cost savings

The European Deterrence Initiative and the 2018 National Defense Strategy provided a once-in-a-generation opportunity for the USAF to prepare for potential high-end conflict in Europe. A key part of this strategy is to preposition war reserve materiel—the facilities, equipment, and vehicles needed to quickly set up bases and begin combat operations—at strategic locations throughout the theater. U.S. Air Forces in Europe and Air Forces Africa (USAFE-AFAFRICA) developed the concept of a deployable air base system (DABS), which includes the resources needed to establish forward operating locations and begin executing high-volume combat operations in the first 30 days of a conflict.

As part of a larger analysis of the feasibility, cost, and risks of this strategy, PAF examined how the use of operational contract support (OCS) or host nation support (HNS) to provide certain types of equipment could help reduce the cost of the DABS kits. Researchers identified 11 categories of equipment that could potentially be supplied by OCS or HNS and that USAFE-AFAFRICA may be willing to source externally. The researchers estimated that USAFE-AFAFRICA could source $33.8 million (40 percent of the total cost) from OCS or $61.4 million (73 percent of the total cost) from HNS. Given USAFE-AFAFRICA’s current plan to acquire 17 DABS kits, use of OCS or HNS could save between $575 million and over $1 billion in up-front costs. This estimate does not include additional savings from storage, maintenance, and transportation. It also does not include the potential costs of sourcing capabilities through OCS or HNS at the time of need. PAF recommended that USAFE-AFAFRICA examine the risks associated with relying on external sources of supply.

Strategic Data Discovery for Army Contracting (2021)

$1 billion or more in projected savings

The Army annually awards hundreds of thousands of contracts worth tens of billions of dollars. In fiscal year (FY) 2016, Army Contracting Command awarded almost 170,000 contracts, valued at $56.4 billion. The Army’s ability to analyze these contracts and identify potential efficiencies is limited by the nature of the data and Army Contracting Command’s information technology infrastructure—including hardware, software, and policy—that preclude adequately querying across all data. In particular, contract data are often stored as PDFs, which are unstructured and cannot be read by computers. The Arroyo team identified an approach to rendering these data machine-readable by developing the tools required to query, expose, and index unstructured data. These tools make visible the full scope of goods and services, customer requirements, and other information related to Army contracts that are not fully communicated in structured data. To demonstrate the approach’s utility, the team pursued a proof-of-concept effort that identified contracts with over $1 billion in unliquidated obligations that could potentially be available for reallocation.


Potential cost savings of hundreds of millions of dollars per year

Since the early 2000s, the Army has spent $1.5 billion to $2 billion dollars annually on recruiting resources—including recruiters, enlistment bonuses, and advertising—to meet its accession requirements. To make the best use of funds, the Army needs to understand how recruiting resources and recruit eligibility policies work together as a system under varying requirements and environments. An Arroyo team developed the Recruiting Resource Model to estimate the optimal recruiting resource levels and mix needed.
to support future recruiting under changing enlisted accession requirements, varying labor market conditions and recruiting environments, and alternative recruit eligibility policies. The model also allows the Army to assess alternative courses of action. In addition to the initial study, which focused on Regular Army recruitment, a follow-on study focused on the U.S. Army Reserve. By estimating a variety of possible scenarios involving alternative economic factors, resourcing strategies, eligibility policies, and accessions goals, the Recruiting Resource Model has predicted that the Army could potentially save hundreds of millions of dollars a year by optimizing the mix of recruiting resources it uses to achieve its accession mission.


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**Increasing Availability and Lowering Costs of Depot-Level Reparable Parts (2021)**

**At least $100 million savings annually projected**

Army depots are often tasked with restoring complex components, such as vehicle engines and transmissions, which are used to repair Army equipment. These parts are also known as depot-level reparables (DLRs). In cases in which depots are unable to service such components, the Army relies on the efficient and effective return and repair of parts to support equipment readiness and to avoid expensive new purchases. However, the return process is complex and has multiple segments involving different process owners, leading to delays in parts being fixed and restored to the supply chain. The Arroyo team analyzed data from the Global Combat Support System–Army Wave 2, developed performance metrics for the process to return parts from the unit to the depot, identified significant inefficiencies, and recommended improvements for managing DLRs. In addition to increasing equipment readiness, improved DLR management below the national level has the potential to help the Army avoid at least $100 million in new DLR purchases annually through improved timeliness.

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**Optimizing Army Enlistment Incentives (2022)**

**$18 million to $121 million annual cost savings projected**

To meet its accession goals, the Army offers enlistment bonuses to recruits. However, many recruits would enlist for lower dollar amounts than the Army offers. A more tailored system that allows potential recruits to choose among alternative enlistment options—both monetary and nonmonetary—could increase enlistments and save the Army money. Arroyo researchers were asked to develop an enlistment options optimizer to create bundles of enlistment incentives that appeal to both prospective recruits and the Army. Arroyo was also asked to develop a strategy to implement the optimizer to improve satisfaction and enlistments among potential recruits, generate cost savings for the Army, and provide the Army with desired recruit characteristics. Arroyo researchers surveyed a national population of young adults ages 18–27 with no prior military experience to ask about their probability of enlisting in the Army and which incentives—from a menu including student loan repayment, a guaranteed job interview when leaving the Army, choice of location of first assignment, choice of job, and traditional enlistment bonuses—they value most. The study found that nonmonetary options compare well with $10,000–$15,000 bonuses and that adding a bonus to other incentives increases their appeal to the level of larger stand-alone bonuses. Among higher-aptitude survey respondents, the largest estimated increases in stated probability of joining the Army came from those choosing nonmonetary incentives. Offering a wider variety of incentives has the potential to save the Army from $18 million to $121 million per year, depending on which options potential recruits select.

**Army Enlistment Options Optimizer: Research Approach, Findings, and Implications**, James Hosek and Bruce R. Orvis, 2023, www.rand.org/t/RRA2214-1
Consolidating Maintenance Career Fields (2016)

$30 million per year in projected savings without reducing readiness

PAF analyzed the potential consolidation of USAF maintenance specialties for the KC-135 tanker fleet. Such a consolidation would entail additional costs, because the maintainers would need to be trained across additional skill sets. But it would also yield benefits, because each maintainer would be able to carry out a wider range of maintenance tasks, reducing the number of maintainers needed to ensure that all tasks could be done in a timely fashion. The analysis found that **such consolidation for the active-duty KC-135 fleet at three main operating bases, at which 90 KC-135s are based, could save $30 million per year without reducing readiness.** Alternatively, $20 million could be saved per year while increasing sortie generation capacity by 7 to 10 percent. PAF expects that similar savings opportunities could exist for the new KC-46 tanker, although not enough data on its maintenance requirements were available in time for the analysis.

Flexible Spending Accounts for Active-Duty Service Members (2022)

About $38 million per year in potential savings

In 2023, DoD expanded eligibility for the Dependent Care Flexible Spending Account (DCFSA), a benefit intended to support the economic well-being of military families by reducing the burden of dependent care costs. In 2021—in support of an Office of the Secretary of Defense report to Congress on the feasibility of implementing flexible spending accounts (FSAs) within DoD—NDRI evaluated the benefits and costs to service members of FSAs (for both dependent care and health care) and the potential costs and savings to DoD. Researchers used information from the Office of Personnel Management on the cost of administering FSA options for federal employees, together with military pay, personnel data, and tax code software. The study found that, because of how DoD provides child care benefits, a potentially large share of military families might not have eligible child care expenses, and most members would have few or no eligible out-of-pocket medical care expenses associated with the military health care program, TRICARE. However, even if only 25 percent of members participated in each program, **DoD would save $6 million annually for the Health Care FSA program and about $32 million for the DCFSA program, after the first year.** Although these figures exclude implementation costs and ongoing overhead costs, the overall implication is that adding FSA options for service members and their families would produce a cost savings for DoD, as well as an overall net benefit to service members who have eligible expenses, although most members will have small or no eligible expenses.

Savings Validated

USAF Compliance with Headquarters Savings Goals (2016)

$176 million in ongoing savings validated

In the FY 2014 National Defense Authorization Act, Congress instructed the Secretary of Defense to streamline DoD and military headquarters. Both in anticipation of this order and in response to it, then-Secretary of Defense Chuck Hagel directed a 20 percent reduction in headquarters spending across DoD by 2019. The USAF asked PAF to assess the USAF’s effort in reducing its major headquarters spending and to independently verify its headquarters reductions. The USAF endeavored to achieve these reductions by the end of FY 2015 (three years earlier than planned). The USAF determined that it needed to reduce headquarters staffs by about 3,000 personnel, and PAF confirmed that number. Compared with the FY 2018 authorized end strength of 13,847, the FY 2016 end strength of 10,869 represented a management headquarters reduction of 21.5 percent. Moreover, **compared with the FY 2018 baseline budget, the FY 2016 budget for the authorized**
end strength of USAF headquarters was lower by $176 million, or 21 percent, as validated by PAF.

The PAF team concluded that the USAF achieved its planned 20 percent reduction in both end strength and spending, and all major commands contributed to those savings. The USAF’s approach to reducing its headquarters management functions included many sound practices, such as identifying processes to streamline information flow and eliminate work, removing or combining redundant organizations, and ensuring that work is conducted at an appropriate organizational level. However, sound practices were not applied consistently across the USAF; different major commands employed different strategies with differing results.


Additional information about the projects highlighted in this document can be obtained by contacting the following:

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