

INDEPENDENT COST ANALYSIS OF THE ARMY AVIATION RESTRUCTURE INITIATIVE AND THE ARMY NATIONAL GUARD ALTERNATIVE

REPORT TO THE CONGRESS



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COST ASSESSMENT AND
PROGRAM EVALUATION

EXECUTIVE SUMMARY

Senate Report 113-211 accompanying H.R. 4870, Department of Defense Appropriations Bill, 2015, requests that CAPE conduct an independent cost analysis of both the Army Aviation Restructure Initiative (ARI) and the Army National Guard Bureau (NGB) alternative. This report responds to that direction.

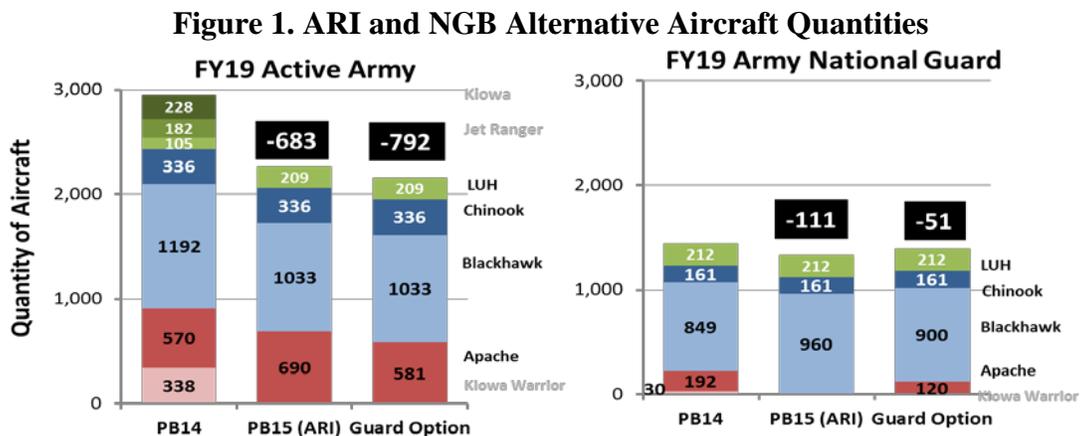
CAPE estimates ARI, once complete, will result in annual cost savings of \$906 million (Fiscal Year 2014 dollars) when compared to the fleet prior to ARI. The Army estimates ARI will save \$1.09 billion annually. As part of the independent cost analysis, CAPE assessed the Army ARI cost estimate method, sources, and results. While the CAPE and Army estimate differ because of varying operational tempo estimating methodologies, CAPE generally validated the Army estimating method and gross annual cost savings. CAPE also estimated the impact of the NGB alternative to ARI and found that it would result in \$730 million in annual savings, a relative difference of \$176 million. These relative differences are congruent with the cost analysis results from the Deputy Secretary of Defense directed, CAPE-led analytical 'Tiger Team' on Army Aviation that reviewed the two alternatives, reached shared understanding, and generated new analysis. The Tiger Team focused on operational issues along with cost and came to agreement that ARI provides less total force structure but more usable capacity, a higher readiness level, and has less training and operational risk than the NGB alternative.

CAPE estimates ARI one-time implementation costs of \$77 million compared to \$570 million for the NGB alternative. The Army estimates ARI will result in one-time cost savings and avoidance of \$12.12 billion, mostly due to the Army decision not to replace the Kiowa armed scout helicopter. CAPE was able to replicate the methodology and sources for the Army estimated one-time cost savings and avoidance but noted the avoidance estimates are projections based on long term plans outside the Future Years Defense Program (FYDP).

Overall, CAPE analysis confirms the Department position that ARI is a better approach. Unless otherwise noted, all cost figures in this report are in Fiscal Year 2014 dollars.

ARI and NGB Alternative Background

During the President’s Budget Fiscal Year 2015 Review, the Army proposed a restructure of the Aviation enterprise designed to find savings because of impending reductions in its top-line. The Army proposed a reduction in force structure that divested all Kiowa scout helicopters (OH-58A, OH-58C, and OH-58D) and the current legacy training helicopter (TH-67) in order to keep modernized platforms. The result would be a reduced supply of attack/reconnaissance assets. This supply could only meet assumed continued high demand by deploying at high tempo in peacetime. Citing active units’ greater suitability for sustained high tempo peacetime operations, the Army proposed a transfer of aircraft amongst the Army and National Guard outlined in Figure 1 below. Under ARI, the Army would divest 683 aircraft (23% of the Army fleet) while the National Guard would divest 111 aircraft (8% of the National Guard fleet). This would be accomplished by transferring Guard Apache helicopters to the Army to replace Kiowa armed scout (OH-58D) aircraft while transferring Army Blackhawk helicopters to the National Guard. The National Guard agreed to the majority of changes under ARI but strenuously objected to the transfer of Apaches. The NGB alternative would: retain 120 Apaches in the Guard; divest 60 Blackhawk helicopters from the Total Army; and result in Army reductions of 792 aircraft (27%) and NGB reductions of 51 aircraft (4%).



‘Tiger Team’ on Army Aviation

Following the 10 July 2014 Council of Governors meeting, the Deputy Secretary of Defense directed establishment of a CAPE-led joint analytical ‘Tiger Team’ to analyze ARI and the NGB alternative, come to agreement where possible, and provide impartial analysis on capacity, risk, and cost. The team, comprised of members across the Department’s Staff, including key Army Staff and NGB Staff representatives, conducted a collaborative and impartial analysis of all relevant assumptions and data informed by stakeholder’s inputs and concerns. This process resulted in development of new analysis, shared understanding, and final conclusions—agreed to by participants—that ARI provides less total force structure but more usable capacity, a higher readiness level, and has less training and operational risk than the NGB alternative. Tiger Team cost analysis consciously focused on the differences between the two plans because NGB agreed with the majority of ARI. The NGB alternative was estimated to cost

\$89-176 million (M) more annually than ARI, and would incur additional one-time procurement costs of \$493M.

CAPE Independent Cost Analysis and Assessment of Army Estimate

The Tiger Team cost analysis was thorough but focused on the differences between the two alternatives as opposed to a bottom-up estimate of Army aviation costs. The analysis presented here builds such a bottom-up estimate. The analyses are congruent as the relative difference between the alternatives remains the same, but this report provides a more complete picture. Results of the CAPE independent cost analysis are presented in Table 1 below.

Table 1. CAPE Independent Cost Analysis

Total Costs (FY14\$B)	FY13 Fleet	ARI	NGB Alt
Annual Operating and Support (O&S)	\$7.12	\$6.12	\$6.30
Annual Institutional Training*	\$1.17	\$1.26	\$1.26
Total Annual Costs	\$8.29	\$7.38	\$7.56
One-Time Costs	-	\$0.08	\$0.57
*Includes ARI equipment set maintenance costs (\$14M/yr) and NGB Alt rotational transport costs (\$4M/yr)			
Comparative Annual Costs (FY14\$M)	ARI vs. FY13	NGB vs. FY13	ARI vs. NGB
Annual Cost Savings	\$906	\$730	\$176*
*\$176M annual O&S cost difference between ARI and NGB Alt due to additional force structure (24 AH-64 BNs vice 20) and training required in NGB plan			

CAPE estimates ARI will result in annual cost savings of \$906M when compared to the FY13 fleet while the NGB alternative would result in \$730M in annual savings. O&S estimates were developed using the Force and Organization Cost Estimating System (FORCES) cost model and by directly applying cost per flight hour factors for each aircraft to each battalion. Institutional training costs were developed using cost and quota data for each training segment (Initial Entry Rotary Wing (IERW), Instructor Pilot Method of Instruction (IPC/MOI), Maintenance Test Pilot (MTP), and Aircraft Qualification (AQC)) at the training base. One-time costs for ARI consist of pilot requalification and second-destination transportation costs as agreed to by both the Army and NGB during the Tiger Team. NGB alternative one-time costs include \$220M for the procurement of 11 remanufactured Apaches required by the additional force structure in the NGB alternative, \$200M for the stretch in the Apache procurement line required by the NGB planned buy profile, and \$150M to procure six RQ-7B Shadow platoons.

As part of the independent cost analysis, CAPE assessed the Army ARI estimate method, sources, and results of \$1.09 billion in annual savings and \$12.12 billion of one-time cost savings and avoidance. As per Senate report direction, the assessment specifically addresses whether the Army included costs required to:

- Procure and maintain additional Lakotas
- Train Army Active Duty and Army National Guard pilots for new missions
- Operate and maintain Apaches and Blackhawks

CAPE Independent Cost Analysis of ARI and NGB Alternative

The Army estimate includes all of these costs with the exception of those required to procure additional Lakotas. The Army does not include the Lakota procurement costs as it considers Secretary Hagel’s decision to procure 100 Lakotas for the training fleet an external adjustment to ARI based on a request by the National Guard Bureau to keep its 212 Lakotas. While true, the Lakota procurement is now part of the plan and should be included for a full accounting of ARI costs and savings to the Department. Overall, CAPE was able to replicate the methodology and sources for the Army estimated one-time cost savings and avoidance but noted the avoidance estimates are projections based on long term plans outside the Future Years Defense Program (FYDP). A full accounting of the CAPE assessment of the Army estimate is provided below.

Army Annual Estimate

The Army annual cost estimate consists of Operating and Support (O&S) and Institutional training costs. For each, the FY13 fleet was compared to the FY20 post-ARI fleet. Results of the Army’s annual cost estimate are provided in Table 2.

Table 2. Army Annual Cost Estimate

FY14SB ¹	FY13 Fleet Costs	FY20 Fleet Costs	Difference
Operations & Sustainment (O&S)	\$6.72	\$5.50	\$1.23
Lakota O&S ²	-	\$0.06	(\$0.06)
Institutional Training	\$1.17	\$1.25	(\$0.07)
Total Annual Costs	\$7.89	\$6.80	\$1.09
Aviation Brigades (AC/RC)	13 / 12	10 / 12	3 / 0

Note 1: Costs may not add up due to rounding

Note 2: Original ARI plan replaced legacy training aircraft with National Guard Lakotas. In PB15, Secretary Hagel approved procurement of 100 Lakotas for the training fleet in order to keep 212 Lakotas in the Guard. The Department has subsequently sought \$811M to procure these aircraft. Congress appropriated \$420M in FY15. The Department request for \$391M is currently pending in the PB16 budget request. \$59M represents annual O&S costs for these additional aircraft.

The Army estimated fleet O&S costs by using the FORCES cost model to generate estimates of personnel and Operations and Maintenance (O&M) costs for each Army and Guard Aviation Brigade or Battalion. The estimates assumed 100% authorized manning, equipping, and readiness and Operating Tempo (OPTEMPO) of 12.5 Hours/Crew/Month for Army units and 7.9 Hours/Crew/Month for Guard units. National Guard Additional Flight Training Periods (AFTPs) were calculated using NG Supplement 1 to Army Regulation 95-1 and National Guard Full Time Support (FTS) were calculated using authorizations in accordance with Full Time Support Management Control System FY13 final voucher.

The Army estimated institutional training costs by taking FY13 actual costs for each of the four training sections (IERW, IPC/MOI, MTP, and AQC) at the institutional training base. To estimate FY20 costs, the Army estimated a quota level by aircraft and training type based on ARI plans for fleet inventory and the training pipeline.

CAPE Assessment of Army Annual Cost Estimate

Overall, the Army method is valid and includes the costs to operate and maintain all Apaches and Blackhawks as well as the cost to maintain additional Lakotas. CAPE Assessment by cost category:

- Use of FORCES: Army method is valid. FORCES, developed and run by the Assistant Secretary of the Army for Financial Management and Comptroller, is the authoritative model. Tiger Team and independent cost analysis also used FORCES to generate personnel costs.
- OPTEMPO: Army method is valid; estimated Flight Hours/Crew/Month (H/C/M) are consistent with the Program Objective Memorandum FY16 Flying Hour Program training strategy. CAPE used a slightly different method by directly applying cost per flight hour factors to individual crew numbers and H/C/M training strategies.
- AFTPs/MilTechs: Army method is reasonable but assumes that all FTS in Guard Apache units (which have higher levels of FTS than the average unit) will be cut from the Guard top-line; in reality, FTS levels are based on a percentage of end strength. Therefore, there is some risk Army will not fully achieve all \$40M of assumed savings in this category.
- Institutional Training: Army method is valid. FY13 costs reflect historic actuals and FY20 assumptions on quotas and force structures are valid and supportable.

Army One-time Cost Savings/Avoidance Estimate

The Army estimates ARI will result in one-time cost savings of \$1.64B and avoidance of \$10.49B, for a total of \$12.12B. In the Army estimate, savings refers to costs within the FY15-19 FYDP; costs outside the FYDP are labeled avoidance. The majority of estimated savings and avoidance are due to the Army contention that the OH-58D Kiowa Warrior armed scout will not need to be replaced as the Apache teamed with Unmanned Aerial Systems (UAS) will fulfill the scout mission. The Army contends the \$811M cost for procurement of 100 Lakota for the training fleet was an external adjustment to the Army’s plan that the National Guard agrees with. As such, the Army does not account for the \$811M as a cost to ARI. Army estimated savings, avoidance, and data sources are presented in Table 3.

Table 3. Army Estimated Savings and Avoidance

FY14S'	Army Estimated Savings	Army Estimated Avoidance	Source
FY15-19 OH-58D Cockpit and Sensor Upgrade Program (CASUP)	\$1.46B		OH-58D Procurement and R&D funds
Lakota Flight Hour Offset	\$0.18B		OPTEMPO x Lakota Cost Per Flight Hour
FY20-30 OH-58D CASUP		\$1.90B	FY20-30 CASUP Army Estimate
OH-58D Replacement, Upgrade, or SLEP		\$6.96B	Armed Aerial Scout AoA Estimate
Training Aircraft Upgrade or SLEP		\$0.19B	Program Office Estimate
New Training Aircraft		\$1.43B	Program Office Estimate
Total	\$1.64B	\$10.49B	

Note 1: Costs may not add up due to rounding

CAPE Assessment of Army One-time Cost Savings/Avoidance Estimate

CAPE is generally able to replicate the sources and methodology the Army used to arrive at the \$12.12B in estimated savings and avoidance. However, it is difficult to validate some of the elements as the savings were repurposed and the avoidance estimates are notional and based on long term plans outside the Future Years Defense Program (FYDP). Therefore, we do not assess that all of the estimated savings and avoidance would be attained as proposed.

The Army estimated savings were reduced from the programs named above but used to fund other priorities. The Army repurposed the \$1.46B in OH-58D funds to other programs within the aviation portfolio, mainly for various Manned Unmanned Teaming (MUM-T) upgrades. Similarly, while the Active operating force will not have to operate or maintain the Lakotas, the \$0.18B in O&S costs will be shifted from the operating force to the training fleet vice saved.

The Army defined avoidance as planned costs outside the FYDP no longer required due to ARI. Army avoidance estimates are for systems that are not programs of record and thus they are difficult to fully assess. However, CAPE validated the sources of these estimates and, as these systems were part of the Army's future plans, assuming cost avoidance is reasonable.

Of note, the Army may have faced eventual greater costs for an OH-58D replacement, upgrade, or SLEP. \$6.96B was the estimated cost for a Kiowa Warrior recapitalization with engine, rotor, structural, and transmission enhancements. This was one of the options examined in follow-on analysis to the Armed Aerial Scout (AAS) Analysis of Alternatives (AoA). The AoA Final Report from January 2012 identified two paths forward: pairing recapitalized Kiowa Warrior aircraft with UAS or sustaining the Kiowa Warrior fleet in the near-term while developing and procuring a modified commercial-off-the-shelf solution paired with UAS. It recommended release of an updated Request for Information (RFI) in order to refine the second option as it was not rooted in a formal industry response, modeled, or costed in the AoA report.

CAPE assessed that the analysis for the first path was sound but the second path was likely unaffordable due to the proposed major modifications. Subsequently, the Under Secretary of Defense (Acquisition, Technology, and Logistics) directed the Army to supplement the AoA with further analysis following release of an updated RFI. In December 2012, the Army briefed options to CAPE which ranged from \$3.75B for Kiowa Warrior recapitalization with no performance upgrades to \$10.41B for a new development armed scout. The \$6.96B option was deemed the lowest return on investment and had moderate to high technical and schedule risk. The Army did not submit a final report or recommendation from the additional analysis as required by USD (AT&L) and thus CAPE did not perform a sufficiency assessment. However, as the \$6.96B option fell in the middle of the range and preliminary sufficiency analysis found the cost estimating process valid, CAPE does not take issue with its use but notes it is unlikely the \$6.96B option would have been pursued.

Summary

CAPE estimates that ARI will result in annual cost savings of \$906M when compared to the fleet prior to ARI. The NGB alternative would result in \$730M of annual savings, for a relative difference of \$176M. The Army estimates that ARI will result in annual cost savings of \$1.09B. CAPE refined but generally validated the Army method for annual costs. CAPE was able to replicate the methodology and sources for the Army estimated one-time cost savings and avoidance but noted the avoidance estimates are projections based on long term plans outside the Future Years Defense Program (FYDP). Overall, despite the issues found with the Army method, CAPE estimates ARI will cost less and provide more operational capacity than the NGB alternative.