



Performance-Based Logistics: Examining the Successes and Challenges When Operating in Stressful Environments

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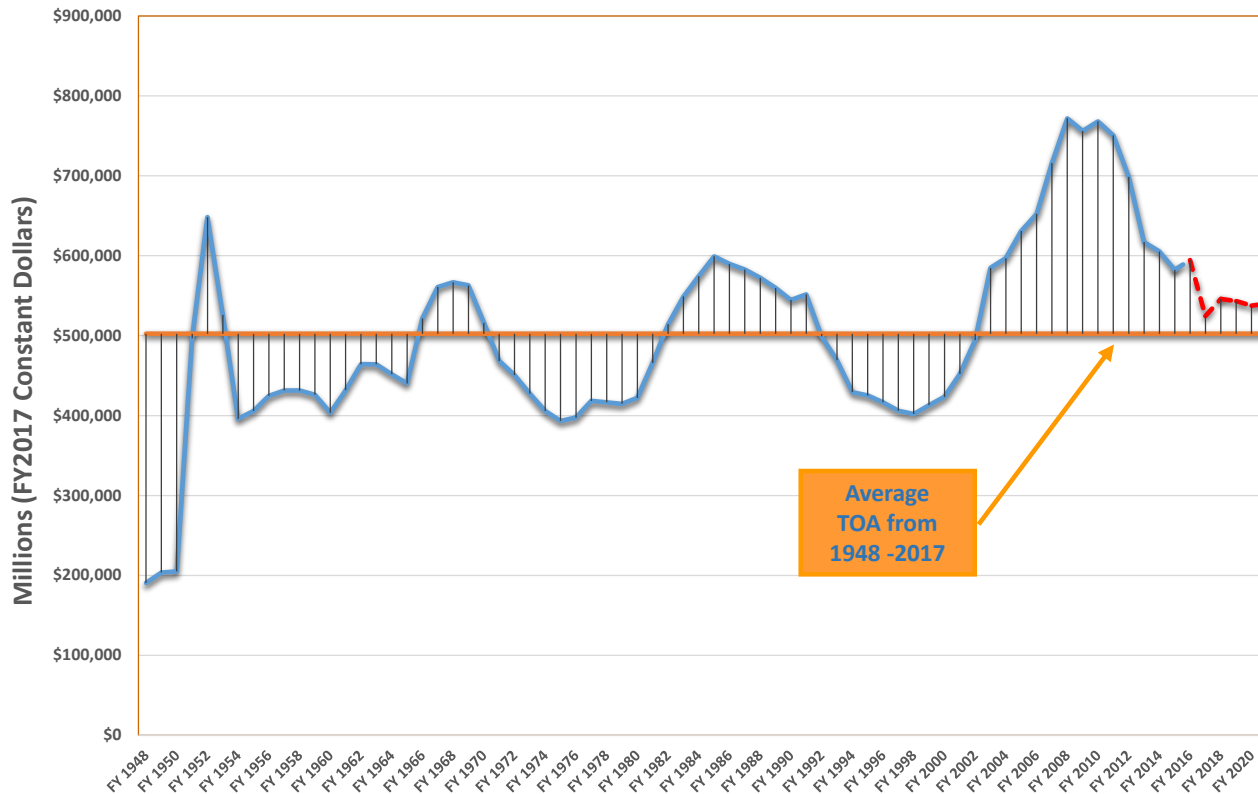


Presentation Outline

- ➔ Introduction
- ➔ 4 PBL Cases
 - HIMARS
 - Stryker
 - AH-64 Apache Sensors
 - H-60 “Tip to Tail”
- ➔ Findings
- ➔ Recommendations

Trends in Defense Appropriations

DoD Total Budget Authority Trends



We can anticipate continued budgetary pressure; at the same time, equipment is worn out and requires repair and modernization.

Source: Based on data from DoD's FY 2017 Green Book, Mar 2016

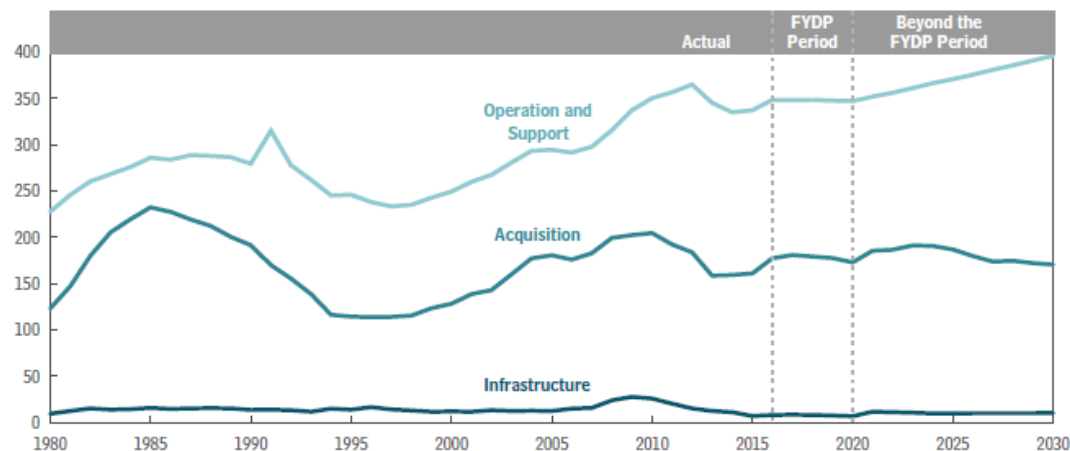
Additional Cuts are Possible

At the Same Time O&S Costs are Rising

- ➔ The O&S budget includes costs of operating and maintaining major weapon systems—these costs also have increased more rapidly than base inflation.
- ➔ A large share of the O&S budget also goes to pay civilian DoD personnel, including the rising health care costs.

Costs of the Operation and Support, Acquisition, and Infrastructure Portions of DoD's Base Budget

Billions of 2016 Dollars



Source: Congressional Budget Office.

Source: CBO, Long-term Implications of the 2016 Future Years Defense Program, Jan 2016.

Rising O&S costs are squeezing out other investments



Product Support Must be Improved

- ➔ Federal budget pressures will limit the number and scope of new platforms and systems for foreseeable future.
 - A smaller force increases the value of each weapons system available to the warfighter.
 - Thus, high levels of availability for platforms and weapons systems will be essential.
- ➔ Twin objectives: reduce costs, and increase performance—both can be achieved through the expanded implementation of performance based logistics.
 - Contracting for performance (as defined by the users) aligns the military Services' and PBL providers' interests, altering the providers' incentives.
 - This results in increased performance at a decreased price.
 - Inherent in PBLs is the transfer of some program risk from the military Service to the PBL provider.

The need to improve efficiency has never been greater



Performance Based Logistics

- ➔ The use of PBL is not aggressively pursued across the DoD.
 - Over 200 PBL contracts in 2005; only 87 by 2013.
 - However, total PBL expenditure has increased significantly, partially due to expansion within successful programs.
- ➔ Research Questions: Are product support providers able and willing to perform in support of emergency and contingency operations?
- ➔ During the recent conflicts, weapons systems often operated at rates that exceeded—sometimes by factors of five or six—their average operating rates during peacetime.
 - Chief among these were combat vehicles and helicopters.
- ➔ We examine PBL support to four systems: the High Mobility Artillery Rocket System (HIMARS), the Stryker Armored Combat Vehicle, the Apache AH-64 helicopter, and the Navy H-60 helicopter.

HIMARS

- ➔ Wheeled rocket and guided missile system—a lighter, transportable version of the M-270 MLRS.
- ➔ Easily deployed to areas previously inaccessible to heavier launchers.
- ➔ System has fully enclosed, armored cab and a launcher pod of 6 rockets.
- ➔ Deployed since 2004—played a significant role in operations in the Al Anbar province of Iraq.





HIMARS PBL

➔ LCCS I (\$96 M)

- PoP : 2004-2007
- Customer: US Army
- Type: FFP/CPFF

➔ LCCS II / LCLS (\$248 M)

- PoP: 2008-2013
- Customer: U.S. Army and USMC
- Type: FFP/CPFF

➔ LCLS III

- PoP: 2014-2018
- Type: CPFF* with incentives

SCOPE

➔ Supports 603 Fielded Systems

➔ Performance Based Logistics (Service)

- Repairs and Spares for Fielded Systems
- 80 critical Launcher/Fire Control System LRUs
- Performance Metrics

➔ 26 Field Service Representatives (FSRs)

- Providing Onsite and Geographic Support
- 22 Locations (8 Overseas)

➔ Contractor managed supply chain Spares Deliveries (Hardware Deliveries)

- Unit/Management Reserve Spares
- Pipeline replenishment
- FMS Spares

* Although there is ample evidence that fixed-price performance-based contracts induce the provider to choose the optimal inventory level, the government believes that it can reduce costs through more direct control. It remains to be seen whether the DoD's decision will lead to lower costs and continued high performance.



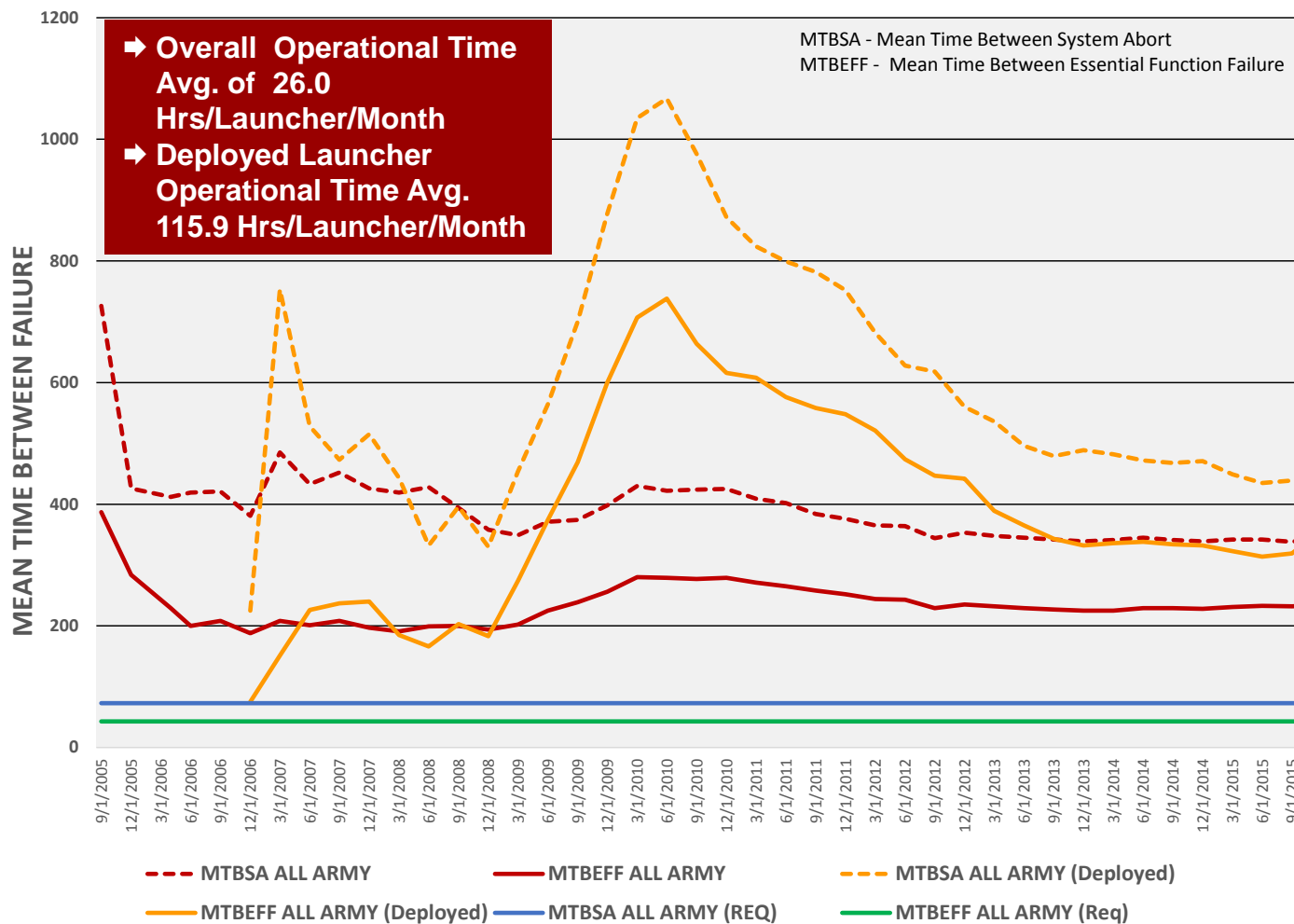
HIMARS PBL Performance

- ➔ **Contract Metric: System Status Readiness (Ao)**
 - Contract Standard: 92%
 - PBL performance: 99%+
 - CONUS MICAP* delivery standard: 24 hrs.; actual: 14 hours
 - OCONUS MICAP delivery standard: 96 hrs.; actual: 1 hour
 - Repair Turn-Around-Time (on-site repair standard): 5 days; actual: 1.2 days
 - Repair Turn-Around-Time (vendor repair standard): 45 days; actual: 34 days
- ➔ **Cost Reduction**
 - Documented BCA-validated savings: \$490M
 - Contractor investment in FSRs yielded add'l \$130M in savings
- ➔ **Received the OSD PBL Award twice: 2006, 2009**

*Mission Impaired Capability Awaiting Parts

HIMARS PBL Performance (cont.)

HIMARS FIELD RELIABILITY



Stryker

➔ Stryker Combat Vehicle

- Stryker is a family of eight-wheel-drive combat vehicles.
- Rapidly-deployable wheeled armored vehicle, transportable in a C-130 aircraft.
- The Stryker can travel at speeds up to 62 mph on highways with a range of 312 miles on 53 gallons of fuel.



- ➔ Stryker uses a Caterpillar engine, common to the Army's family of medium tactical vehicles.
- ➔ It has an integrated armor package protecting soldiers against improvised explosive devices, rocket propelled grenades, and a variety of infantry weapons.
- ➔ Among fastest acquisitions of any major Army system.



Stryker PBL

- ➔ First five-year PBL contract awarded in 2002 to GD
 - CPFF contract provided flexibility to meet rapidly-evolving conditions.
 - Contractor responsible for all ordering, management, distribution of parts, and vehicle maintenance.
 - Contractor personnel filled a variety of roles:
 - Vehicle mechanics
 - Armament repairers
 - Automated logistics specialists

- ➔ Follow-on PBL contract was a 6-year (base year and 5 option years), CPFF contract awarded for the increasing number of vehicles: as of February 2013 was funded for approximately \$1.6B



Stryker PBL Performance

- ➔ Contract required monthly readiness rate of 90% during deployments; 98% stateside
 - Stryker exceeded expectations, achieving, 95% cumulative readiness during the height of the war in Iraq.
 - Stryker vehicles were driven in excess of 5.6 million miles during the first two deployments—800% higher than anticipated usage.
- ➔ In 2005, Army initiated transition from contractor to soldier maintenance.
 - 71 soldiers required to replace 45 Stryker vehicle maintenance contractors.
 - Transition questioned by GAO, but still underway.

AH-64 Apache Sensors

- ➔ Attack helicopter that performs armed reconnaissance, rear, close, and shaping missions, including deep precision strikes.
- ➔ Over 3.9 million flight hours with deployments during Desert Storm, Iraqi Freedom, Enduring Freedom, and Inherent Resolve.
- ➔ Central to the Apache's mission is the Modernized Target Acquisition and Designation Sight/Pilot Night Vision Sensor (M-TADS/PNVS) system, nicknamed the "Eye of the Apache."

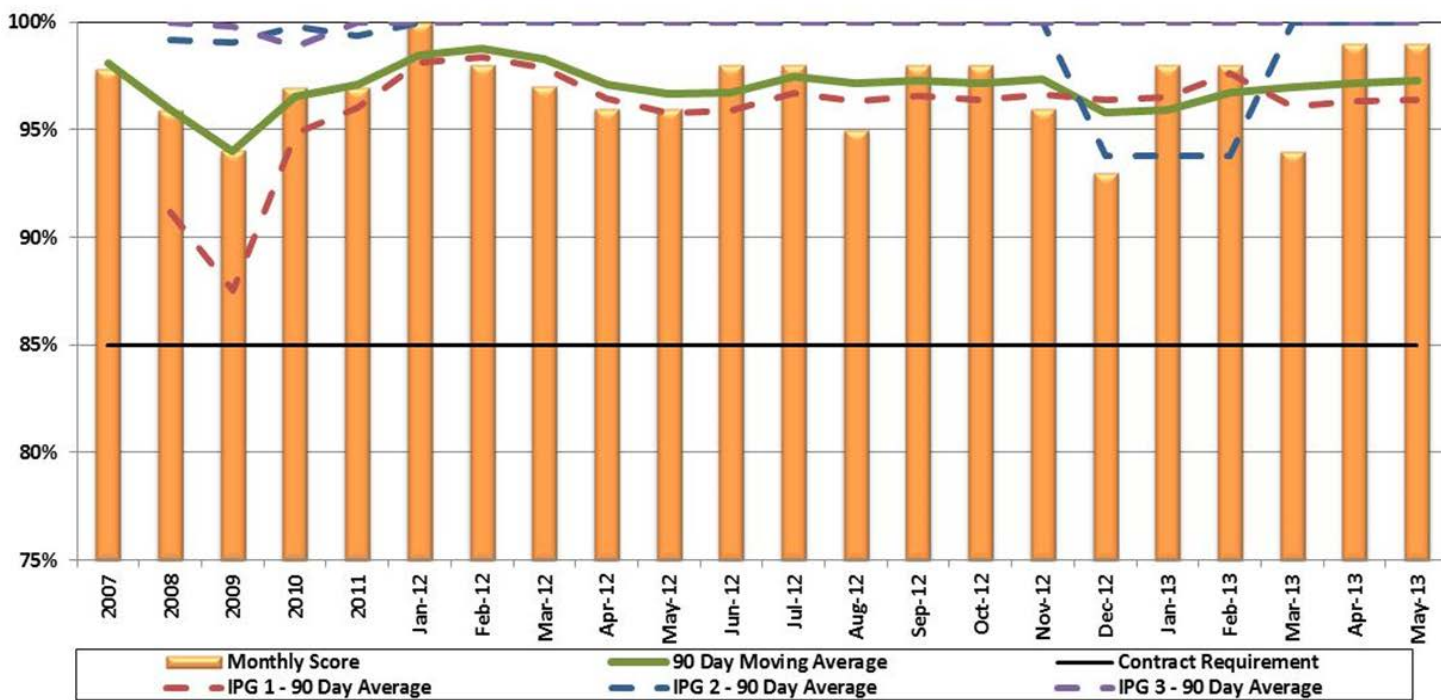




AH-64 Apache Sensors PBL

- ➔ PBL supports over 670 aircraft in 27 battalions worldwide, including multiple forward operating bases.
- ➔ PBL has relied on FFP contracts tied to number of flight hours
 - Provides Army the needed flexibility to contract for actual usage.
 - Maintains contractor incentives to innovate and improve reliability.
- ➔ 2007: First four-year contract (base year and three one-year options): \$380 million
- ➔ 2012: Follow-on four-year contract: \$375 million
- ➔ 2016: Third PBL contract, five-year, (base year and four one-year options): \$424 million
 - Represents a price decrease of 10% compared to the previous contract.

AH-64 Apache Sensors PBL Performance



- ➔ Contract Metric: MTADS/PNVS subsystem availability: 85%
 - PBL performance 2007-2013: 97%
- ➔ This availability maintained during peak OPTEMPO (2011-2013) of >200,000 flying hrs.
- ➔ 2012-2013: **99% SA** for deployed units--Highest level of support for those in harm's way.



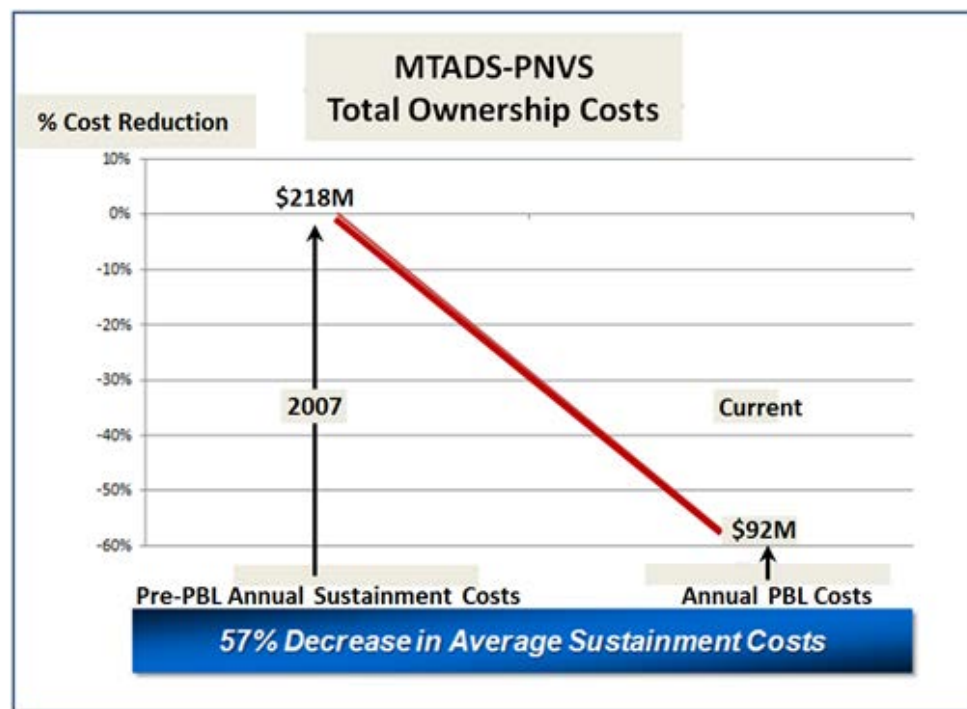
AH-64 Apache Sensors PBL Performance (cont.)

➔ Reliability

- July 2010 to present: over 100% increase in MTBF
- Targeted contractor investments in product & process improvement

➔ Total Ownership Costs

Over 50% reduction in average annual sustainment cost



Seahawk

- ➔ Family of multipurpose twin-engine, medium-lift helicopters.
- ➔ New aircraft have updated mission systems, avionics.
 - Including a common cockpit allowing pilots to shift from one aircraft to another with minimal retraining.
- ➔ Seahawk helicopters were used for a variety of missions in Iraq.





Seahawk “Tip-to-Tail” PBL

- ➔ Tip-to-Tail (T2T) PBL, initially a joint venture between Lockheed Martin and Sikorsky.
 - As with the Apache Sensors PBL, contract price is tied to flight hours.
 - Supports Navy, Coast Guard, and foreign customers.

- ➔ 2003: \$417M five-year, FFP contract for legacy H-60
 - Initially supported over 500 parts (airframe and avionics).
 - Contract modified over time to support over 1,200 parts in 2008 for a total contract value of \$900M.

- ➔ 2009 and 2010: Two one-year “bridge” contracts awarded
 - Navy wanted visibility into contractor cost data.
 - Contractor wanted longer contract term, the Navy a shorter term.

- ➔ 2010: Negotiations resulted in \$1.4B four-year FFP contract (no options).
 - Contractor cost data used to inform pricing.
 - Contract covers both legacy H-60s and newer MH-60R/S.
 - One of the largest PBL contracts in Navy history.



Seahawk Tip-to-Tail PBL (Cont.)

- ➔ PBL provides requisition processing, requirements forecasting, inventory management, repair, overhaul, modification, packaging, handling, storage, reliability, technology, and more.
- ➔ Major repairs performed by OEMs and PPPs with naval depots.
 - PBL increased reliance on intermediate-level repairs by funding FRC specialists to assist aboard ship with Aircraft Intermediate Maintenance Departments.
- ➔ Primary Performance Metric: Supply Response Time (percentage of requisitions filled on time) -- deliver at least 80% of all requisitions within a specified time dependent on the priority of the requisition.

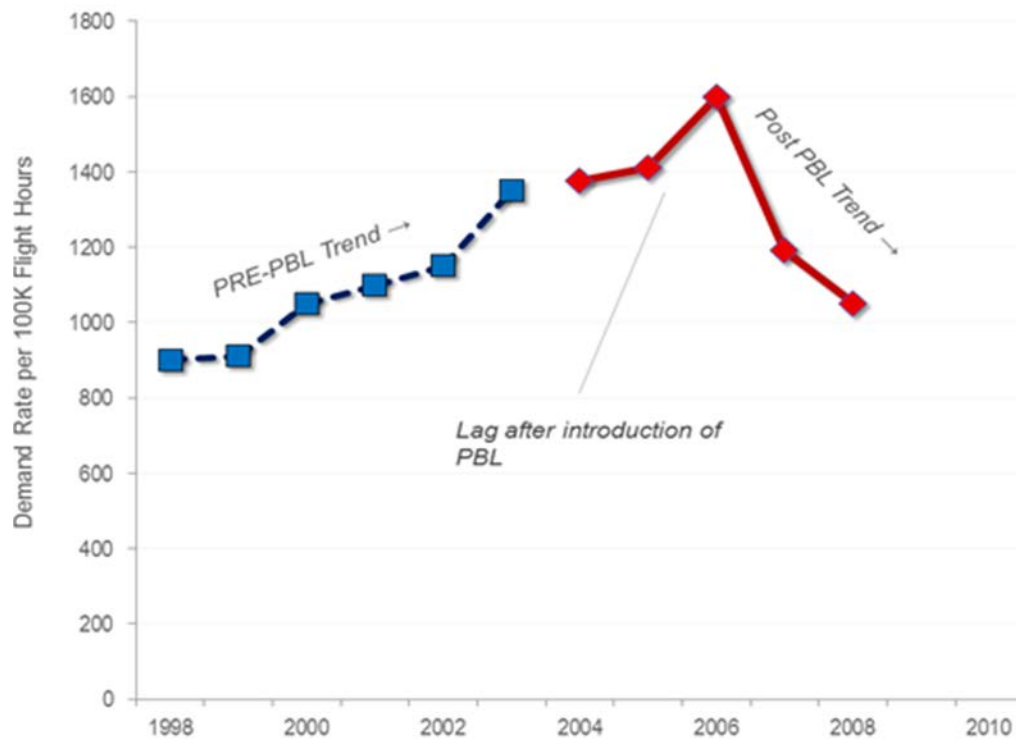
Seahawk Tip-to-Tail Performance

- ➔ Contract Metric: Supply Response Time/Fill Rate
 - Contract Standard: 80% PBL performance: 98%+
 - Backorders reduced from over 400 to 24 across 1600 LRUs



Seahawk Tip-to-Tail Performance (cont.)

- ➔ Secondary Performance Indicators—lower demand rate for parts despite ageing legacy aircraft and higher OPTEMPOs during conflicts.
- ➔ Business case analysis indicated first PBL provided savings of \$41M over five years; \$46M for second PBL.





Conclusions/Findings

- ➔ PBL supported systems operating in combat environments are capable of meeting or exceeding performance requirements, contributing to mission success, often reducing costs.
- ➔ PBL contractors have the proven ability to support weapons systems operating in stressful environments.
- ➔ PBL provides sufficient flexibility and capacity to adapt to changing operational tempos.



Recommendations

- ➔ Promote the use of PBL as a proven support strategy for weapons systems
 - PBL performs better than traditional support mechanisms, even in stressful environments.
 - The DoD should renew its commitment to the expansion of PBL in order to improve weapons systems operation and reduce costs.

- ➔ Ensure proper alignment of government objectives with provider incentives
 - An appropriate PBL contract aligns the objectives of the customer and the support provider, leading to a win-win scenario.
 - However, an inappropriate structure can create perverse incentives, and result in undesired or unintended consequences.



Recommendations (Cont.)

- ➔ Avoid distortions to the PBL paradigm
 - The power of PBL lies in affording the provider the flexibility to select the optimal mix of inventory levels, maintenance activities, and technology upgrades in order to meet performance requirements.
 - Shifting one or more of these functions to the government customer distorts the PBL paradigm and may lead to reductions in performance.
- ➔ Structure PBL contracts appropriately
 - In unpredictable environments, cost-plus contracts are often more suitable.
 - However, programs should implement cost controls through the use of additional metrics beyond availability, e.g. cost-per-unit usage rates, logistics footprint constraints.