A strategy for weapon system product support that provides (vs. employs the purchase of) support as an integrated performance package designed to optimize system readiness. It meets performance goals for a weapon system through a support structure based on performance agreements with clear lines of authority and responsibility.

Product Support Strategy (PSS)
Performance-Based Logistics (PBL) Goals/Objective

Through the application of Performance-Based Logistics (PBL) we hope to do the following:

- To Provide Warfighters Increased Operational Readiness
- To Enhance the Logistics Response Times
- To Enhance Deployment
- To Reduce the Logistics Footprint
- To Reduce Logistics Cost
What is a BCA?

- Until recently, BCA was not a common term in DoD - but routine in the business world.
  - In DoD, we usually do: “economic analysis; cost/benefit analysis; cost of ownership analysis; analysis of alternatives”
- In general, a BCA is an extended form of cost/benefit analysis that assesses:
  1. An alternatives’ total costs for satisfying a business need weighed against the alternatives’ total benefits to determine an optimum solution
  2. BUT ALSO ADDRESSES qualitative and subjective factors directly impacting the decision-making process, along with risk and sensitivity analysis
What is a BCA?

- The output of a BCA is an analysis of viable alternative business strategies, along with recommendations for proceeding with the best value alternative.
- REMEMBER…DoD is BUDGET-DRIVEN, so if it doesn’t make good sense from a cost perspective, it’s going to be a hard sell.
Why Create a Business Case?

Well, because we have to...

- **1999 NDAA section 346**
  - DoD must notify Congress if a “Prime Vendor” contract that includes depot level maintenance or repair on a weapon system is pursued; requires an “analysis of costs and benefits”

- **USD/ATL 23 Jan 2004 Memo**
  - BCAs to be used to “assess changes from existing support strategies for legacy systems and to support the product support strategy for new weapon systems”

- **2004 Strategic Programming Guidance**
  - Requires the Services to complete a BCA by 30 Sep 06 on all *Fielded* ACAT I and II programs for application of PBL
And Because We Need To...

- The focus is on achievement of a ‘best value’ support strategy that meets PBL Goals.
- To achieve best value, we need to assess many factors throughout the life cycle to achieve the PBL Goals and when, where, how, and by whom workload can best be accomplished.
- Those factors fall into three primary categories:
  - **Statutory:** Title 10 U.S.C.
  - **Policy:** OSD and Service policy...and
And Because We Need To...

- **Best Value**: Best use of public/private sector capabilities and equipment design considering:
  - Operational mission
  - Life cycle phase
  - Existing support infrastructure, skills base, and capacity
  - Competencies and constraints
  - Uniqueness and/or commonality of workloads
  - and others...

The BCA serves as a critical decision tool in arriving at the best value answer with a complex, comprehensive range of mandatory, desired, and other criteria.
PBL BCA-A Life Cycle Activity

- Is used to determine if PBL is suitable for a particular weapon system
- Is used in conjunction with supportability analyses in design phases
- Is used in the initial decision to invest in a project.
- Guides the decision to select among alternative approaches to satisfy PBL goals.
- Can be used to select Product Support Integrator (PSI)
- Is used to validate any proposed scope, schedule, or budget changes during the course of the project.
- Should also be used to identify the various budget accounts and amounts affected by the various product support strategies.
- Should be a living document as project or organization changes occur they should be reflected in updates to the business case.
- Should be used to validate that planned benefits are realized at the

Expanded from DAU Briefing
Logistics In The Life Cycle

Pre-Systems Acquisition
- ICD: Initial Capabilities Document
- CDD: Capabilities Development Document
- CPD: Capabilities Production Document

Systems Acquisition
- (Engineering and Manufacturing Development, Demonstration, LRIP & Production)

 IOC
- LRIP/OT&E
- FRP Decision Review

FOC
- Operations & Support

Block 1
- Critical Decision Review

Block 2
- Capture Data to Define Current Support Strategy And Performance
- Then go to:
  - Conduct Market Research, Investigation, Survey

Block 3
- Don’t Forget To Add Consideration For These Into Your SOQ/SOW

Block 4
- Monitor PSI’s PBA Performance
- Administer the PBA(s) (Incentives, Dis-Incentives)

Concept Refinement
- Concept Decision

Technology Development

System Development & Demonstration
- Critical Decision Review

Production & Deployment
- FRP Decision Review

Operations & Support

Pre-Systems Acquisition
- Conduct Market Research, Investigation, Survey
- Identify User’s Required Capabilities
- Identify Alternative Product Support Strategies
- Conduct Risk Assessment
- Conduct Supportability Analyses
- Conduct Economic Analysis
- Document Results in Business Case Analysis (BCA)

Systems Acquisition
- Obtain AAE Approval Of PBL Strategy
- Develop Stmt of Objective (SOO) or Stmt of Work (SOW)
- Prepare Model/Draft Performance-Based Agreement (PBA)
- Conduct Solicitation Process
- Conduct Evaluation Process
- Announce Product Support Integrator (PSI) Selection

Sustainment & Disposal

PBL In The Life Cycle

**Concept & Technology Development Phase**
- Initiate Business Case Analysis (BCA)
  - PBL Planning
  - Supportability Analysis
  - Risk Assessment
  - Life-Cycle Cost Modeling
  - SS Development
- SEIPT Participation
- Core Depot Assessment

**System Development & Demonstration Phase**
- BCA Development
  - Support Strategy Development
  - PSI Selection
  - Life-Cycle Cost Modeling
  - PBA Development
  - Data Collection Mechanics Identified
- SEIPT Participation
- Core Depot Assessment
- BOIPFD/QQPRI
- Training Analysis & Development
- Test and Evaluation Support

**Production and Deployment Phase**
- BCA Development
  - PSI Negotiates and Put PBAs/PSAs in Place
  - Test Data Collection in a Field Environment
- Complete Core Depot Assessment
- BOIPFD/QQPRI
- New Equipment Training Plan

**Operations and Support Phase**
- Performance Based Logistics Management
  - Metrics Data Collection and Performance Assessment
  - PSI Reports performance to PM (TLCSM)
- Continuous Sustainment Process Improvement
- Continuous Product Improvement
  - Reliability
  - Maintainability
  - HMI

PBL Is A Life Cycle Process and Not Just A Sustainment Event
CASA Life Cycle Cost Model

LCC Sensitivity to MTBF

$10.3M / % Baseline

Life Cycle Cost (LCC)

$3,000,000,000
$2,500,000,000
$2,000,000,000
$1,500,000,000
$1,000,000,000
$500,000,000

Percent of Baseline

0 50 100 150 200 250
BCA Structure

A. Introduction
- Identify Subject, Purpose, Scope, Baseline, Alternatives, and Objectives of the BCA
- Include Performance Metrics and Warfighter PBAs

B. Methods and Assumptions
- Specify analysis methods and rationale (what costs, what estimating methods, and whose benefits)
- Specify Ground Rules and Assumptions (GR&A)
  - List filtering criteria (Statutory; Policy): “No or Few Option Constraints”; Title 10, etc.

C. Business Impacts: Analysis/comparison of alternative solutions against baseline
- Define current baseline (as basis for comparison of alternatives)
- Cost estimates: Analysis of baseline vs. alternatives in COST terms. May include design impacts.
- Non-financial analysis: Analysis of all non-financial factors; baseline vs. alternatives

D. Sensitivity and Risks
- Identify Risk Categories, Risk Metrics, and Risk Level with rationale
- Conduct Sensitivity Analysis: how results depend on, or react to changes in, important assumptions (“what if”)
- Risk Assessment: For each risk category, assign risk metric (low, medium, high), with rationale

E. Conclusions and Recommendations
Recommend specific actions based on PBL business objectives and the results of the analysis.
OSD Metrics

- Operational Availability
- Mission Reliability
- Total Life Cycle System Cost per Unit of Usage
- Cost per Unit of Usage
- Logistics Footprint
- Logistics Response Time
DoD Product Support Strategy BCA

Guiding Principles

• The assessments will include:
  – cost per output
  – performance measures/metrics
  – capitalization/asset ownership
  – size of footprint
  – reliability growth
  – life cycle costs
  – Diminishing Manufacturing Sources (DMS) management
  – obsolescence/obsolescence mitigation plan
  – technology insertion
  – risk management
ARMY PBL APPROACH

- All ACAT I and II systems (new/legacy) sub-systems and/or components where PBL is proven to be economically and operationally feasible

- ACAT III may apply PBL at the discretion of the PEO/PM, with HQDA approval

- PBL must be tailored to individual system/sub-system/component needs

- Decision to be based on a Business Case Analysis (BCA)

- BCA to be validated by DASA(EC) (formerly CEAC)

- Performance-Based Agreements (PBAs) will be approved at HQDA Level
AMC Guidance

• AMC organizations will support PEOs and PMs in developing PBL strategies
  – Strategies should be operationally and economically feasible
• Comply with existing statutes, regulations, and Army warfighting doctrine
• Integrate PBL seamlessly into financial and logistics business systems
• Consider *sunk costs* of fixed organic
AMC Guidance (Cont.)

- Develop PBL strategies that use a total Army, integrated, enterprise-wide approach
- Life Cycle Management Commands will review all PBL-related BCAs
  - CEAC will validate
- Initiate, adopt, and apply performance-based practices to AMC acquisitions and operations
# Team C4ISR PBL Tools

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Application Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computerized Optimization Model for Predicting &amp; Analyzing Support Structures (COMPASS)</td>
<td>Maintenance concept &amp; supply support optimization to an Operational Availability (Ao) goal and system support cost estimates of a Maintenance Allocation policy based on item level reliabilities and optimum sparing to Ao</td>
</tr>
<tr>
<td>Selected Essential-item Stock for Availability Method (SESAME) Model</td>
<td>Time phased initial provisioning spares optimization, system Ao evaluation for proposed or known sparing, and Plus Up sparing optimization after fielding to increase readiness</td>
</tr>
<tr>
<td>Automated Cost Estimating Integrated Tools (ACEIT)</td>
<td>System Life Cycle Cost (LCC) analysis for Project/Product Manager and most applicable for determining non-logistics support related development and production cost estimates</td>
</tr>
<tr>
<td>Logistics Cost Estimating Tool (LCET)</td>
<td>Time phased COMPASS cost estimates for LCC analysis, O&amp;S cost estimates not covered by COMPASS, early-on support cost estimates, and electronic linking of COMPASS support results to ACEIT LCC analysis</td>
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<tr>
<td>Depot and Item Level (DIL) Analysis Tool</td>
<td>Business Case Analysis (BCA) of depot level repairable items for contractor repair, organic repair or throwaway of each item in system/sub-system and determines economically if Public/Private Partnerships are worthwhile</td>
</tr>
<tr>
<td>Quantity Discount Source Selection Evaluation Tool</td>
<td>Demand weighted total cost estimate of all item purchases, holding costs and ordering costs over contract period &amp; permits bidders to propose their own quantity discount ranges</td>
</tr>
<tr>
<td>Tailored Spreadsheet for Source Selection Support Cost Estimating</td>
<td>Usable on source selections when the system level repair is at depot or on legacy systems where maintenance cost is not a significant total cost driver</td>
</tr>
<tr>
<td>Achieving a System Operational Availability Requirement (ASOAR) Model</td>
<td>Optimally allocates a system Ao to end item/sub-system Ao goals, early-on analysis of Reliability, Ao, Maintainability &amp; Supportability requirements, and determine probability of mission success for a fleet of similar systems</td>
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### Team C4ISR PBL Tools

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<td>Readiness</td>
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<tr>
<td>COMPASS</td>
<td>Computerized Optimization Model for Predicting and Analyzing Support Structures</td>
<td>Readiness and Cost</td>
</tr>
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<td>ACEIT</td>
<td>Automated Cost Estimating Integrated Tools</td>
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</tr>
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SESAME, COMPASS & ACEIT are Army Standard Models  
ASOAR & LCET are CECOM Developed Models
COMPASS Usefulness

- Optimizes Maintenance Concepts (Level of Repair Analysis (LORA)) to Achieve an End Item Ao Requirement at the Lowest Total Support Cost
- Compares Similar Maintenance Level Alternatives (Source of Repair Analysis) for Best Value
- Evaluates Design Breakdown Impacts to RAM Related Logistics Support Costs

Supply Sparing Mix Optimization to End Item Ao is Embedded
SESAME Usefulness

- Optimizes Multi-Echelon Retail Level Initial Sparing to Achieve End Item Ao Requirement or a Procurement $, Weight or Volume Goal

-OR-

- Optimizes Plus Up Sparing to Achieve End Item Ao Given the Present Retail Level Sparing Mix

-OR-

- Evaluates End Item Ao Based on Sparing Mix, LRU Reliabilities and Logistics Response Times

Maintenance Concept for each Essential Item is Proposed or Known
ACE IT Usefulness

- Integrates Cost Estimates or Data From Other Computer Programs
- Often Used for Program Office Estimates & LCC Estimates
- Provides Credible Estimates for Time Phased Non-Logistics Acquisition Costs
LCET Model Usefulness

- More Credible Logistics Costs in LCC Estimates
- Time-Phased COMPASS Module Results Yield Highest Fidelity Support Cost Estimates
  - Relates Item Reliability to Readiness & Support Costs
  - Adjusts Results for Worth of Warranty
- Logistics Cost Spreadsheet Module Covers
  - Macro-Level Logistics Costs w/o Item Level Reliability
  - Non-COMPASS Logistics Costs After Items Known
- Merges Multiple Runs of Different Time Frames
- Links COMPASS & ACE IT to Permit Concurrent Supportability Optimization & LCC Estimation
Depot & Item Level Analysis Tool

• Depot Level Source of Repair Analysis at Both the Individual Item and Equipment Level

• Determines Whether Organic Depot, Contractor Depot or Throwaway is Least Cost for Each Item

• Optimal Item Level Mix plus Equipment Level Costs are Added & Compared to Determine if Mixed Repair is Still Less Than All Contractor or All Organic Repair

• Public-Private Partnering Outcome Yields an ROI for Each Organic Repaired Item & Prioritizes by Savings

• Initial Sparing Results from 2 Separate COMPASS or SESAME Runs are Manually Inputted if Applicable
Economic Order Quantity (EOQ)

- Best Buy Quantity Dependencies:
  - Purchase Cost
  - Ordering Cost
  - Holding Costs
  - Procurement Demand Rate

- Constraints/Adjustment Factors:
  - Minimum Reorder Cycles
  - Remaining Life
  - Shelf Life
  - Quantity Range for Unit Price
  - Delayed Reordering
Quantity Discount Source Selection Evaluation Tool

- Determines Likely Buy Quantities & Contract Purchase Costs for Items
- Bidders Provides Quantity Ranges & Prices for each Potential Contract Year
- Buyer Provides
  - Low, High and Likely Demand Rates for Items
  - Weighting Factors for Demand Rates
- Automatically Selects Lowest Cost EOQ Buys
- Simulates Buys for Items over Contract Life
- Computes Weighted Average Total Cost to Buyer
Achieving a System Operational Availability Requirement (ASOAR) Model

- Allocates Optimum Ao to End Items Being Acquired from System Readiness Rate
- Determines Ao Inputs to Use in Supportability Optimization Models
- Integrated Analysis of RAM and Supportability
  - Used Early-On to Help Generate Requirements
  - Determines the Fleet Ao and Mission Reliability When Using Multiple Similar Systems in a Mission
**PBL BCA-Summary**

- The BCA is a living document to be maintained during the whole lifecycle
- It becomes part of the PSS
- It has to be Validated/Updated
  - Prior to exercise of a contract or PBA option
  - Significant changes during the performance period/terms of a contract (PBA) or evaluation period
  - Whenever there are major programmatic changes
  - At least every five (5) years
PBL BCA-Summary

- An expanded cost/benefit analysis performed in iterations over the life cycle
- Best value solution for product support-PBL
- Alternatives weigh total cost against total benefits
- Goes beyond cost/benefit or traditional economic analyses
- Links each alternative to how it fulfills strategic objectives of the program.
- Independently, and without prejudice, identifies which alternative provides optimum mission performance given cost and other constraints, including qualitative or subjective factors.

Expanded from Defense Acquisition Guidebook