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Life Cycle Costs in Cost Benefit Analysis (CBA)

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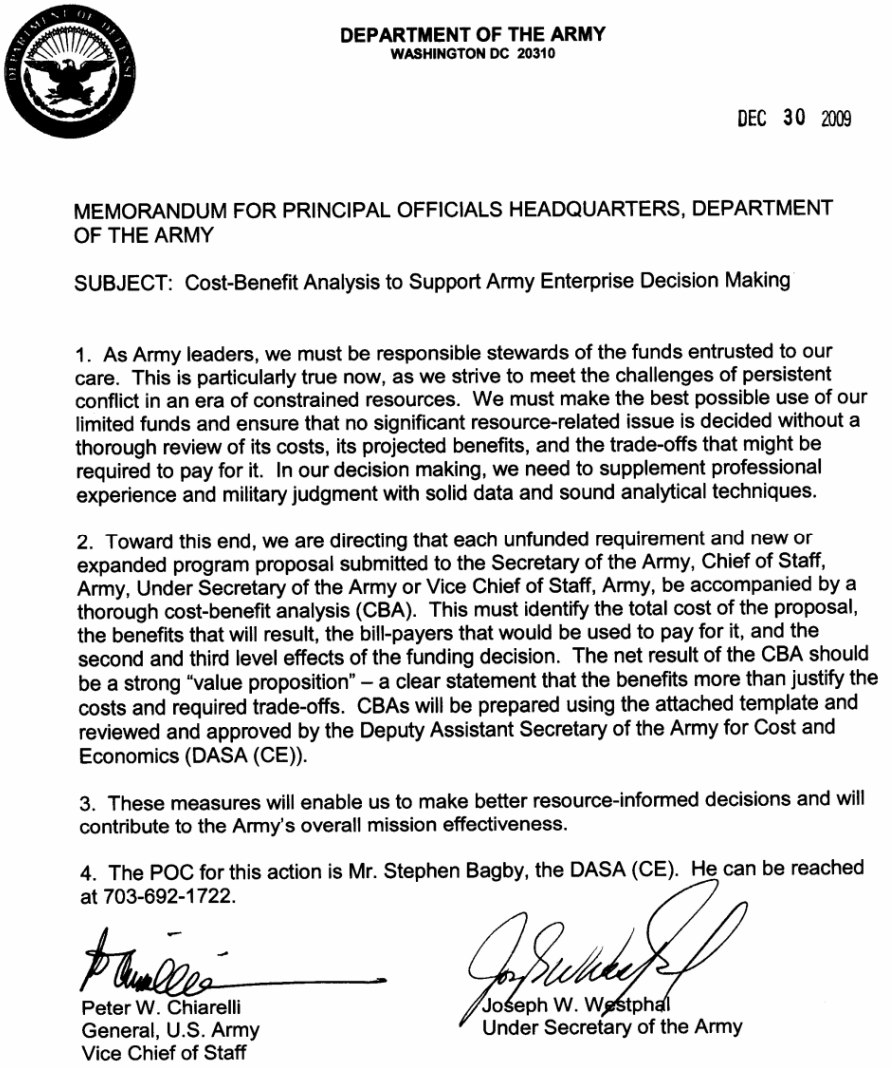
Background

Early Cost Team's function is to provide cost input, develop, and/or validate the cost methodologies for Analysis of Alternatives (AoAs) and Cost Benefit Analysis (CBA), as well as review and comment on the accuracy and integrity of cost related documents involved in the Joint Capabilities Integration and Development System (JCIDS) process.

Army CBA Policy

- VCSA Memo, "Cost-Benefit Analysis to Support Army Enterprise Decision Making" (dated December 20, 2009)
- CBA is required for each unfunded requirement under consideration within the Army
- CBAs must be "Strong Value Propositions"
- Greater emphasis on cost content to support requirements validation decisions
- CBAs must be attached to Pre-Milestone-A, B, and C requirements documents that directly address the requirement under consideration



DEPARTMENT OF THE ARMY
WASHINGTON DC 20310

DEC 30 2009

MEMORANDUM FOR PRINCIPAL OFFICIALS HEADQUARTERS, DEPARTMENT OF THE ARMY

SUBJECT: Cost-Benefit Analysis to Support Army Enterprise Decision Making

1. As Army leaders, we must be responsible stewards of the funds entrusted to our care. This is particularly true now, as we strive to meet the challenges of persistent conflict in an era of constrained resources. We must make the best possible use of our limited funds and ensure that no significant resource-related issue is decided without a thorough review of its costs, its projected benefits, and the trade-offs that might be required to pay for it. In our decision making, we need to supplement professional experience and military judgment with solid data and sound analytical techniques.

2. Toward this end, we are directing that each unfunded requirement and new or expanded program proposal submitted to the Secretary of the Army, Chief of Staff, Army, Under Secretary of the Army or Vice Chief of Staff, Army, be accompanied by a thorough cost-benefit analysis (CBA). This must identify the total cost of the proposal, the benefits that will result, the bill-payers that would be used to pay for it, and the second and third level effects of the funding decision. The net result of the CBA should be a strong "value proposition" – a clear statement that the benefits more than justify the costs and required trade-offs. CBAs will be prepared using the attached template and reviewed and approved by the Deputy Assistant Secretary of the Army for Cost and Economics (DASA (CE)).

3. These measures will enable us to make better resource-informed decisions and will contribute to the Army's overall mission effectiveness.

4. The POC for this action is Mr. Stephen Bagby, the DASA (CE). He can be reached at 703-692-1722.

Peter W. Chiarelli
General, U.S. Army
Vice Chief of Staff

Joseph W. Westphal
Under Secretary of the Army

Life Cycle Cost

❖ What is life cycle cost and when does estimate development start??

Cost estimate that contains all costs from the start through implementation, operation, and disposal for a program or project.

-- CBA Guide v2

A document that includes:

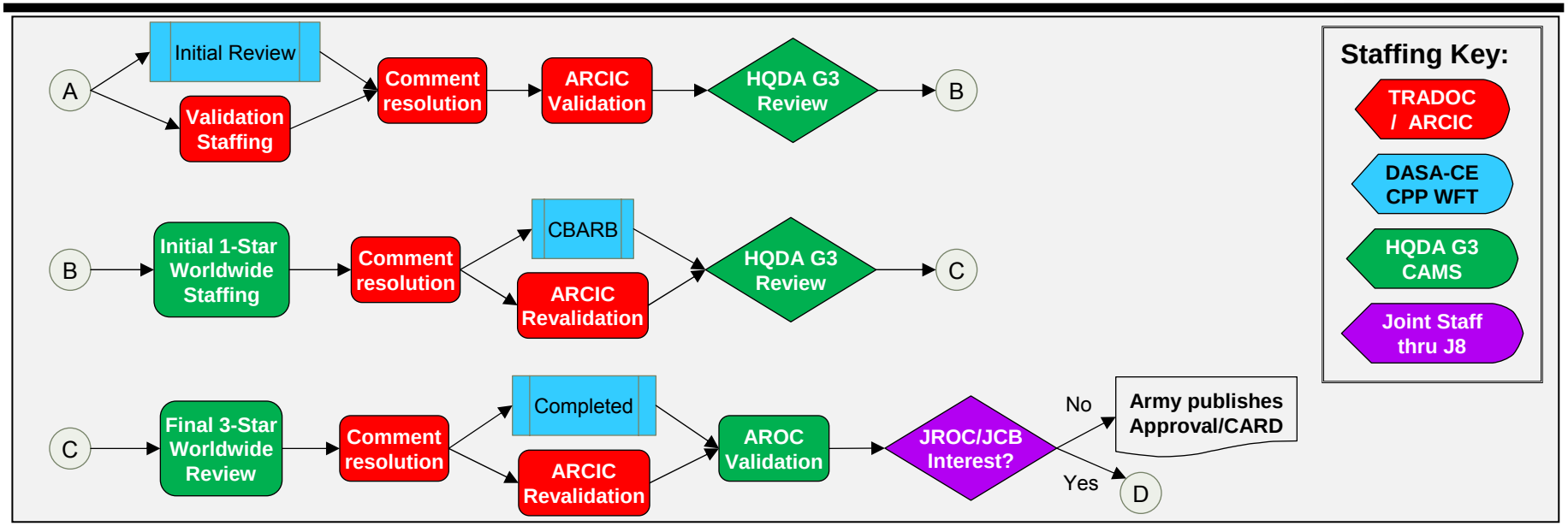
1) all costs incurred during the total life from project initiation through termination of a system or aggregation of systems.
2) cost for research and development, production, military construction, deployment, and operation and support.

-- Army Cost Analysis Manual

CBA Review Process

- Read the CBA
- Identify POCs
- Conduct analysis and annotate concerns
- Contact Cost Analyst/ Proponent for CBA
- Adjudicate comments
- Brief Leadership

CBA Flowchart



❖ Metrics

Capability Documents — Status

Review Stage	Open	In Adjudication	Closed	Total	CY12TD
Army Initial Staffing (1-Star/SES)	4	5	116	125	8
3-Star Review	11	0	58	69	6
Overall Totals	**15**	**5**	**174**	**194**	**14**

CBAs - Level of Effort — Status

Action	Open	Pending/Rework	Closed	Total	CY12TD
Pre-Screen	2	13	54	69	8
CBA Review	6	48	78	132	34
CBARB	0		37	37	8
Overall Totals	**8**	**61**	**169**	**238**	**50**

Department of the Army: CBA Snapshot

ODASA Cost & Economics

Army CBAs Must:

- Provide Clear Problem Statement
- Provide clear objective/goal
- Define appropriate/consistent scope of analysis
- Provide assumptions, facts, constraints
- **Describe status quo and provide baseline cost estimate**
- Present multiple COAs that are clearly defined
- **Provide cost estimate and benefit summary for each COA**
- **Provide decision matrix, weighing costs and benefits with an appropriate weighting scheme**
- Recommend best value COA

B.	Main Content	CBA POC (Preparer)	DASA-CE Use Only
1.	Executive Summary (Include the total cost of the recommendation and what time period it covers.)		☑ ☒
2.	**The 8-Step Methodology**		
	Step 1: Define the Problem/Opportunity		
	a. Problem/Opportunity Statement		
	b. Objective/Goal		
	c. Background/Circumstances		
	Step 2: Define Scope; Formulate Facts and Assumptions		
	a. Scope (Include dimensions such as time, location, organization, technology, or function)		
	b. Facts, Constraints, and Assumptions		
	Step 3: Define Alternatives		
	a. Status Quo (Required as baseline if relevant for comparison to estimate savings, cost avoidance, and other aspects of given Course of Action (COA) improvements)		
	b. Three or more alternative COAs		
	Step 4: Develop Cost Estimates for Each Alternative		
	a. Quality of cost data and sources identified (Relevant, valid, normalized, verifiable, and reasonable)		
	b. Documented cost estimating methodology (Include rationale using work breakdown structure (WBS) to derive cost elements)		
	c. Accurate and credible cost estimates in constant and current dollars		
	Step 5: Identify Quantifiable and Non-Quantifiable Benefits		
	Step 6: Define Alternative Selection Criteria (Financial and Non-financial)		
	Step 7: Compare Alternatives		
	a. Costs and benefits comparison (Benefits should exceed costs where possible)		
	b. Second and third order effects		
	c. Risk assessment and mitigation (Business/ Programmatic, Operational, Process, Technical, Schedule, and Organizational)		
	d. Decision matrix support tools/methods (Criteria are consistent with Step 6 and have reasonable ratings and weights)		
	e. Sensitivity analysis (Optional, but encouraged; meaningful causal factors susceptible to realistic changes)		
	f. Billpayers/tradeoffs		
	Step 8: Report Results and Recommendations (Using a narrative and/or suggested briefing format)		

Documentation

❖ Provide supporting data for all COAs in CBA

- Methodology
- ACEIT or Excel file
- Data sources

	Cost Element	Approp	Total	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
	*Configuration Functions												
	* Base Year of Calculation		2008										
	* Units of Calculation		M										
	* System Inflation Table for Calculation		US Government Indices for FY 2007, 29Nov2007										
	* Custom Inflation Table for Calculation		Custom Cache										
	* ACE Session Name												
	* ACE Session Path												
	* Time of Calculation		9:45:12										
	* Date of Calculation		########										
	* Time ACE Session Last Saved		12:00:51										
	* Date ACE Session Last Saved		########										
	* Risk Iterations	Table											
#		Numbers											
1	Revised ACP Estimate												
2	Total		3,248.93	0.031	17.949	19.693	20	38.3	114	134	160	151	238
3	Investment		1,454.82	0.031	17.949	19.693	20	38.3	111	124	149	138	193
4	Program Management		456.02						51.8	59.1	62.5	62.5	57.4
5	Personnel		381.705						41.9	48.4	51.8	51.7	49.3
6	PMO		206.889						19.9	24.3	25.9	26.7	27.2
7	Military		12.1941						1.31	1.35	1.55	1.6	1.65
8	Field Tactical	MPA	6.1345						0.74	0.77	0.79	0.82	0.85
9	PLM+	MPA	6.0596						0.56	0.58	0.75	0.78	0.8
10	Government Civilian		75.4974						8.54	9.24	9.43	9.63	9.82
11	Field Tactical	RDTEA	61.8373						7.39	7.56	7.72	7.87	8.03
12	Field Tactical - Finar	RDTEA	5.1991						0.17	0.68	0.69	0.7	0.72
13	PLM+	RDTEA	8.461						0.98	1	1.03	1.05	1.07

Army Resources

- Army Military Civilian Cost System (AMCOS)
- Automated Cost Database (ACDB)
- Automated Cost Estimating Integration Tools (ACEIT)
- Capabilities Knowledge Base (CKB)
- FM&C website/Inflation indices
- Joint Integration Analysis Tool (JIAT)
- Operating and Support Management Information System (OSMIS)

Comments/Concerns

- **Is there transparency between the capability document and CBA?**
  - Section 16.1 – Threshold aligns with cost shown in CBA

**** EXAMPLE ****

16.1 (U) Threshold

Fully burdened research, development, test, and evaluation (RDT&E) costs of $102.4M were borne, and will be borne, by the materiel developer (i.e., US Army Medical Research and Materiel Command (USAMRMC) from FY08 - FY16). Total procurement costs will be $3.3586M. When expended, this product will be disposed of at no cost. Thus the total life-cycle cost is $105.7586M, in base year 2012 dollars (BY12$).

SDP ($M)	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	Total
RDT&E	$27.493	$32.543	$10.312	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 70.348
PROC	$ -	$ -	$ -	$ 0.527	$ 3.137	$ -	$ -	$ -	$ -	$ -	$ 3.664
O&S	$ -	$ -	$ -	$ 0.005	$ 0.031	$ 1.262	$ 1.285	$ 1.308	$ 1.331	$ 1.355	$ 6.578
Total	$27.493	$32.543	$10.312	$ 0.532	$ 3.168	$ 1.262	$ 1.285	$ 1.308	$ 1.331	$ 1.355	$ 80.590

Over Time…

➢ *CHALLENGES*

- Non-Cost Analysts
- Process Timeline
- Estimates
  - Useful Life
  - POM

• *LESSONS LEARNED*

- ❑ Improve Product Quality
  - – Pre-screening
  - – Increase face-to-face
- ❑ Information Sharing
  - – Portal Development

ODASA Cost & Economics

BACKUP