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by PRICE® Systems

Targeting Affordability and Controlling Cost Growth through Should-Cost Analysis

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Secretary Carter Memorandum

On September 14th 2010 The Honorable Ashton B. Carter; Under Secretary of Defense for Acquisition, Technology and Logistics, released a memorandum addressed to the acquisition professionals of the Department of Defense. The primary thrust of the memorandum was the current need for greater efficiency and productivity in defense spending.

- **Secretary Carter provided guidance organized into five initiatives [1]:**
  - Target Affordability and Control Cost Growth
  - Incentivize Productivity and Innovation in Industry
  - Promote Real Competition
  - Improve Tradecraft in Services Acquisition
  - Reduce Non-Productive Processes and Bureaucracy.

Notes: 1 - Memorandum for Acquisition Professionals: SUBJECT: Better Buying Power for Obtaining Greater Efficiency and Productivity in Defense Spending (Washington, D.C Sep 14 2010).
2 - Memorandum for Secretaries of the Military Departments / Directors of the Defense Agencies: SUBJECT: Implementation Directive for Better Buying Power – Obtaining Greater Efficiency and Productivity in Defense Spending (Washington, D.C Nov 3 2010).

Secretary Carter's Guidance Summarized

- **Initiative #1**
  - Focus on affordability
  - Drive to obtain cost control
  - Improve production rates
- **Use Will Cost / Should Cost Management to drive productivity**
  - Use should cost analysis to negotiate productivity improvements
  - Scrutinize every element of program cost to assess the contractor's ability to reduce cost year to year

Guidance Roadmap

<u>Target Affordability and Control Cost Growth</u>

- Mandate affordability as a requirement
  - At Milestone A set affordability target as a Key Performance Parameter
  - At Milestone B establish engineering trades showing how each key design feature affects the target cost
- Drive productivity growth through Will Cost/Should Cost management
- Eliminate redundancy within warfighter portfolios
- Make production rates economical and hold them stable
- Set shorter program timelines and manage to them

<u>Incentivize Productivity & Innovation in Industry</u>

- Reward contractors for successful supply chain and indirect expense management
- Increase the use of FPIF contract type where appropriate using a 50/50 share line and 120 percent ceiling as a point of departure
- Adjust progress payments to incentivize performance
- Extend the Navy's Preferred Supplier Program to a DoD-wide pilot
- Reinvigorate industry's independent research and development and protect the defense technology base

<u>Promote Real Competition</u>

- Present a competitive strategy at each program milestone
- Remove obstacles to competition
  - Allow reasonable time to bid
  - Require non-certified cost and pricing data on single offers
  - Require open system architectures and set rules for acquisition of technical data rights
- Increase dynamic small business role in defense marketplace competition

<u>Improve Tradecraft in Services Acquisition</u>

- Create a senior manager for acquisition of services in each component, following the Air Force's example
- Adopt uniform taxonomy for different types of services
- Address causes of poor tradecraft in services acquisition
  - Assist users of services to define requirements and prevent creep via requirements templates
  - Assist users of services to conduct market research to support competition and pricing
  - Enhance competition by requiring more frequent re-compete of knowledge-based services
  - Limit the use of time and materials and award fee contracts for services
  - Require that services contracts exceeding $1B contain cost efficiency objectives
- Increase small business participation in providing services

<u>Reduce Non-Productive Processes and Bureaucracy</u>

- Reduce the number of OSD-level reviews to those necessary to support major investment decisions or to uncover and respond to significant program execution issues
- Eliminate low-value-added statutory processes
- Reduce by half the volume and cost of internal and congressional reports
- Reduce non-value-added overhead imposed on industry
- Align DCMA and DCAA processes to ensure work is complementary
- Increase use of Forward Pricing Rate Recommendations (FPRRs) to reduce administrative costs

Sept 14, 2010

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Definitions

Should Cost (Analysis)

- Approximation of a contract-price, developed by the customer's accounting, engineering, procurement, and other costing staff. The staff conducts a thorough, in-depth review of the contractor's plan to identify and eliminate inefficiencies and diseconomies, and quantifies their effect on the total cost of the project. The resulting cost figure is the should-cost estimate. [1]

- A [illegible]ent of contract Pricing that employs an integrated team of Government Procurement cost and p[illegible] contract administration, auditors, and Engineering representatives to conduct a [illegible] Cost review and Evaluation of a program at the contractor's plant. Its purpose is [illegible]fficient practices in the contractor's management and operations, to qua[illegible] impact on cost, and to develop a realistic price objective for Negotiation[illegible]he results of the should cost effort. [2]

Practical Guidance on using Should Cost / Will Cost analysis to achieve efficiencies and affordability

Will Cost Estimat[illegible]

- Contract pricing based on what the bid[illegible] to do a particular job within a specified timeframe. Such projections are bas[illegible] cost data and, therefore, require analysis to eliminate the likelihood o[illegible] [1]

Should Cost Estimate

- An Estimate of contract price which reflects reasonably achievable contractor Ec[illegible] Efficiency, and is developed by a Should Cost analysis at a contractor's plant. [2]

Notes: 1 – Should Cost Definition Retrieved December 3, 2010, from Business Dictionary: http://www.businessdictionary.com/definition/should-cost-estimate.html & http://www.businessdictionary.com/definition/will-cost.html
2 - "Should Cost" Analysis Literature Review; Tomeka Williams, Professor Of Business-Cost and Financial Management Defense Acquisition University-CNE. Retrieved December 3, 2010, from DAU Acquisition Community Connection –: https://acc.dau.mil/CommunityBrowser.aspx?id=399121

Definitions from "Financial Management Hot Topics" February 22, 2011

Will Cost vs Should Cost

- **Will Cost**
  - Most likely cost (at least at the 50% confidence level)
  - ICE/POE
  - APB/SAR
  - Budget
- **Should Cost**
  - Not the same as the FAR definition of "Should Cost"
  - Challenge all aspects of program costs to do better
    - Challenge learning curves
    - Challenge overhead costs
    - Look for cost reduction initiatives (e.g., labor hours, materials, processes, CDRLs)
    - Component breakout
    - Prototype/Production quantities
    - MYP
    - Shorten time to develop/build

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Should Cost Modeling[1]

- **Definition**

  Should cost modeling is the process of determining what a product should cost based upon its component raw material costs, manufacturing costs, production overheads, and reasonable profit margins.

- **Why Use Parametric Cost Modeling?**
  - Speed, Accuracy, top-level parameters
  - Lower cost over traditional methods
  - Provides ability to conduct sensitivity analysis gaining greater insight into cost drivers
  - ***Product-oriented WBS*** allows identification and simulation of efficiencies

- **Issues Associated Cost Modeling**
  - Most cost modeling vendors are hardware parts and commodity oriented (material costs account for 70% hardware costs)
  - Requires data collection and mining

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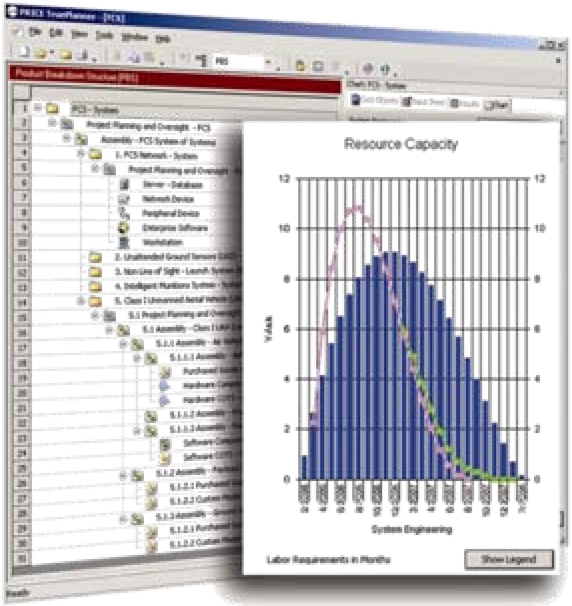
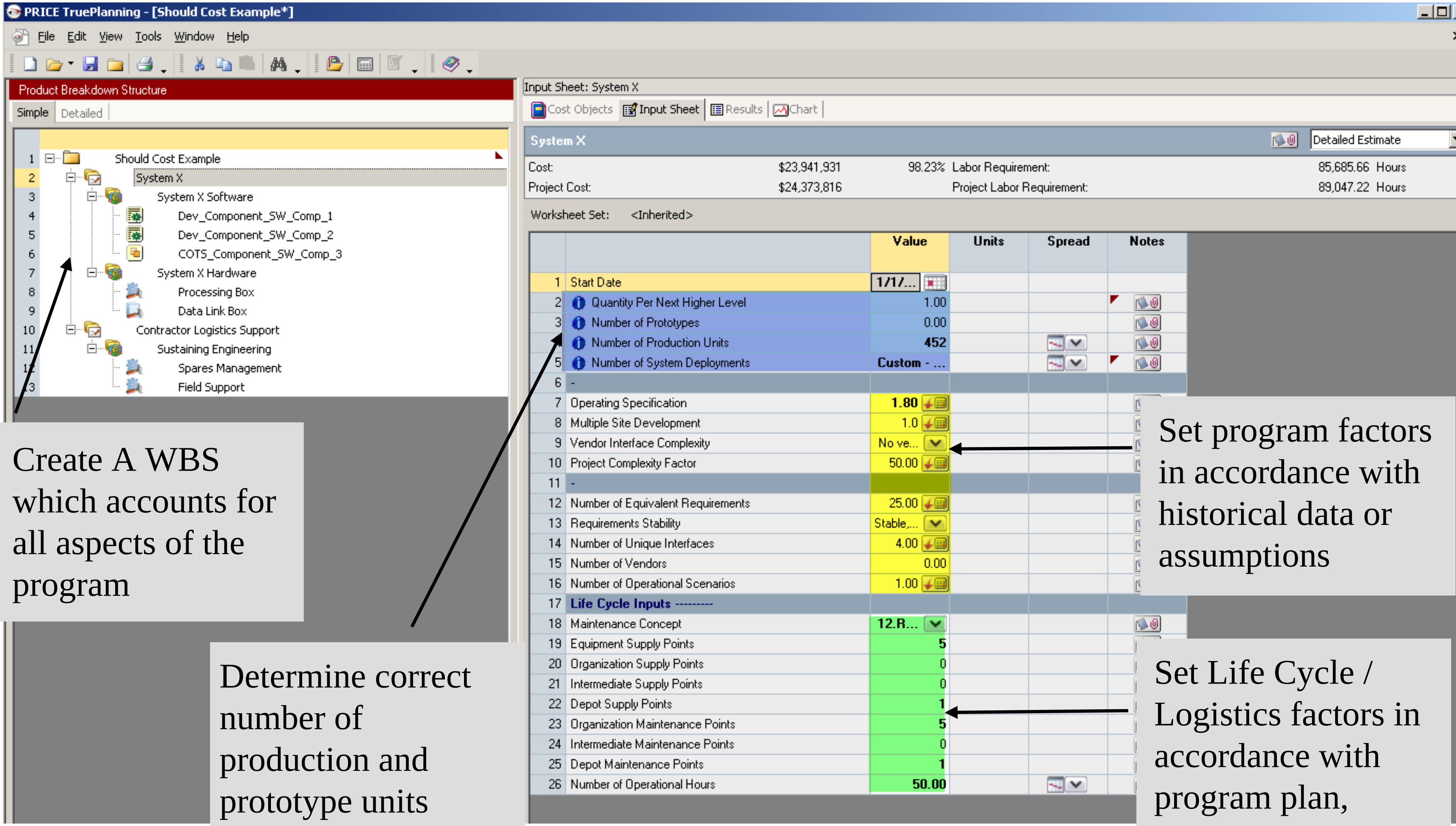


Note: **1** - *Should-Cost Modeling*. Retrieved December 3, 2010, from Sourcing Innovation: http://blog.sourcinginnovation.com/2006/08/22/shouldcost-modeling.aspx

Agile, parametric models are essential!



Create A WBS which accounts for all aspects of the program

Determine correct number of production and prototype units

Set program factors in accordance with historical data or assumptions

Set Life Cycle / Logistics factors in accordance with program plan, historical data or assumptions

5 Steps to Targeting Affordability and Controlling Cost Growth through Should-Cost Analysis

1. **Establish Will Cost using**
   a) Contract price
   b) Models that leverages supplier's actual productivity history to simulate most-likely-cost at 50% confidence level

2. **Establish Should Cost using models that**
   a) simulate best practices applied to your program or item
   b) simulate desired objectives, i.e.; weight reduction

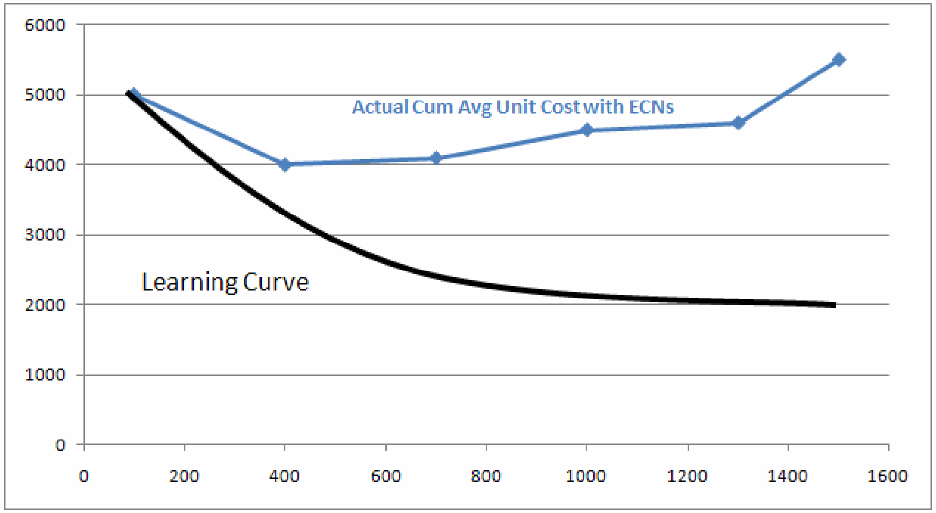
3. **Identify CRIs - Work with suppliers to determine specific cost reduction initiatives (CRIs) that drive efforts a Should Cost target**

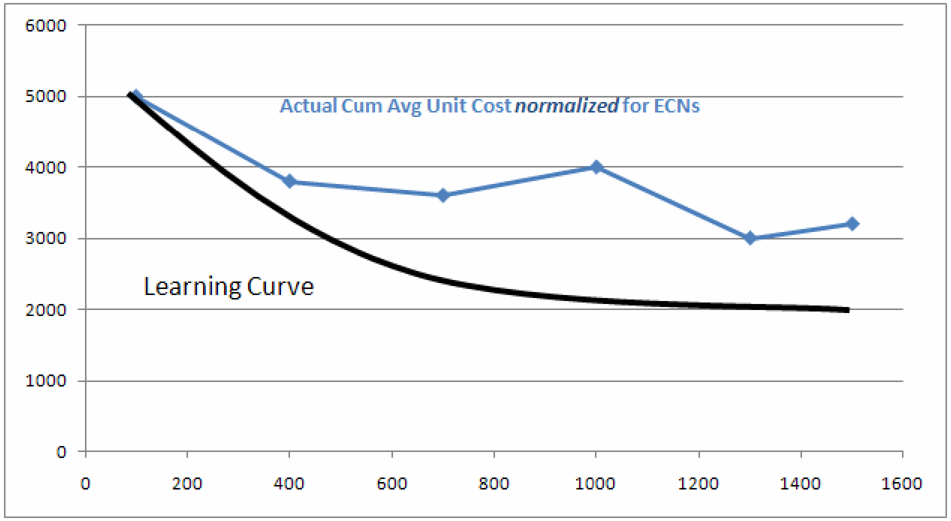
4. **Incentivize suppliers to realize subsequent phase CRIs with Award Fees**

5. **Create a Should Cost glide path and implement a continuous process that uses models to track CRIs results over time**

2 Example: Using Learning Curve and ECN Modeling to Establish Should Cost*

- **Track supplier's cumulative average unit cost over product lots**
- **Use models to determine cost of engineering change notices (ECNs) and normalize average unit costs**
- **Use learning curve to determine Should Cost**





**taken from Lockheed Martin Tactical Aircraft Supplier Assessment using PRICE H, 1997*

2

Example: Using Models to simulate best practices to establish Should Cost*

- **Identify an analogous system/item that employs best practices**
- **Use models to recast system/item in target operating environment and other specifics**
- **Present findings to supplier and determine a fair Should Cost target**

**taken from Global Positioning System (GPS) and the use of Parametrics, LT COL Latterman, USAF 1992; Approach saved the program millions of dollars*

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2

Example: Using Models to simulate best practices to establish Should Cost*

- **Publically available information used to model best commercial practice for GPS handheld receiver**
- **Used PRICE models to recast receiver in military operating environment and other requirements**
- **Presented findings to supplier and determined a fair Should Cost target**

**taken from Global Positioning System (GPS) and the use of Parametrics, LT COL Latterman, USAF 1992; Approach saved the program millions of dollars*

EP&P Packaging Ideas

GPS Receiver Miniaturized

A highly integrated, miniaturized version of a global positioning system [redacted] The hand-held unit is packaged in a volume of 100 cm^3 and weighs 8 oz (Fig. 1). The small size is achieved by a special GPS chipset designed at Rockwell, combined with high density interconnections, surface mount, and a special antenna design.

The dedicated chipset consists of five chips: a gallium arsenide monolithic microwave integrated circuit (MMIC), an advanced architecture microprocessor, a multifunction interface chip, a signal synthesizer, and a signal processor. The chipset is said to incorporate the latest MMIC and VLSI technology to achieve a significant size reduction.

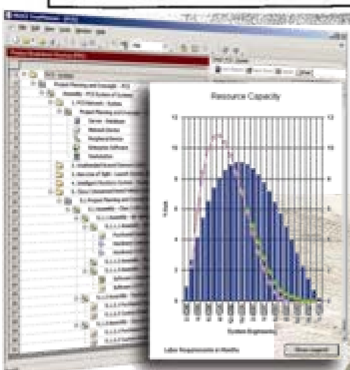
The chips are used to implement two high density hybrid circuits (Fig. 2). One is an RF-IF translator hybrid and the other is the frequency synthesizer. A single surface-mount printed circuit board is used for the major interconnection. It contains passive chips, two RAM and ROM SOICs and an EPROM.

The antenna is called a dual-patch ceramic antenna developed especially for this program. It consumes a small volume but has high sensitivity.

The GPS receiver automatically selects and acquires four satellites for best geometry and solves the navigation equations for display on the liquid crystal display.

Figure 1. The miniature receiver uses gallium arsenide and VLSI chips to achieve small size.

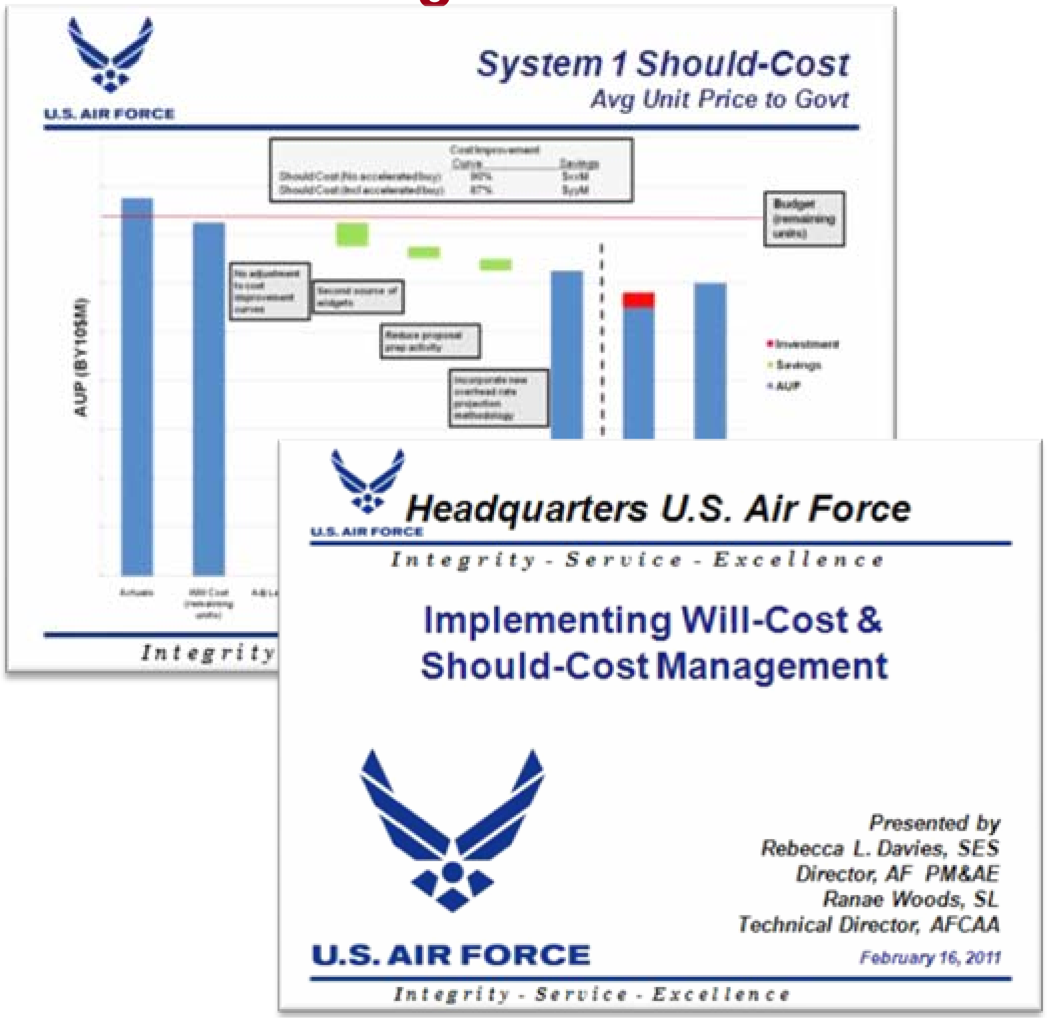
Figure 2. Antenna cover is removed (left) to show the ceramic patch antenna. The back of the unit (right) shows the RF/IF hybrid (rectangular package on top) and the frequency synthesizer hybrid just below it.



3 Identify CRIs - Work with suppliers to determine specific cost reduction initiatives (CRIs) that drive efforts a Should Cost target

What if…

- ***Aluminum vs. Titanium?***
- ***7 production lots of 100 over 7 years vs. 3 production lots of 250 500 over 7 years?***
- ***No gaps between lots vs. 5 month gap between lots?***
- ***Weight is increased?***



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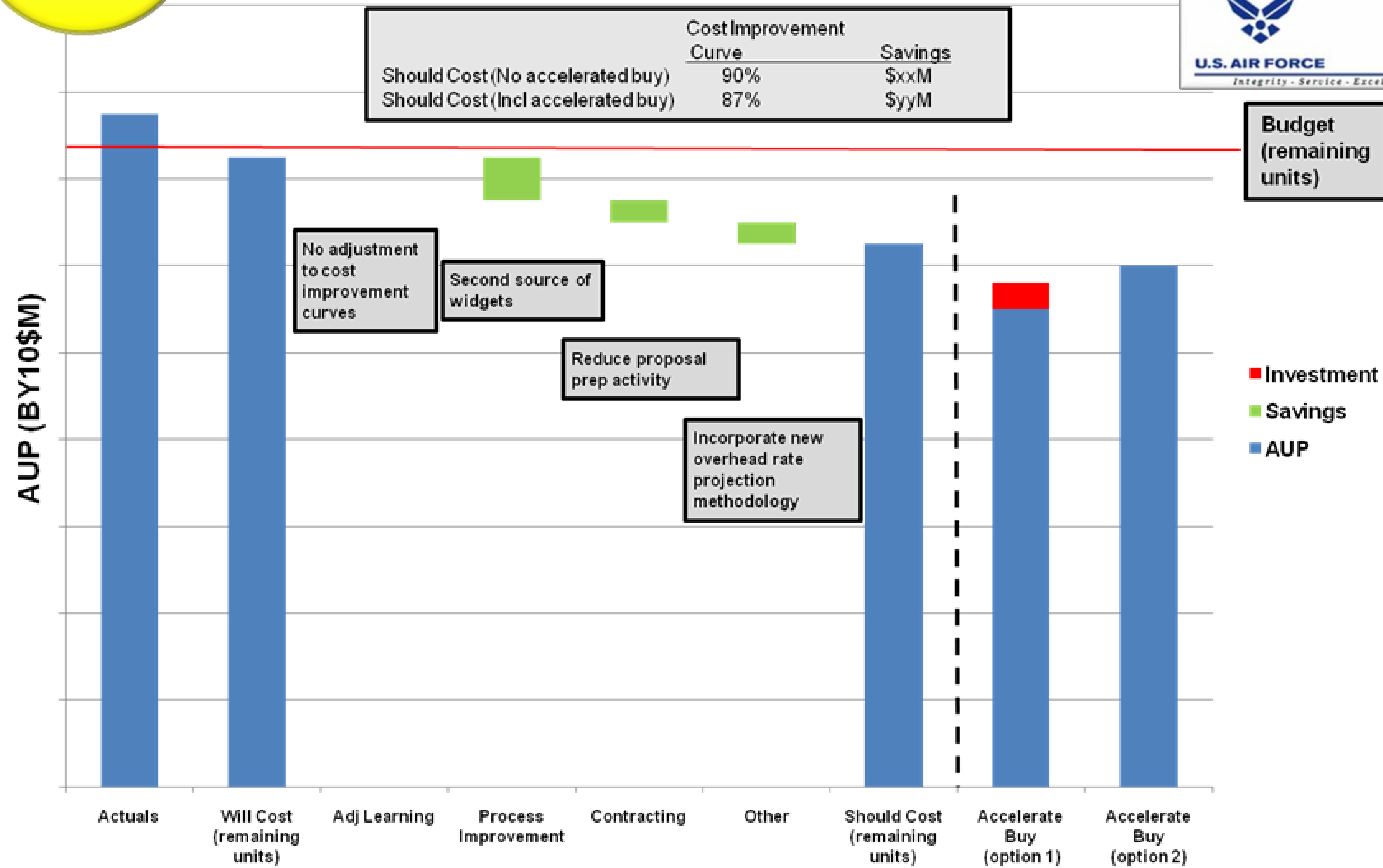
System 1 Should-Cost
Average Unit Price to Government



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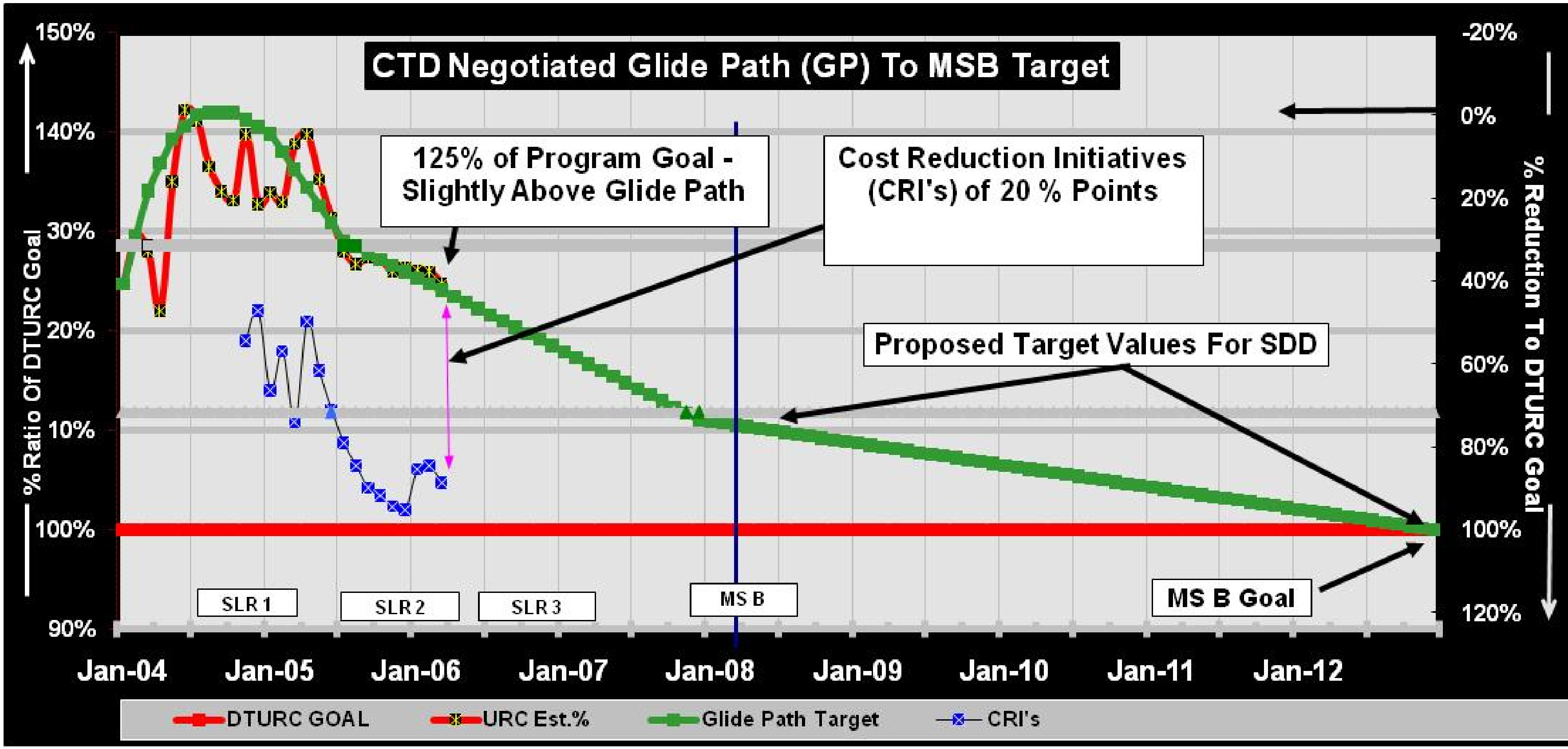

Taken from Army Program awarded Army CAIV Program of the Year 1998

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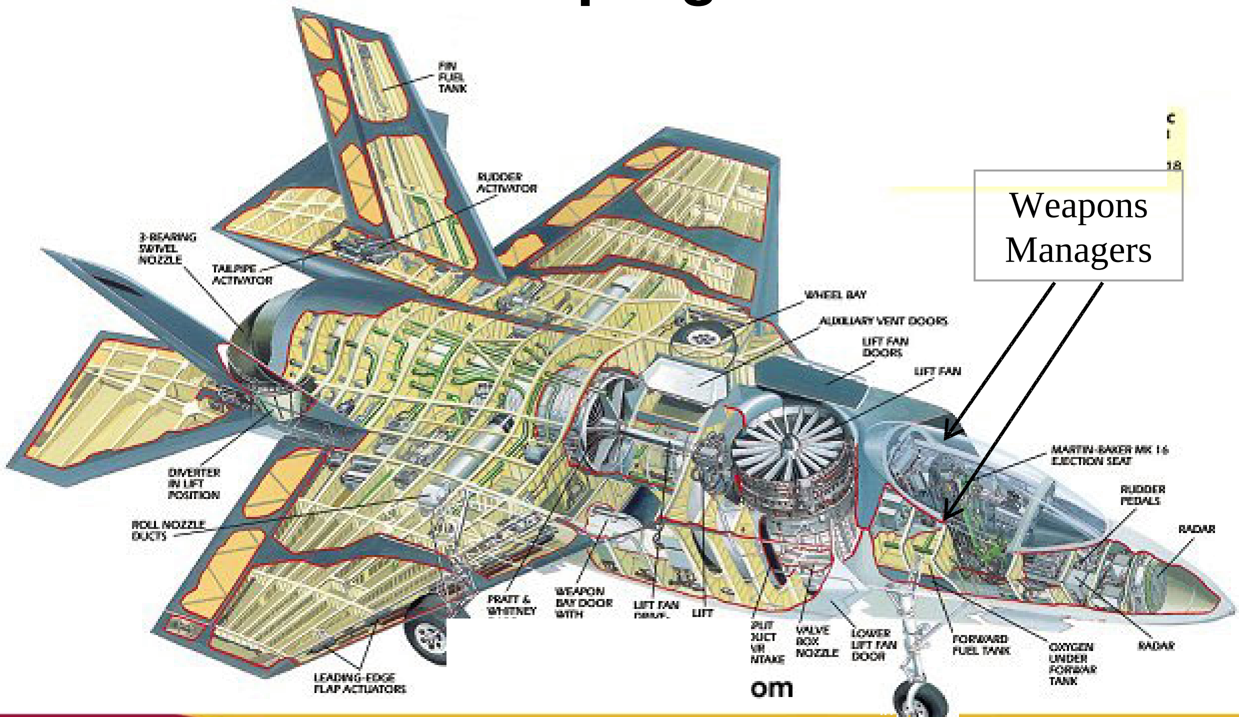
Should Cost Example

- **Weapons Manager - flexible remote interfacing product tailored to Jet Fighter AC & Weapons distributed I/O management and actuation control.**
- **Sanitized Data from an actual program**

- Cost Savings Opportunity via Technology Refreshes – 4 times over 52 year operating period.



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Baseline (Will Cost)

- **Development for 15 prototype & 2880 production A/C (SW & HW).**
  - LRIP followed by full scale production of first lot.
  - 4 lots of multi-year (5) buys follow
- **10 – 15 hour per month average A/C operation over 50 years.**
- **Contractor repair of unit failures.**

3

Opportunity (Should Cost)

- Development for 15 prototype & 140 production A/C (SW & HW); LRIP & full scale production of first lot only.
- 4 technology refresh developments (2 A/C prototype systems for each) followed by full scale production quantities of: 760, 970, 780, and 230.
- 10 – 15 hour per month average A/C operation over 50 years.
- Contractor repair of unit failures.

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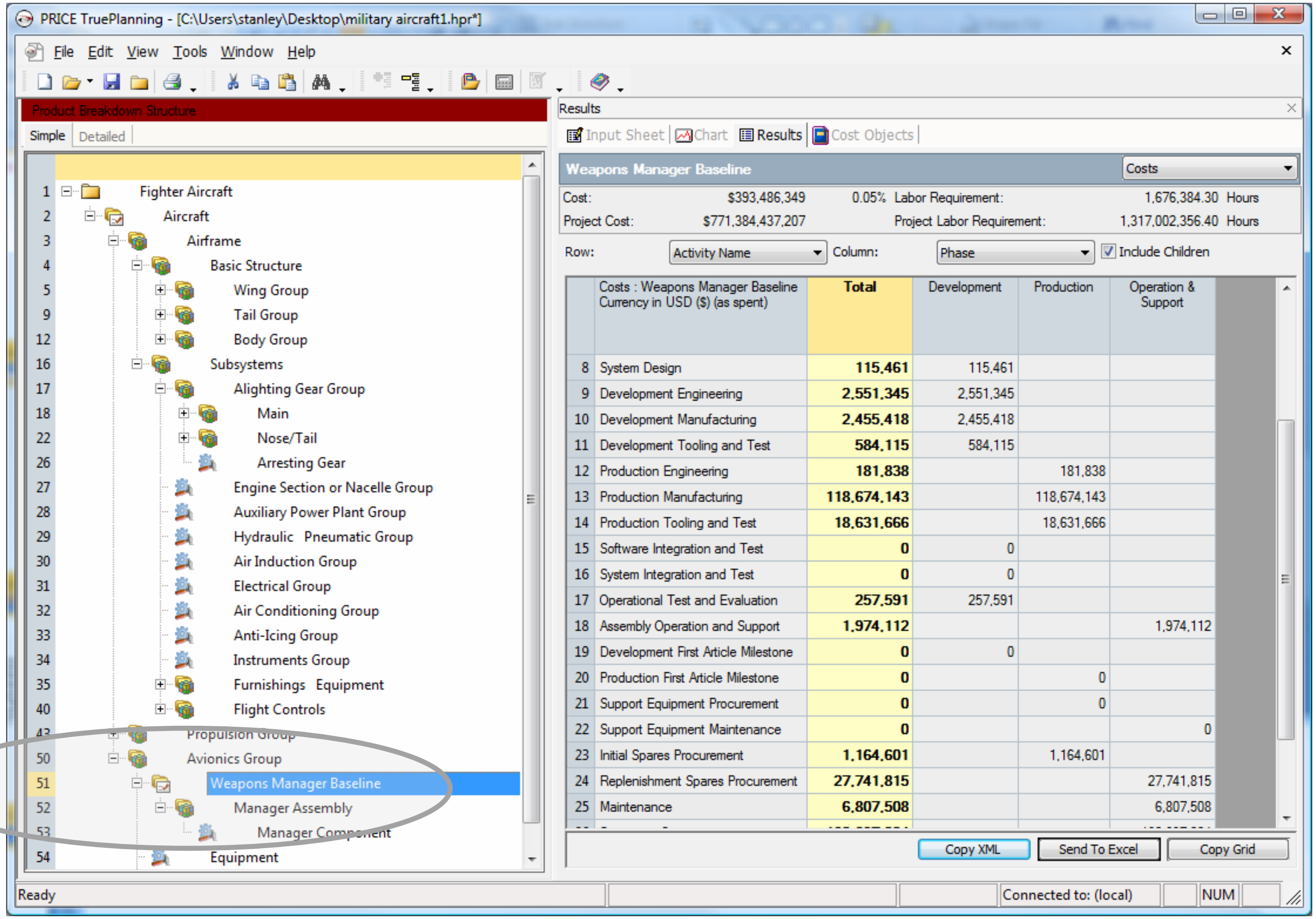
Baseline (Will Cost) Estimate Structure



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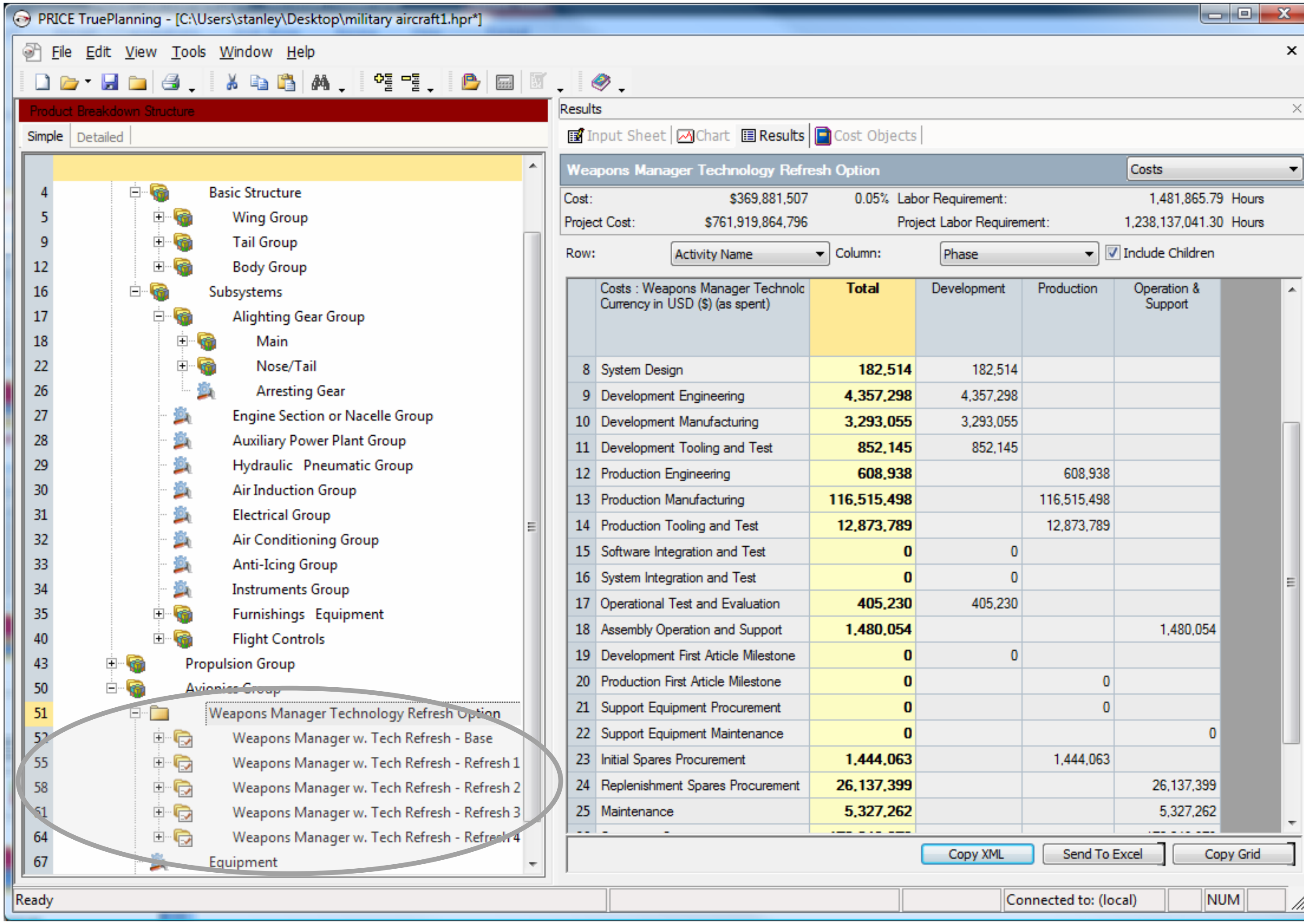
Opportunity (Should Cost) Estimate Structure



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Results

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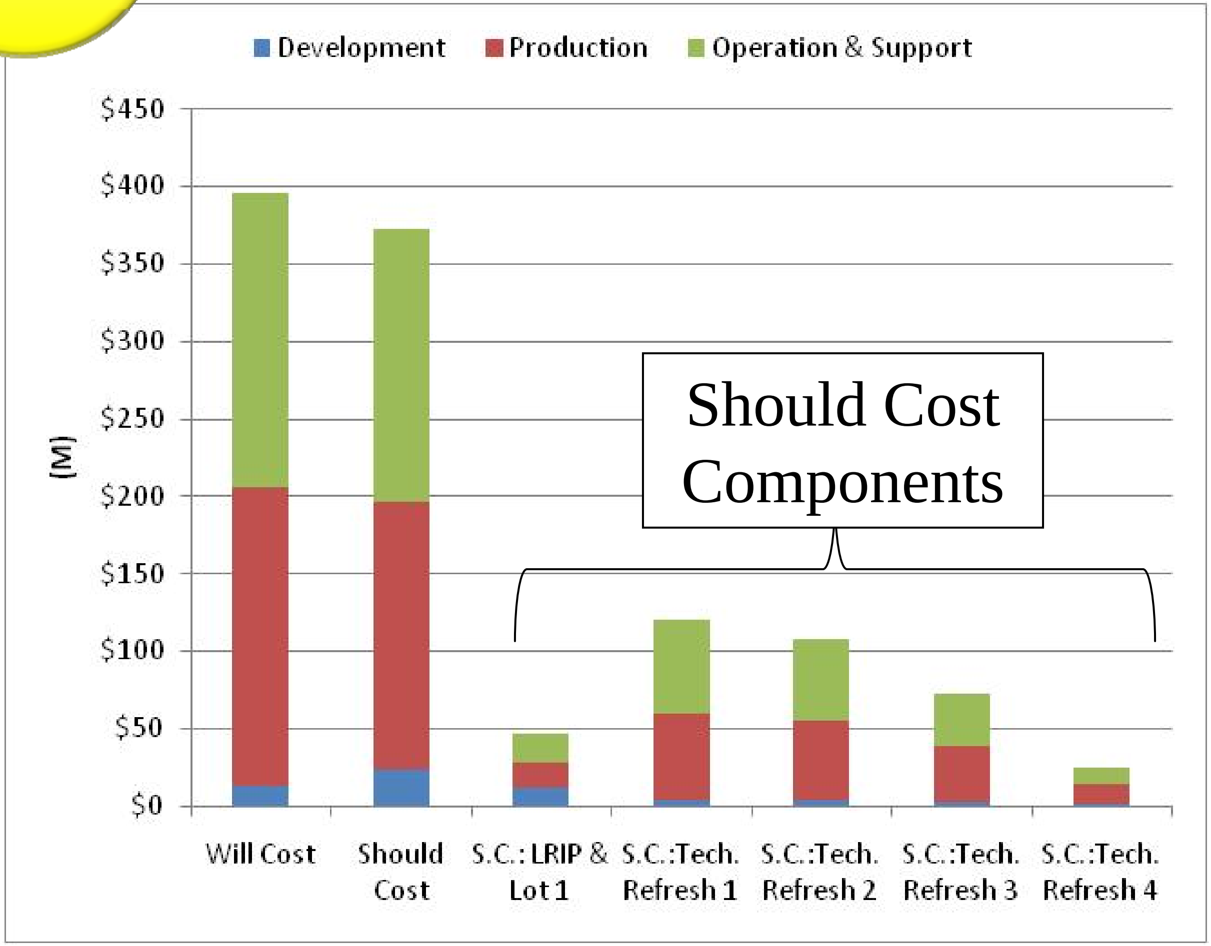

- $11M additional Dev to save $20M Prod & $14M O&S.
- Is a Net Savings of $23M (approx. 6%) over 50+ years really an exciting opportunity?

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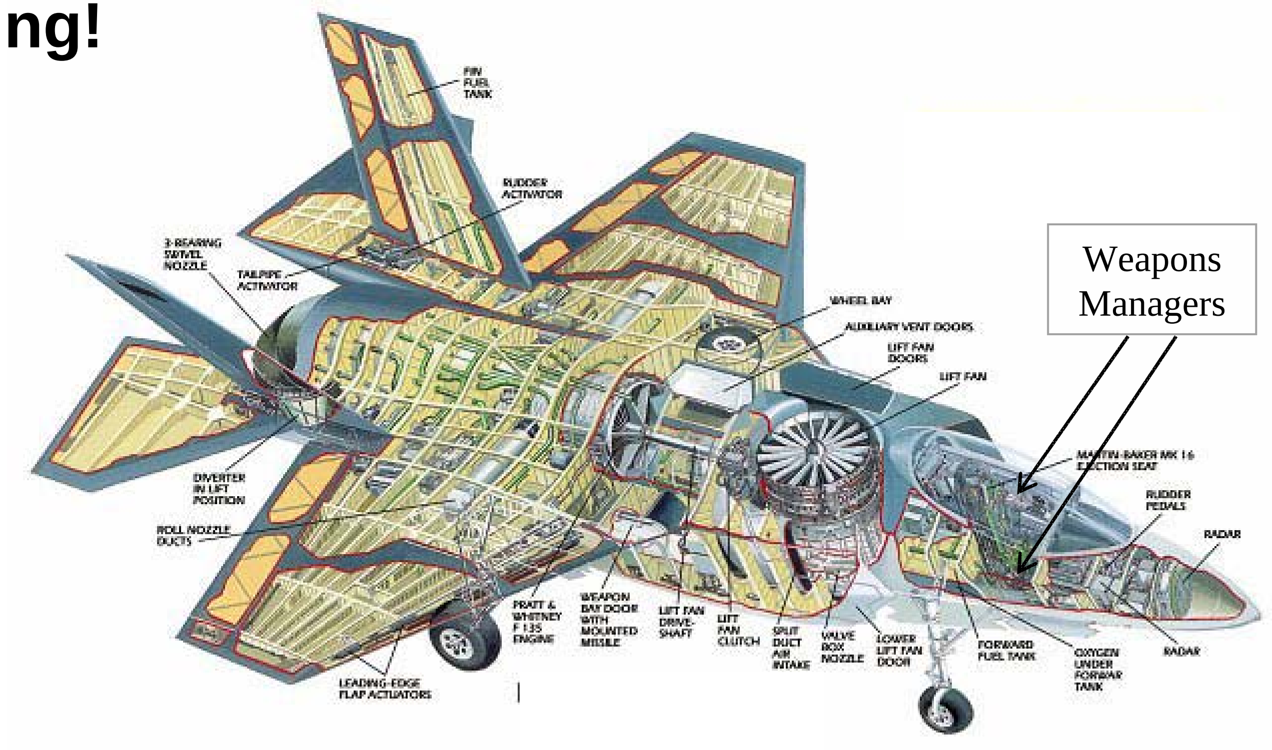
Bigger Picture

- **A/C could be an $800B program.**
- **If only 25% of it can achieve 6% savings, the net would be $12B - $3B more than the 2011 operating budget of Toronto – that's getting exciting!**



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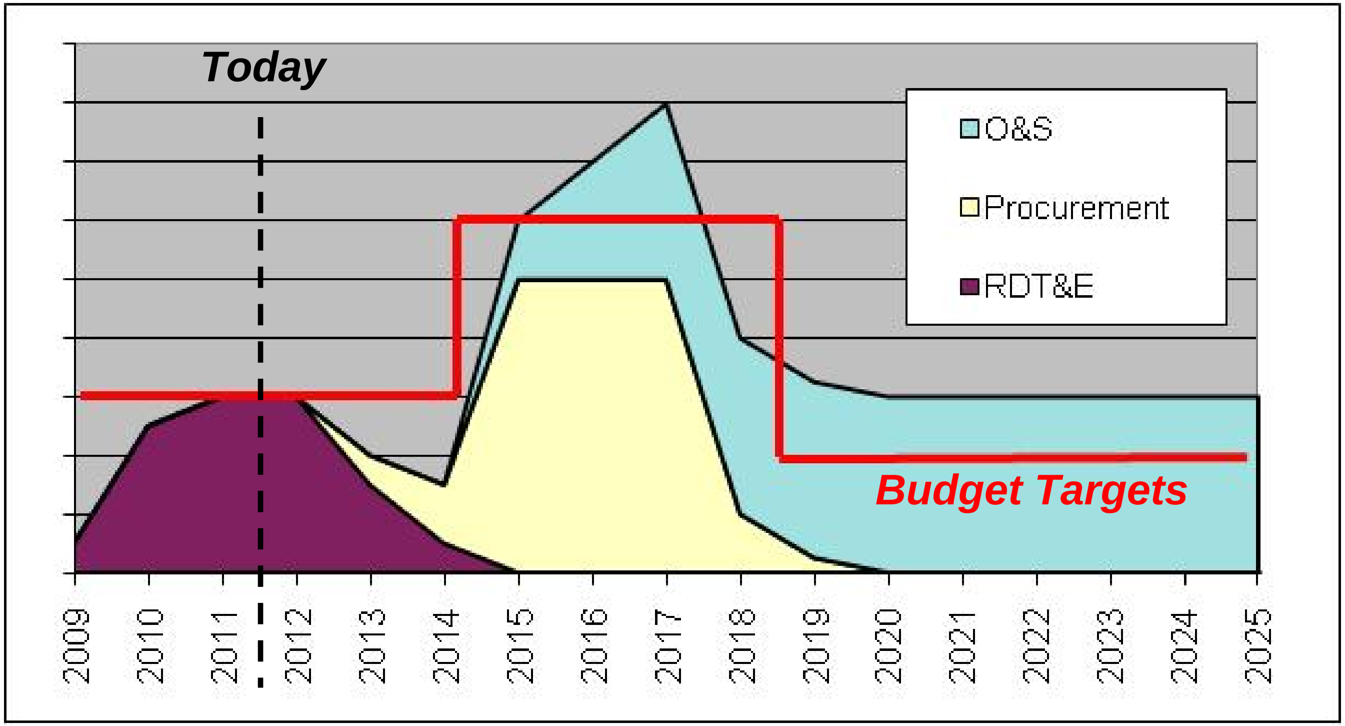
Incentivize suppliers to realize subsequent phase CRIs with Award Fees



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Incentivize suppliers to realize subsequent phase CRIs with Award Fees

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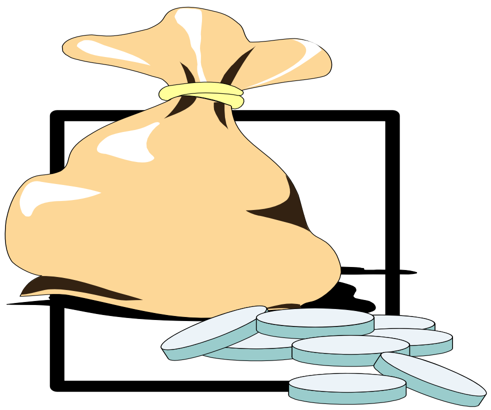
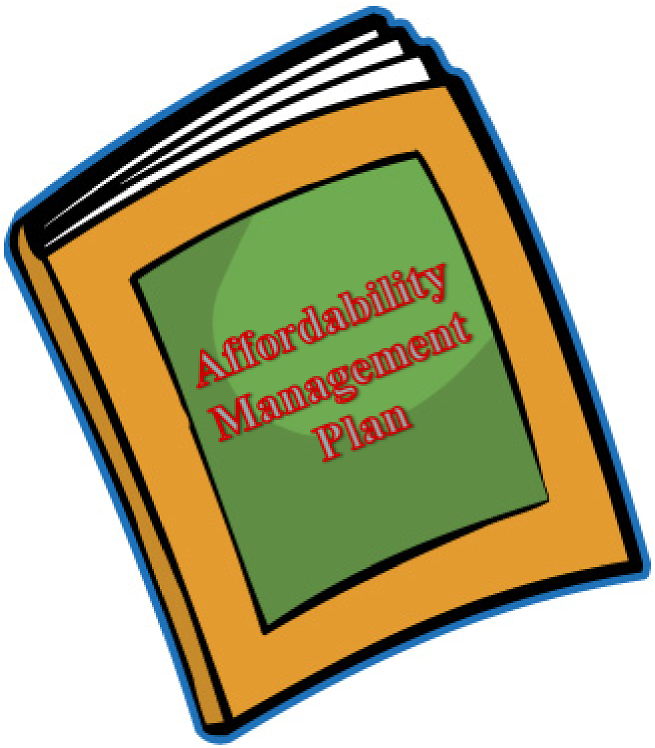
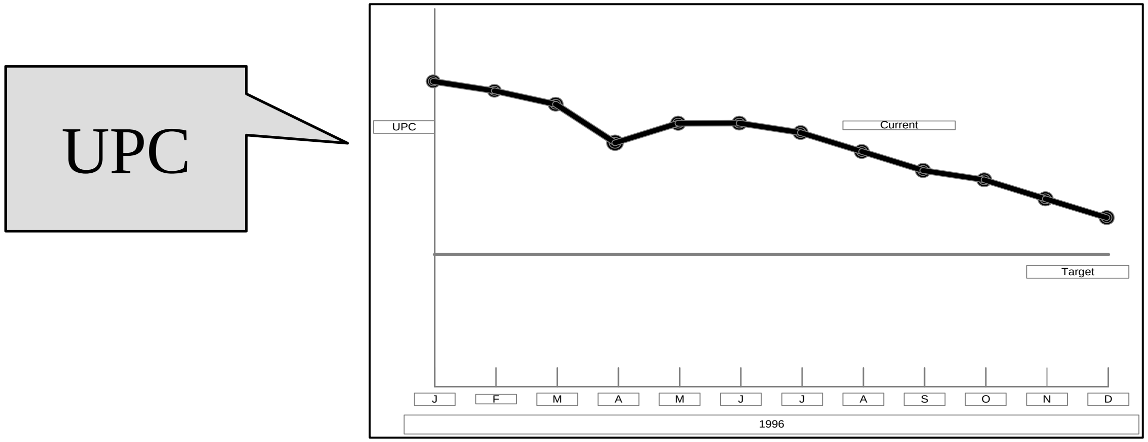


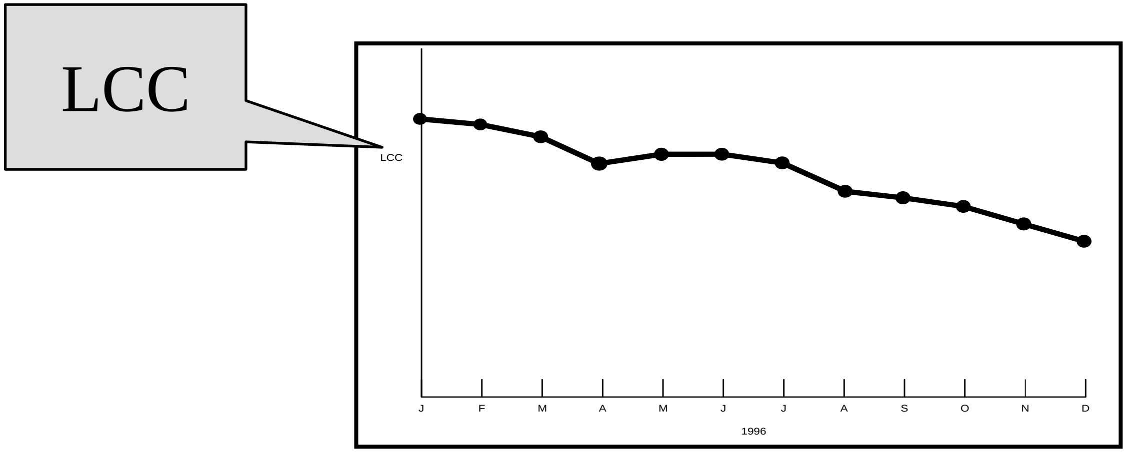
Army Program Example

- **CPIF contract with an Award Fee incentive - up to 8%.**
- **Identifying Efficiencies & Affordability Management is an area of emphasis in the award fee criteria.**
- **Unearned award fee rolled over to look-back period at end of contract to provide long-term incentive.**
- **Three cost goals:**
  - Minimize Life Cycle Costs
  - Achieve Unit Rollaway Cost Goal
  - Control O&S cost drivers

5 Create a Should Cost glide path and implement a continuous process that uses models to track results over time as CRIs are accomplished







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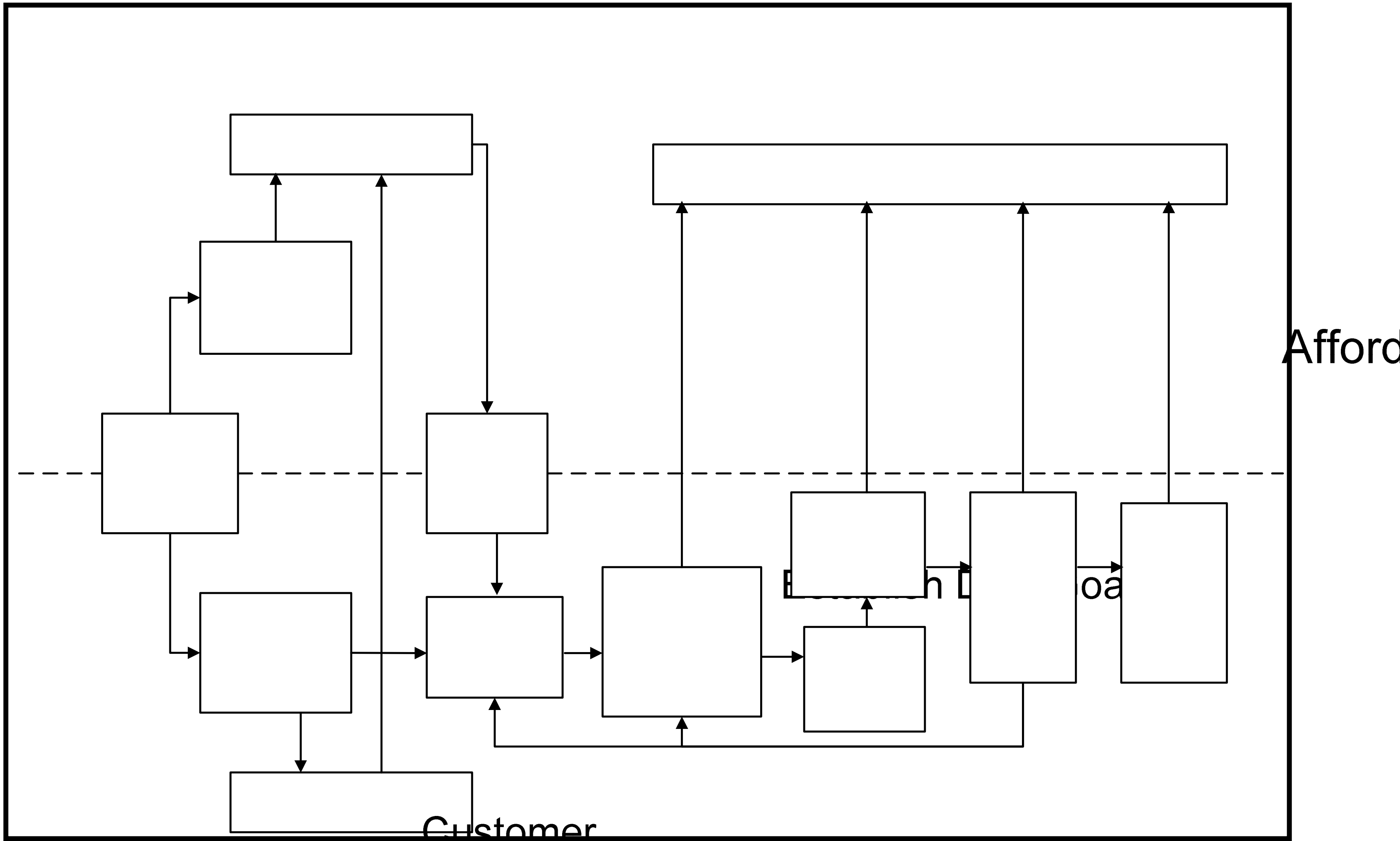

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Summary

- Program Managers and Suppliers are challenged to identify efficiencies and manage affordability using Will Cost and Should Cost analysis
- Agile parametric models are necessary to rapidly analyze data, determine Should Costs, and identify efficiencies that drive savings
- There are many examples of success and reusable artifacts from these successes
- Common among the successes are 5 proven steps to successfully target affordability and control cost growth through Should-Cost analysis

Q & A