Air Force Materiel Command

Cost Capability Policy Update DRAFT

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HQ AFMC/A5C
25 March 14

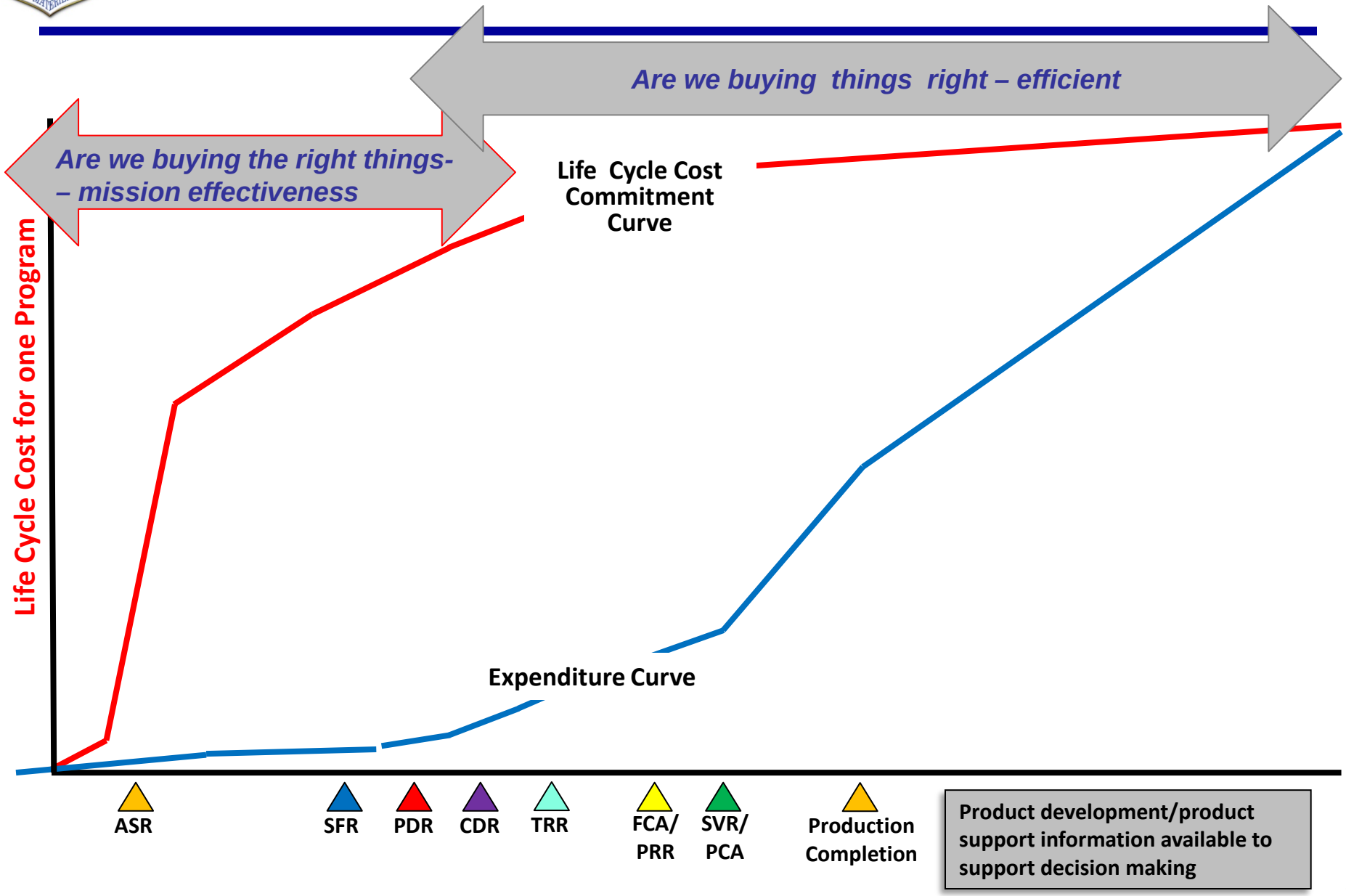
Purpose

- **Provide an overview of recent direction requiring *cost capability analysis* to be presented at:**
  - **All Air Force Requirements Oversight Councils (AFROCs)**
  - **Air Force Requirements Review Groups (AFRRGs)**
  - **Air Force Review Board (AFRBs)**
  - **Configuration Steering Boards (CSBs)**

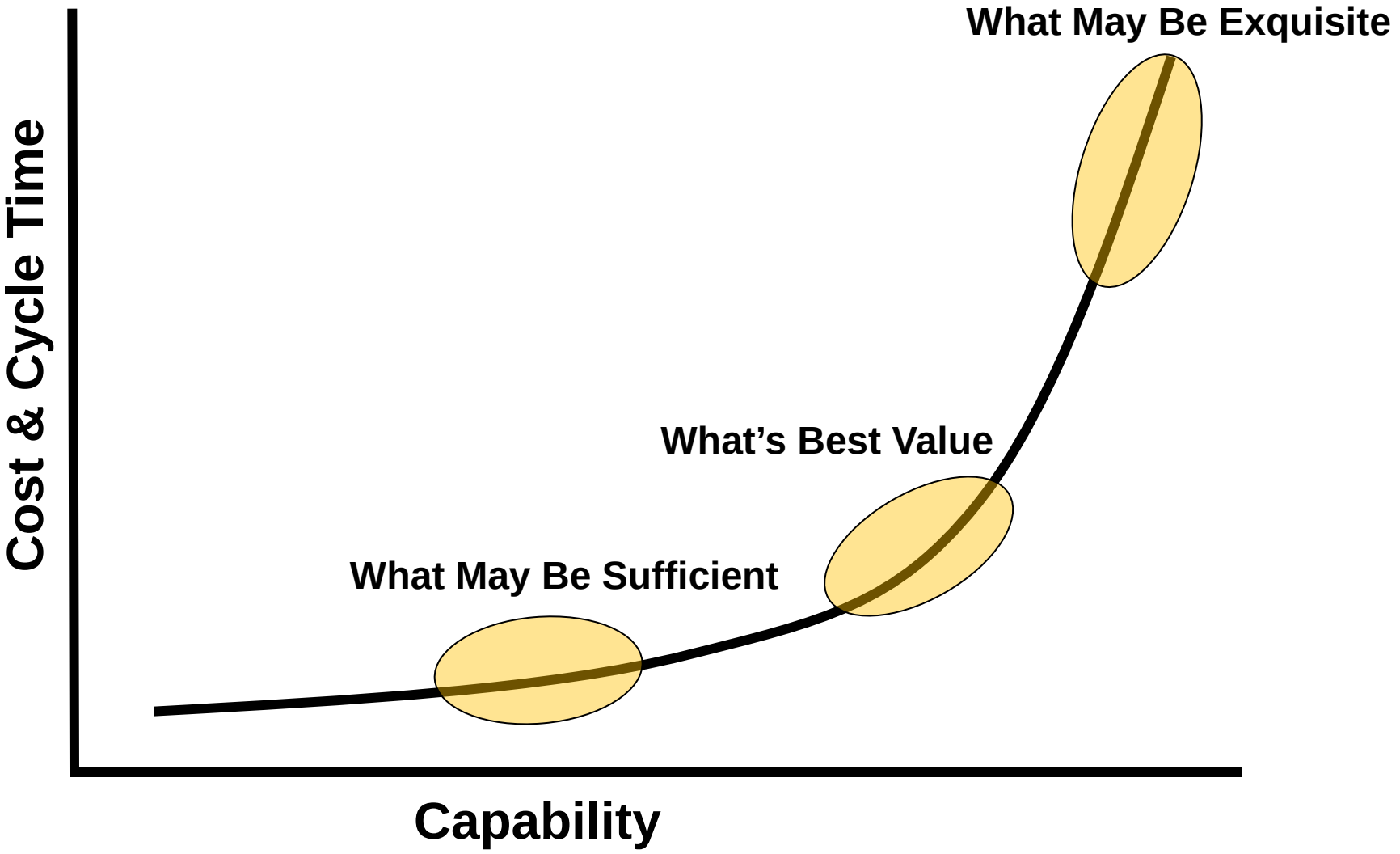
Overview

- Background / New Air Force Policy
- Cost Capability Analysis Defined
- Decision Framework
- “Pilot” Programs – What We are Learning
- Roles and Responsibilities
- Examples – How its Done
- What’s Coming
- Summary

Motivation – Inform Life Cycle Affordability



Cost Capability Analysis: The Concept



The analysis must be defensible, repeatable

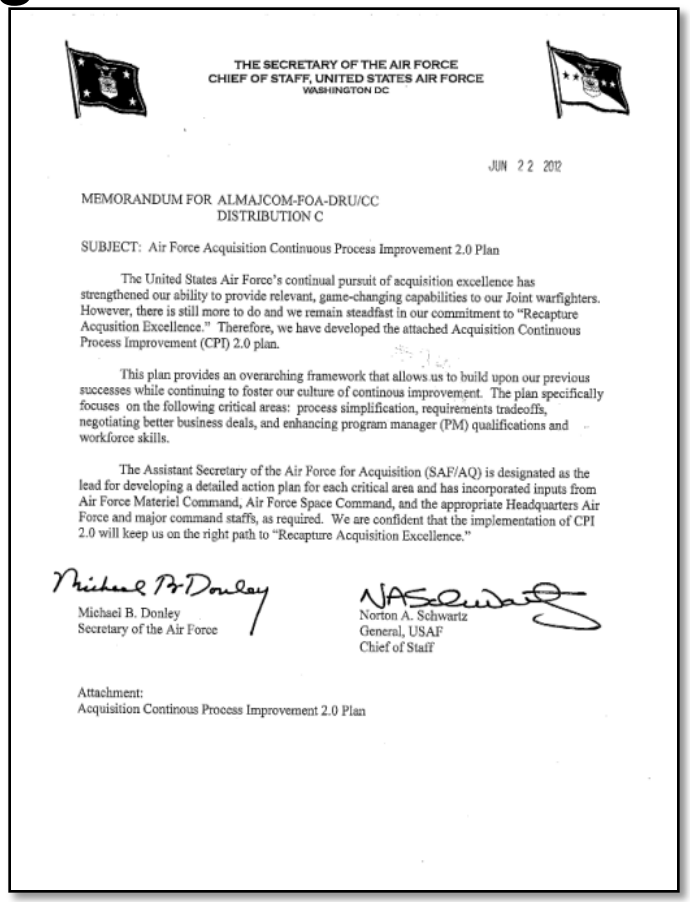
Background
Contractual Requirements Sufficiency

- **2011 CORONA Fall Tasker-9 directed AF/A3/5 and SAF/AQ to conduct Contractual Requirements Sufficiency**
  - **Problem: Too many programs are too costly resulting in either lower quantity fielded or terminating programs**
  - **Goal: Improve understanding of effects of requirements on cost and cycle time to inform affordability decisions**
  - **Solution: Determine explicit steps to vet affordability and cycle-time trades in requirements and acquisition processes**
- **Acquisition Continuous Process Improvement (CPI 2.0) identified seven root causes and solution to strengthen linkage between acquisition and requirements**

Number one root cause: "Decision makers are not demanding cost capability analysis to inform decisions in acquisition or requirement forums"

Background (cont)
CPI 2.0

- **22 Jun 12, CSAF and SECAF signed CPI 2.0 Plan**
  - ***Process Simplification:***
    Streamline acquisition oversight process
  - ***Requirements Sufficiency:***
    Affordability trades
  - ***Value Proposition:***
    Increasing business acumen
  - ***Workforce:***
    Optimize workforce throughout the Acquisition Enterprise



THE SECRETARY OF THE AIR FORCE
CHIEF OF STAFF, UNITED STATES AIR FORCE
WASHINGTON DC

JUN 22 2012

MEMORANDUM FOR ALMAJCOM-FOA-DRU/CC
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SUBJECT: Air Force Acquisition Continuous Process Improvement 2.0 Plan

The United States Air Force's continual pursuit of acquisition excellence has strengthened our ability to provide relevant, game-changing capabilities to our Joint warfighters. However, there is still more to do and we remain steadfast in our commitment to "Recapture Acquisition Excellence." Therefore, we have developed the attached Acquisition Continuous Process Improvement (CPI) 2.0 plan.

This plan provides an overarching framework that allows us to build upon our previous successes while continuing to foster our culture of continous improvement. The plan specifically focuses on the following critical areas: process simplification, requirements tradeoffs, negotiating better business deals, and enhancing program manager (PM) qualifications and workforce skills.

The Assistant Secretary of the Air Force for Acquisition (SAF/AQ) is designated as the lead for developing a detailed action plan for each critical area and has incorporated inputs from Air Force Materiel Command, Air Force Space Command, and the appropriate Headquarters Air Force and major command staffs, as required. We are confident that the implementation of CPI 2.0 will keep us on the right path to "Recapture Acquisition Excellence."

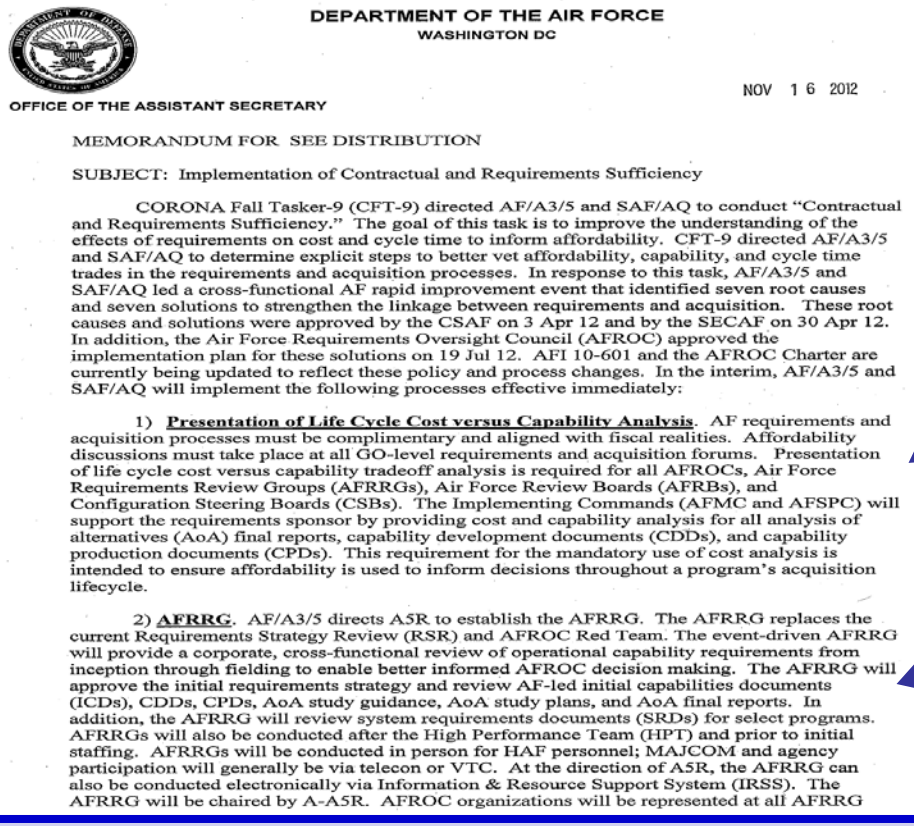
Michael B. Donley
Secretary of the Air Force

Norton A. Schwartz
General, USAF
Chief of Staff

Attachment:
Acquisition Continous Process Improvement 2.0 Plan

Mandates cost/schedule capability/design trade-off curves throughout the lifecycle!

Background
Contractual Requirements Sufficiency Memo



DEPARTMENT OF THE AIR FORCE
WASHINGTON DC

OFFICE OF THE ASSISTANT SECRETARY

NOV 16 2012

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Implementation of Contractual and Requirements Sufficiency

CORONA Fall Tasker-9 (CFT-9) directed AF/A3/5 and SAF/AQ to conduct "Contractual and Requirements Sufficiency." The goal of this task is to improve the understanding of the effects of requirements on cost and cycle time to inform affordability. CFT-9 directed AF/A3/5 and SAF/AQ to determine explicit steps to better vet affordability, capability, and cycle time trades in the requirements and acquisition processes. In response to this task, AF/A3/5 and SAF/AQ led a cross-functional AF rapid improvement event that identified seven root causes and seven solutions to strengthen the linkage between requirements and acquisition. These root causes and solutions were approved by the CSAF on 3 Apr 12 and by the SECAF on 30 Apr 12. In addition, the Air Force Requirements Oversight Council (AFROC) approved the implementation plan for these solutions on 19 Jul 12. AFI 10-601 and the AFROC Charter are currently being updated to reflect these policy and process changes. In the interim, AF/A3/5 and SAF/AQ will implement the following processes effective immediately:

1) **Presentation of Life Cycle Cost versus Capability Analysis**. AF requirements and acquisition processes must be complimentary and aligned with fiscal realities. Affordability discussions must take place at all GO-level requirements and acquisition forums. Presentation of life cycle cost versus capability tradeoff analysis is required for all AFROCs, Air Force Requirements Review Groups (AFRRGs), Air Force Review Boards (AFRBs), and Configuration Steering Boards (CSBs). The Implementing Commands (AFMC and AFSPC) will support the requirements sponsor by providing cost and capability analysis for all analysis of alternatives (AoA) final reports, capability development documents (CDDs), and capability production documents (CPDs). This requirement for the mandatory use of cost analysis is intended to ensure affordability is used to inform decisions throughout a program's acquisition lifecycle.

2) **AFRRG**. AF/A3/5 directs A5R to establish the AFRRG. The AFRRG replaces the current Requirements Strategy Review (RSR) and AFROC Red Team. The event-driven AFRRG will provide a corporate, cross-functional review of operational capability requirements from inception through fielding to enable better informed AFROC decision making. The AFRRG will approve the initial requirements strategy and review AF-led initial capabilities documents (ICDs), CDDs, CPDs, AoA study guidance, AoA study plans, and AoA final reports. In addition, the AFRRG will review system requirements documents (SRDs) for select programs. AFRRGs will also be conducted after the High Performance Team (HPT) and prior to initial staffing. AFRRGs will be conducted in person for HAF personnel; MAJCOM and agency participation will generally be via telecon or VTC. At the direction of A5R, the AFRRG can also be conducted electronically via Information & Resource Support System (IRSS). The AFRRG will be chaired by A-A5R. AFROC organizations will be represented at all AFRRG

Issued by SAF/AQ & AF/A3/5:

The goal is to improve the understanding of effects of requirements on cost and cycle time to inform affordability

Presentation of cost capability tradeoff analysis is required for all AFROCs, AFRRG, AFRB and CSBs.

Codified in AFI 10-601: " Lead Command/CFLI in conjunction with the Implementing Command, produces and presents cost capability analysis, provides results at all requirements and acquisition forums, and includes in Analysis of Alternative (AoA) Final Reports, Capability Development Document (CDD), and Capability Production Document (CPD)"

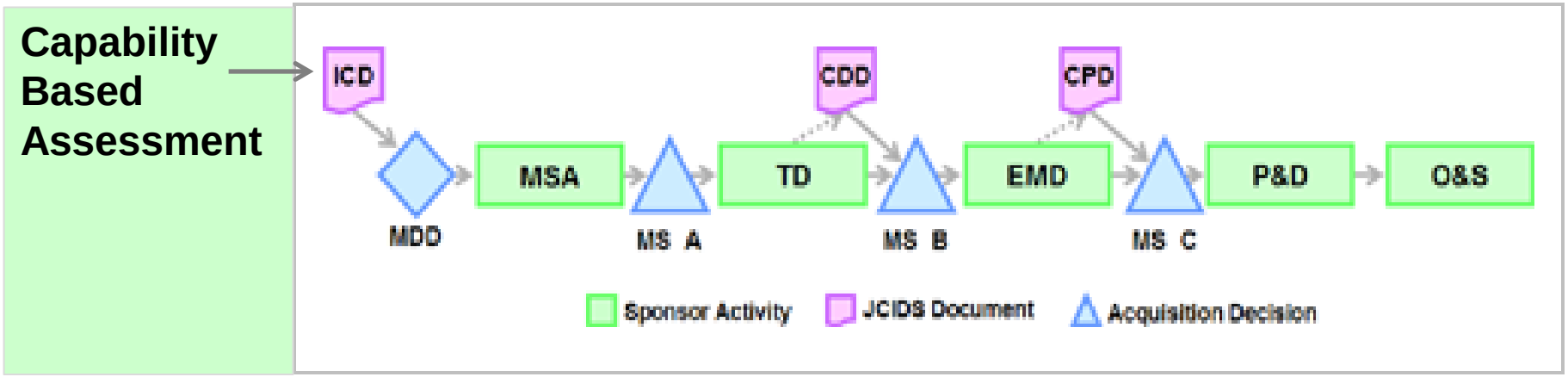
The AF Must Do Cost Capability Analysis

What is Cost Capability Analysis?

- **Multi-objective decision analysis (MODA) using cost and military utility for a representative broad range of alternatives that results in a trade space between cost and warfighting capabilities**
  - **Identifies cost and operational effectiveness drivers**
  - **Identifies relative value in terms of warfighting capability (i.e. mission tasks, measure of effectiveness)**
  - **Integrates cost and military utility to illuminate the trade space**
  - **Yields information to compare many options cost and capability**
  - **Reduces potential sources of bias for development of candidate solutions**
  - **Intended to inform affordability decisions throughout the program's life cycle**

When to Perform It?

- **Start early!**
  - **Works best when used at the earliest point before the ICD is developed to understand what the realm of the possible is; then throughout Life Cycle**



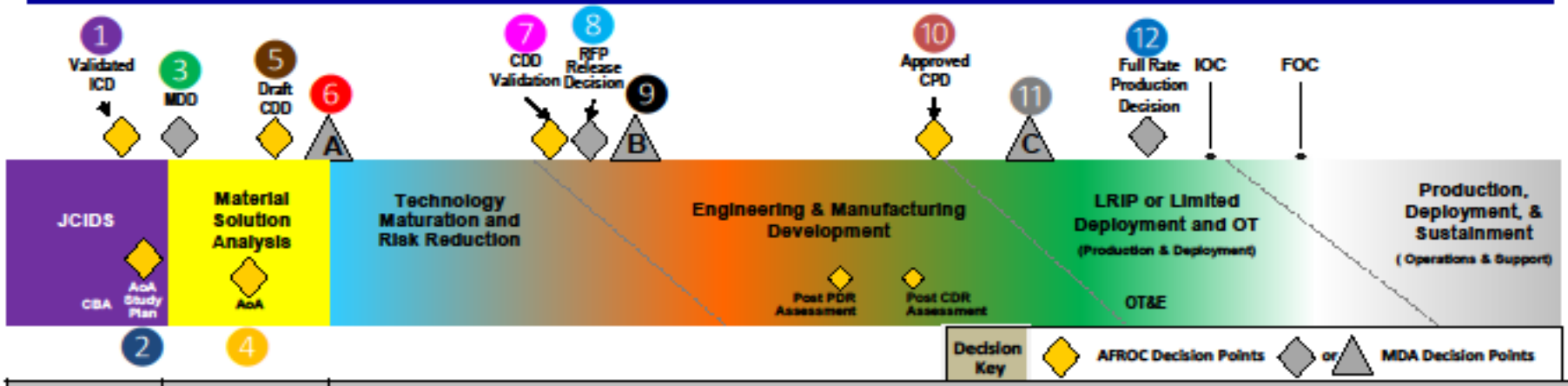
- **Reported at AFROC for AoA final report, Capability Development Document (CDD) and Capability Production Document (CPD)**

Benefits of the Analysis

- **Facilitates Communication**
  - **Provides a way to depict and show what capability is lost or gained from one alternative to another and at what cost**
- **Aids Decision Making**
  - **Helps to clarify pros and cons for alternatives**
  - **Provides a way to down-select alternatives based on affordability and minimum acceptable capability**
  - **Focuses on military outcome (operational capability)**
- **Documents Decisions**
  - **Record of logic and analysis considered by decision makers**
  - **Provide basis for requirements trade-offs**
  - **Provides analytical pedigree and verifies application of systems engineering principles**

Not just checking a box. Cost capability analysis is part of the decision making process!

Cost Capability Analysis Decision Framework



Decision Points	AF Decision Maker*	Key Question
1 ◆	AFROC	What are the affordable and viable military concepts to mitigating the identified capability gap? Does the AoA Study Plan adequately describe the methodology for estimating the life cycle costs and operational effectiveness of the potential concepts identified in the study guidance to close the gap identified in the ICD?
2 ◆	AFROC	
3 ◆	MDA	
4 ◆	AFROC	Does the preferred solution provide the maximum military utility for cost within affordability constraints. Do the KPPs and KSAs reflect life-cycle trades between cost, schedule and performance resulting in the maximized military utility within the affordability constraints? For each KPP and KSA, what are the cost and operational impacts and resulting military utility to accepting a lower threshold value? Does the acquisition strategy reflect maximizing military utility?
5 ◆	AFROC	
6 ▲	MDA	
7 ◆	AFROC	Can you validate the preferred solution provides the maximum military utility for cost within affordability constraints. Do the KPPs and KSAs reflect life-cycle trades between cost, schedule and performance resulting in the maximized military utility within the affordability constraints? For each KPP and KSA, what are the cost and operational impacts and resulting military utility to accepting a lower threshold value? Does the acquisition strategy reflect maximizing military utility?
8 ◆	MDA	
9 ▲	MDA	
10 ◆	AFROC	Have changes to the program baseline been assessed to ensure the maximum military utility for cost within affordability constraints? If so, what trades were made to arrive at those values and what are the cost, schedule, technical, and operational implications?
11 ▲	MDA	
12 ◆	MDA	

* Final decision maker, other reviews may occur prior to final decision, i.e. AFRRG RSR for AF)

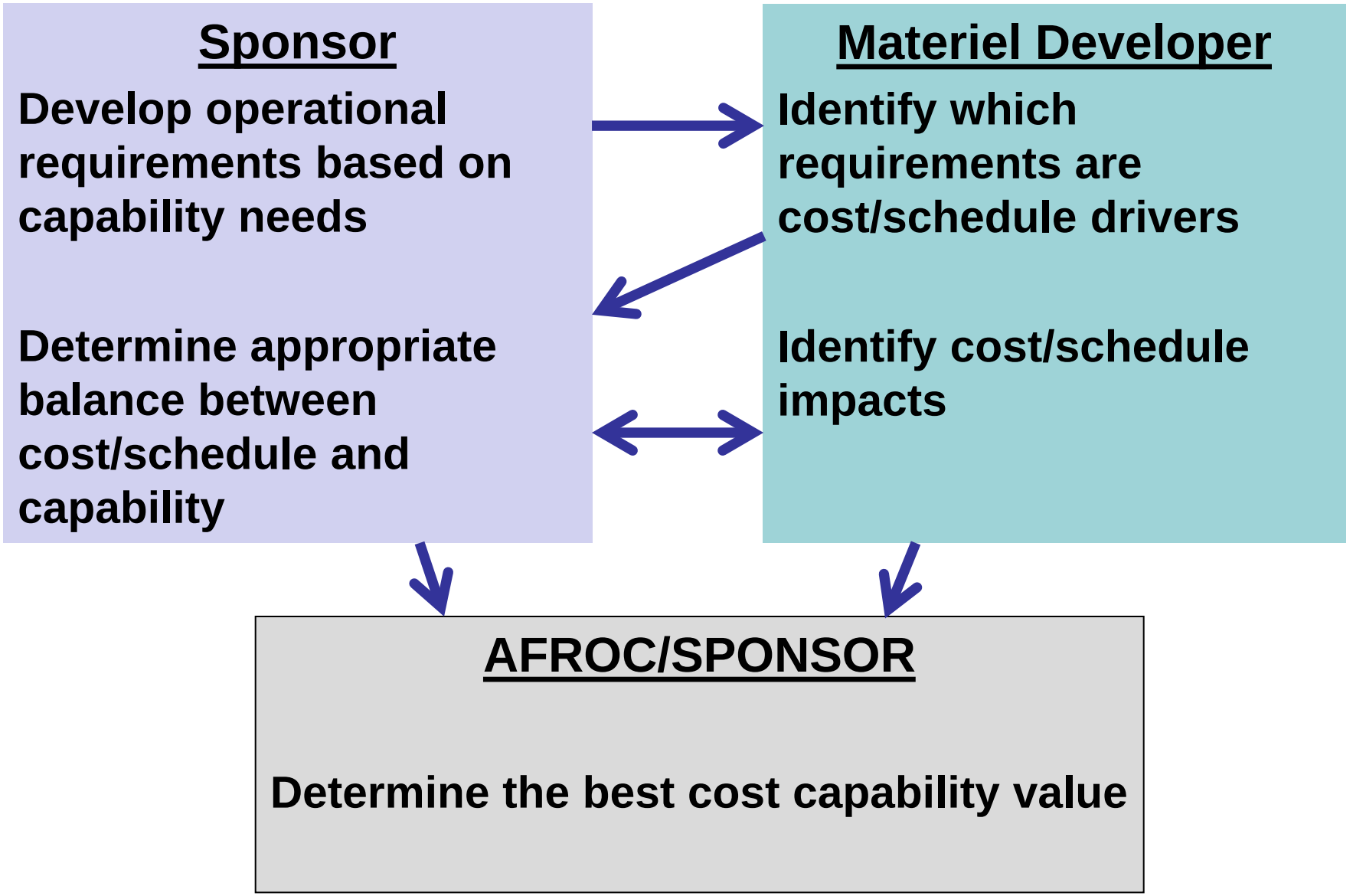
Cost/Capability Pilot Programs - What We're Learning

- **Trial programs for developing the analysis and capturing lessons learned:**

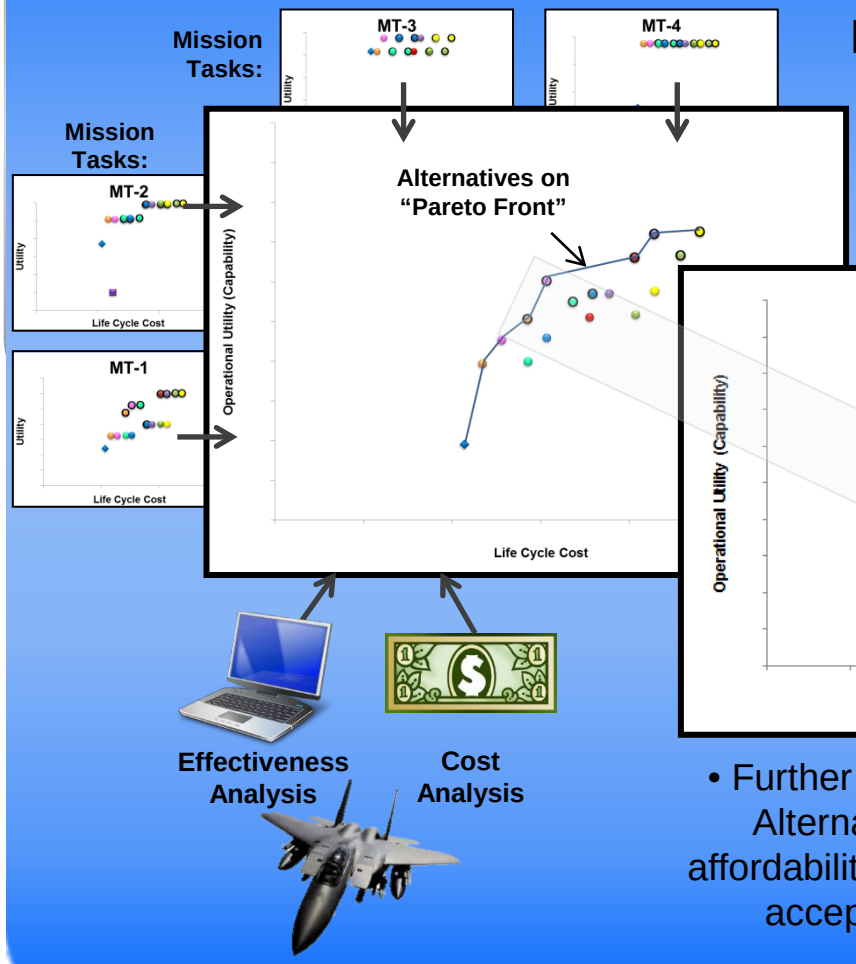
  Advanced Pilot Training (T-X)
  Presidential Aircraft Recapitalization (PAR)
  Ground-Based Strategic Deterrence (GBSD)
  Global Aircrew Strategic Network Terminal (Global ASNT)
  Three-Dimensional Expeditionary Long Range Radar (3DELRR)
  F-15 Eagle Passive/Active Warning and Survivability System (EPAWSS)

  - **No formal cost/capability process existed**
  - **Difficult to define military value/worth of a proposed capability**
    - **Must define military value before trades can be evaluated**
  - **Multi-disciplined team approach needed**
    - **Requirement owner/warfighter, PM, EN, cost analyst, ops research**
    - **Requires tight coupling of engineering and cost functions within the program office**
  - **Depicting results of analysis more difficult than expected**
  - **Industry analysis provided valuable insights to decisions**
  - **Cost capability methodology should be started in Development Planning (DP) and Analysis of Alternatives (AoA) timeframe and used throughout lifecycle**

Roles and Responsibilities of the Stakeholders

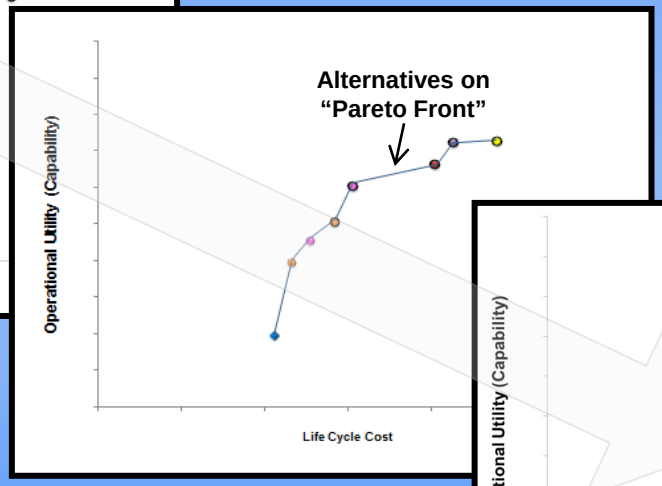


F-15 EPAWSS AoA Pilot Program



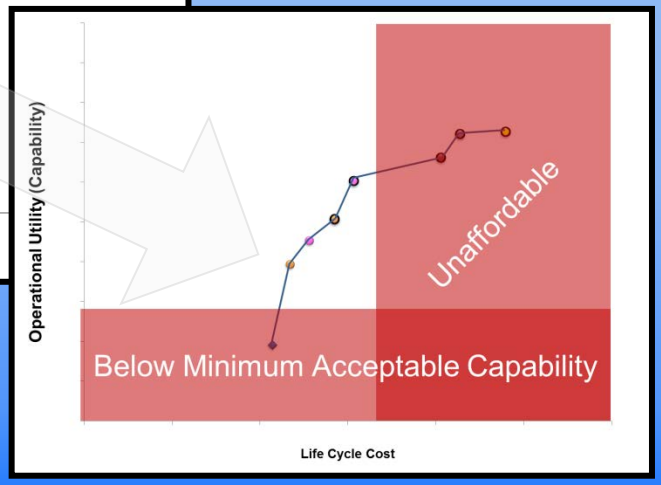
F-15 EPAWSS (AFMC Pilot Program)

- ACC defined the priority—or operational value—derived from each measure under four AoA Mission Tasks
- Performing cost & effectiveness analysis at detail level
- Aggregating normalized results to compare Alternatives



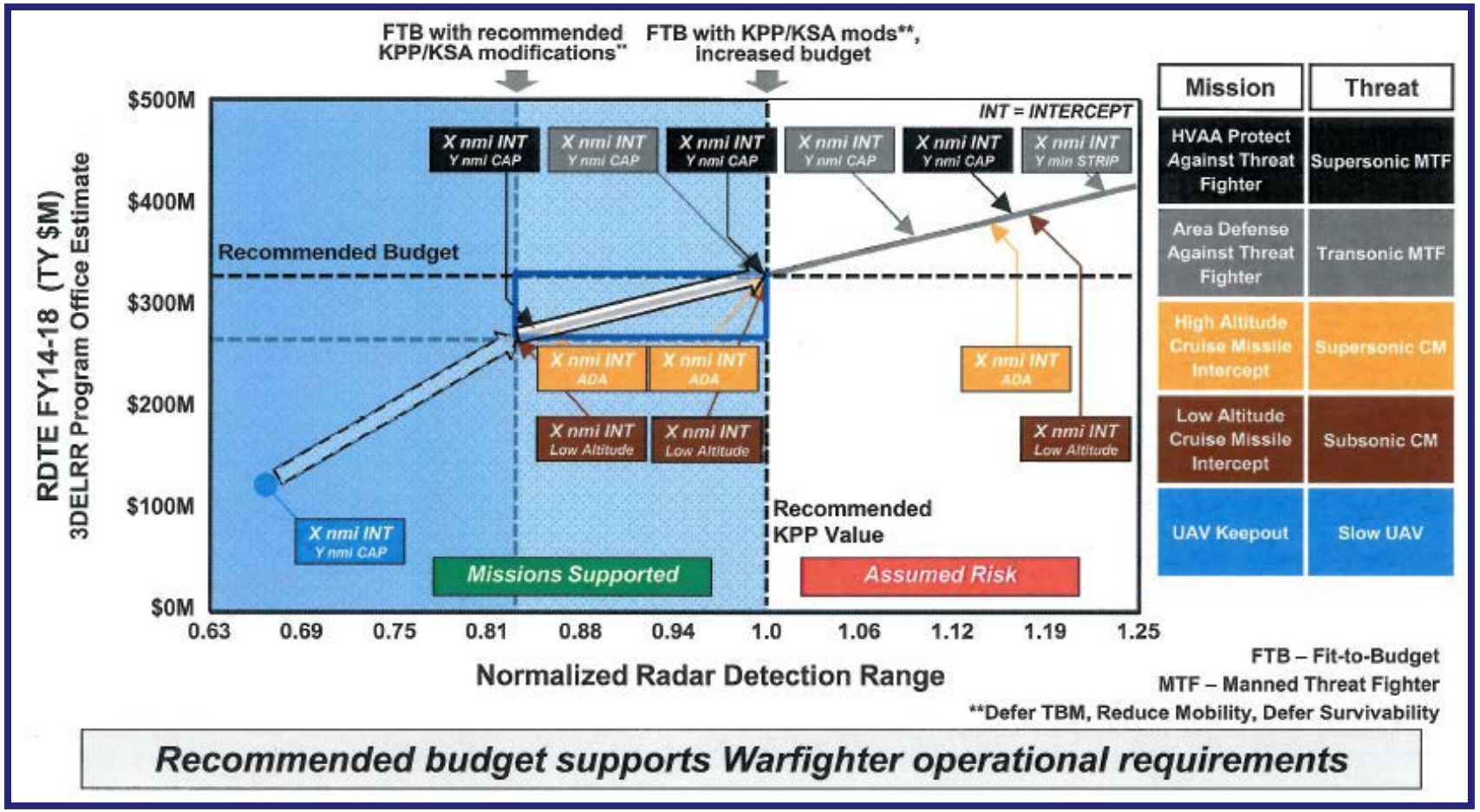
- First down-selecting Alternatives that are on the "Pareto Front"

- Further down-selecting Alternatives based on affordability and minimum acceptable capability



EPAWSS = Eagle Passive/Active Warning Survivability System

3DELRR Pilot Program Cost Capability Analysis



"Didn't truly understand what we could live with and without until cost is a variable in the trade space discussions"

What's Coming

- **Respond to SECAF question on what resources it will take to do cost capability analysis**
  - **Develop recommendations for implementation**
    - **Standardized methodologies**
    - **Standardized tools and data**
    - **Skill sets and expertise**
    - **Policy and procedures**
    - **Training**
    - **Organizational construct**
  - **Recommendations will be linked to Air Force affordability/trade decisions (Decision Framework)**
  - **Guidebook**
    - **To assist requirement sponsors, program offices, decision making bodies throughout the Air Force in conducting the analysis**

Summary

- **Cost capability policy is now in effect**
  - **Required to be presented at the AFROC, AFRRG, AFRB and CSB**
- **Captured lessons from AF “Pilot” programs**
- **Guidebook is being written**

Supports AF and DoD Decisions

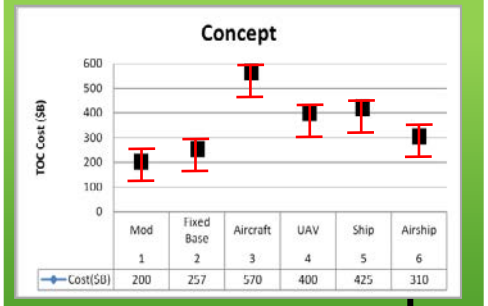

LEADING EDGE TECHNOLOGY
WORLD CLASS SUSTAINMENT
WAR-WINNING SYSTEMS

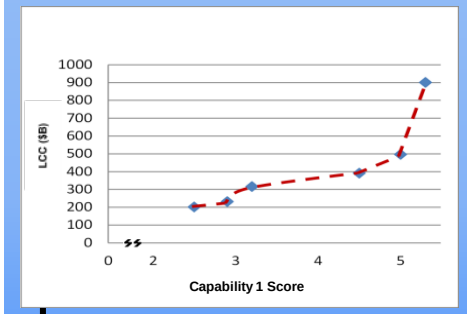
Understanding the Trade Space

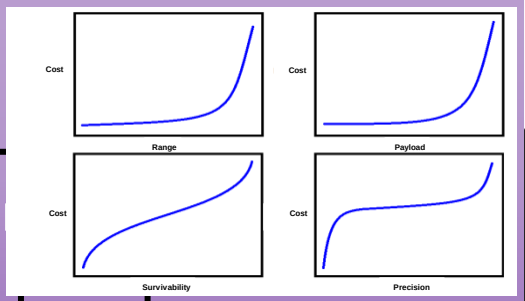
U.S. AIR FORCE

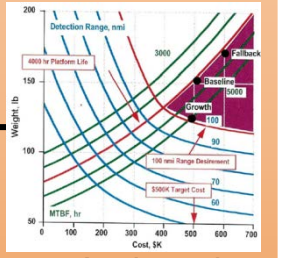
AIR FORCE LCMC

	Concept Development	MDD	Materiel Solution Analysis	A	Technology Development	B	Engineering & Manufacturing Development	C
Phase								
Decision	Can we afford to fill a capability gap?		What alternatives exist to fill a capability gap?		Are there cost / schedule / requirements trades to meet affordability goals?			
Design Baseline	Materiel Approach Concept(s)		Concept Definition (CCTD – Concept Characterization and Technical Description)	Preferred Alternative	Prototype and System Spec (Detailed Engineering Design)		Initial Product Baseline	
Measure-ments	• Capability Attributes		• System Attributes • AoA Measures of Effectiveness • Initial KPP values		• Prototypes inform design & requirements • Final KPP values in CDD • System Requirements Document finalized		DT&E Technical Performance Measures results included in CPD	
Curves	Life Cycle Cost vs. Concept		LCC vs. Alternatives		LCC vs. KPPs / KSAs and Cost Drivers		LCC vs O&S Strategy	
Documents & Reviews	Initial Capabilities Document (ICD) → AFROC → AFRB		AoA Results with Rqmts Correlation Table (RCT) → AFROC → AFRB		Capability Development Document (CDD) → AFROC → CSB System/Technical Rqmts Document (SRD/TRD) → AFRB → CSB		Design / Cost / Capability Capability Production Document (CPD) → AFROC → AFRB → CSB	









AFMC pilot programs are implementing cost-capability process tailored to each program's phase and specific needs

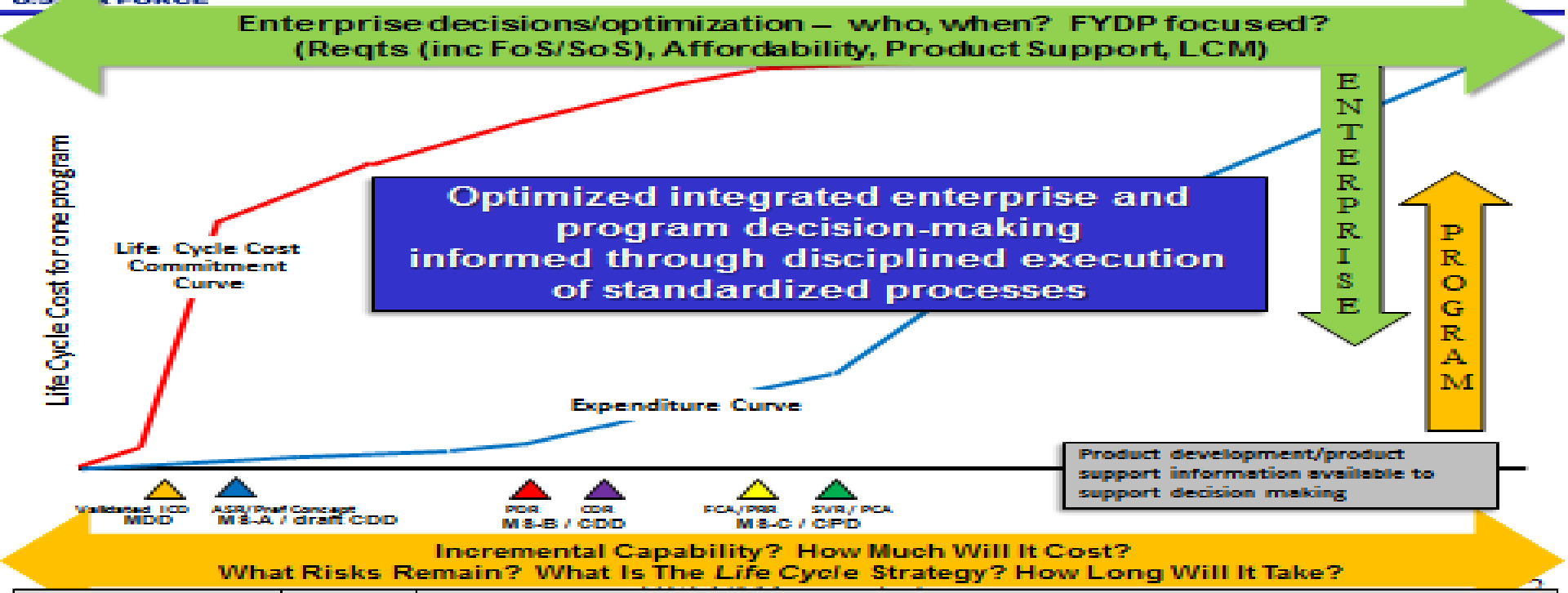
Key Questions to be Answered

- **What are the operational requirements/conditions that are the primary drivers for cost/schedule/risk?**
- **What is the impact upon operational effectiveness, cost and schedule if these drivers are adjusted?**
- **What are the best value option that provides acceptable capability to the warfighter?**

Spending a large % of a program's budget to get the last few % of KPP/KSA performance is not always the "Best Value"

AF Decision Framework

(Time horizon updated to Reqts/MS Reviews to aid discussion – subj to change based on 5000.01)



Decision	AF Decision Maker	Unique Cost Capability Questions
Validate ICD	AFROC	What are the affordable and viable military concepts to mitigating the identified capability gap? Does the AoA Study Plan adequately describe the methodology for estimating the life cycle costs and operational effectiveness of the potential concepts ID'd in the study guidance to close the gap ID'd in the ICD?
Approve AoA Study Plan	AFROC	
MDD	MDA	
Approve AoA Results	AFROC	Does the preferred solution provide the maximum military utility for cost within Affordabiltiy constraints. Do the KPPs and KSAs reflect life-cycle trades between cost, schedule and performance resulting in the maximized military utility withing the affordabiltiy constraints? For each KPP and KSA, what are the cost and operational impacts and resulting military utility to accepting a lower threshold value? Does the Acquisition Strategy refelect maximizing military utility.
Approve Draft CDD	AFROC	
Approve Milestone A	MDA	
Approve CDD	AFROC	Can you validate the preferred solution provides the maximum military utility for cost within Affordabiltiy constraints. Do the KPPs and KSAs reflect life-cycle trades between cost, schedule and performance resulting in the maximized military utility withing the affordabiltiy constraints? For each KPP and KSA, what are the cost and operational impacts and resulting military utility to accepting a lower threshold value? Does the Acquisition Strategy refelect maximizing military utility.
Approve Release of RFP	MDA	
Approve Milestone B	MDA	
Approve CPD	AFROC	Have changes to the program baseline been assessed to ensure the maximum military utility for cost within Affordability constraints? If so, what trades were made to arrive at those values and what are the cost, schedule, technical, and operational implications?
Approve Milestone C	MDA	
Approve FRP	MDA	