



# **Analysis of Alternatives (AoAs) from a Cost Estimating Perspective**

**Office of the Deputy Assistant Secretary of the Army  
for Cost and Economics (DASA-CE)**

*09 June 2015*

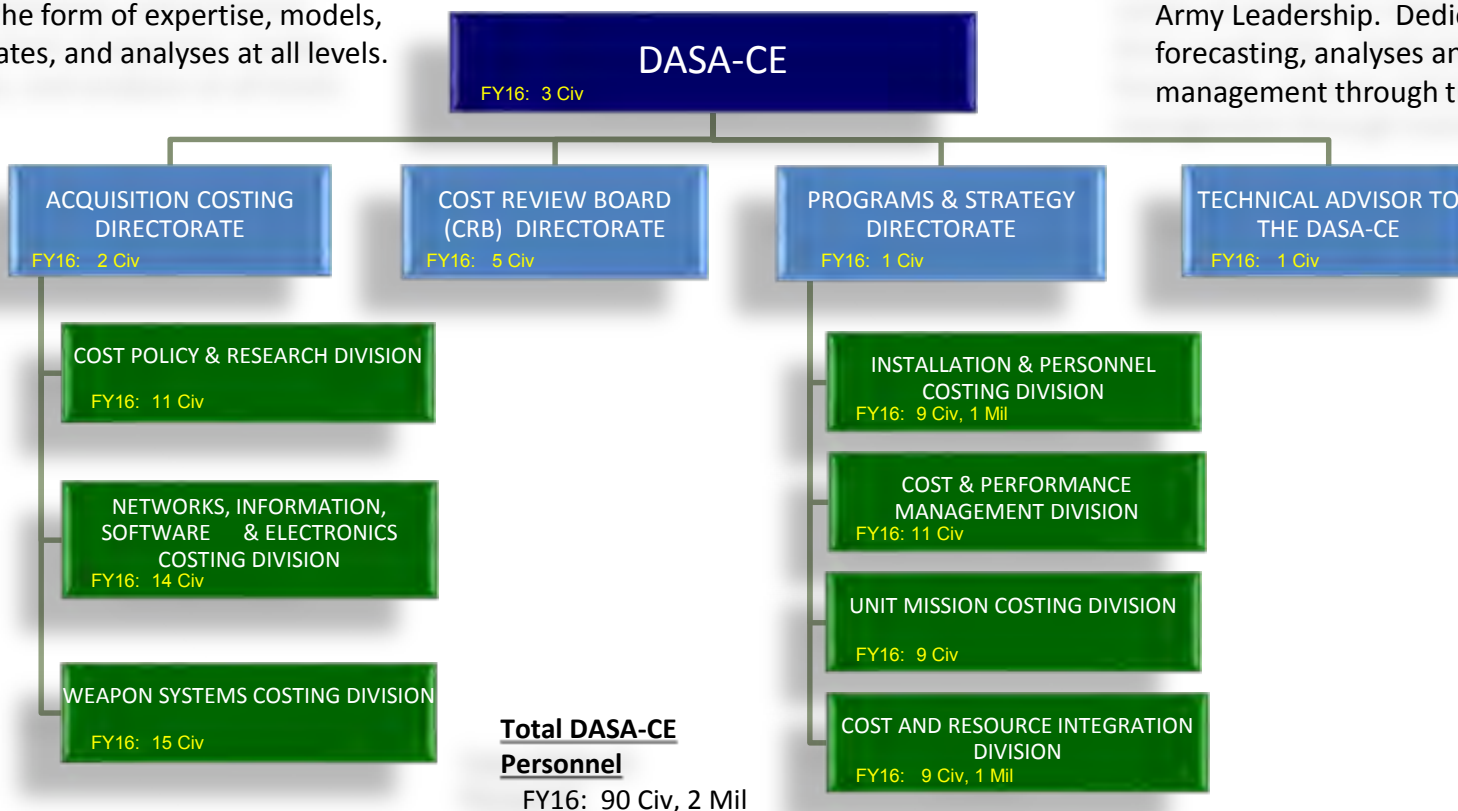


# Who We Are at ASA(FM&C) DASA-CE

**DASA**  
**Cost &**  
**Economics**

**Mission:** Provide Army decision-makers with cost, performance, and economic analysis in the form of expertise, models, data, estimates, and analyses at all levels.

**Vision:** Innovative and impartial center of excellence relied upon by Army Leadership. Dedicated to cost forecasting, analyses and performance management through trained people.



**Function of Early Cost Team:** Provide cost input, develop, and/or validate the cost methodologies for Analysis of Alternatives (AoAs) and Cost-Benefit Analysis (C-BA), 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) and Defense Business System (DBS) acquisition processes.



# The Art of Early Costing





# Early Cost Estimating – Why Is It Important?

Pre-Milestone A typically takes more creativity to develop reasonable, more detailed estimates as we are not able to follow prescribed costing methods for MS-B & MS-C

## ❖ GAO statements in 2009 (Pre-WSARA) regarding cost growth:

- programs start with poor foundations and inadequate knowledge for developing realistic cost estimates;
- programs move forward with artificially low cost estimates, optimistic schedules and assumptions, immature technologies and designs, and fluid requirements;
- changing or excessive requirements cause cost growth; and
- an imbalance between wants and needs contributes to budget and program instability

## ❖ DoDI 5000.02 requires cost estimates for AoAs and Milestone A decisions

- In the past, most Army programs first surfaced for a decision at Milestone B
- DoD leadership now making decisions on acquisition programs much earlier in system lifecycle
- In the **ABSENCE** of a Cost Analysis Requirement Description (CARD)
  - Reliant on capabilities of analogous systems for linking factors to cost elements
  - Requires more research to build source documentation leading to eventual system book

## ❖ Better Buying Power (BBP) Initiative (v3.0)

- LCCE informs affordability goal contained in MS-A Acquisition Decision Memorandum (ADM)



# Better Buying Power 3.0

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## Achieve Affordable Programs

- Continue to set and enforce affordability caps

## Achieve Dominant Capabilities While Controlling Lifecycle Costs

- Strengthen and expand “should cost” based cost management
- Build stronger partnerships between the acquisition, requirements, and intelligence communities
- Anticipate and plan for responsive and emerging threats
- Institutionalize stronger DoD level long-range R&D planning

## Improve the Professionalism of the Total Acquisition Workforce

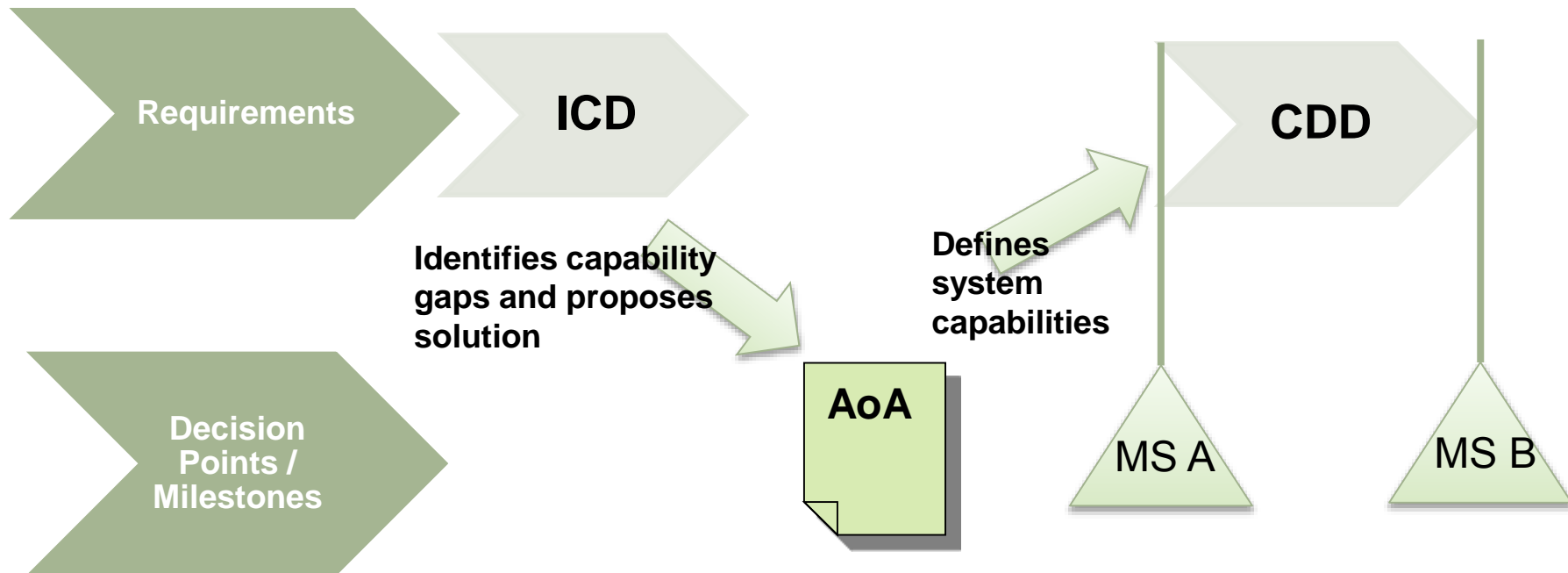
- Establish higher standards for key leadership positions
- Establish stronger professional qualification requirements for all acquisition specialties
- Strengthen organic engineering capabilities
- Ensure the DOD leadership for development programs is technically qualified to manage R&D activities
- Improve our leaders’ ability to understand and mitigate technical risk
- Increase DoD support for Science, Technology, Engineering, and Mathematics (STEM) education

***Continue Strengthening Our Culture of:  
Cost Consciousness, Professionalism, and Technical Excellence  
-- Honorable Frank Kendall***



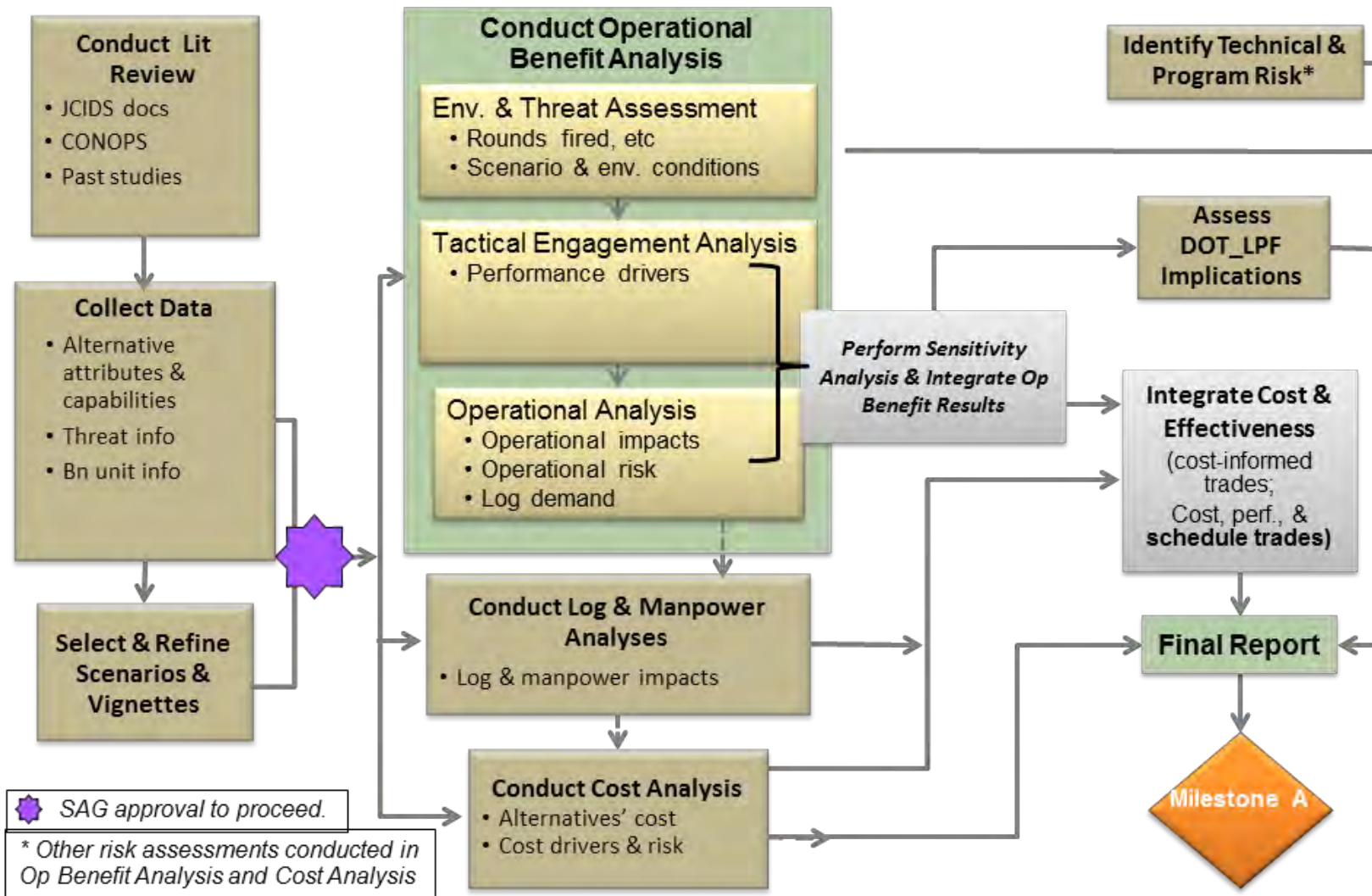
# *AoAs within the Joint Capabilities Integration & Development System (JCIDS)*

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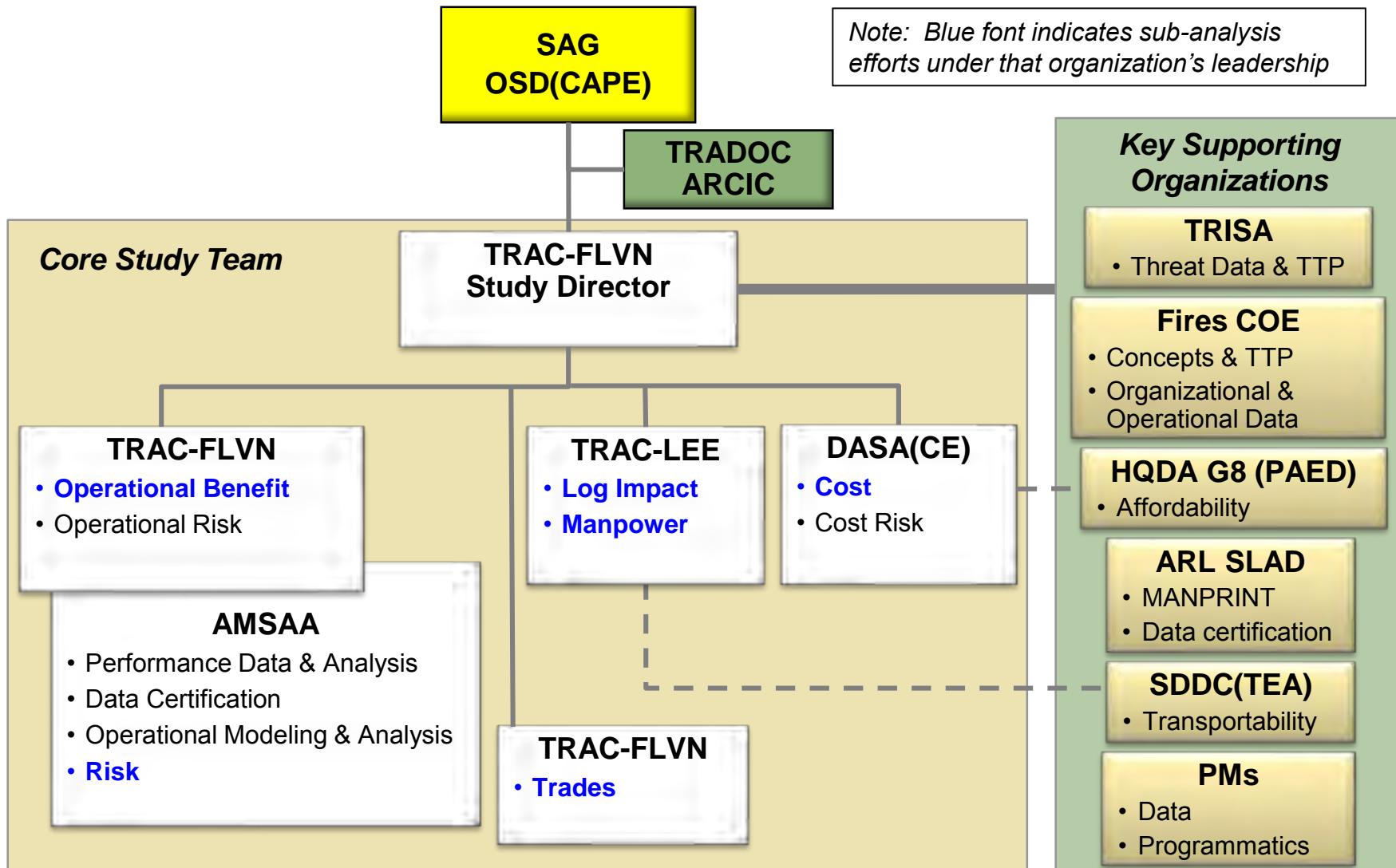
# AoA Study Approach





# Study Team Organization

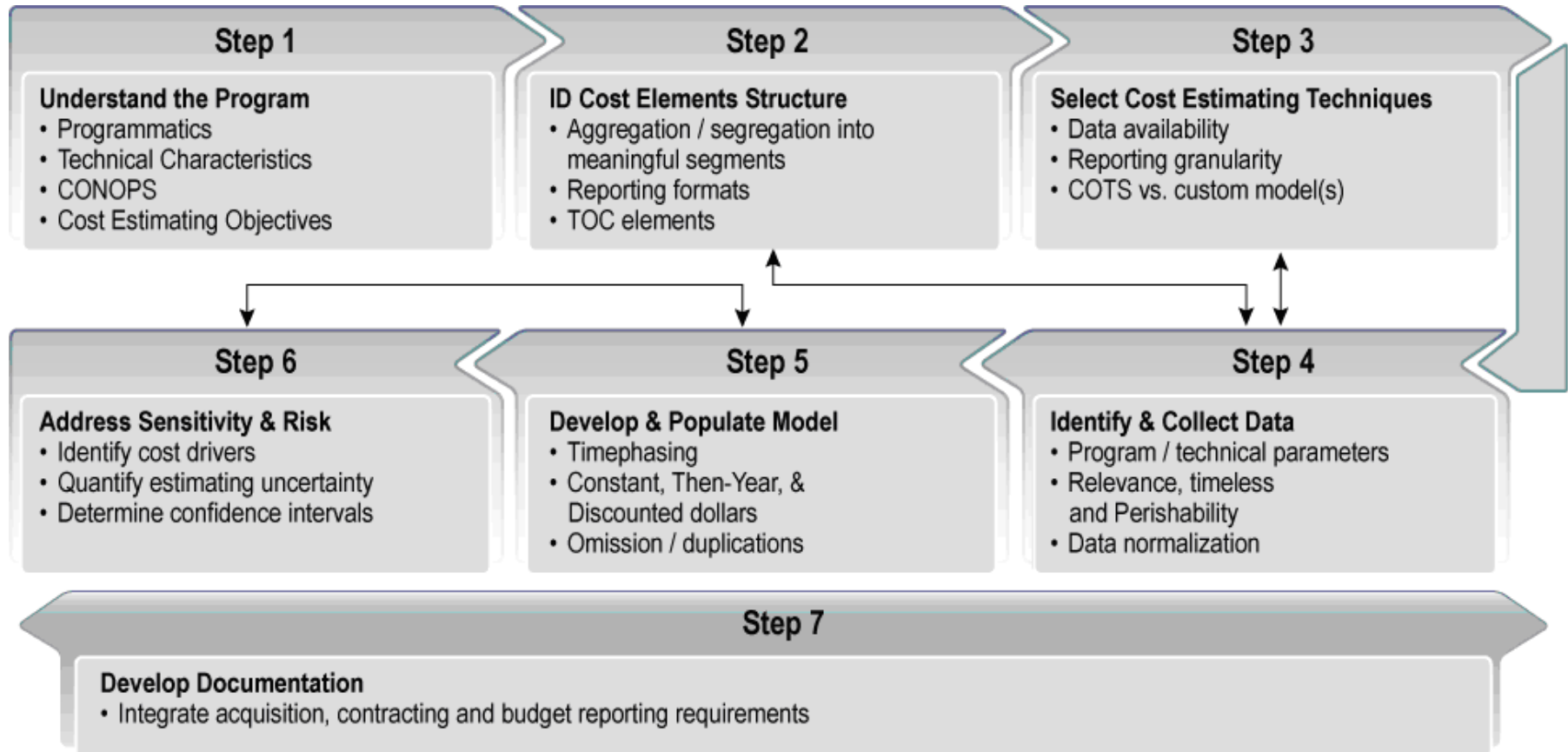
Note: Blue font indicates sub-analysis efforts under that organization's leadership







# Cost Analysis Approach





# More Important Cost Elements

Development  
Engineering



Prototype  
Manufacturing

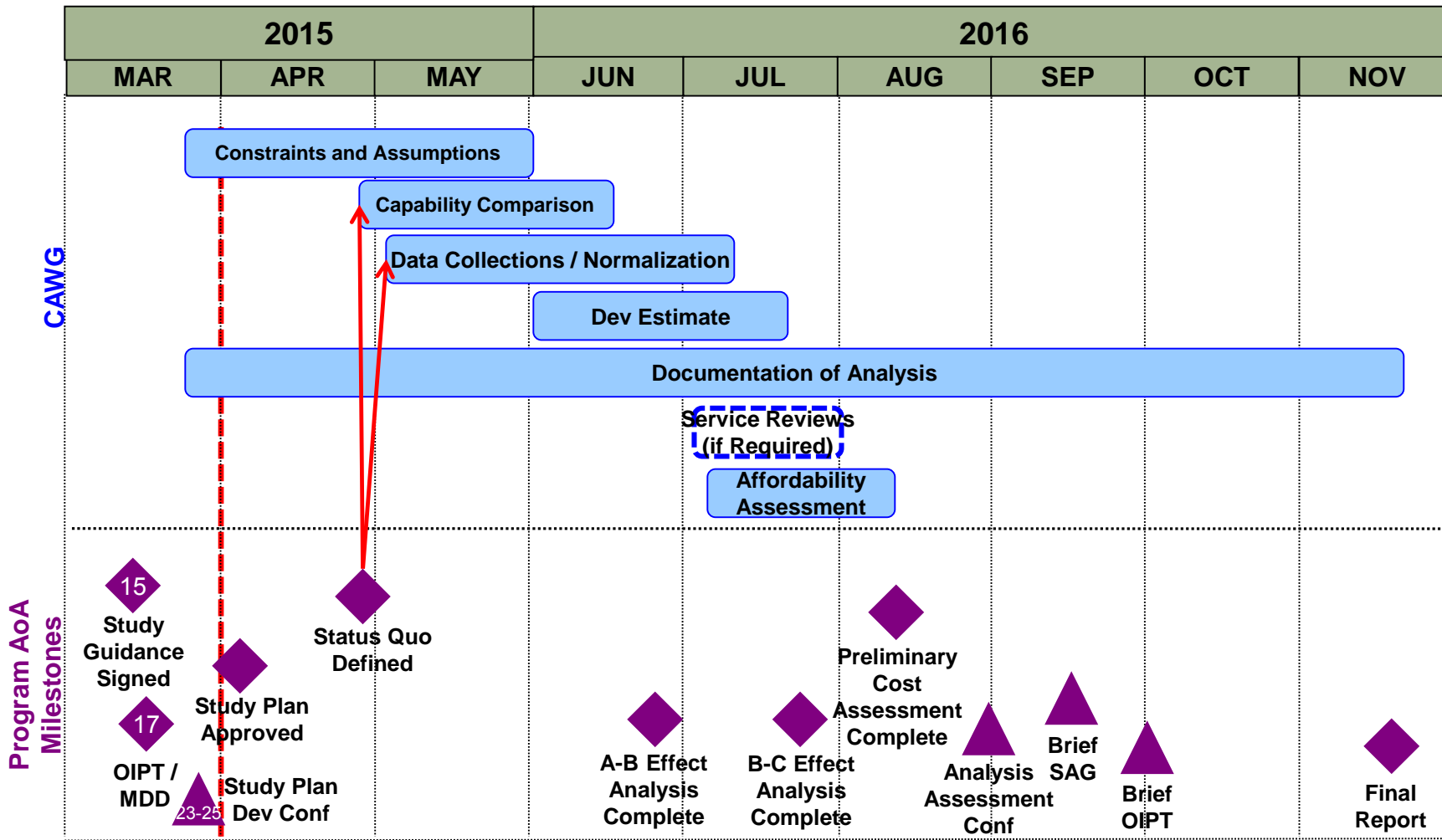


	PHASE TOTAL
<b>RDT&amp;E</b>	<b>\$503.71</b>
<b>DEVELOPMENT ENGINEERING</b>	<b>\$165.48</b>
DEVELOPMENT ENGINEERING MISSILE	\$61.01
DEVELOPMENT ENGINEERING SIMPLIFIED	\$5.50
DEVELOPMENT ENGINEERING TECH FIRE CONTROL	\$4.40
DEVELOPMENT ENGINEERING FIRE CONTROL SENSOR	\$96.42
<b>PRODUCIBILITY ENGINEERING &amp; PLANNING</b>	<b>\$36.34</b>
PRODUCIBILITY ENGINEERING & PLANNING MISSILE	\$13.01
PRODUCIBILITY ENGINEERING & PLANNING SIMPLIFIED LAUNCHER	\$5.00
PRODUCIBILITY ENGINEERING & PLANNING TECH FIRE CONTROL	\$1.25
PRODUCIBILITY ENGINEERING & PLANNING FIRE CONTROL SENSOR	\$17.08
<b>DEVELOPMENT TOOLING</b>	<b>\$3.12</b>
DEVELOPMENT TOOLING MISSILE	\$1.10
DEVELOPMENT TOOLING SIMPLIFIED LAUNCHER	\$0.61
DEVELOPMENT TOOLING TECH FIRE CONTROL	\$0.00
DEVELOPMENT TOOLING FIRE CONTROL SENSOR	\$1.41
<b>PROTOTYPE MANUFACTURING</b>	<b>\$126.51</b>
PROTOTYPE MANUFACTURING MISSILE	\$18.55
PROTOTYPE MANUFACTURING SIMPLIFIED LAUNCHER	\$7.61
PROTOTYPE MANUFACTURING TECH FIRE CONTROL	\$3.15
PROTOTYPE MANUFACTURING FIRE CONTROL SENSOR	\$97.20
<b>SYS ENG / PROGRAM MGMT</b>	<b>\$10.32</b>
PROJECT MGMT ADMIN	\$10.32
OTHER	\$0.00
<b>SYS TEST &amp; EVALUATION</b>	<b>\$56.58</b>
SYS TEST & EVALUATION MISSILE	\$22.19
SYS TEST & EVALUATION SIMPLIFIED LAUNCHER	\$3.67
SYS TEST & EVALUATION TECH FIRE CONTROL	\$4.36
SYS TEST & EVALUATION FIRE CONTROL SENSOR	\$26.36
<b>TRAINING</b>	<b>\$5.76</b>
TRAINING MISSILE	\$1.44
TRAINING SIMPLIFIED LAUNCHER	\$1.44
TRAINING TECH FIRE CONTROL	\$1.44
TRAINING FIRE CONTROL SENSOR	\$1.44
<b>DATA</b>	<b>\$9.65</b>
DATA MISSILE	\$3.58
DATA SIMPLIFIED LAUNCHER	\$1.11
DATA TECH FIRE CONTROL	\$1.11
DATA FIRE CONTROL SENSOR	\$3.85
<b>SUPPORT EQUIPMENT</b>	<b>\$4.33</b>
PECULIAR	\$2.47
PECULIAR MISSILE	\$0.08
PECULIAR SIMPLIFIED LAUNCHER	\$0.08
PECULIAR TECH FIRE CONTROL	\$0.00
PECULIAR FIRE CONTROL SENSOR	\$2.31
COMMON	\$1.86
DEVELOPMENT FACILITIES	\$0.00
OTHER RDT&E	\$0.00



# CAWG Notional Plan of Action and Milestones Example

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# Insights and Lessons Learned

## ❖ **Cost Analysis Working Group**

- Assembled with cost analysts from key supporting organizations to include the study director
- Point of contact information
- Regular teleconferences (audio and video) to keep every one informed and focused
- Agenda sent prior to teleconference
- Central repository or SharePoint site for documents
- PM willingness to work with the CAWG

## ❖ **Use of ACEIT**

- Fewer potential errors
- Easier to follow than multiple Excel spreadsheets
- Revisions and alternate cases are simpler to perform

## ❖ **Identification of goals, objectives, and requirements**

- Spend more time on the AoA scope
- Identify and establish alternatives early
- Obtain CARD-like document for background information
- Running list of ground rules and assumptions



# *Insights and Lessons Learned*

## ❖ **Interaction with other working groups**

- Cost impacts from other working groups' studies
- PM representatives with economic/political motives

## ❖ **Meetings**

- Face to face meetings more productive than teleconferences
- Cost Review Board type of meeting with AoA study team

## ❖ **Risk Assessment**

- Non-cost folks confusion over risk versus uncertainty
- Work closely with AMSAA schedule risk representative with identification of analogous systems

## ❖ **Trades Analysis**

- CAWG involvement necessary to capture changes that have cost implications
- Survey sent out to technical team requesting description of major components of each alternative



# Risk Assessment Workshop Overview

- ❖ **Purpose:** facilitate the gathering of data to support the risk assessments to include impacts on performance, cost, and schedule
- ❖ **Objectives:**
  - Review Technology Readiness Assessment (i.e. TRL, MRL, and IRL) for each critical technology
  - Assess probabilities for delivery of each critical technology; document evidence/support
  - Assess consequences to performance, schedule and cost if technology is not delivered; document evidence/support
  - Discuss PM schedules, analogous programs for schedule risk, and other scheduled-related risks
  - **Discuss potential cost drivers, analogous programs for cost risk, and potential data sources**
- ❖ **Participants:**

AMSAA  
RDECs  
TRAC

ODASA-CE  
PEO/Program Manager  
ARCIC

TRADOC Centers of Excellence  
OSD AoA Action Officer Stakeholders

- ❖ **Structure:** for each technology...



Risk Workshop will also facilitate gathering of pertinent information that will support the schedule and cost risk assessments.



# Summary

- ❖ **Using the AoA based estimates early in the acquisition process will:**
  - Meet the intent Defense Acquisition Executive intent to have cost informed decisions early in the acquisition process
  - Provide decision makers with timely cost analysis
  - Reduce resources required to provide cost analysis; neither POE nor reconciliation process for MS A
  - Help maintain acquisition decision schedule
  
- ❖ **Requires ASA (ALT) to ensure early estimates developed from the AoA Estimates receive required and timely input/support from Program Offices (CARDs, Acquisition Strategy, Logistics Plans, etc)**



***Questions?***





## *Backup*



# Available Tools and Models for Cost Data

Personnel

**AMCOS** *The Army Military-Civilian Cost System*

*AMCOS must be used for military & civilian personnel compensation and benefits*

Facilities



**US Army Corps of Engineers**

*Form 1391 – MILCON construction costs*

Equipment



**Unified Facilities Criteria**

*Sustainment costs estimation*



**Army Equipping Enterprise System**

*Equipment costs by LIN*

**FORCES**

*OPTEMPO, CONOPS, force structure, equipment, transportation*



**Electronic Document Access**

*Contract data*



**Advantage!**  
[www.gsaAdvantage.gov](http://www.gsaAdvantage.gov)

*Services, leases, equipment*



# DASA-CE Early Cost Team (ECT)

## ❖ Six-person+ Team

- ALison Tichenor (Team Lead) ..... 703-697-1569
- Rex Stone (Alternate Lead) ..... 703-697-1609
- Ronako Carson ..... 703-697-1577
- Kirby Hom ..... 703-697-1622
- Kenny Ragland ..... 703-697-1568
- Kyle Glanton ..... 703-697-1599
- Jared McCullough (Intern, 1<sup>st</sup> year) ..... 703-697-1576

## ❖ Support within DASA-CE Acquisition Costing Directorate from cost teams assigned to the other two divisions (by commodity)

- Weapon Systems Costing Division
- Networks, Information, Software & Electronics (NISEC) Costing Division (aka C4ISR)



# Welcome to Our World!

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