



# 2009 Munitions Executive Summit

## *OSD Perspective*

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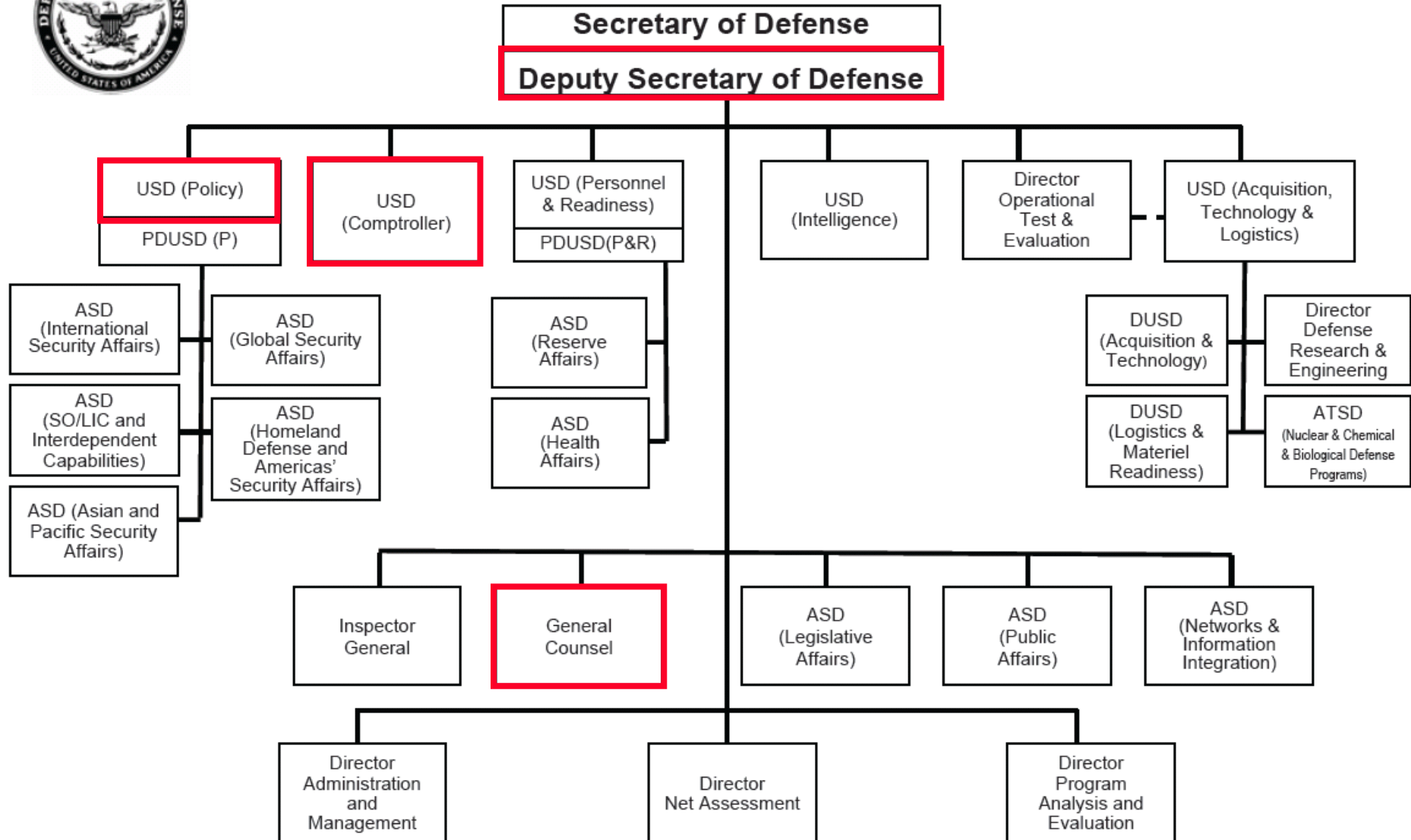


# Discussion Topics

- OSD / AT&L Organization
- AT&L Goals and Initiatives
- DoDI 5000.02 Update
- Budget Trends
- Munitions Interest Areas
  - Insensitive Munitions DOTC and Joint Munitions Program
  - Fuze Technology
  - Cluster Munitions
  - Conventional Munitions Demil
  - Rocket Motors Business Process Review
  - Small Arms Joint Assessment Team
  - TATB
  - Joint Munitions Program
  - DoD Ordnance Technology Consortium (DOTC)



# Office of the Secretary of Defense



UNDER SECRETARY OF DEFENSE  
(ACQUISITION, TECHNOLOGY AND LOGISTICS)  
Honorable John J. Young, Jr.  
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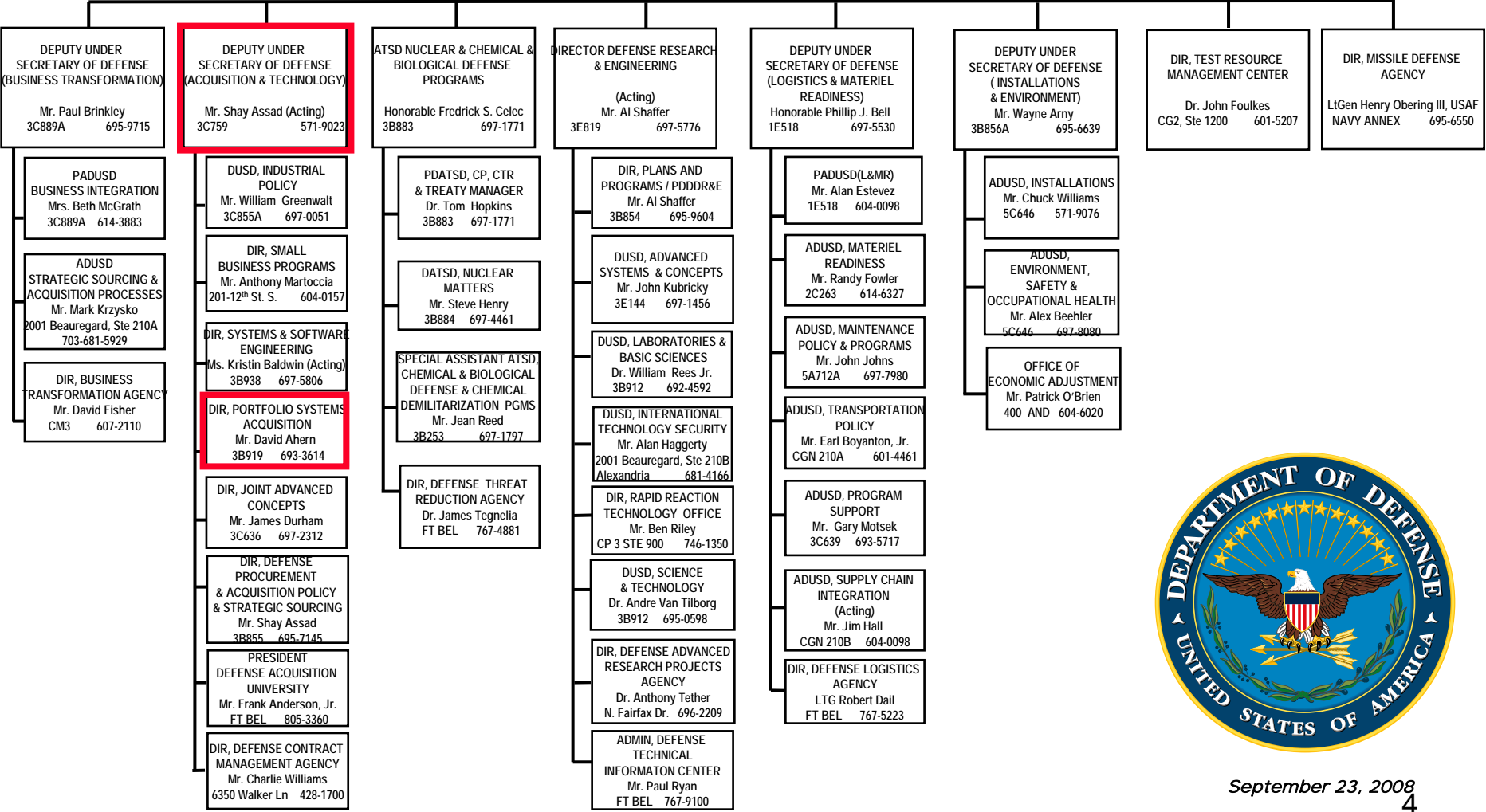
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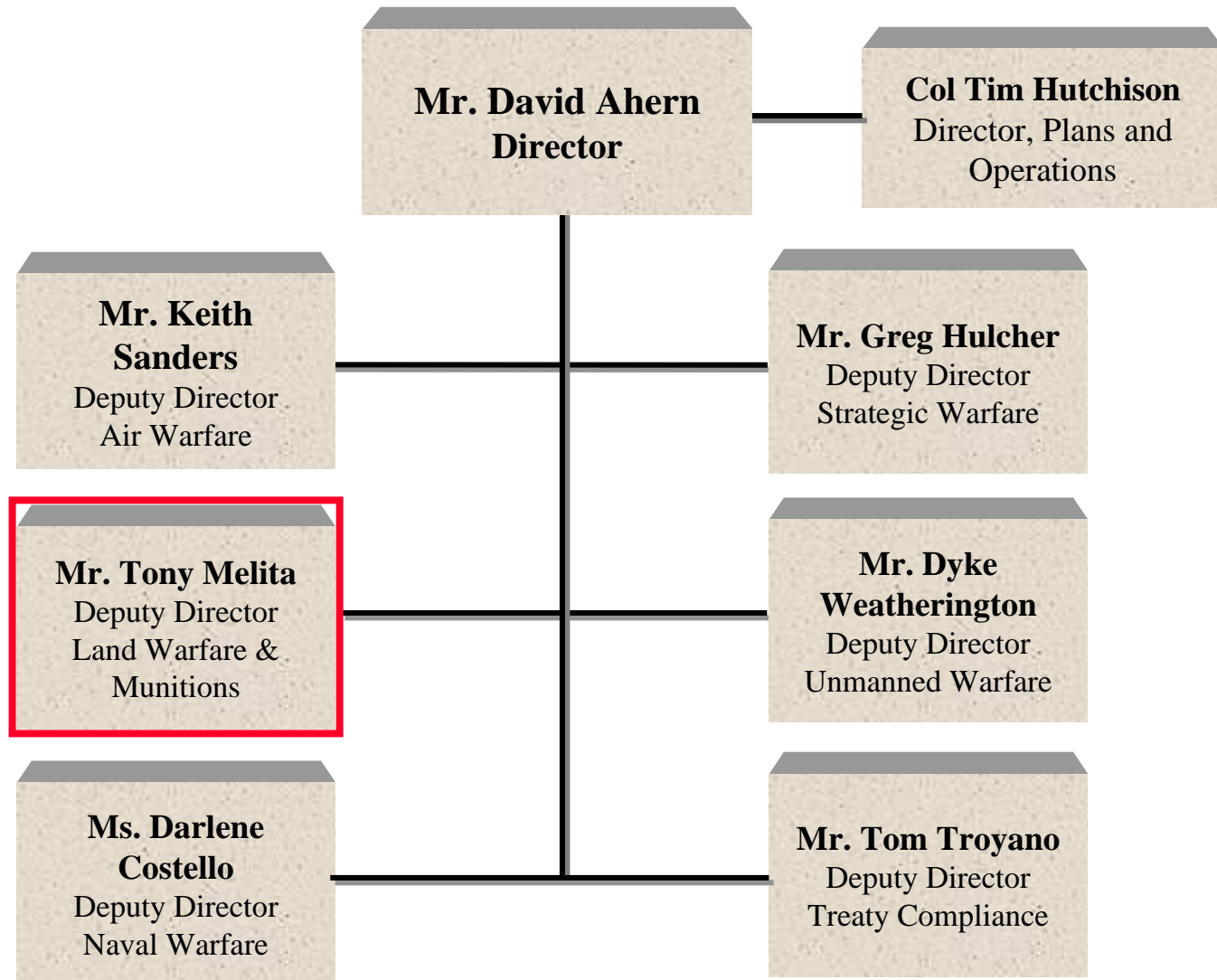
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# PORTFOLIO SYSTEMS ACQUISITION (PSA)

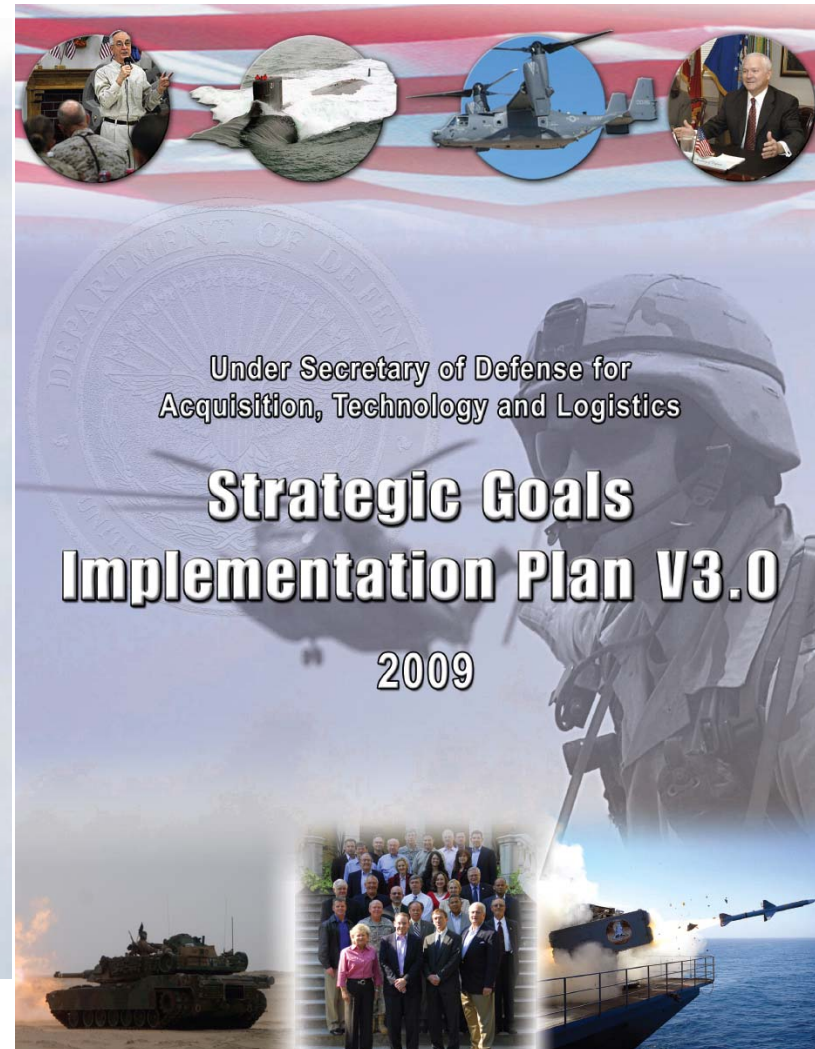


# USD (AT&L) Goals

## AT&L Organizational Goals

1. *High-performing, Agile, and Ethical Workforce*
2. *Strategic and Tactical Acquisition Excellence*
3. *Focused Technology to Meet Warfighting Needs*
4. *Cost-effective Joint Logistics Support for the Warfighter*
5. *Reliable and Cost-effective Industrial Capabilities Sufficient to Meet Strategic Objectives*
6. *Improved Governance and Decision Processes*
7. *Capable, Efficient, and Cost-effective Installations*

<http://www.acq.osd.mil>





## **Goal 3**

### **Focused Technology to Meet Warfighting Needs**

- **Promote and shape investments to lower costs and development time for the enterprise.**
- **Take proactive steps to transition technology programs.**
- **Conduct Defense Support Team (DST) activities to assist ACAT Programs.**
- **Enable greater coordination and collaboration on S&T programs.**



**Goal 5**  
**Reliable and Cost-Effective Industrial Capabilities**  
**Sufficient to Meet Strategic Objectives**

- **Understand effects of DoD policy and program decisions on the industrial base, and the extent to which industry decisions limit or expand DoD options.**
- **Expand and sustain the industrial base to encourage competition and innovation for essential industrial and technological capabilities.**
- **Expand Non-Traditional Supplier participation in DoD Acquisition.**

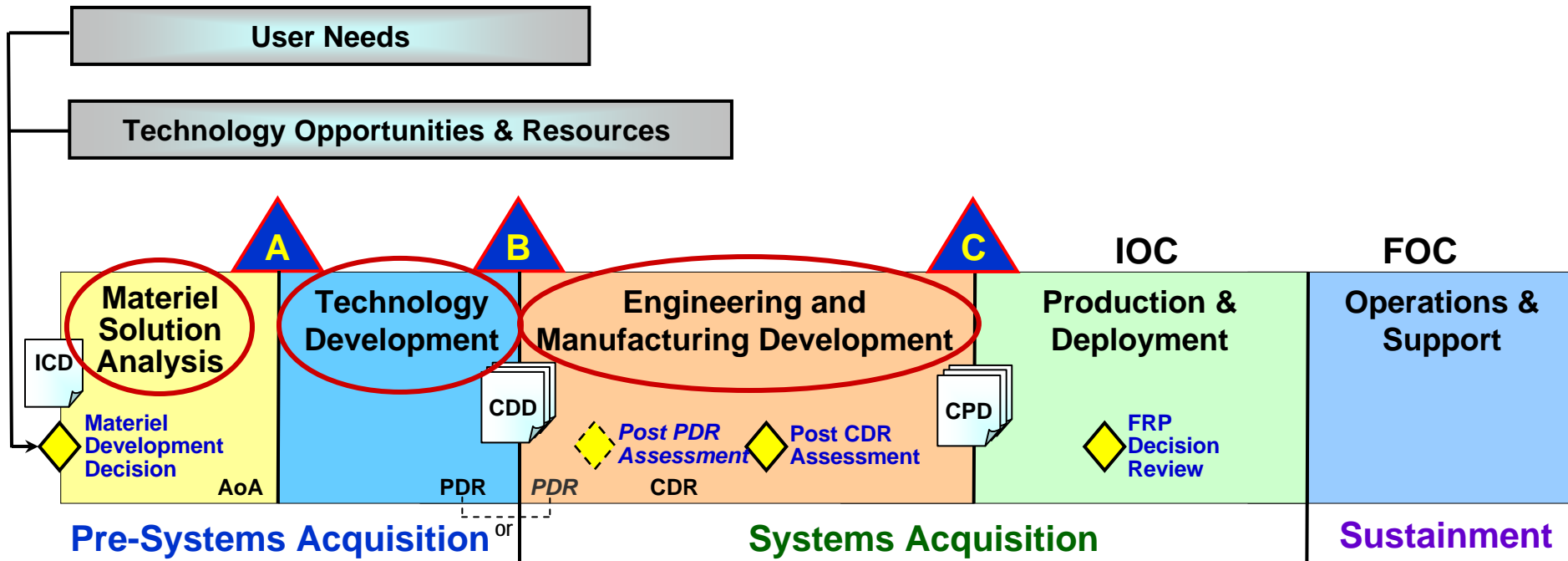


# **Operation of the Defense Acquisition System**

## **DoDI 5000.02 Update**

Detailed information available at  
<https://akss.dau.mil/dapc/>

# The Defense Acquisition Management System 2008

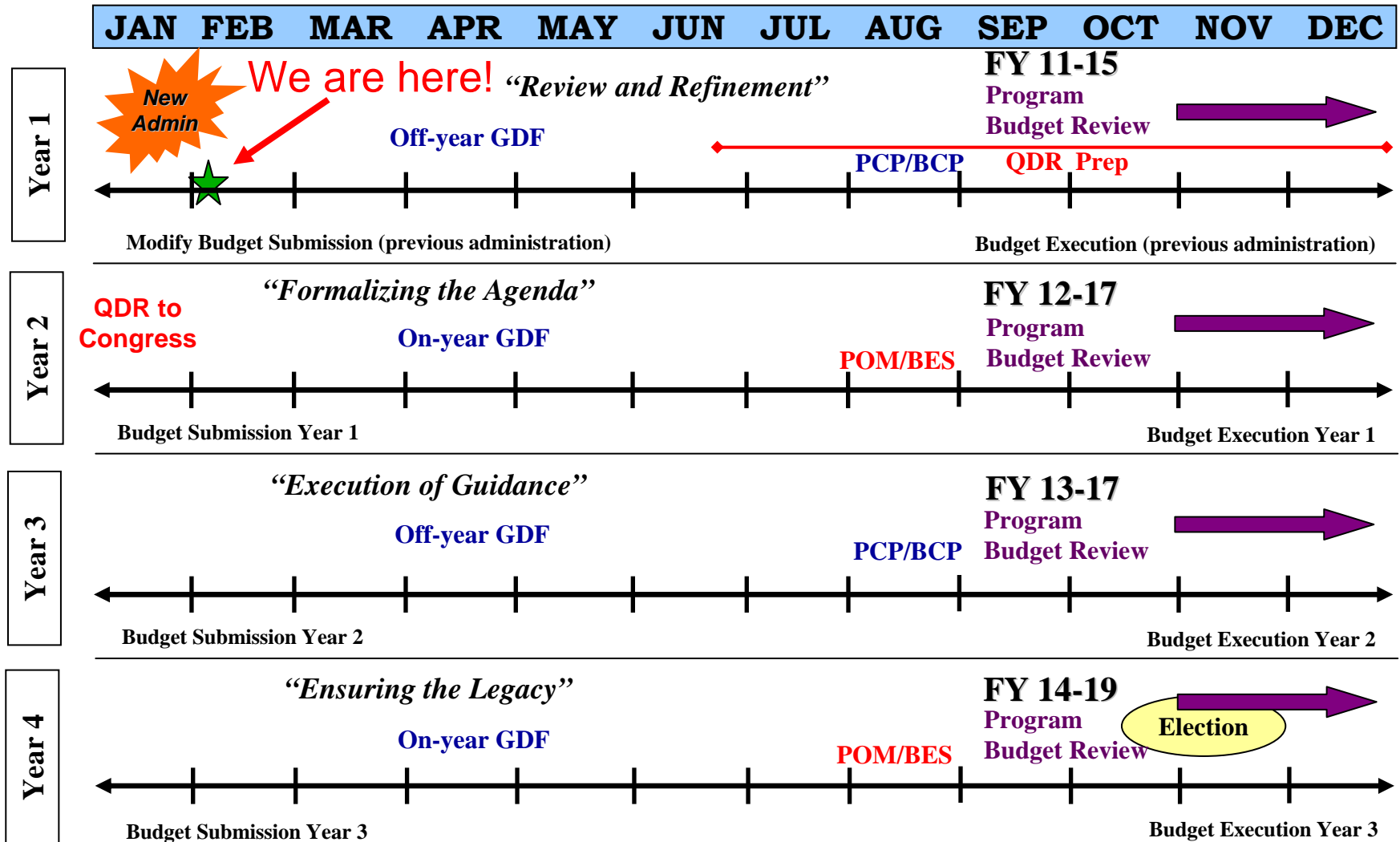


## Changes to Phases

Old (2003)	New (2008)	Change from 2003
Concept Refinement (CR)	Materiel Solution Analysis	More robust AoA (result of changes to JCIDS)
Technology Development (TD)		Competitive prototyping / PDR
Systems Development & Demonstration (SDD)	Engineering & Manufacturing Development (EMD)	More robust system engineering

# Budget Trends

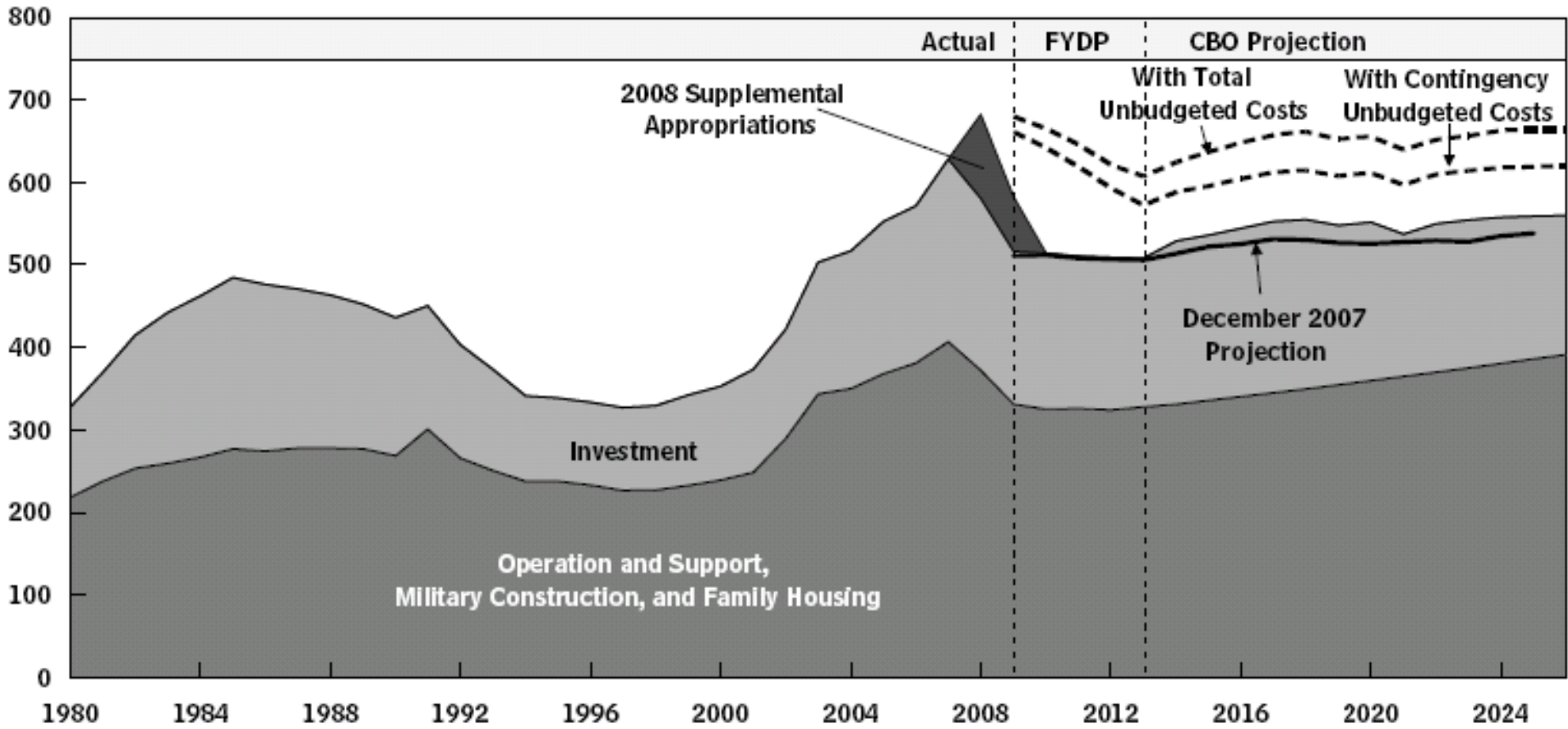
# Planning, Programming, Budgeting, and Execution



**4 Administration Years with 2-year PPBE Cycle**

# Past and Projected Resources for Defense

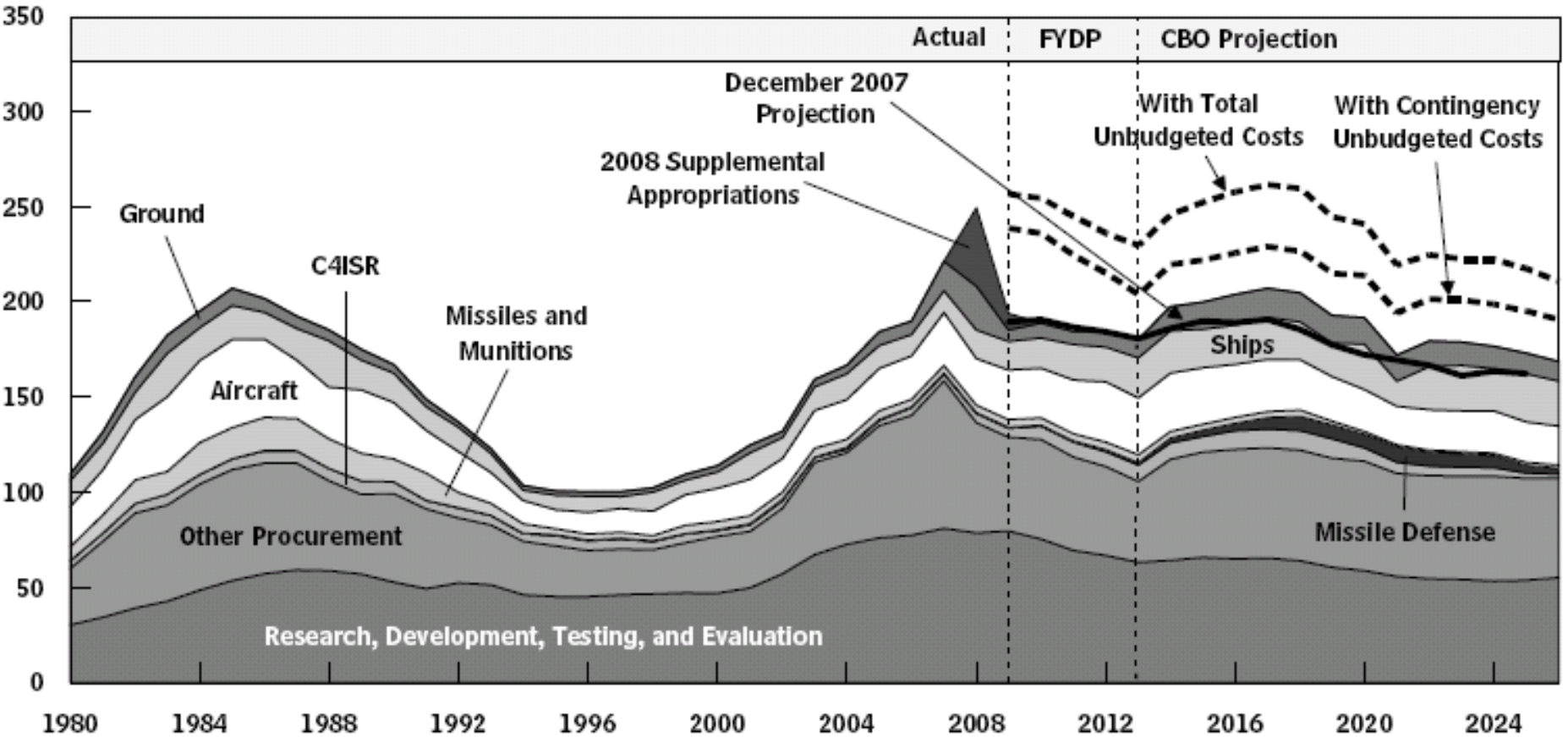
(Billions of 2009 dollars)



Source: Congressional Budget Office, "LONG-TERM IMPLICATIONS OF THE FISCAL YEAR 2009 FUTURE YEARS DEFENSE PROGRAM," January 2009

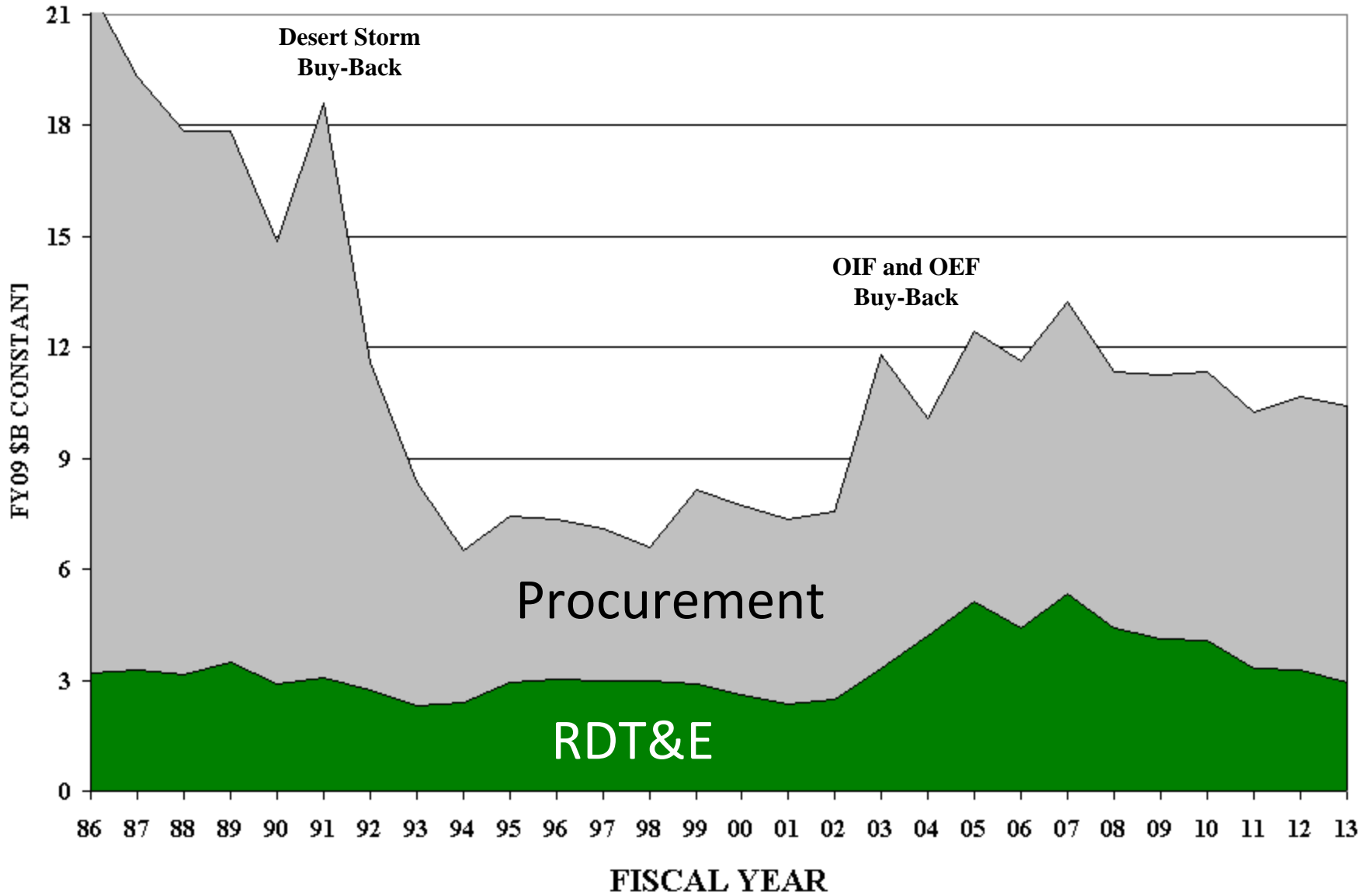
# Past and Projected Resources for Defense Investment

(Billions of 2009 dollars)

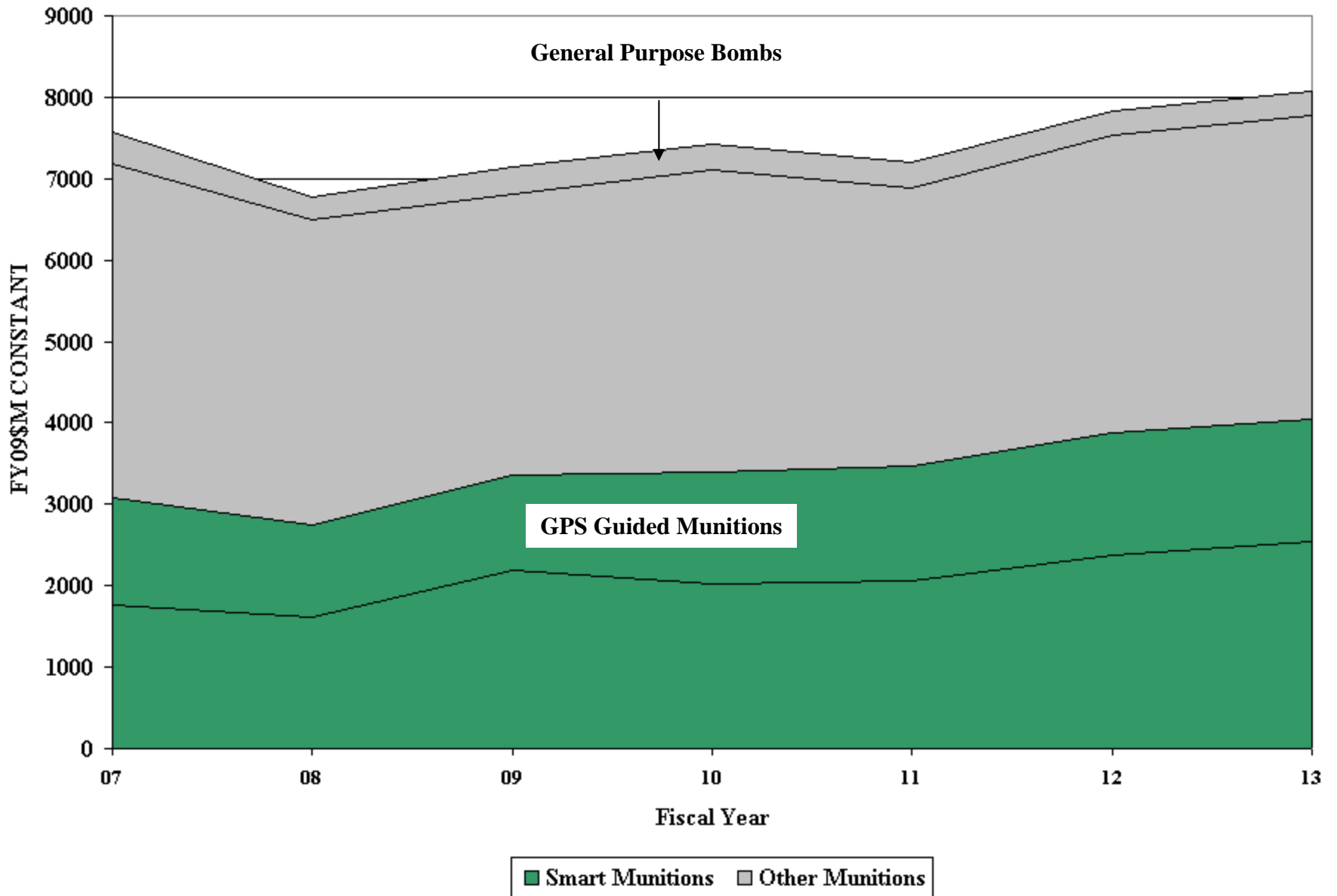


Source: Congressional Budget Office, "LONG-TERM IMPLICATIONS OF THE FISCAL YEAR 2009 FUTURE YEARS DEFENSE PROGRAM," January 2009

# DoD Munitions RDT&E and Procurement



# Smart Munitions vs. Other Munitions Procurement Trend

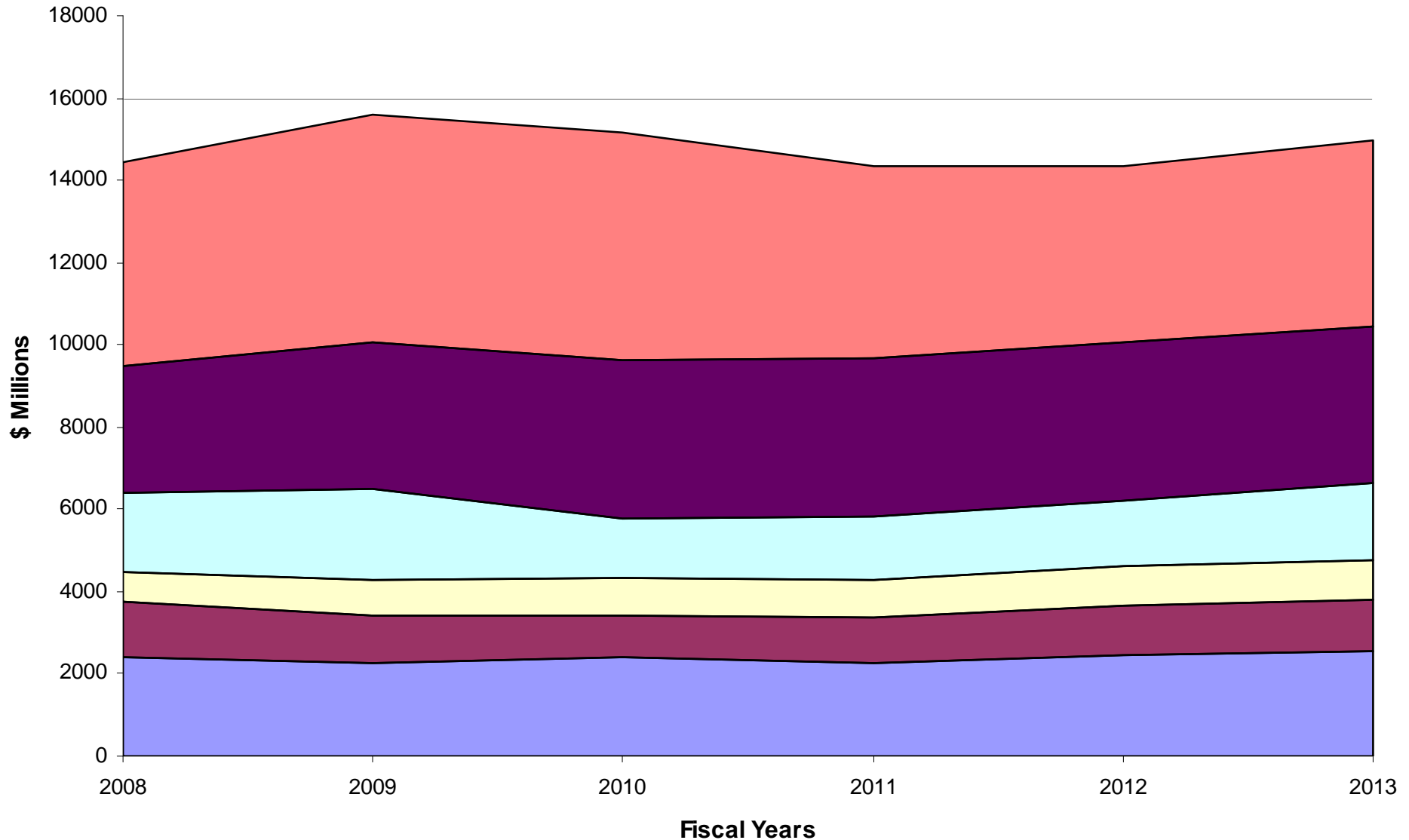




# FY 2009 President's Budget Munitions Appropriations

	2007	2008	2009	2010	2011	2012	2013
<b>Ammo (A)</b>	2,616	2,389	2,276	2,403	2,284	2,432	2,558
<b>Ammo (N)</b>	1,049	1,362	1,122	1,032	1,061	1,245	1,247
<b>Ammo (AF)</b>	1,044	749	894	907	925	944	961
<b>Missiles (A)</b>	1,617	1,899	2,211	1,429	1,546	1,582	1,864
<b>Missiles (AF)</b>	4,115	4,945	5,537	5,518	4,674	4,268	4,483
<b>Weapons (N)</b>	2,897	3,093	3,575	3,874	3,840	3,870	3,837
<b>(\$ M)</b>	13,338	14,437	15,615	15,163	14,330	14,341	14,950

# FY 2009 President's Budget Munitions Appropriations



■ Ammo (A)  
 ■ Ammo (N)  
 ■ Ammo (AF)  
 ■ Missiles (A)  
 ■ Weapons (N)  
 ■ Missiles (AF)

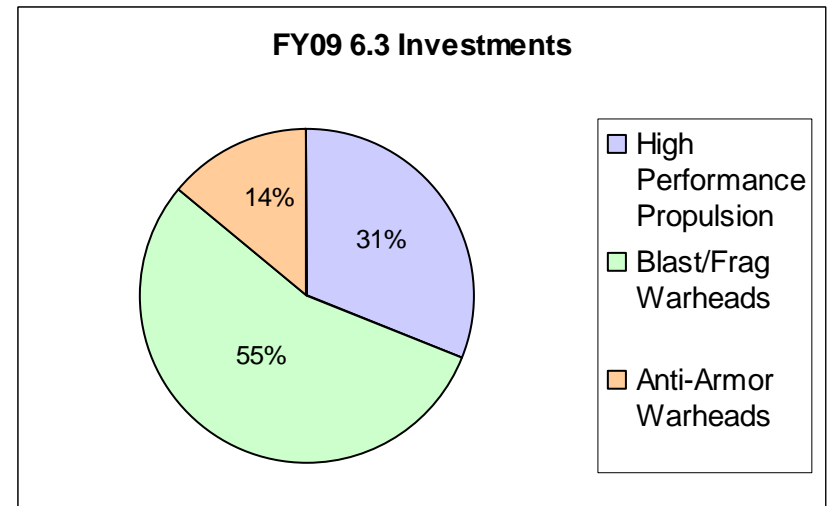
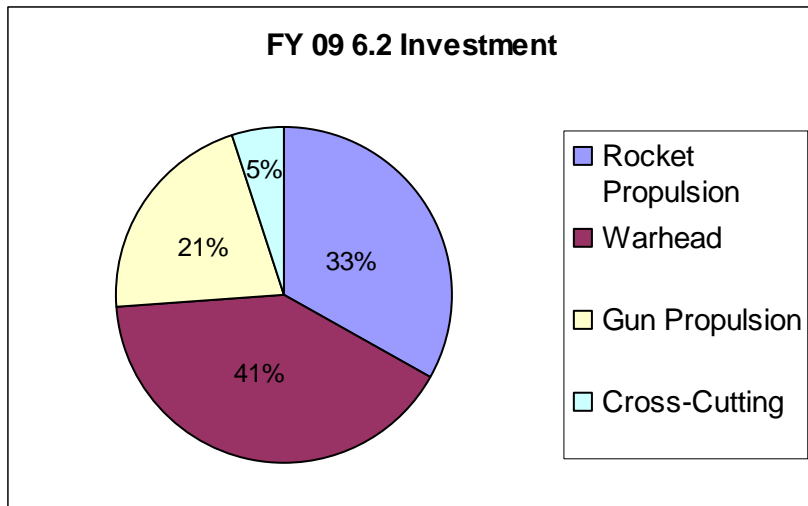
# Munitions Interest Areas

# In insensitive Munitions (IM) Update

- IM Strategic Plans continue to garner the attention of senior military leadership – reduced munition vulnerability translates into reduced platform vulnerability
- Third submission of strategic plans has highlighted the significant improvements being made in some systems while identifying other areas that need additional focus and investment to prevent them from blocking advancement toward an IM compliant stockpile
  - Over 80% Munitions stockpile remains non IM compliant
- Encouraged by strategic investments and trickle down of technology described in some plans; we will work with all PEOs to ensure that their IM investment plans are linked to IM technology transitions and to acquisition “windows of opportunity”
- IM Strategic Plans remain the primary tool for guiding IM technology investments

# Joint IM Technology Program Update

- Joint Insensitive Munitions Technology Program
  - Total FY10-15 Funding is \$231M
  - Program is focused on developing and demonstrating enabling technologies in 5 munition areas – High Performance Rocket Propulsion, Minimum Smoke Rocket Propulsion, Blast/Fragmentation Warheads, Anti-Armor Warheads, Large Caliber Gun Propulsion
  - First technology transfer should occur in FY09
  - *DOTC is the mechanism for engaging industry*



# Fuzing Science & Technology Efforts

- POM10 fuze issue addresses fuze technology shortfalls for priority capabilities
- \$81.4 million S&T funding FY2010 - FY2015
- VISION – Advance and maintain a healthy U.S. industrial and fuze technology base; establish early and continued government involvement in the development, application, and transition of fuze technology to munitions development.
- 4 Fuze Area Technology Groups formed:
  - Hard Target Survivable Fuzing
  - Tailorable Effects Weapon Fuzing
  - High Reliability Fuzing
  - Enabling Technologies and Common Architecture
- Participants
  - DoD communities: S&T / Requirements / Acquisition
  - Dept. of Energy
  - Industry via DOTC



# Cluster Munitions

- New DoD policy issued June 2008; after 2018 all cluster munitions must have UXO rate of 1% or less.
  - Joint Staff leading a study to identify capability impacts, alternatives to replace legacy cluster munitions
- Convention on Cluster Munitions signed by 94 nations in December 2008; bans nearly all cluster munitions; U.S. is not a signatory
  - U.S. is negotiating within the Convention on Conventional Weapons to regulate (not ban) use of cluster munitions
- Impacts of new policy and treaty:
  - Increase in demil liability
  - Potential new R&D and production of replacement munitions
  - Possible changes in how U.S. operates with coalition partners who signed Convention on Cluster Munitions

# Design for Demilitarization

## Policy Memo Signed by USD(AT&L) August 2008

- Demilitarization stockpile poses safety and environmental hazards, and impacts readiness
- If not considered early in the design, increases weapons' life cycle costs
- During system design, weapons designers can optimize demil methods and resource reclamation and reuse
  - Facilitate disassembly and access to energetic materials
  - Use energetic materials and components having reclamation or reuse potential
  - Efficiently accommodate existing demilitarization processes
  - Reduce the use of environmentally sensitive materials
  - And enhance safety for demil operators
- PMs will now include in acquisition documents and in design reviews how they intend to address demil in design and test
  
- Current stockpile: ~460K short tons ammo, 360K short tons missiles
- Army is executive agent for all conventional ammunition demil
  - FYDP Execution ~ \$750M
  - FYDP R&D ~ \$85M
- Cluster munitions policy will increase demil stockpile



# Rocket Motors

## Business Process Review (BPR)

- Concept Decision Review of the Joint Air-to-Ground Missile (JAGM), March 2007, directed DUSD(A&T) lead a BPR to streamline the five year development/certification timeline
- With Service Acquisition Executive support, we formed an IPT made-up of stakeholder PEOs to oversee the effort, and assembled Nation-wide SMEs (from all 3 Services) to conduct a nine-month Lean Six Sigma review
- The review resulted in a new joint process for DoD rocket motors development and qualification and 13 recommendations for reducing cycle-time and program risk
- Pending USD(AT&L) charter for a Joint Rocket Motor Advisory Group (JRMAG), to serve as a multi-Service body of technical experts that will inform the requirements generation and material development processes

# Small Arms & Ammunition Joint Assessment Team & Defense Support Team



# TATB

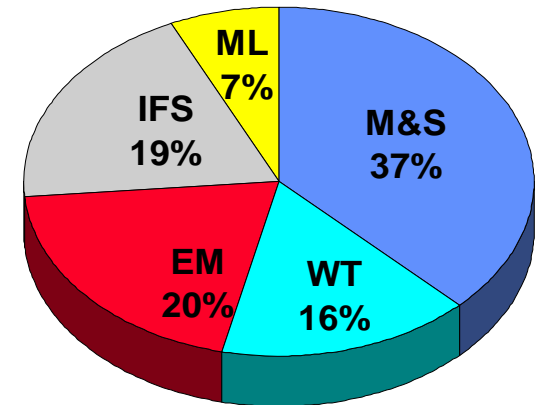
- Triaminotrinitrobenzene (TATB) is one of the least sensitive explosive materials known and is a critical ingredient in the booster explosives PBXN-7, used in bomb and missile fuzes and PBXW-14, used in mortar fuzes.
- The only qualified source, BAE Systems, Royal Ordnance in Bridgewater, UK, ceased production in Dec 2005 and closed in 2006.
- Current efforts to develop and qualify a drop-in replacement have been unsuccessful to date
- Current needs being met from a limited DOE stockpile
- Lack of a qualified TATB source may critically impact our capabilities
- Support from the entire munitions community required to address this critical need

# TATB – Way Forward

- Establish senior-level steering committee – DoD & DOE
- DoD-wide IPT in place to identify and oversee TATB efforts – All potential solutions will be considered.
  - Continued support for MANTECH efforts at BAE and ATK, if warranted
  - Re-establish previous manufacturing capability at U.S. facility, if warranted
  - Utilize DoD prize authority to incentivize non-traditional defense contractors to work this issue
  - Utilize Title III authority to encourage industry investments
  - Consideration of stop-gap solutions should TATB availability end
  - Long-term technology investments to identify, scale-up, and qualify a TATB replacement through Joint IM Technology Program investments
  - Request for Information to U.S. Industrial Base for TATB and 1,3,5-TCB manufacturers

# Joint DoD/DOE Munitions Program (JMP)

- Goal: transition technologies and tools developed by the JMP-DOE National Labs to NWEC members in accordance with federal laws & Lab rules
- To date several technologies have transitioned to industry, none have occurred through DOTC/NWEC
- Approx. 40 projects in 9 Technology Coordinating Groups arranged in 5 focus areas:
  - Modeling & Simulation (TCG I & II)
  - Energetic Materials (TCG II & III)
  - Initiation, Fuzing & Sensors (TCG X & XIII)
  - Warhead Technology (TCG IV & XI)
  - Munitions Lifecycle (TCG IX & XIV)



FY09 Funding

# Current JMP Transition Opportunities

- Composite Case Technology for Munitions
- LLM-105 High-Power/Insensitive Explosive
- CHEETAH – Thermochemical code
- Complex system reliability estimation and prediction software
- On demand sensitization of materials technology
- Schlieren System for Surveillance of Detonators
- Advanced Diagnostic Suite for Detonators
- Inkjet Deposition of Explosives
- Micro-Monolithic Capacitive Discharge Unit (M2CDU)
- Thin-Film Thermal Battery Technology (TFTB)
- CTH – Shock Physics Analysis for Munitions Applications
- 3-Axis Milli-Pen (3AMP) Acceleration Recorder

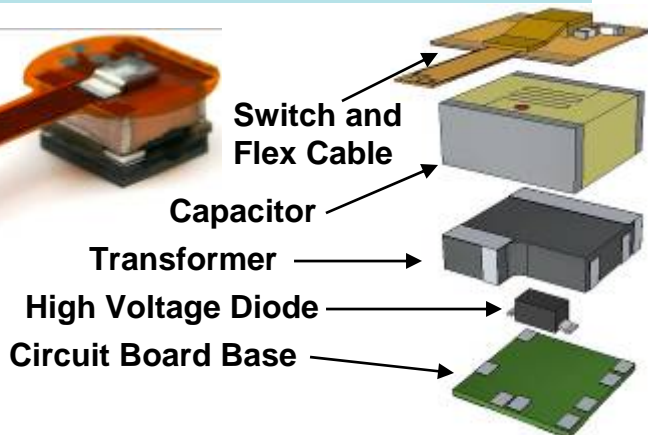
For Technology Transition Opportunity Quad Charts contact JMP Technical Advisor, Eric Brown ([eric.brown@osd.mil](mailto:eric.brown@osd.mil))

# EXAMPLE JMP Technology Transition Opportunity

## Micro-Monolithic Capacitive Discharge Unit (M<sup>2</sup>CDU)

### Overview

Prototype  
M<sup>2</sup>CDU



Click on link  
to DOTC to  
express  
interest

PoC: Paul Butler, SNL, pcbutle@sandia.gov; 505-844-7874

### Transition Intent

Transition the M<sup>2</sup>CDU technology for wide range of applications. One non-exclusive license has been executed with component supplier Novacap to develop, manufacture, and distribute the M<sup>2</sup>CDU in accordance with export controls.

### Applications

Applications include harsh-environment, miniaturized electronic fuzes for military uses, and for industrial purposes such as the drilling industry.

### Development Milestones

◆ = TRL

Milestones	FY06	FY07	FY08
• Built 1 <sup>st</sup> prototype	◆ 3		
• Demonstrated in harsh environments	◆ 6		
• Redesign for reliable assembly techniques		◆ 5	
• Redesign for manufacturability		◆ 4	

### Technical Description

Miniaturization technologies and assembly methods harden the module against harsh deceleration environments. Technologies include Low-Temperature Co-Fired Ceramics for hardened transformers and high-k dielectrics for multi-layered-ceramic capacitors. Assembly of the unit is non-trivial.

### Warfighter Payoff

The M<sup>2</sup>CDU enables the survivability and performance of smart fuzes for defeat of hard and deeply buried targets. Their small volume also benefits missile/rocket ancillary systems such as rocket motors, gas generators, separation charges, and may enable safer and more reliable fuze architectures.

# The Technology Transition Challenge

- DOTC is a technology transfer point for the DOE/DoD Joint Munitions Program
  - Technology can be transferred directly to industry with laboratory oversight
- No technology transitions to industry via DOTC to date
  - “Industry Day” events held in 2003, 2005
  - Technologies from Livermore, Los Alamos, Sandia presented
- Seeking to improve the transition process, but....cannot succeed without commitment from industry



# DoD Ordnance Technology Consortium

## DoD Laboratories



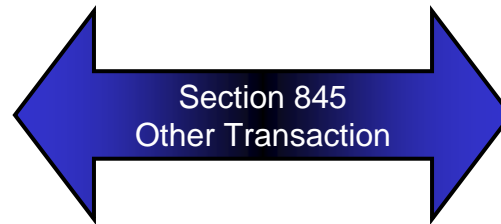
- OUSD (AT&L) LW&M
- Department of The Army
- Department of the Navy
- Department of the Air Force
- Department of Energy
- Special Operations Command
- Other Agencies and Departments

## National Warheads & Energetics Consortium



- Defense Contractors
- Traditional & Non-Traditional
- Academic Institutions
- Not-for-Profits Organizations

## Rapid & Agile Acquisitions

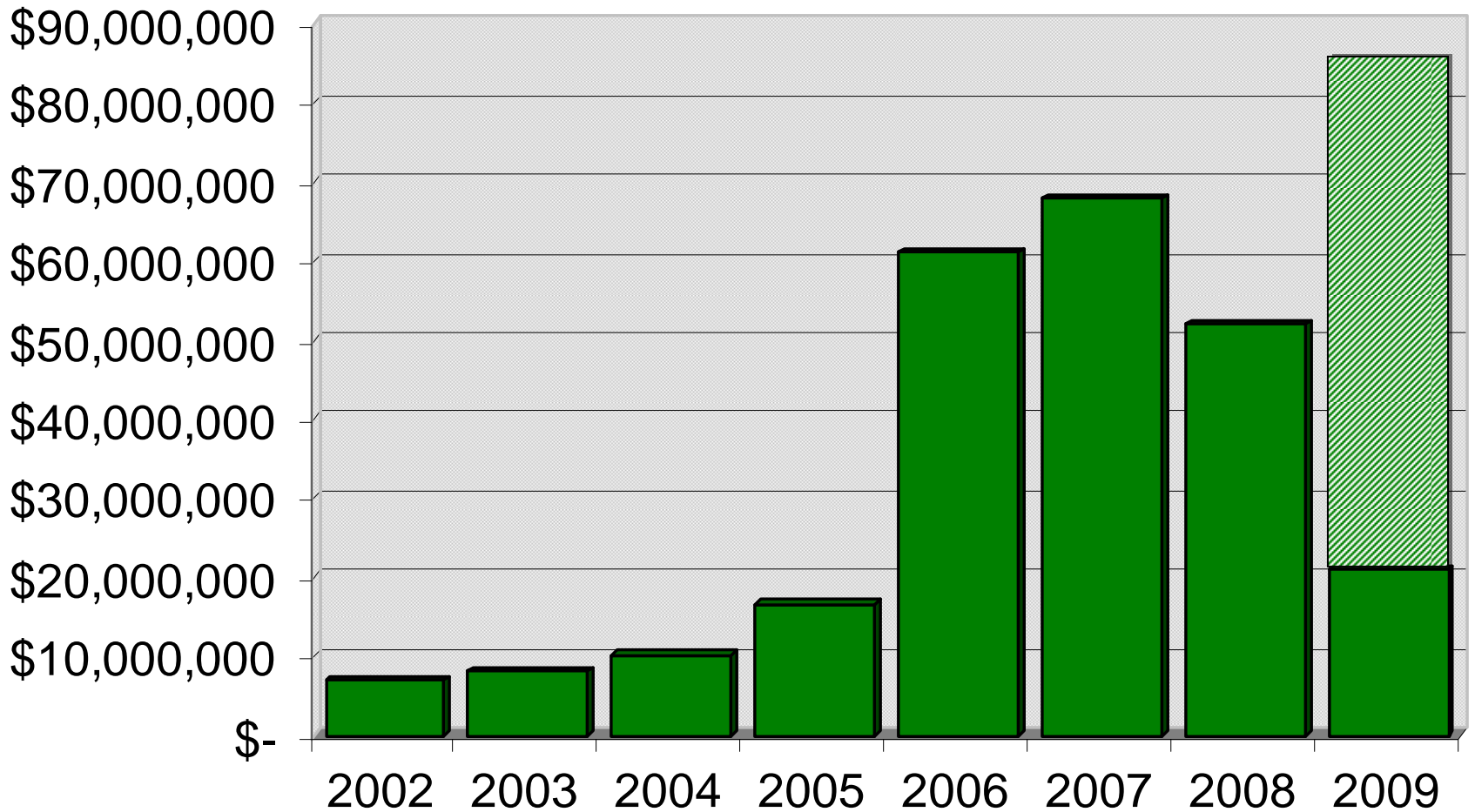


*DoD and NWECC... Partnering to Leverage Capabilities and Investment*

# DOTC Mission

- Demonstrate Feasibility and Transition Advanced Explosives, Propellants, Pyrotechnics, Warheads, Fuzing and Demilitarization Prototype Technologies
  - Advocate a critical mass of world-class technologists to meet the Department of Defense needs for conventional energetics (explosives, propellants, pyrotechnics), warheads, fuzes and demilitarization
  - Operate as an “open” center in which industry, academia, and other Government organizations and departments can freely participate
  - Be a focal point to rapidly transfer technology to the war fighter
  - Develop strong working affiliations with private and public energetics, warhead, fuze and DEMIL facilities and technology organizations
  - Leverage governmental and private sector research and development resources to maximize return on investment
    - Promote non-traditional defense contractor involvement
    - Promote innovation

# DOTC Resources



# DOTC Success =

- Stronger partnerships between Government and Industry
- Better collaboration among Government labs
- Increasing contributions of non-traditional defense contractors
- *Transitioning technology to system development and to the field*



**Questions?**