



# Joint Capabilities Development Process: Impact on the PPBS

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**April 22, 2004  
Director, Plans & Programs  
Defense Research and Engineering**

# Report Documentation Page

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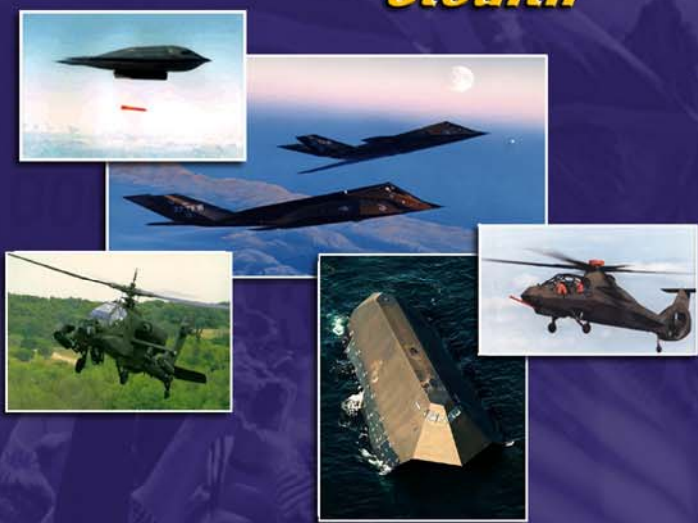
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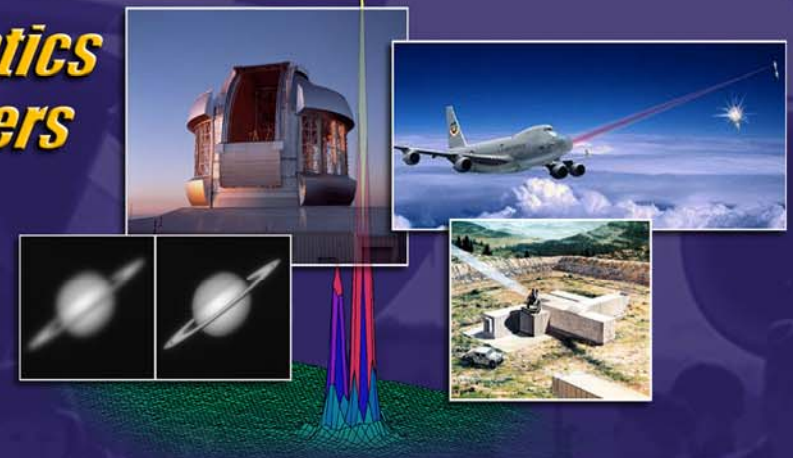


# *A Focus on Revolutionary Advances*

## *Stealth*



## *Adaptive Optics and Lasers*



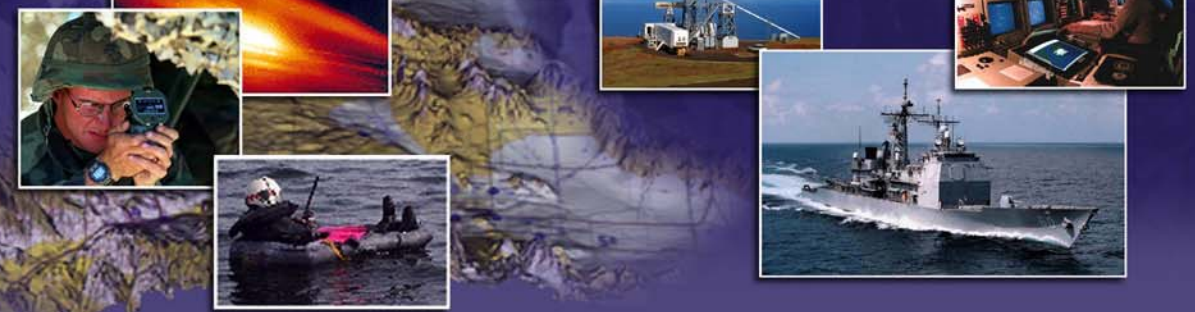
## *GPS*



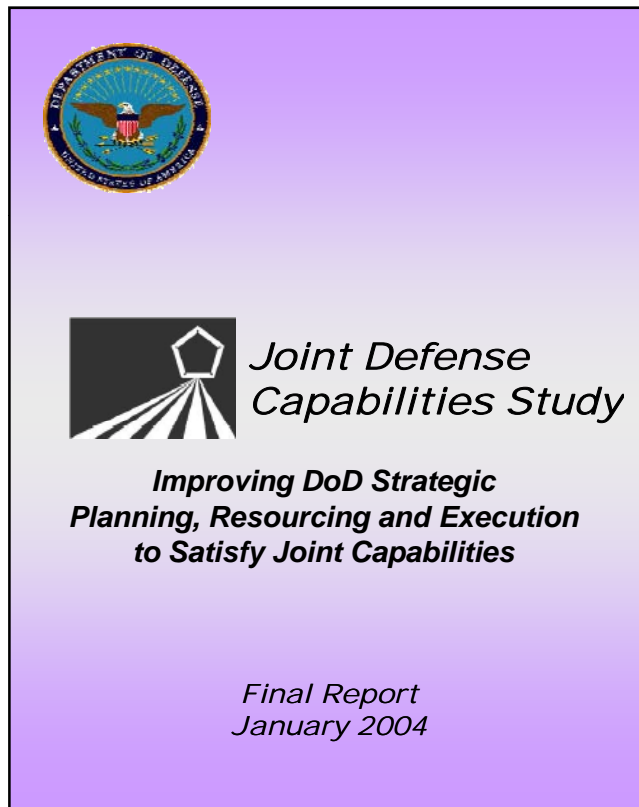
## *Night Vision*



## *Phased Array Radar*



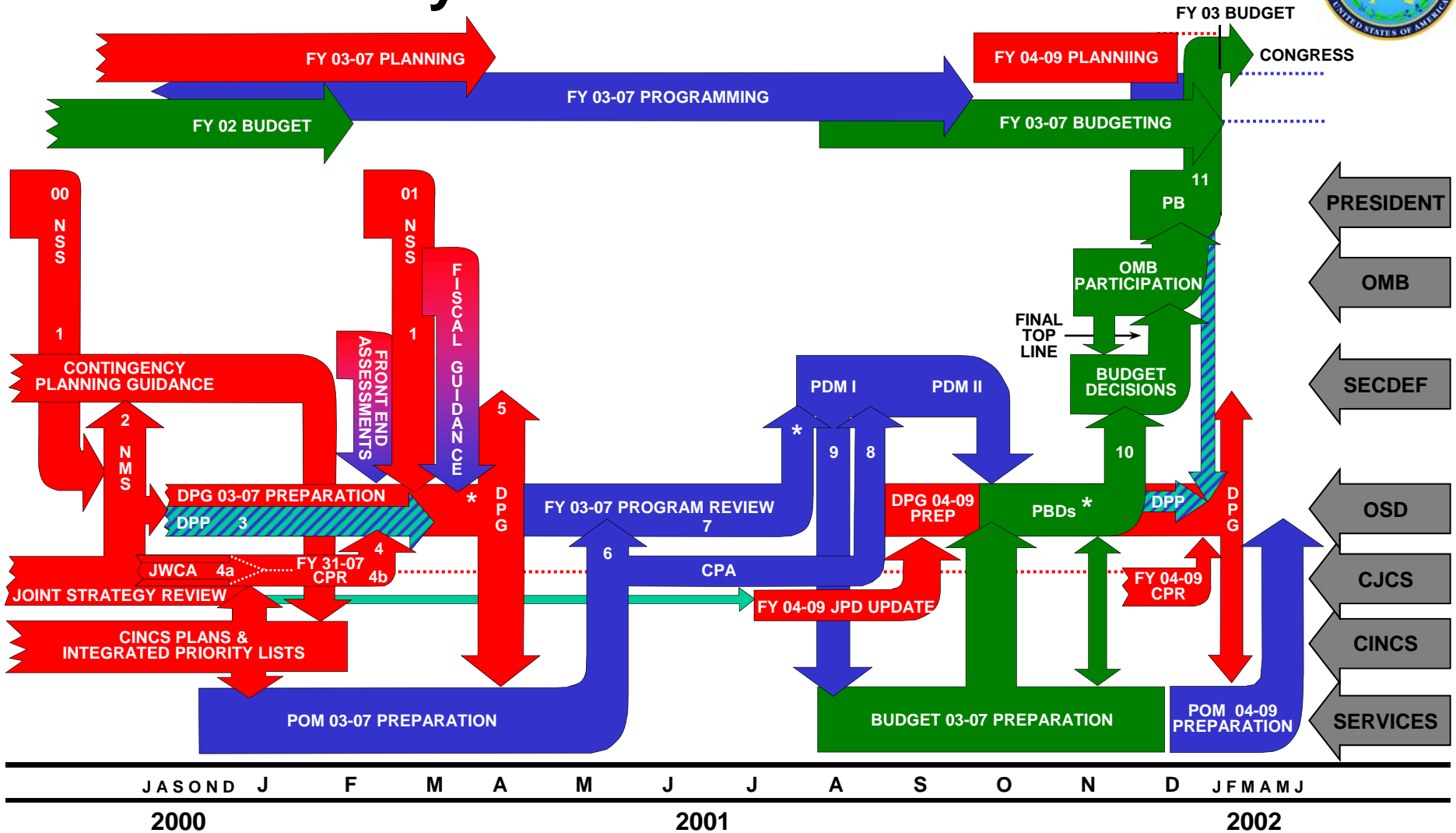
# The Need For Change



**“The resourcing function focuses senior leadership effort on fixing problems at the end of the process, rather than being involved early in the planning process.”**

***The Joint Defense Capability Study, Final Report, Jan 2004***

# Defense Planning, Programming & Budgeting System — Circa 2002



- 1. National Security Strategy
- 2. National Military Strategy
- 3. Defense Program Projection
- 4a. Joint Warfighting Capabilities Assessment
- 4b. Chairman's Program Recommendations
- 5. Defense Planning Guidance

- 6. Program Objectives Memoranda
- 7. Program Review
- 8. Chairman's Program Assessment
- 9. Program Decision Memoranda

- 10. Program Budget Decisions
- 11. President's Budget

\* Potential Defense Resources Board (DRB)/Expanded DRB

# Future Battlespace



*"Innovation within the armed forces will rest on experimentation with new approaches to warfare, strengthening joint operations, exploiting U.S. intelligence advantages, and taking full advantage of science and technology....."*

The National Security Strategy of the United States, September 2002

# The Challenge: Pace of Technology



**“Moore’s Law”** → Computing doubles every 18 months

**“Fiber Law”** → Communication capacity doubles every 9 months

**“Disk Law”** → Storage doubles every 12 months

## Defense Acquisition Pace (*circa 2003*)

<b>F-22</b>	<b>Milestone I:</b>	<b>Oct 86</b>	<b>IOC:</b>	<b>Dec 05*</b>
<b>Comanche</b>	<b>Milestone I:</b>	<b>Jun 89</b>	<b>IOC:</b>	<b>Sep 09</b>

\* Computers at IOC are 512 X faster, hold 65,000 X bits of information than they did at MS I

**Technology growth is non-linear...  
Acquisition path has been linear**

# The Need for Transformation



“The United States will ... transform America’s national security institutions to meet the challenges and opportunities of the twenty-first century.”

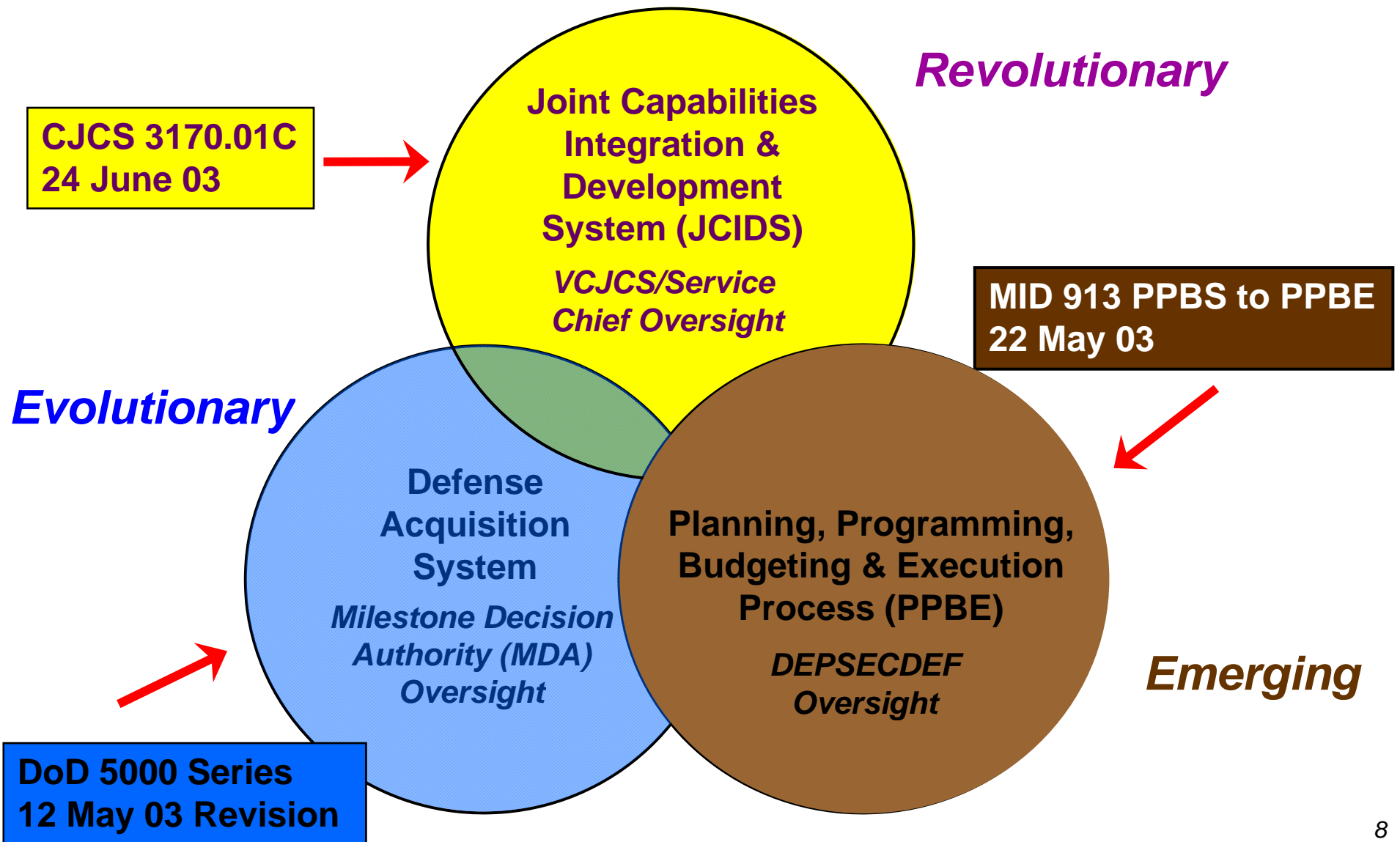
President George W. Bush,  
September 2002

“The Department currently is pursuing transformational business and planning practices such as adaptive planning, a more entrepreneurial, future-oriented capabilities-based resource allocation process, accelerated acquisition cycles built on spiral development, out-put based management, and a reformed analytic support agenda.”

Secretary of Defense Donald Rumsfeld,  
Transformation Planning Guidance  
April 2003



# Acquisition Decision Support Systems In Transformation



# Previous Requirements, Acquisition, and Planning, Programming & Budgeting Process



## Requirements

- Service, not Joint focused
- Joint warfighting needs not prioritized
- Systems not necessarily integrated
- Duplication existed, particularly in smaller programs
- Evolutionary Acquisition not well institutionalized

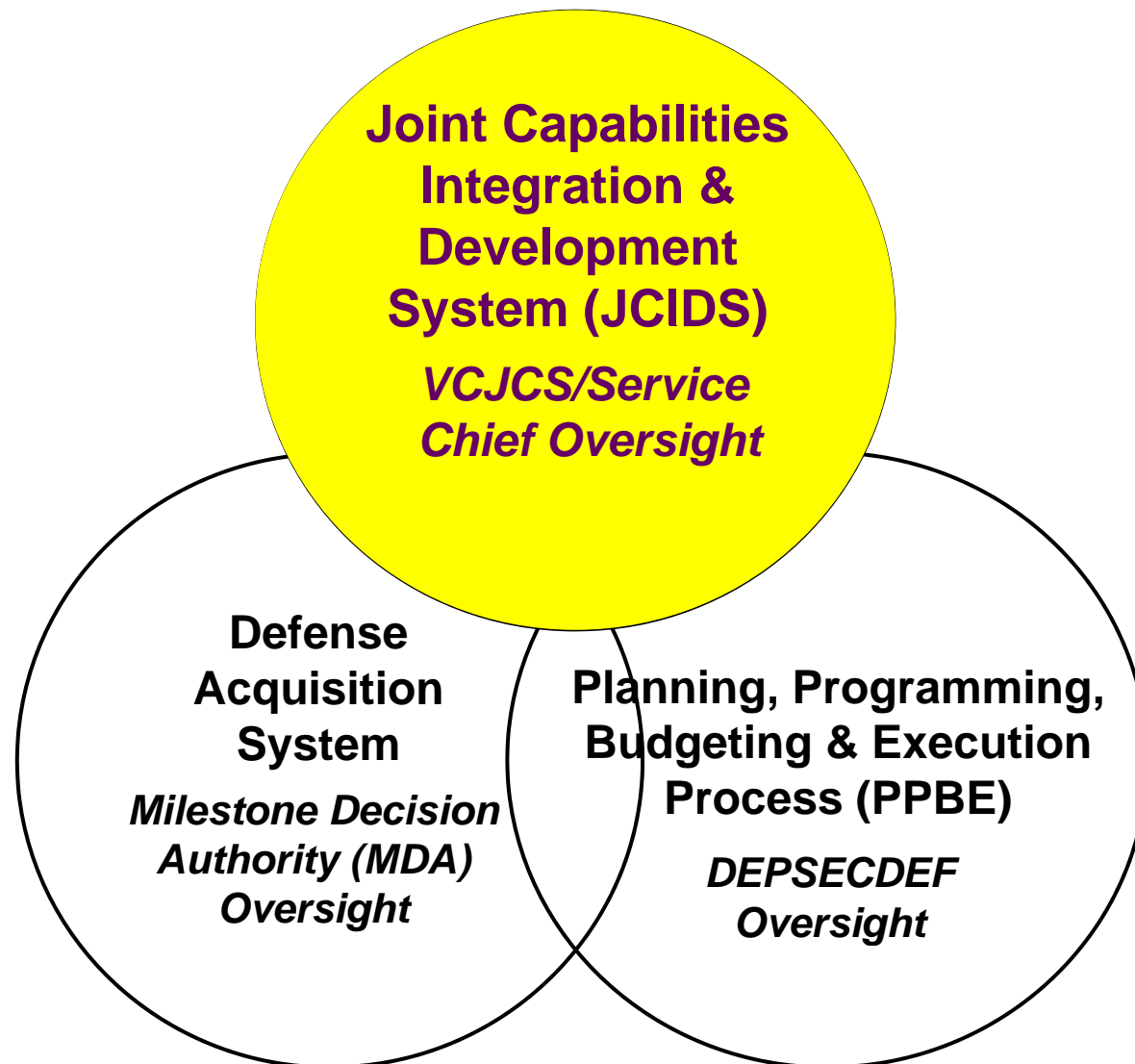
## Acquisition

- Policies overly prescriptive
- Acquisition environment did not foster efficiency, creativity and innovation
- Evolutionary Acquisition not well institutionalized

## PPBS

- Strategic planning process did not drive identification of needs for military capabilities
- Imposed fiscal discipline but did not integrate strategy into a coherent defense program

# Acquisition Decision Support Systems In Transformation



# US Capabilities-Based Planning

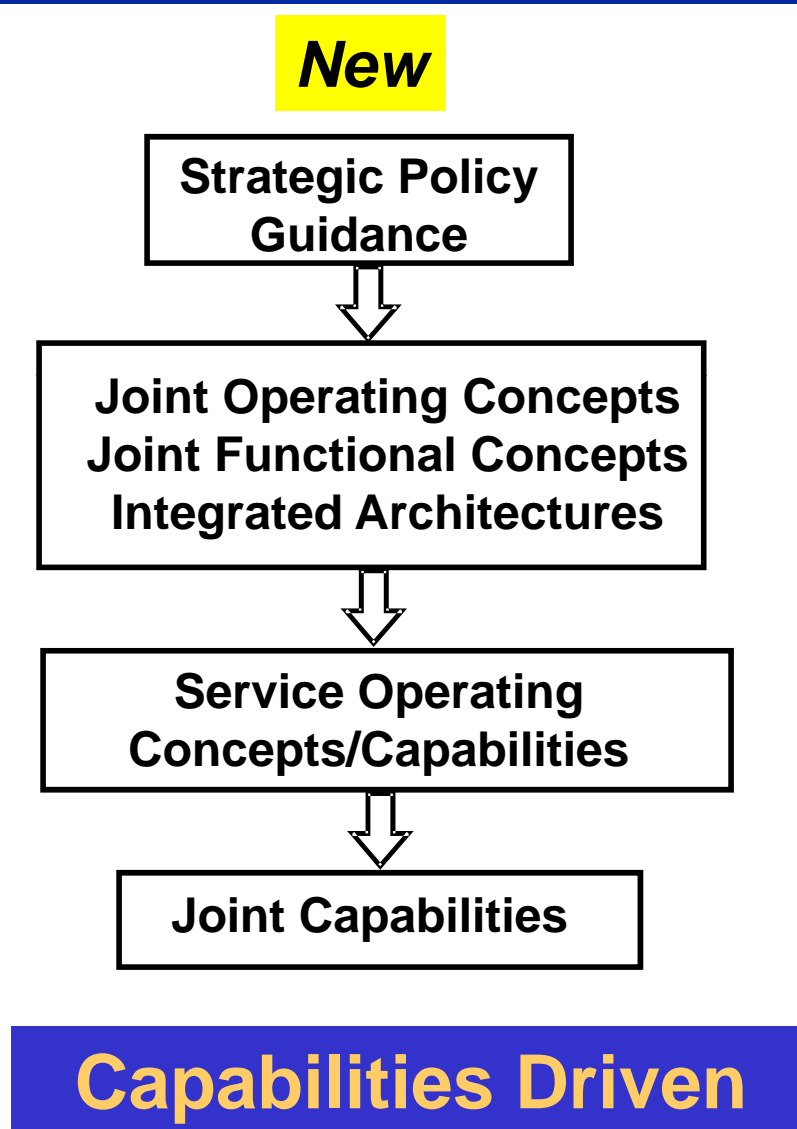
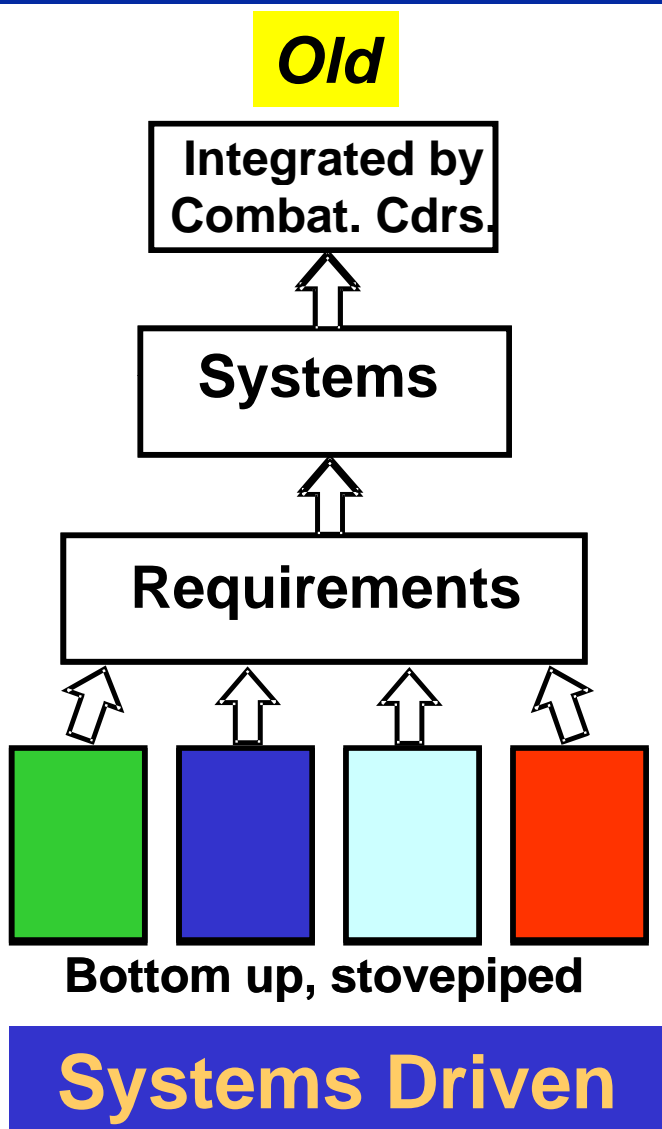


*“A central objective of the Quadrennial Defense Review was to shift the basis of defense planning from a “threat-based” model that has dominated thinking in the past, to a **“capabilities-based”** model for the future. This capabilities-based model focuses more on **how adversaries might fight**, rather than specifically whom the adversary might be or where a war might occur. It recognizes that it is not enough to plan for large conventional wars in distant theaters. **Instead the United States must identify the capabilities** required to deter and defeat adversaries who will rely on surprise, deception, and asymmetric warfare to achieve their objectives.”*

-- *Donald Rumsfeld, Secretary of Defense, Sept. 30<sup>th</sup>, 2001, Foreward to the Quadrennial Defense Review Report*



# New Process



# Current (How) vs Future (What) Perspectives



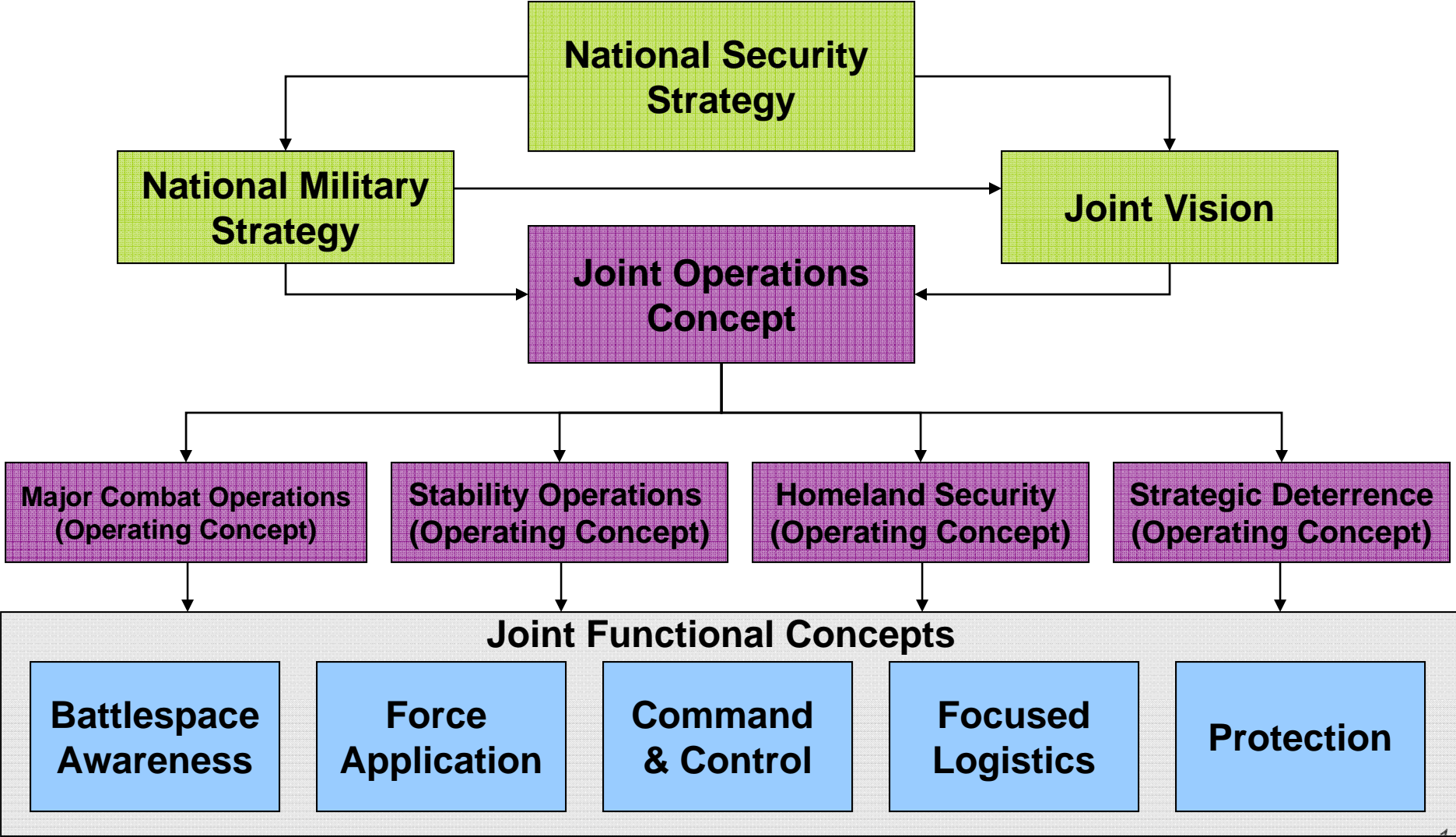
**Shoot** Target

Current dominant perspective

Shoot **Target**

Future model perspective

# Hierarchy of Joint Concepts



# Functional Concepts



## ***BATTLESPACE AWARENESS***

**Collect and analyze battlespace information**

## ***COMMAND AND CONTROL***

**Develop alternatives and disseminate orders**

## ***FORCE APPLICATION***

**Cause effects on the enemy**

## ***PROTECTION***

**Prevent an enemy's effect on us**

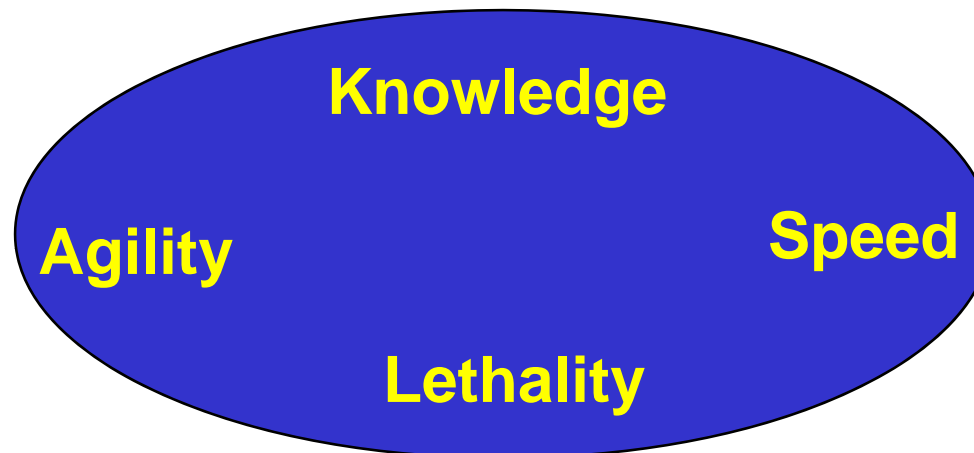
## ***FOCUSED LOGISTICS***

**Sustain and support the force**



# Transformation Technology Initiatives

- Transformation Attributes



- DDR&E Initiatives

- Surveillance and Knowledge Systems
- Energy and Power Technologies
- National Aerospace Initiative

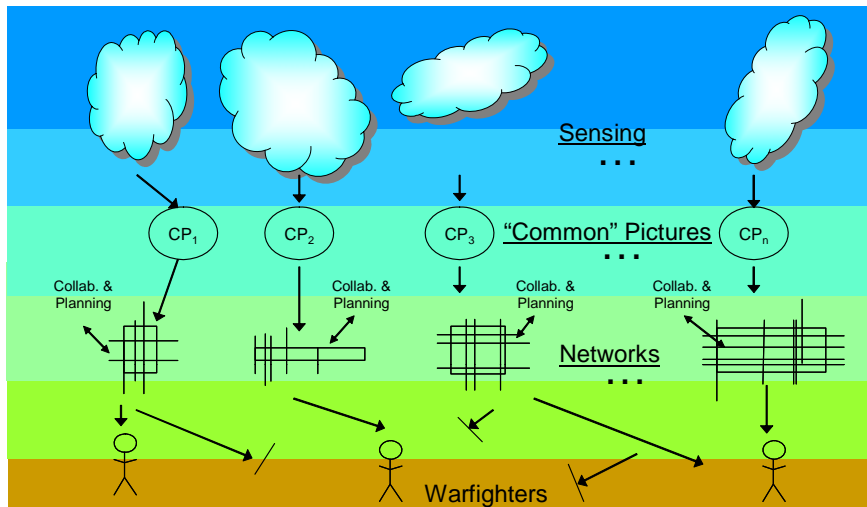
- Other Key Thrusts

- Objective Force (Army)
- Future Satellite Force (Air Force)
- Electric Ship (Navy)

**What Technologies Bring About Tomorrow's Operational Advantage?**

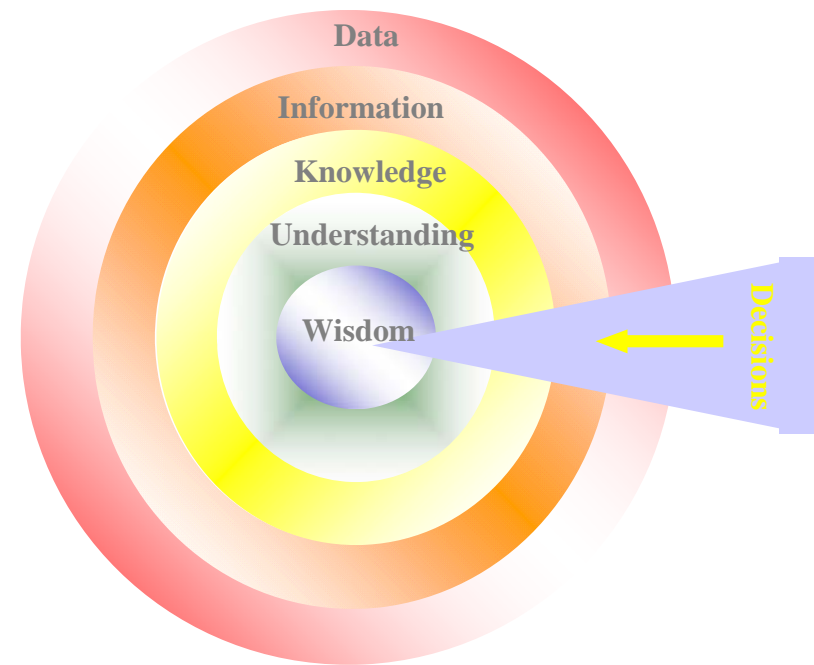
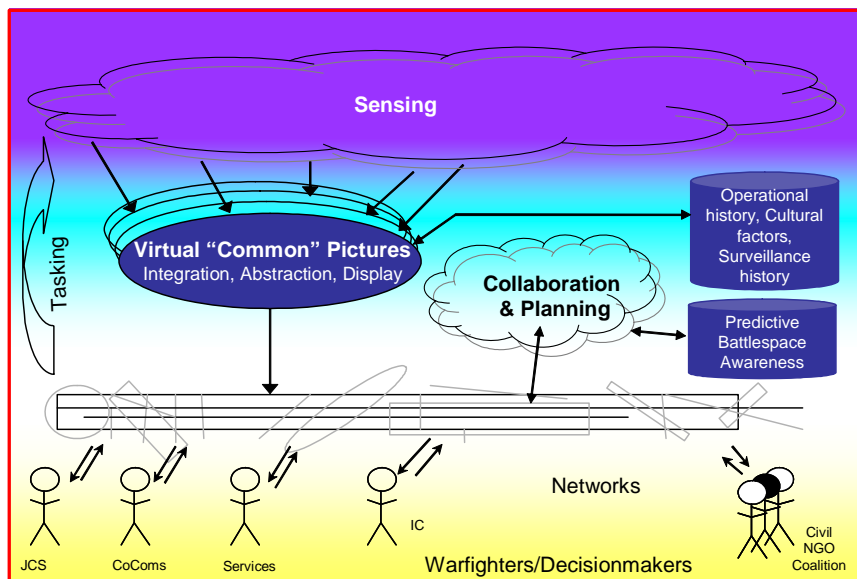
# Surveillance & Knowledge

## Enabling Integrated C4ISR



### Technology Foci

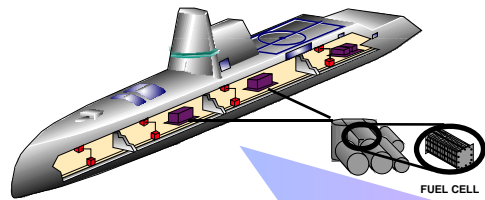
- Adaptive Networks
- Ubiquitous Sensors
- Decision Aids



# Power Technologies ...Pervasive & Enabling



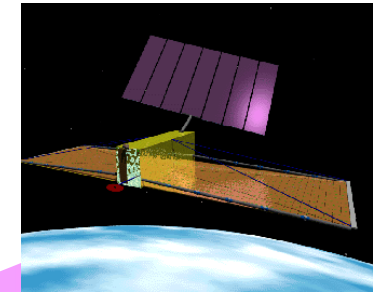
<b>POWER GENERATION</b>
<ul style="list-style-type: none"> <li>• Fuel Cells &amp; Fuel Reforming</li> <li>• Novel Power</li> </ul>
<b>ENERGY STORAGE</b>
<ul style="list-style-type: none"> <li>• Batteries</li> <li>• Capacitors</li> </ul>
<b>POWER CONTROL AND DISTRIBUTION</b>
<ul style="list-style-type: none"> <li>• Switching &amp; Conditioning</li> <li>• Power Transmission &amp; Distribution</li> <li>• Thermal Management</li> </ul>



*Electric Warship*

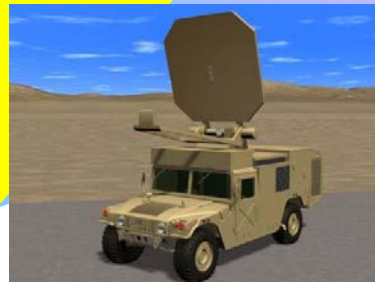


*More Electric Aircraft*

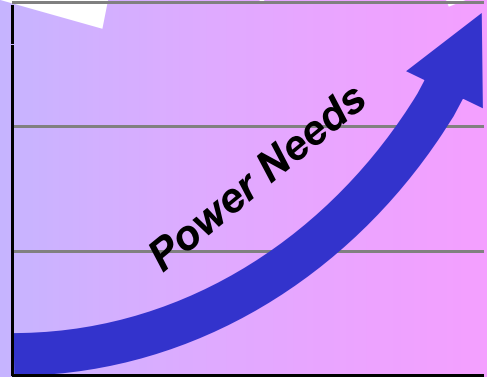
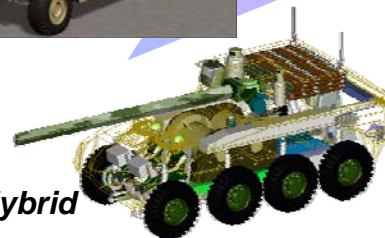


*Space Based Radar*

*High Power Microwave*

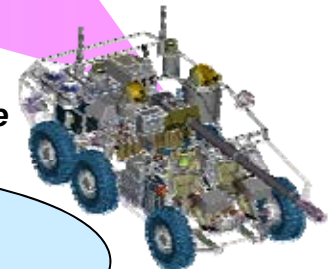


*Electric/Hybrid Weapons*



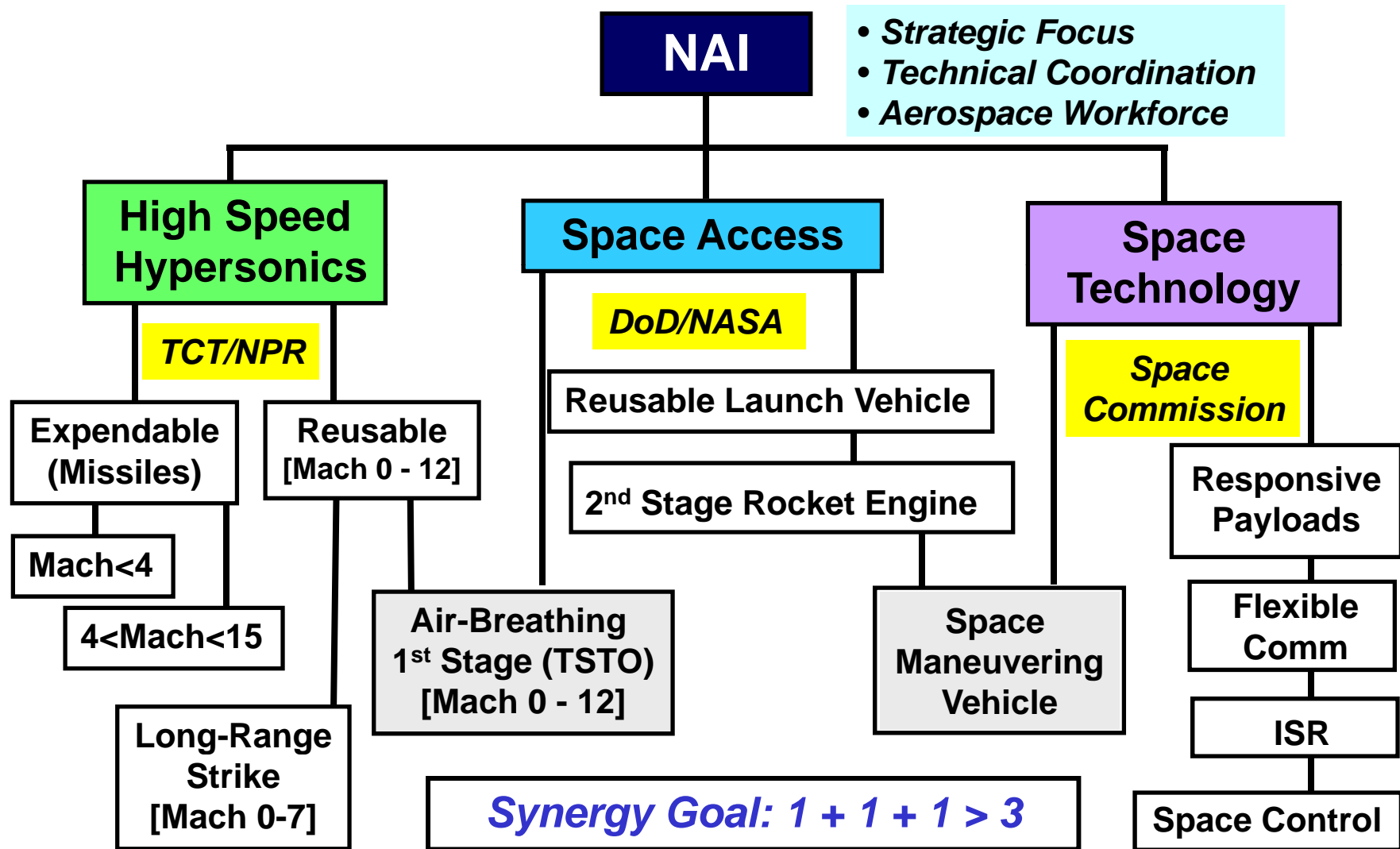
*Warrior*

*Hybrid/Electric Combat Vehicle*



**New Operational Capabilities**

# National Aerospace Initiative Technology Framework





# The Objective Force

## Today



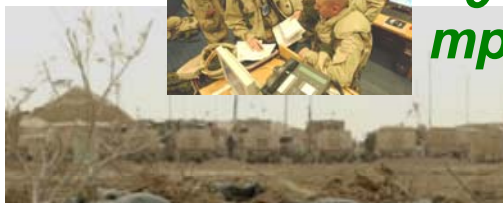
~100 lb.  
load



70+  
tons



0  
mph



*From Platforms to  
System of Systems*



*C-130-Like  
Transportability*

## Future Force

< 40 lb.  
effective  
load



*Fully networked*

< 20  
tons

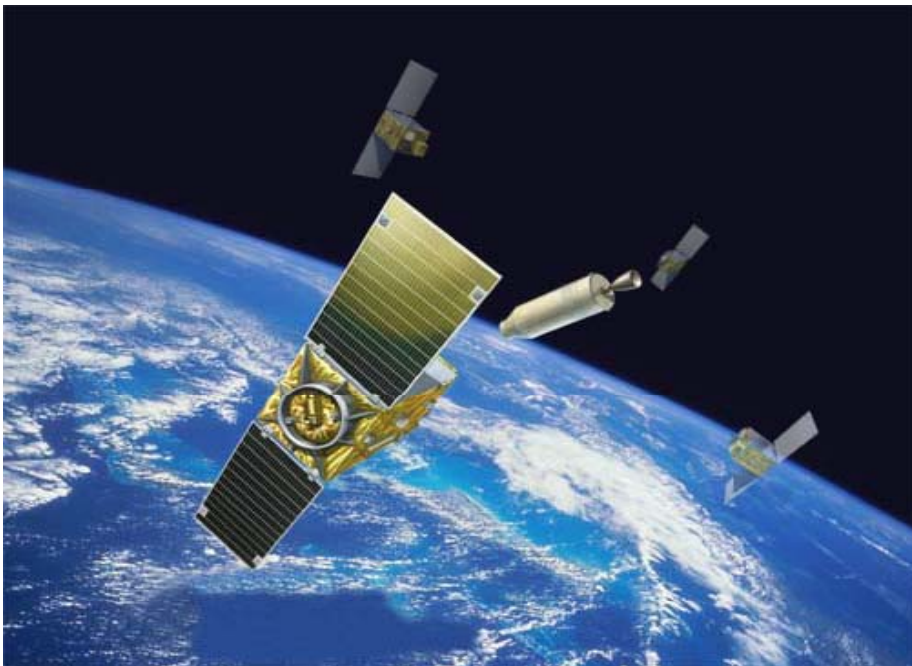


> 40  
mph



**Accelerating Transformational Capabilities**

# The Future Satellite Force



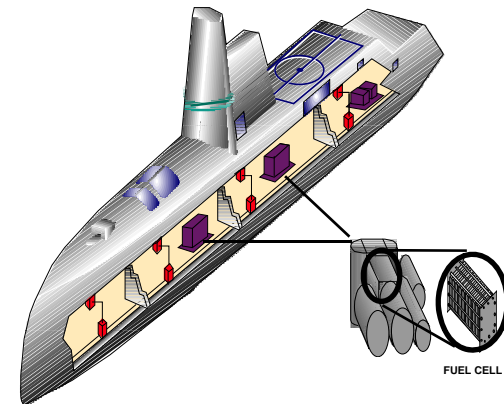
**The XSS-11 Small Sat**

- **First demonstration of a fully autonomous satellite designed for orbital navigation around another resident space object (RSO)**
- **Demonstrates:**
  - Software logic and algorithms to safely rendezvous, navigate around, and inspect an RSO
  - Revolutionary mission planning and operation tools
  - Collision avoidance — space situational awareness

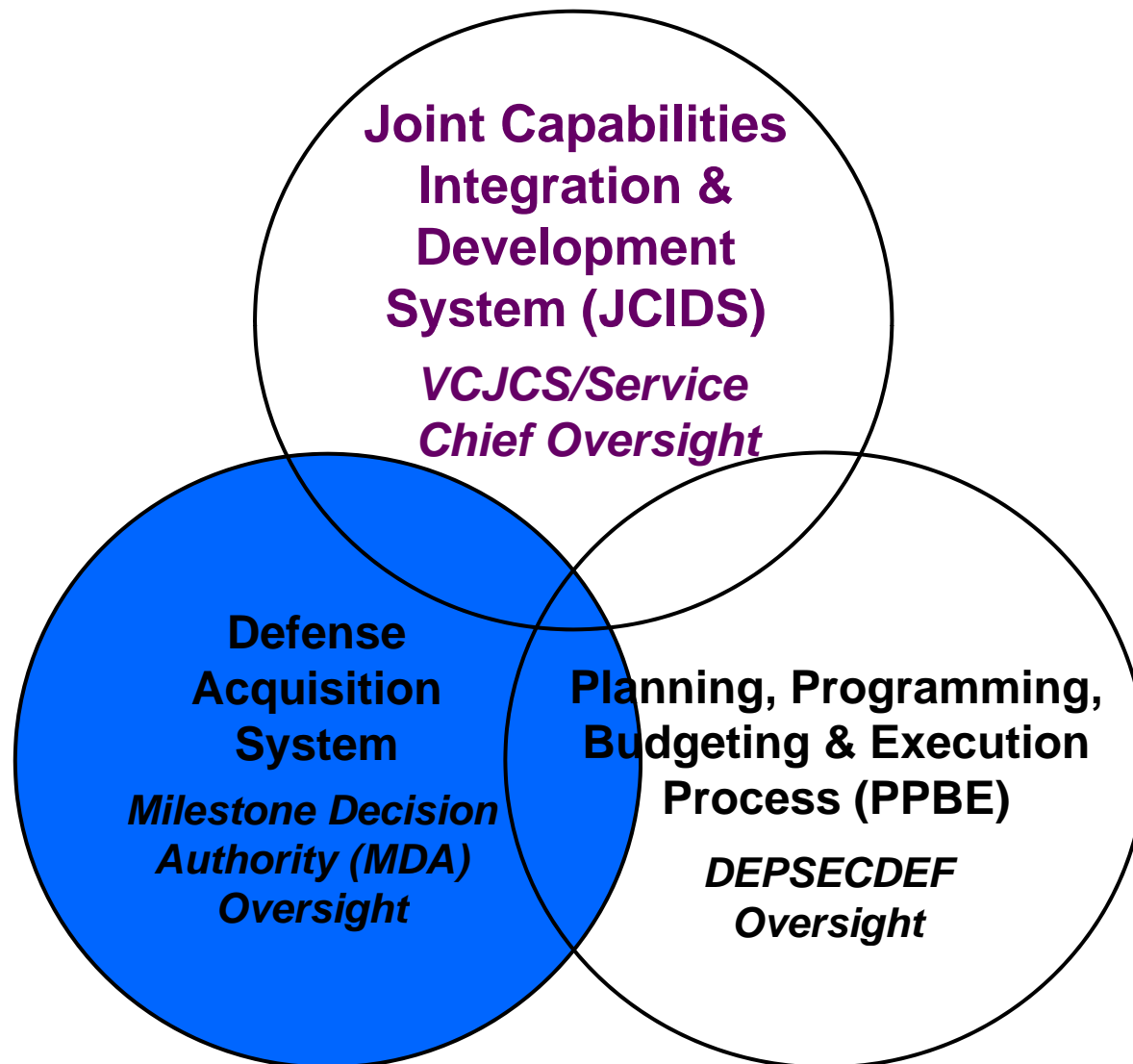
# The Electric Navy



- **Enables Transformational Weapons Systems**
  - Electromagnetic Guns
  - Shipboard Laser Systems
  - Adv. High Powered Sensors
- **Improves Survivability**
  - Rapid and anticipatory reconfiguration of power and systems
- **Reduces Noise**
  - Eliminates propulsion gear noise
  - Enables lower speed propellers
  - Enables silent watch capabilities
- **Reduces Life Cycle Costs**
  - Reduction in Number of Prime Movers
  - Significantly Greater Fuel Efficiencies
  - Eliminate high maintenance hydraulic systems



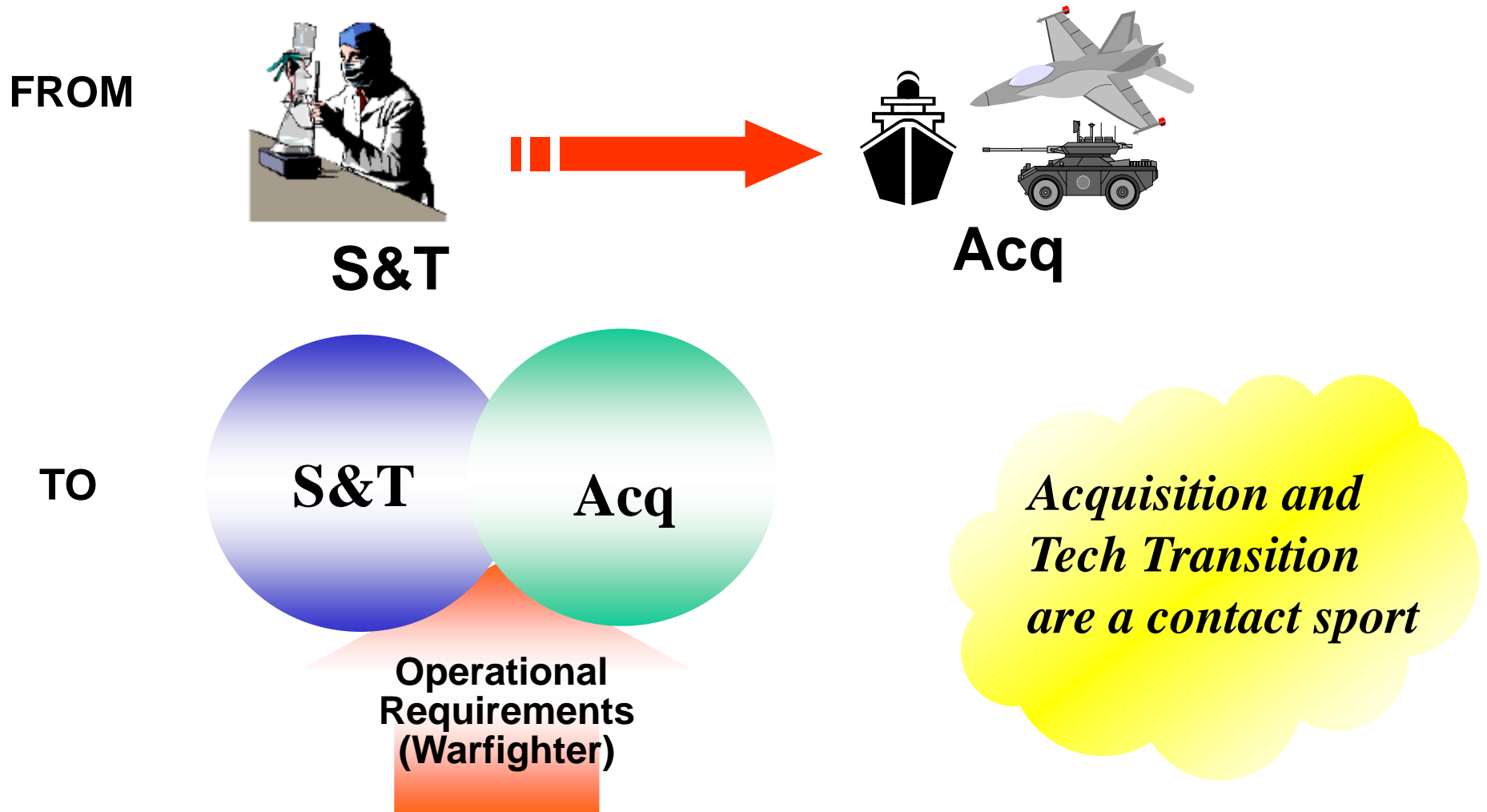
# Acquisition Decision Support Systems In Transformation



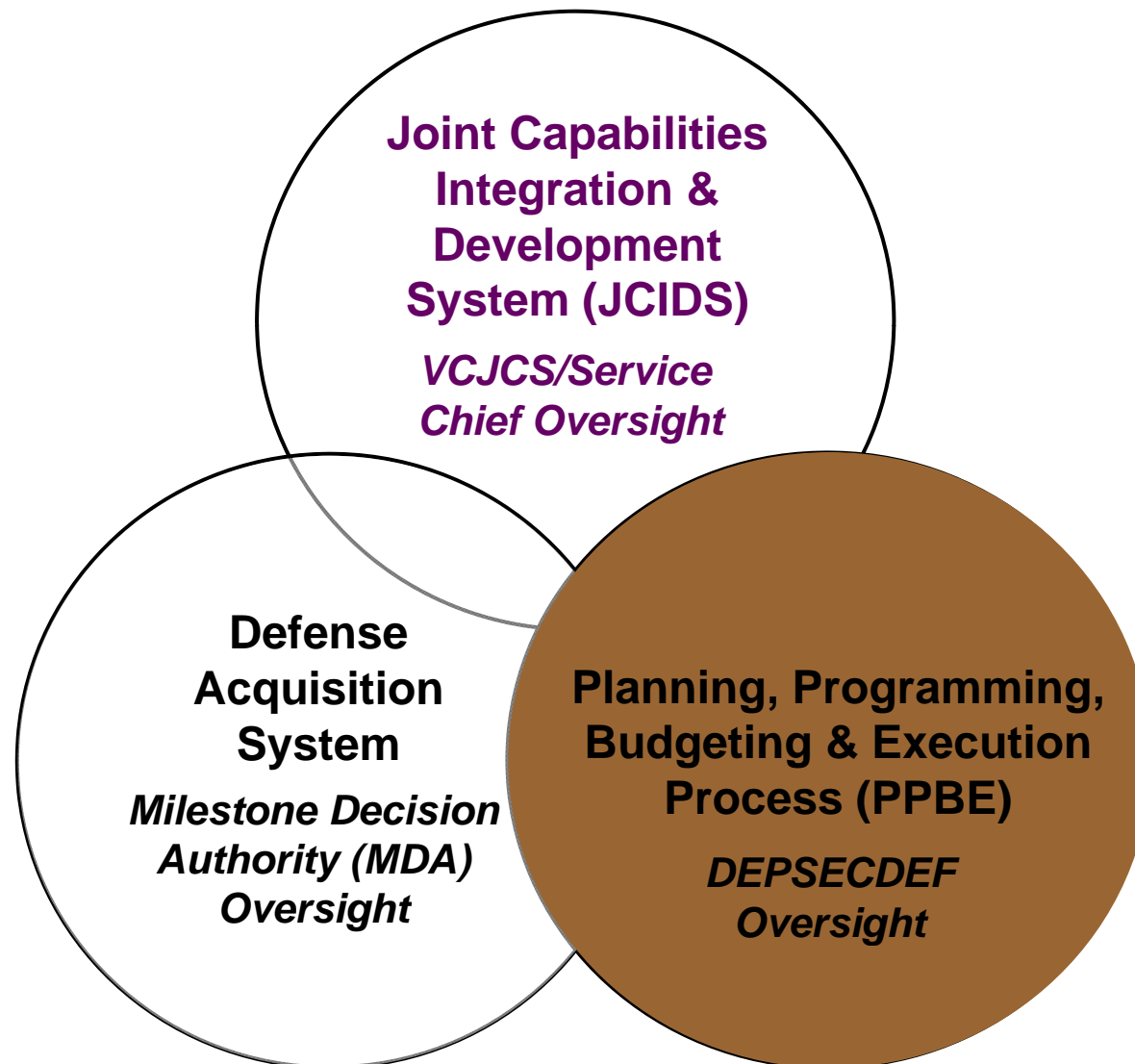
# Acquisition Model Evolution



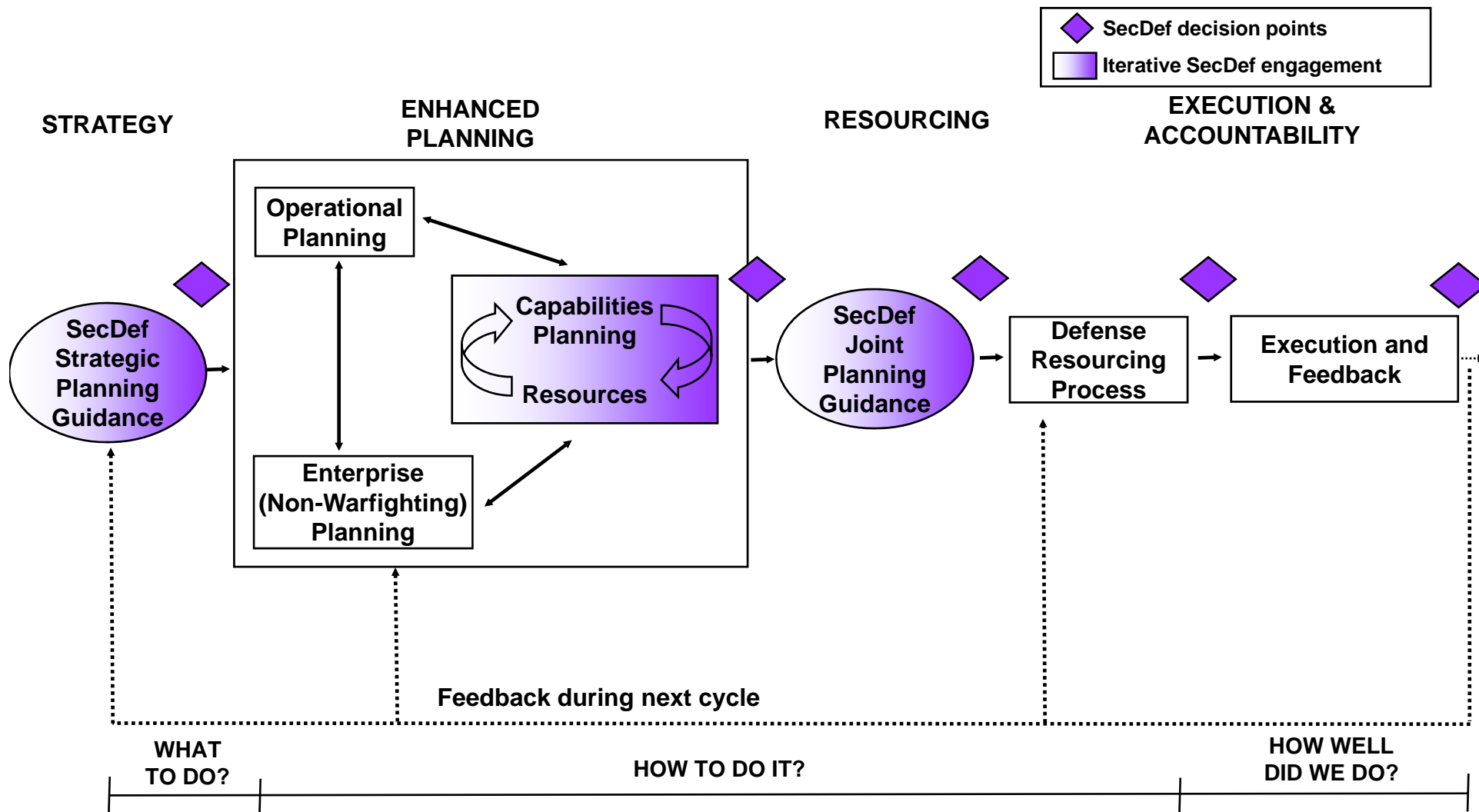
All Services are moving their acquisition processes



# Acquisition Decision Support Systems In Transformation



# The “End State” Process – What’s Needed



# Management Initiative Decision (MID) 913

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## **May 2003: Replaced old PPBE with new PPBE**

- **Move to a two-year cycle**
- **Enhanced Planning Process: Strategic Planning Guidance (SPG) and Joint Programming Guidance (JPG) replace DPG**
- **Off-year SPG/DPG is optional (at the discretion of SECDEF)**
  - **Will not introduce major changes in off-year**
- **Off-year review focus on execution and performance**
- **Incorporate metrics and cost models**
  - **Focus on outputs: what are we getting for our money?**
- **Over time, metrics will become the analytical underpinning to ascertain whether the appropriate allocation of resources exists**

# Major Components of New Process

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- **Program Change Proposal (PCP) = Big Ticket Items**
- **Budget Change Proposal (BCP) = Small Adjustments**
- **Two year cycle:**
  - **Even Years: Budget completely revised**
  - **Odd Years: Budget changes tend to be small, “fact of life”**

# **FY 2005 – 2009 Program / Budget Schedule**

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- **Aug**            **PCPs due to OSD (PA&E)**
- **Aug**            **PCP Dispositions issued**
- **Sep**            **Detailed info submitted for accepted PCPs**
- **Oct**            **BCPs due to OSD (Comptroller)**
- **Nov**            **PDM issued**
- **Nov**            **1st Round PBDs completed**
- **Nov**            **Top line guidance from OMB**
- **Dec**            **Major Budget Issues**
- **Dec**            **Final FY 2005 Budget Decisions**
- **Dec**            **FY 2005 President's Budget Lock**
- **Jan/Feb**        **Lessons Learned**

# Summary



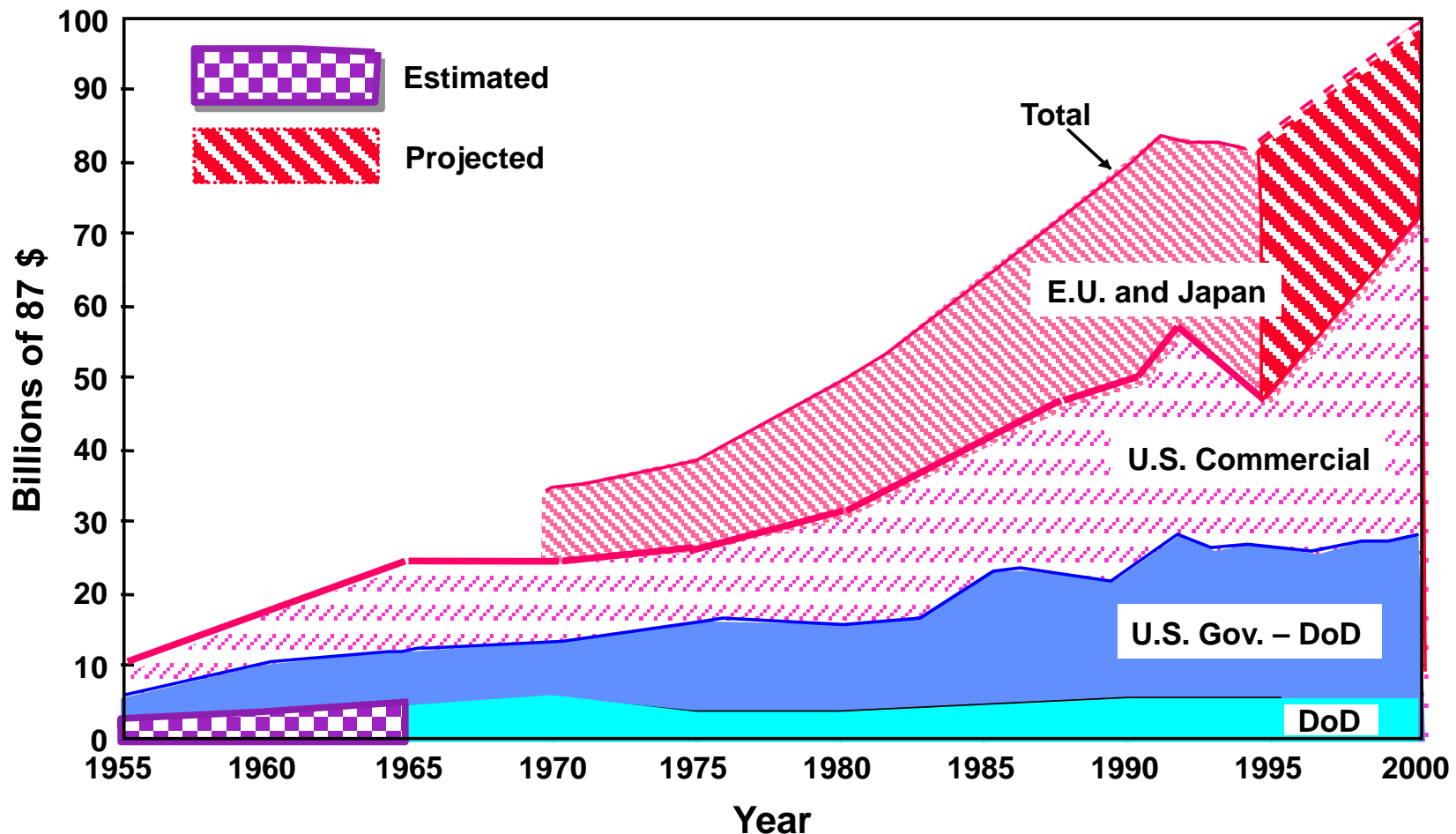
- **SecDef direction to “transform” the DoD is on track**
  - Transformation implies more substantive change
  - Larger change is aided by budget stability
- **DoD business practices are evolving on three primary axes simultaneously**
  - JCIDS
  - Acquisition
  - PPBE
- **Current (FY05) DoD program reflects transformation; New PPBE system tries to preserve it!**



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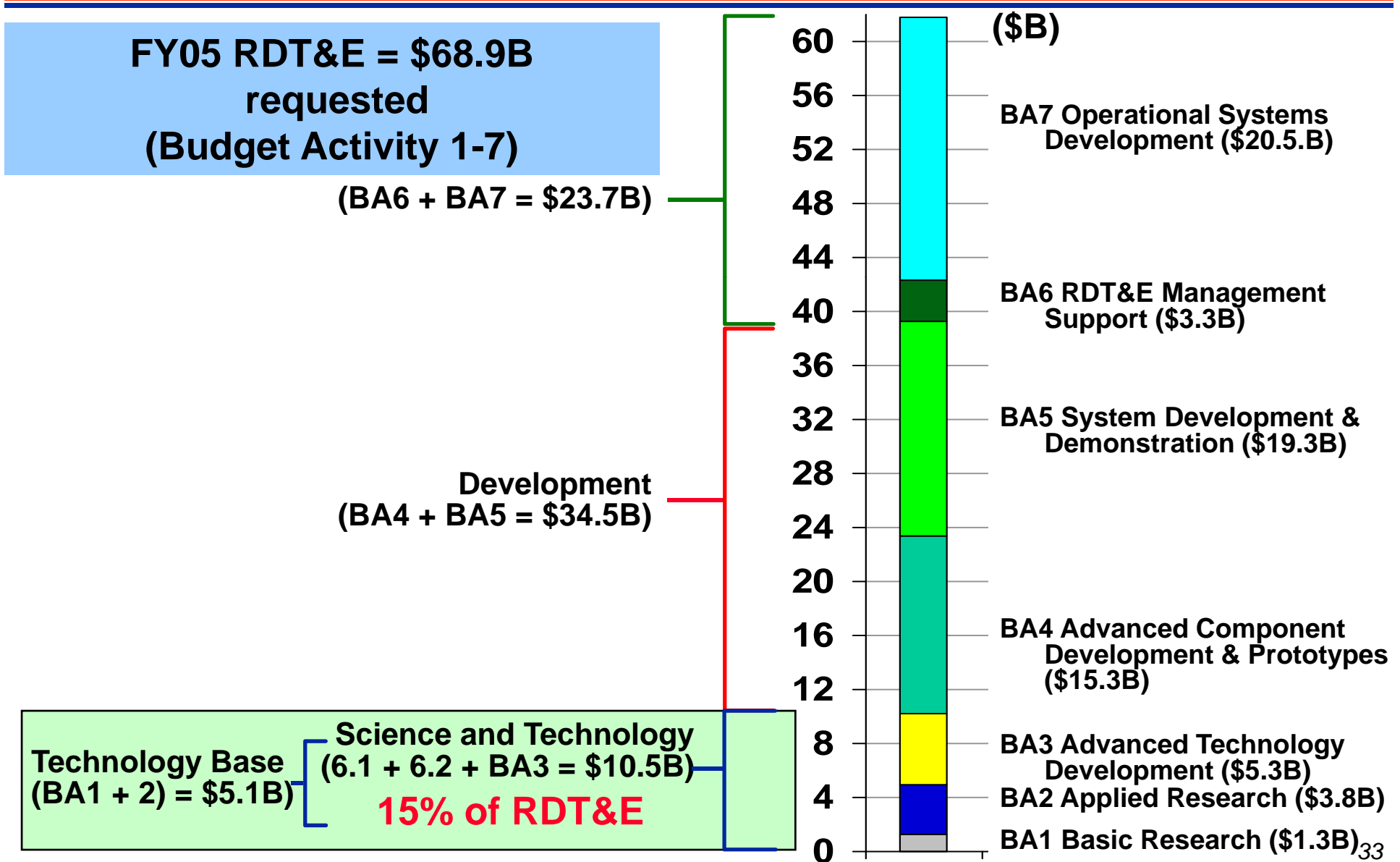
# Backup Slides

# Worldwide Research Base is Growing

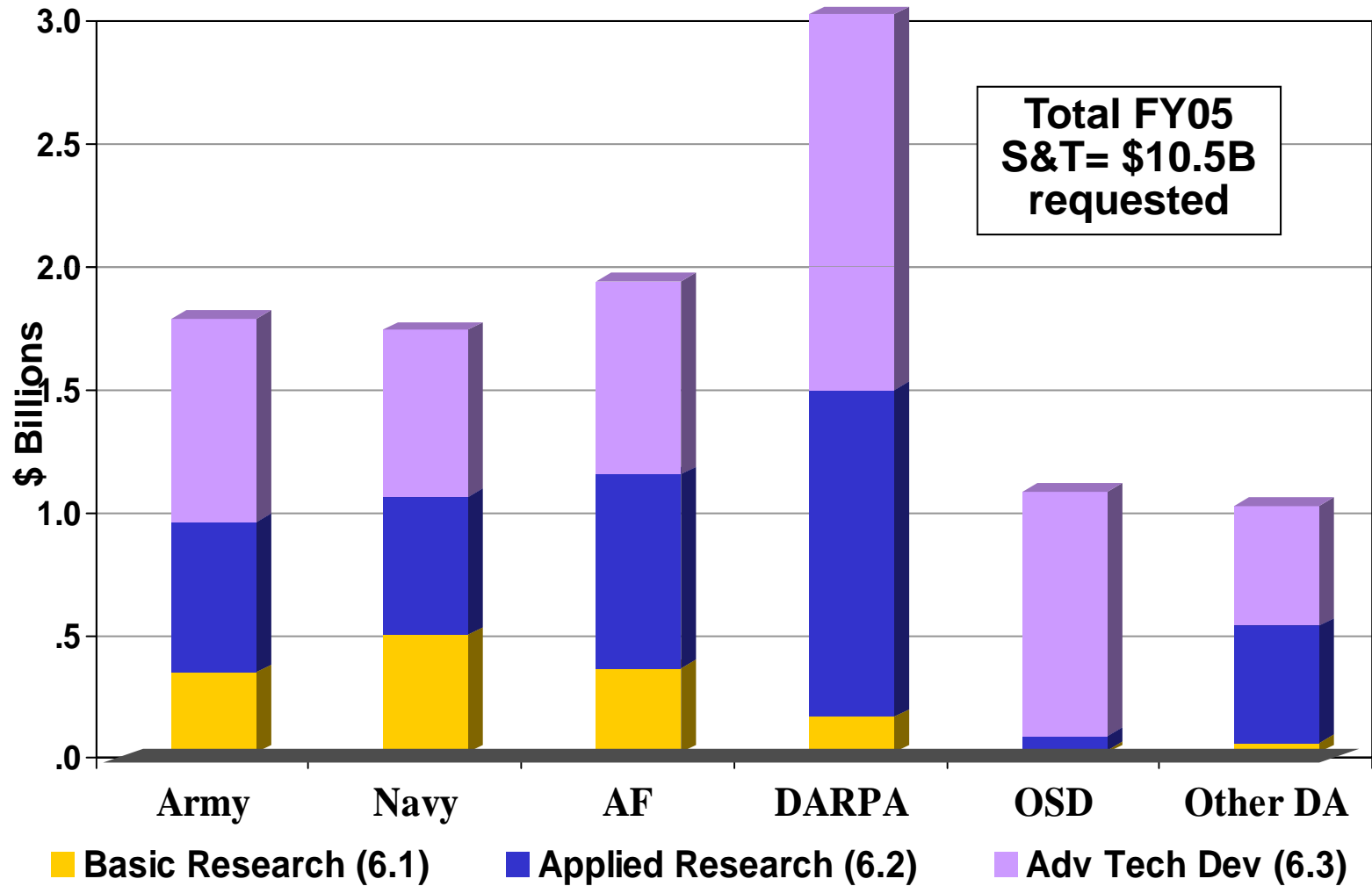


Source: Report of the Defense Science Board Task Force on the Technology Capabilities of Non-DoD Providers; June 2000; Data provided by the Organization for Economic Cooperation and Development & National Science Foundation

# FY05 RDT&E Budget Request



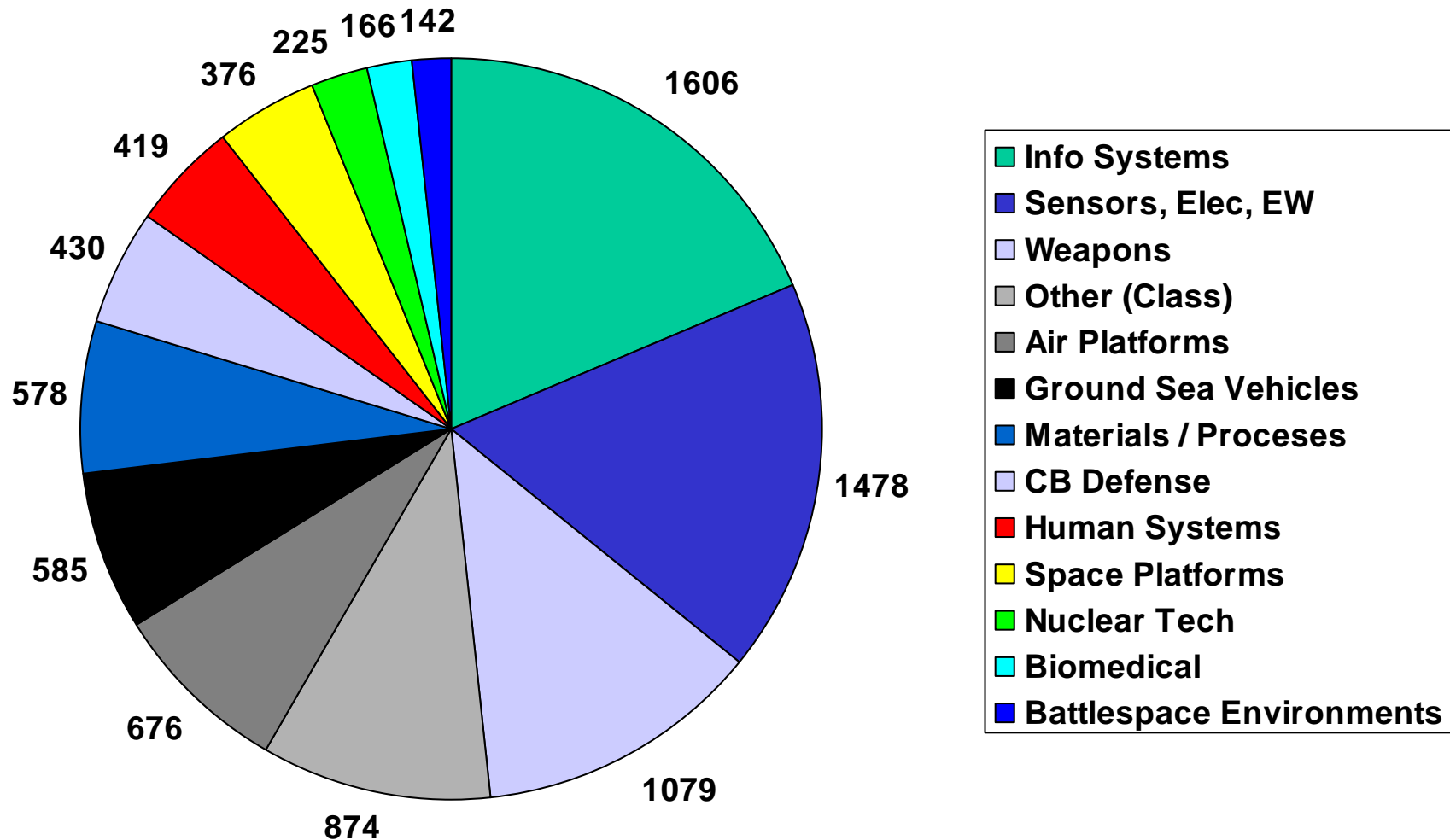
# FY05 Budget Request DoD S&T



# FY05 PBR



-- "Reliance Funding" by Technical Capability Area--



# Definition of Transformation

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**“The Evolution and Deployment of Combat Capabilities  
That Provide Revolutionary or Asymmetric  
Advantages to Our Forces”**

**- QDR (Sep 30, 2001)**

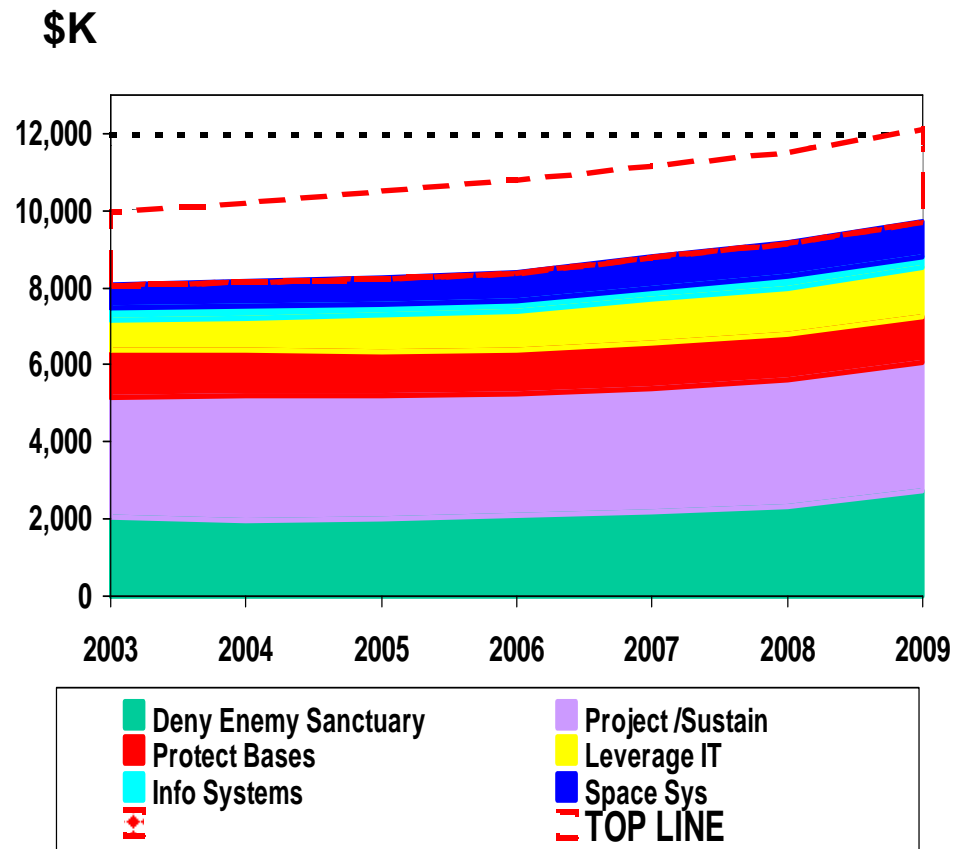


# S&T Program Characterized By Quadrennial Defense Review Goals



- At Project Level, about 79% of total DoD S&T program is invested in QDR Goals
- The remaining 21% includes:
  - Basic Research (~\$1.3B)
    - Key Transformation enabler
  - Environmental Programs (~\$50M)
  - Enabling Technologies
    - Electronics
    - Materials, etc.
  - Joint Experimentation (~\$175M)
  - Classified Programs (~\$800M)

## Investment in QDR Transformational Operational Goals



# FY 2004-2009 Defense Planning Guidance

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- **“The Department’s current planning, programming, budgeting and acquisition systems are rigid, unresponsive and ill-suited for a dynamic and uncertain security environment.**
- **DoD needs to streamline and integrate PPBS and the major acquisition and requirements processes with particular attention paid to those areas where technological change occurs most rapidly.”**
- **Tasked the Senior Executive Council to provide a systematic approach for replacing these processes**

# Old Process: Annual, Consecutive-Phase PPBS

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- **FY 02-07 POM and prior:**
  - Defense Planning Guidance (DPG) (Apr)
  - Programming (POM Development) (Jan – Sep)
  - Budgeting (BES Development / Review) (May – Dec)
  - Submission of President’s Budget (Feb)
  - Congressional Review of Budget Request (Feb – Sep)
  - Congressional Authorization and Appropriation
  - Execution of Budget Authority
    - Commit, obligate, expend, and outlay funds

# Defense Planning Corresponding to Four-Year Presidential Terms

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## **Year 1 (Review and Refinement):**

Early National Security Strategy (NSS)

Off-year SPG/JPG as required (at discretion of SECDEF)

Limited Changes to Baseline Program

## **Year 2 (Formalize the Agenda):**

Quadrennial Defense Review (QDR)

– Aligned with PB submission in second year of an administration

Fiscal Guidance Issued

On-year SPG/JPG (implementing QDR)

POM/BES Submissions

## **Year 3 (Execution of Guidance):**

Off-year SPG/JPG as required (at discretion of SECDEF)

Limited Changes to Baseline Program

## **Year 4 (Ensuring the Legacy):**

Fiscal Guidance Issued

On-year SPG/JPG (refining alignment of strategy and programs)

POM/BES Submissions

# Planning, Programming, Budgeting and Execution

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- **Primary Resource Management System for DoD:**
  - Articulates strategy
  - Identifies size, structure and equipment for military forces
  - Sets programming priorities
  - Allocates resources
  - **Evaluates actual output against planned performance and adjusts resources as appropriate**

# Planning, Programming, Budgeting and Execution Phases



- **Planning**
  - Assess capabilities / review threat
  - Develop resource informed guidance
- **Programming**
  - Turn guidance into achievable, affordable packages
  - Six-year program (Future Years Defense Program)
- **Budgeting**
  - Assess for efficient funds execution
  - Scrub budget years
  - Prepare defensible budget
- **Execution Review (incorporated in program/budget review)**
  - Develop performance metrics
  - Assess actual output against planned performance
  - Adjust resources to achieve desired performance goals

# DepSecDef Direction for FY 2005 - 2009 Submission

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- **No DPG-05**
  - Components comply with DPG-04 and PDM direction
- **No FY05-09 Program Objective Memorandum (POM) or Budget Estimate Submission (BES) submittal to OSD**
- **Components instead submit Program Change Proposals (PCPs) or Budget Change Proposals (BCPs)**
  - Both BCPs and PCPs will be cost neutral (offsets required)
  - PCPs resolved thru Program Decision Memorandums (PDMs)
  - BCPs resolved thru Program Budget Decisions (PBDs)

# Program Change Proposals (PCPs)



- **Identify areas to take additional risk (offsets)**
  - Offsets may be used for other initiatives
- **Limited to items that exceed \$250 million across FYDP**
  - Threshold at individual programmatic issue level
  - May address smaller issues if serious programmatic problem
  - If less than \$250 million, may submit as BCP if budget year is affected
- **Must comply with PDM decisions**
- **Combatant Commanders may submit up to six prioritized PCPs regardless of dollar value**
- **Full budgetary data submitted for accepted PCPs**

# Budget Change Proposals (BCPs)

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- **Generally limited to fact-of-life changes:**
  - Cost increases
  - Schedule delays
  - Management reform savings
  - Workload changes
  - Budget execution experience
  - Congressional action
- **May involve FYDP years if total cost is less than \$250 million and budget year is affected**
- **Offsets required**
- **Backed up with appropriate budget exhibits**

# Functional Concepts Portfolios



## BATTLESPACE AWARENESS

- All source intelligence collection
- Environmental data collection
- Predictive analysis
- Knowledge management
- Own force information collection

The Goal: Sense,  
Orient and Predict the  
Battlespace to Decrease  
Time to Act

*“Before Real Time  
Knowledge of the  
Battlespace”*

# Functional Concepts Portfolios



## COMMAND AND CONTROL

- Common operational picture
- Joint force command and control
- Communications and computer environment

The Goal: Integrated  
Information Systems  
of Systems

*“Common Knowledge  
Through All Echelons”*

# Functional Concepts Portfolios



## **FORCE APPLICATION**

- Land Operations
- Maritime Operations
- Air Operations
- Space Operations
- Joint Targeting
- Conventional Attack
- Nuclear Attack
- Military Deception
- Computer Network Attack
- Electronic Attack
- Psychological Operations
- Special Operations
- Special Operations
- Joint Fire Support
- Suppression of Enemy Air Defense

The Goal: Apply Superior  
Military Force from all  
Potential Platforms

***“Multiple Force Application  
Options For Commanders”***

# Functional Concepts Portfolios



## PROTECTION

- Personnel and Infrastructure Protection
- Computer Network Defense
- Counter-proliferation
- Non-proliferation
- Consequence Management

The Goal: Protect  
US Forces and Facilities  
From all Forms of  
Potential Attack

*“Total Asset Protection  
Against All Potential Threats”*

# Functional Concepts Portfolios



## **FOCUSED LOGISTICS**

- **Deployment  
Distribution**
- **Sustain**
- **Medical**
- **Mobility**
- **Logistics C2**

**The Goal: Deploy and  
Sustain US Forces  
Worldwide**

***“Total Asset Visibility”***

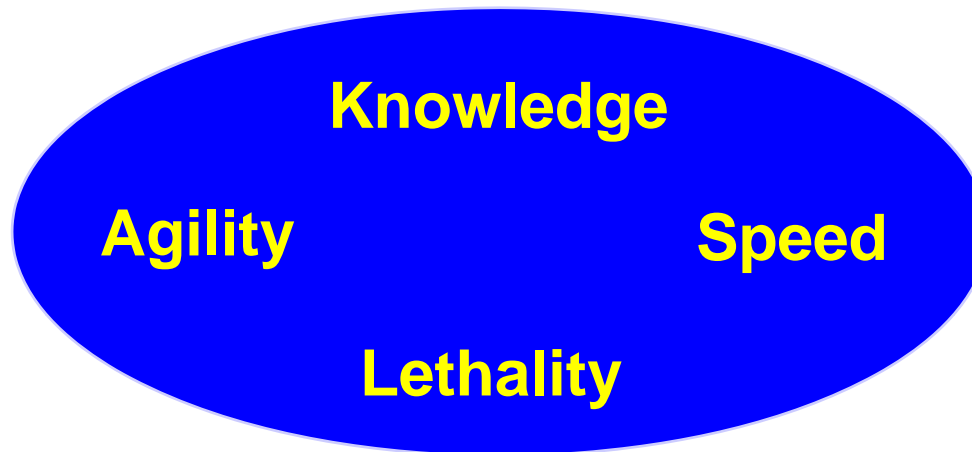
# Projects Mapped to FCBs



	Battlespace Awareness	Command & Control	Force Application	Focused Logistics	Force Protection
NAI	★ ★		★ ★		
SKS	★ ★	★ ★	★ ★		★ ★
EPT		★ ★		★ ★	★ ★
FCS					

# Technology and Transformation

## Transformational Attributes



- Transformation Occurs With Leaps In Capabilities:
  - Manhattan Project—Lethality
  - Reconnaissance Satellites—Knowledge
  - Stealth—Agility
  - Ballistic Missiles—Speed

**What Technologies Bring About Tomorrow's Operational Advantage?**

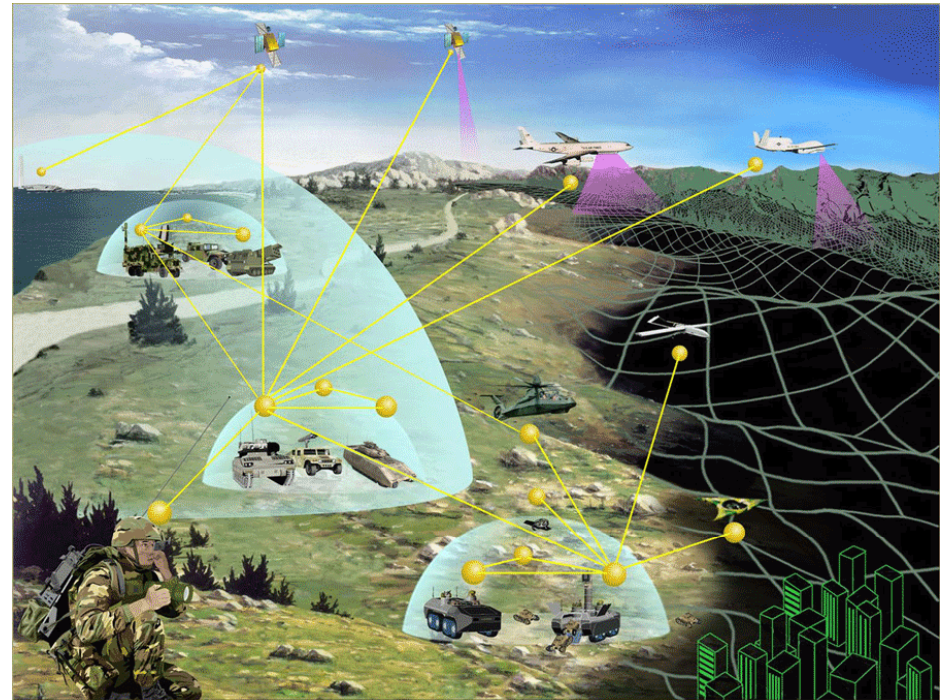
# Future Combat Systems

## S&T Investments to Enable the Future Force



### Description

- A system of multi-functional systems enabling soldiers to operate as a integrated, distributed, networked force
- The major fighting system in the Unit of Action—strategically responsive, lightweight, lethal, survivable, with its sustaining combat support force



### Major Goals

- Implement the “power of the net” to achieve commander-centric operations providing decision superiority in all battlefield functions from Finding the Enemy to Decisive Defeat—through overwhelming speed of maneuver and precision fires with minimum logistics demands.
- Provides line of sight & non-line of sight fires, troop transport in a networked system of systems