



***Department of Defense  
Science and Technology***

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Office of the Deputy Under Secretary of Defense  
(Science & Technology)**

# ***Defense Science and Technology***

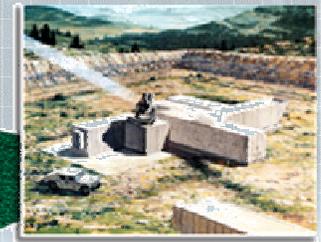
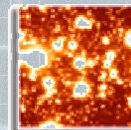
## ***Mission***

**. . . to ensure that the warfighters today and tomorrow have superior and affordable technology to support their missions, and to give them revolutionary war-winning capabilities.**

**Office of the Deputy Under Secretary of Defense for Science and Technology**

# Revolutionary Advances

**Adaptive Optics  
and Lasers**



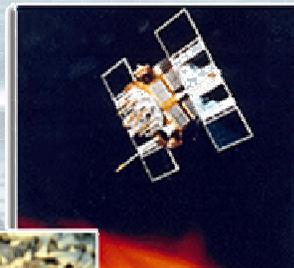
**Stealth**



**Night Vision**



**GPS**



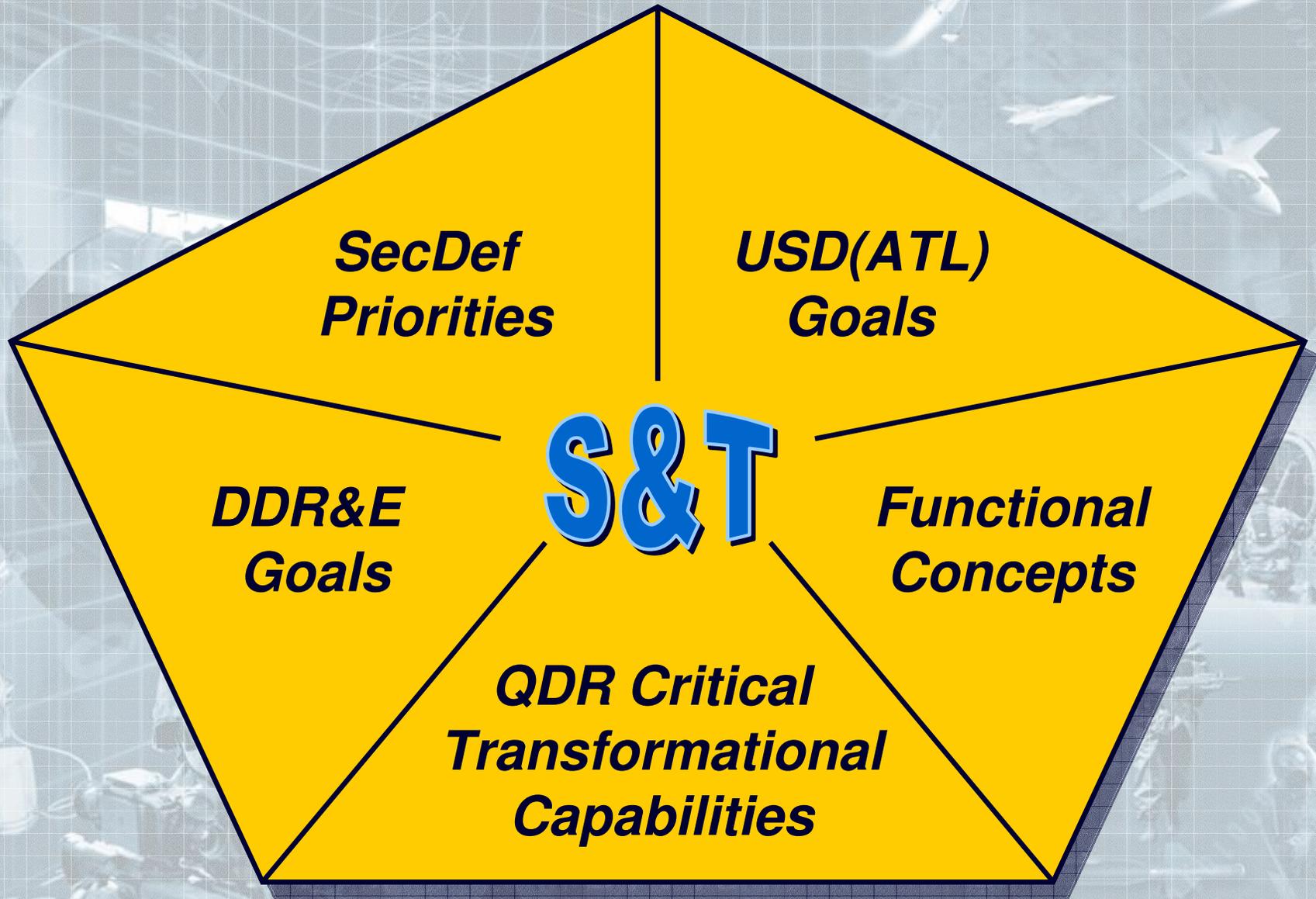
**Phased Array Radar**



# ***The Uncertain Future -- Hard Problems***

- **How do we protect our forces in the face of weapons proliferation - WMD, missiles?**
- **How do we fight in cities?**
- **How do we transport our forces more rapidly?**
- **What is a proper mix of heavy vs. light forces?**
- **What type of weapons do we develop?**
- **What will be DoD's role in Homeland Security?**
- **How do we protect our information management systems and infrastructure?**

# ***S&T Alignment***



# S&T Alignment

## ***SecDef Priorities***

- Successfully pursue the War on Terrorism
- Strengthen joint warfighting capabilities
- Transform the Joint Force
- Optimize intelligence capabilities
- Counter the proliferation of WMD
- Improve force manning
- New concepts of Global Engagement
- Homeland defense

## ***USD(ATL) Goals***

- Acquisition excellence with integrity
- Logistics integrated and efficient
- Systems integration and engineering for mission success
- Technology Dominance
- Resources Rationalized
- Industrial Base Strengthened
- Motivated, agile workforce

## ***DDR&E Goals***

- Integrate DoD S&T and focus on Transformation
- Enhance Technology Transition
- Expand outreach to Combatant Commands and Intelligence Community
- Accelerate support to the War on Terrorism
- Address S&E workforce

**S&T**

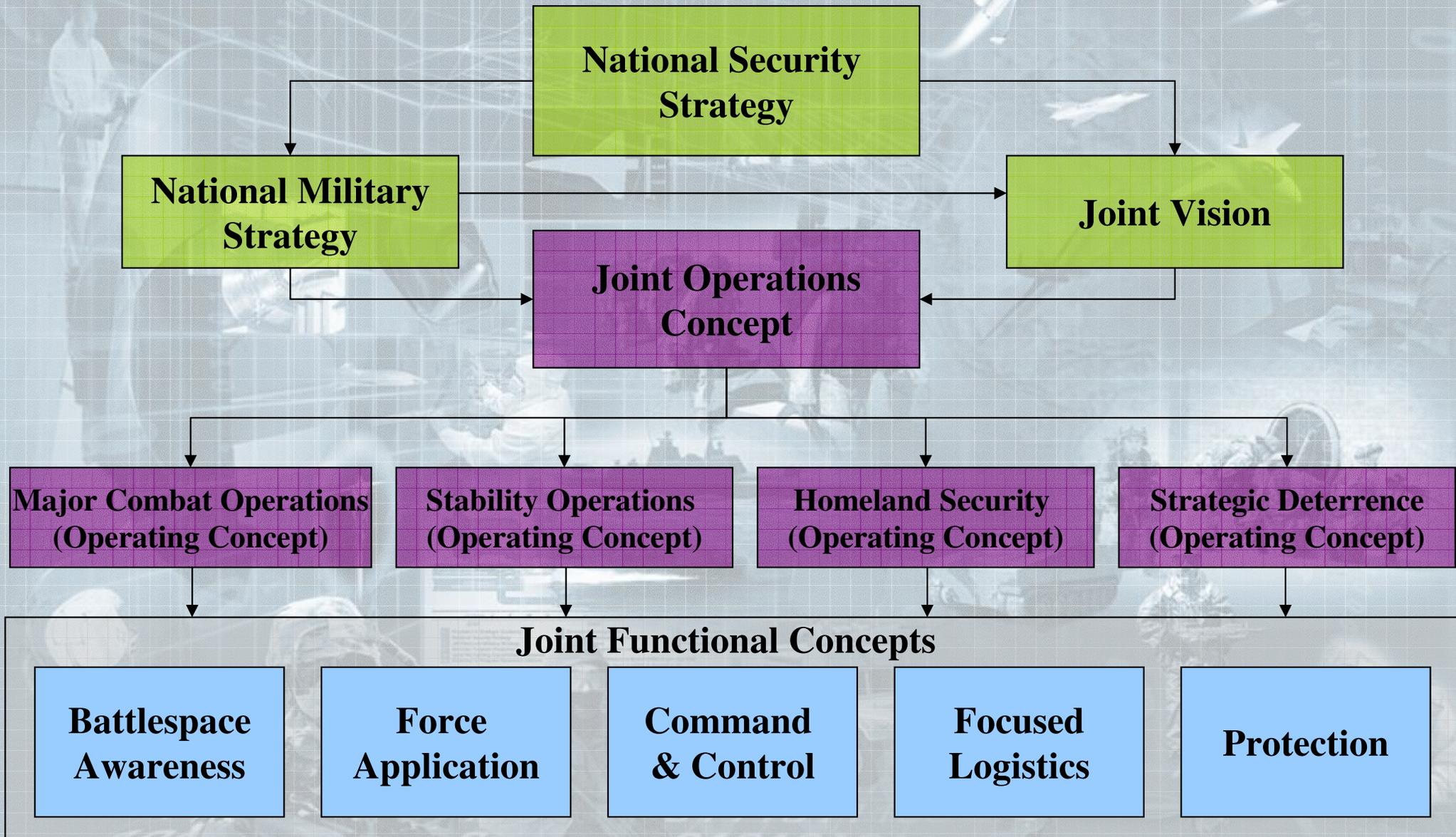
## ***QDR Critical Transformational Capabilities***

- Protect Bases of Operations
- Conduct Information Operations
- Project and Sustain US Forces
- Deny Enemy Sanctuary
- Conduct Space Operations
- Leverage Information Technologies

## ***Functional Concepts***

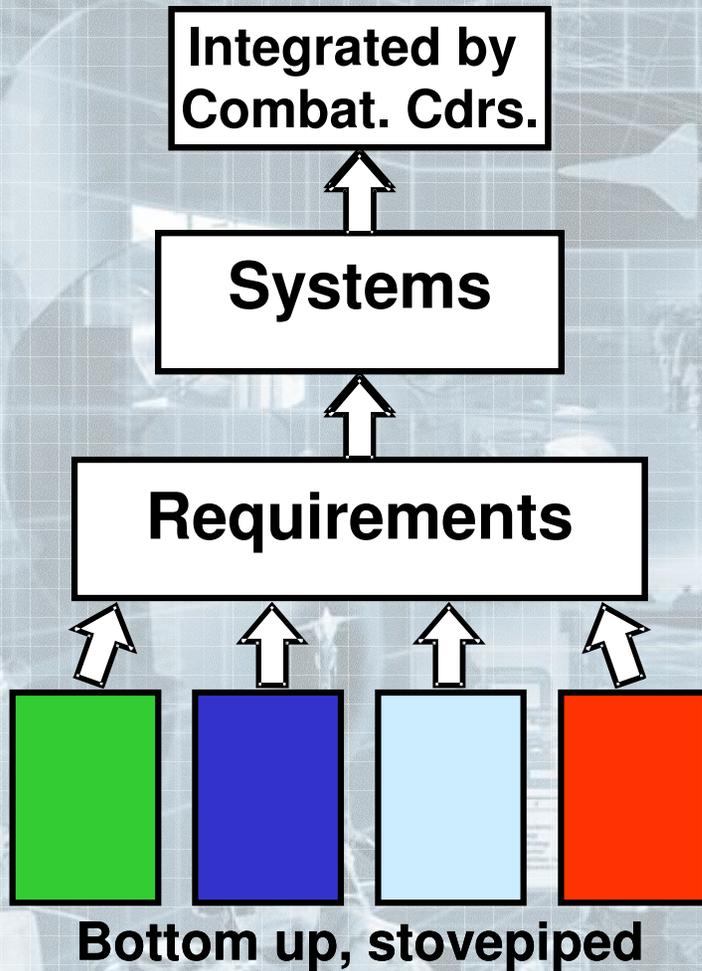
- Battlespace Awareness
- Command And Control
- Force Application
- Protection
- Focused Logistics

# Hierarchy of Joint Concepts



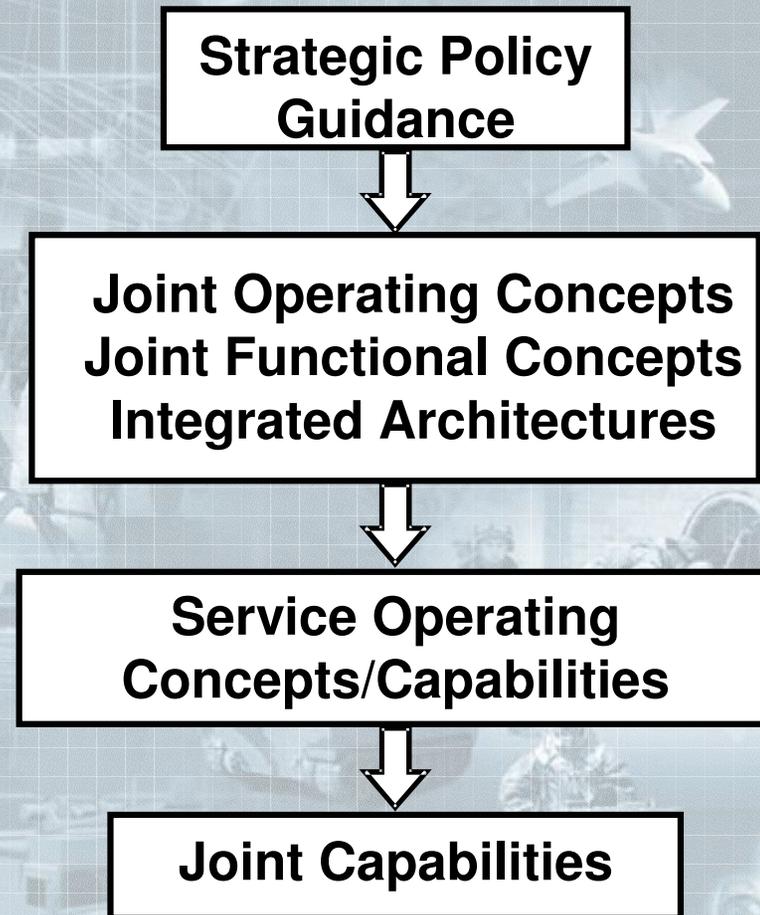
# Capabilities-Based Planning

**Old**



**Systems Driven**

**New**



**Capabilities Driven**

# ***Defense S&T Reliance Process***

***Purpose*** - To help DUSD(S&T), the Services, and Defense Agencies coordinate planning and articulate the value of research and technology within the DoD.

***Scope*** - Oversee, Develop & Maintain the Defense S&T Strategy, Basic Research Plan (BRP), Defense Technology Area Plan (DTAP), Joint Warfighting S&T Plan (JWSTP), and the Defense Technology Objectives (DTOs).

# ***Basic Research Plan (BRP)***

- **Links longer term research to broad, revolutionary warfighter capabilities**
- **Guides new technology development built around Basic Research areas**
  - **Physics**
  - **Chemistry**
  - **Mathematics & Computer Science**
  - **Electronics**
  - **Materials Science**
  - **Mechanics**
  - **Terrestrial and Ocean Sciences**
  - **Atmospheric and Space Sciences**
  - **Biological Sciences**
  - **Cognitive and Neural Science**

# ***Defense Technology Area Plan (DTAP)***

- **A detailed plan focusing DoD science on militarily significant technologies in specific functional areas**
- **An agreement between the S&T community and Acquisition customers in specific technologies:**
  - **Air Platforms**
  - **Chemical-Biological Defense**
  - **Nuclear Technology**
  - **Information Systems**
  - **Materials & Processes**
  - **Weapons**
  - **Biomedical**
  - **Sensors & Electronics**
  - **Space Platforms**
  - **Human Systems**
  - **Ground Vehicles & Watercraft**

# ***Joint Warfighting S&T Plan (JWSTP)***

- **Joint perspective horizontally across 6.2 and 6.3 plans**
  - Support to requisite technology and advanced concepts for superior Joint and Coalition warfighting
  - Near-, mid-, and long-term needs of joint warfighter are properly balanced and supported
- **Support the five Joint Functional Concepts:**
  - Battlespace Awareness
  - Command & Control
  - Force Application
  - Focused Logistics
  - Protection

# Joint Warfighting S&T Plan (JWSTP)

JWSTP-- Focus to blend emerging technology into warfighter needs



*An agreement between Joint Warfighters and S&T Community*

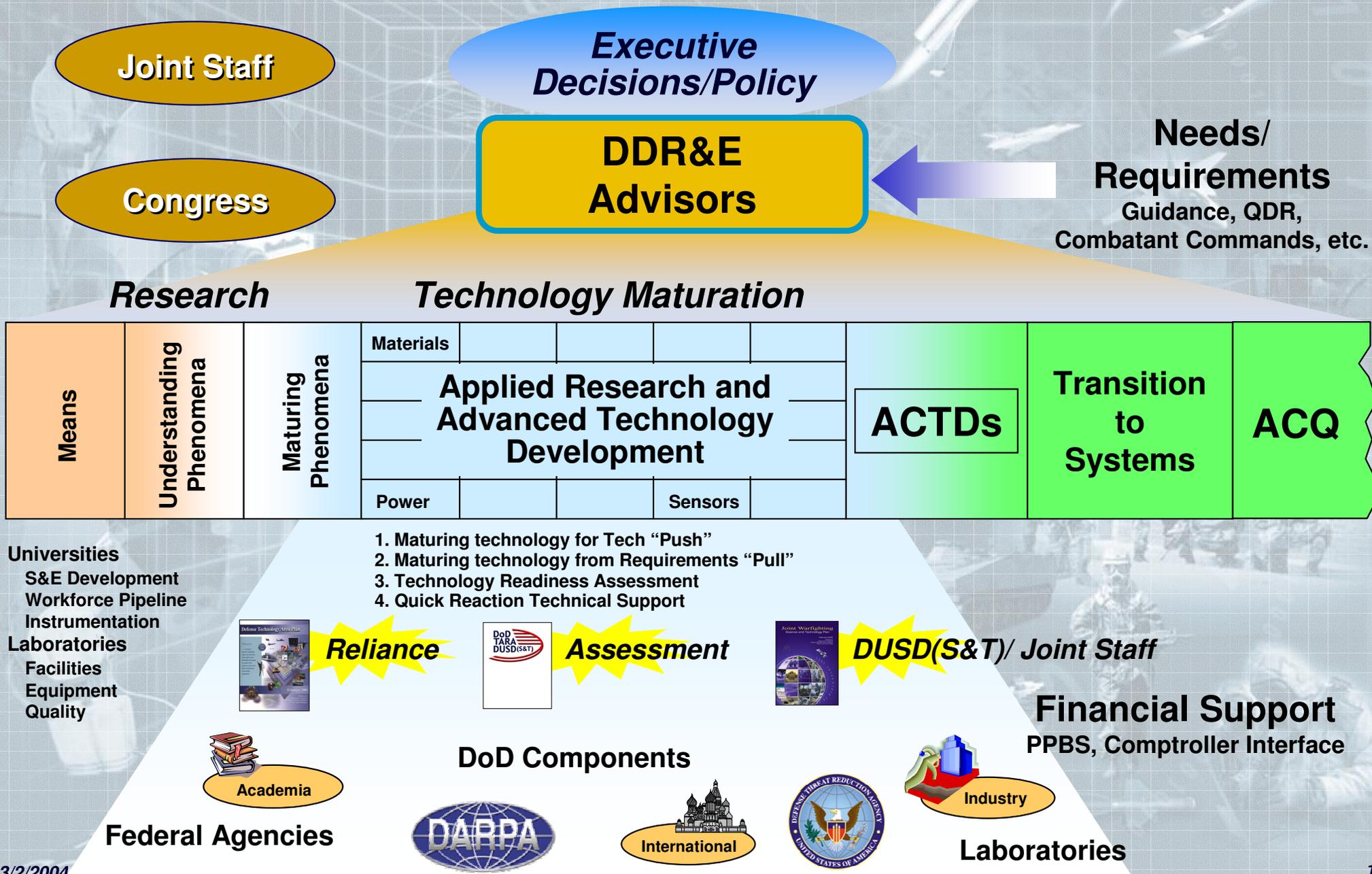
**Example:** DTO E.02 *Military Operations in Urban Terrain*

**Objective:** Demonstrate a situation awareness/communications/geolocation capability in restrictive environments.

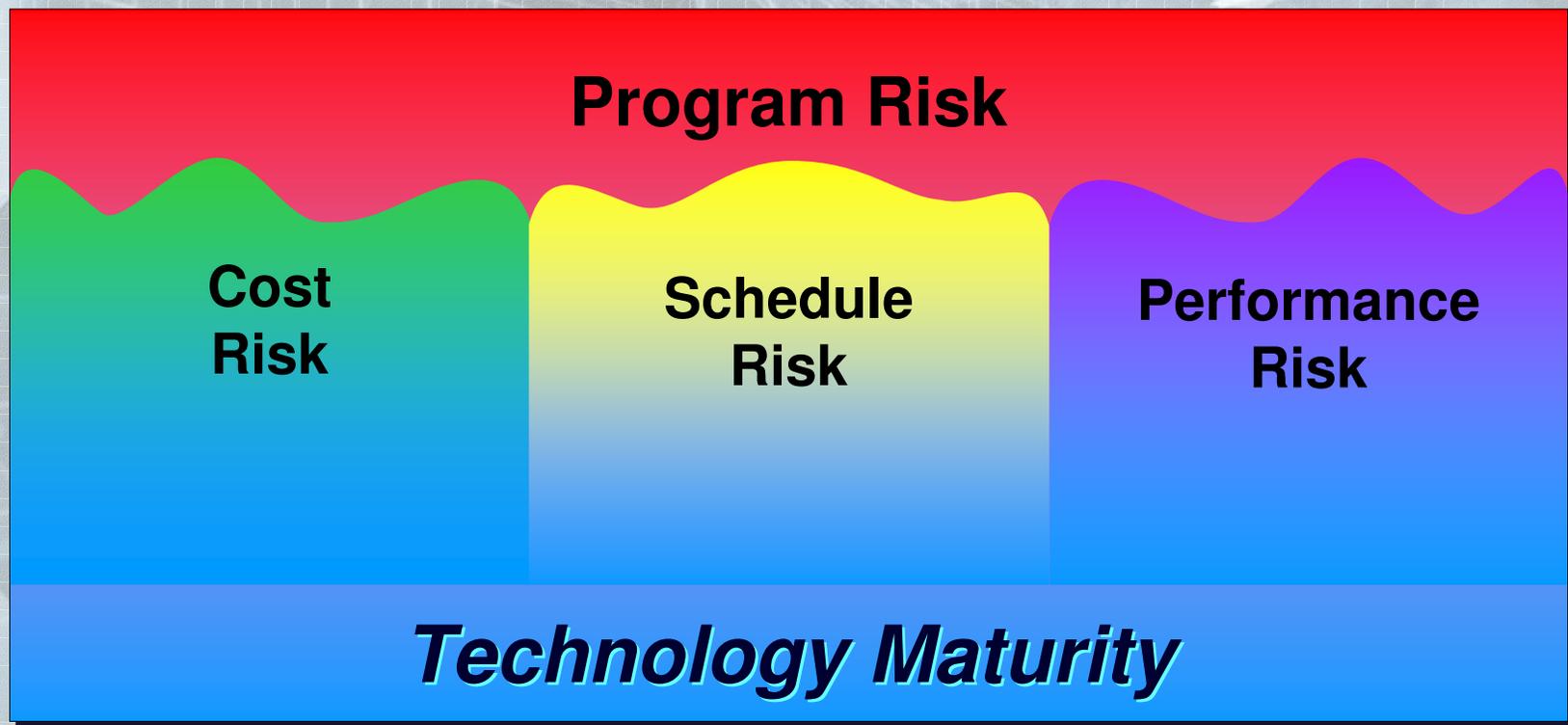
# ***Defense Technology Objectives (DTOs)***

- **A DTO states:**
  - **What specific technology advancements will be developed and/or demonstrated**
  - **By what fiscal year**
  - **For what specific benefit**
  - **Stated quantitatively against one or two metrics solving what technical barrier**
  - **For what customer**
  - **The funding available**

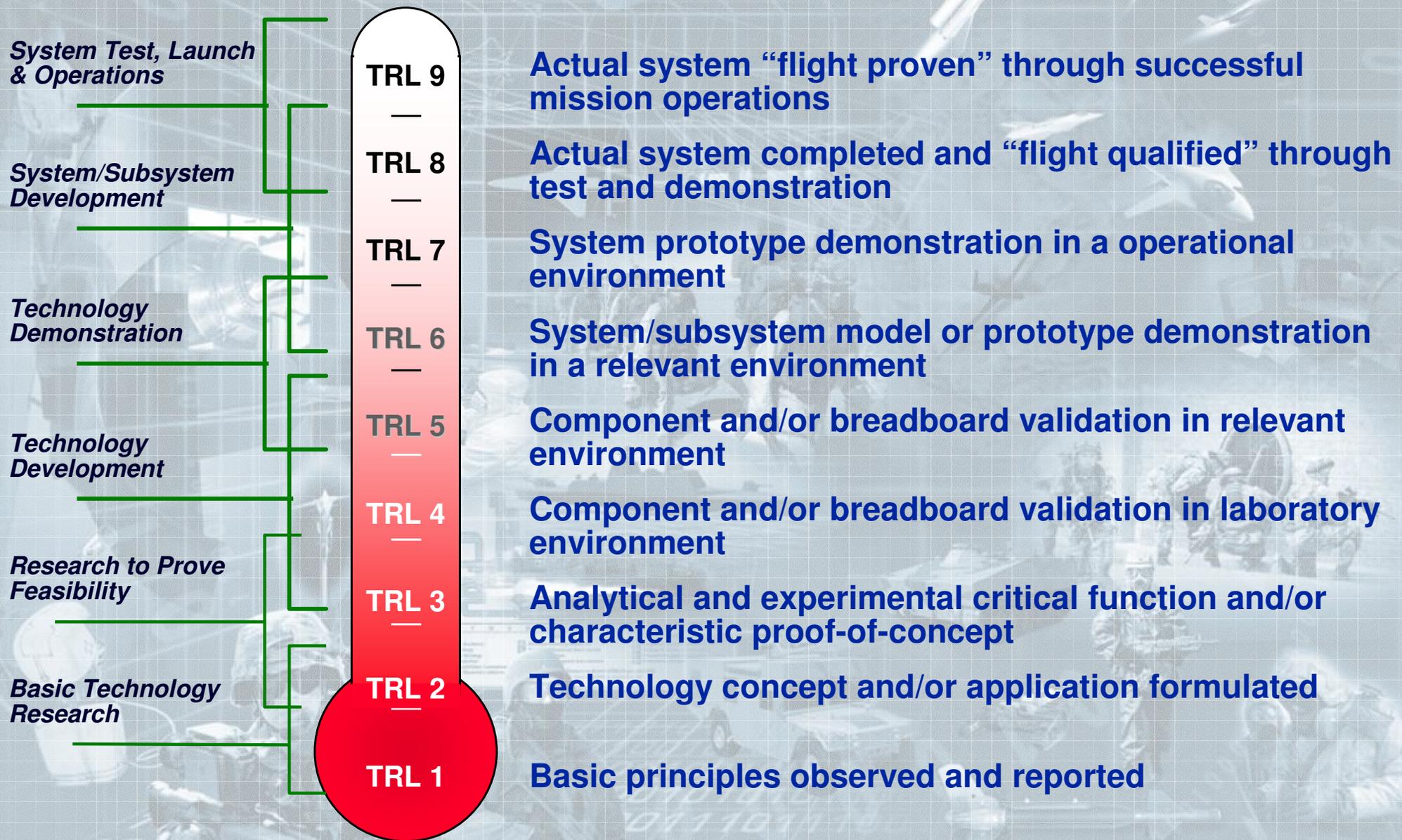
# Spectrum of S&T



# ***Technology Readiness Assessments***



# Measuring Technology Maturity Technology Readiness Levels



# ***Major TRAs Planned for 2004 -2005***

**CVN 21 Aircraft Carrier - MS B April 2004**

**Joint Common Missile - April 2004**

**Littoral Combat Ship - MS A June 2004**

**Future Combat System (FCS) Program Update – Nov  
2004**

**DD (X) Destroyer – March 2005**

# ***Impact of TRA Process***

- **Identification of Risk Areas for Increased Attention in SDD**
- **Improved Integration of Efforts between S&T and Acquisition Communities on technology transition issues**
  - **TRAs developed primarily thru S&T/acquisition working groups**
  - **Oversight at a high level**
  - **TRA/TRLs used as a tool in technology transition planning for evolutionary development**

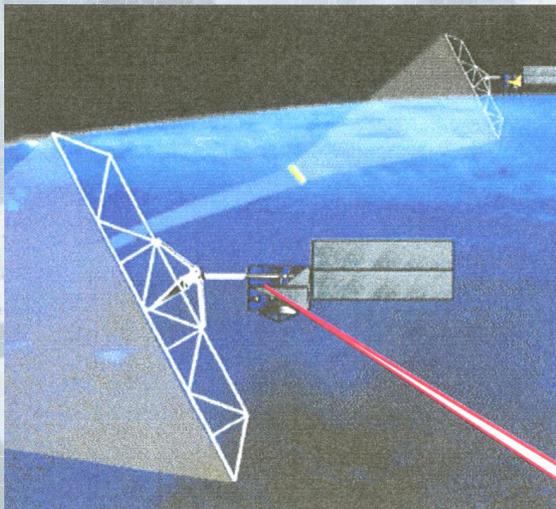
# S&T Requires Strong Partnerships

Link to the Warfighter



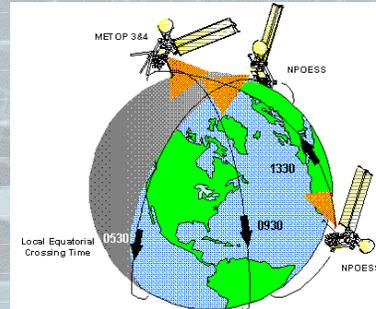
Service Labs

DARPA



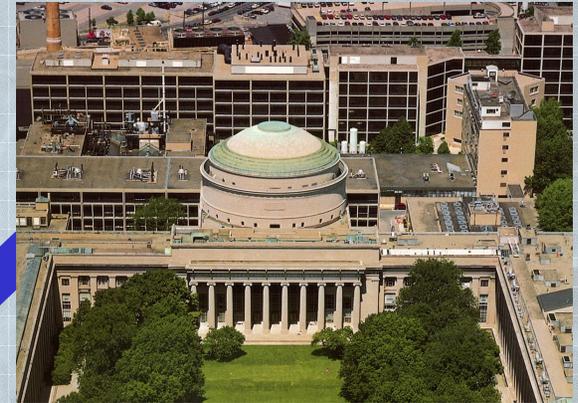
High Risk, High Payoff

Expanded Resource Base



Interagency

New Ideas, Knowledge



Universities

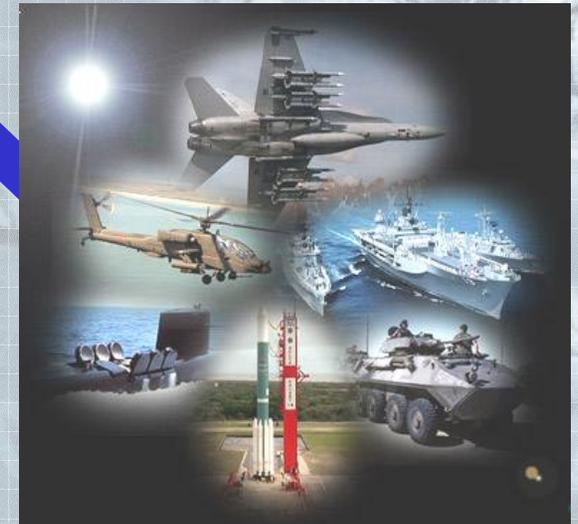
Industries

Maximum National Security Payoff

International



Coalition Capability



Innovation, Transition