Nuclear, Chemical and Biological Defense Research and Development

Pacific Operational Science & Technology Conference

4 April 2007

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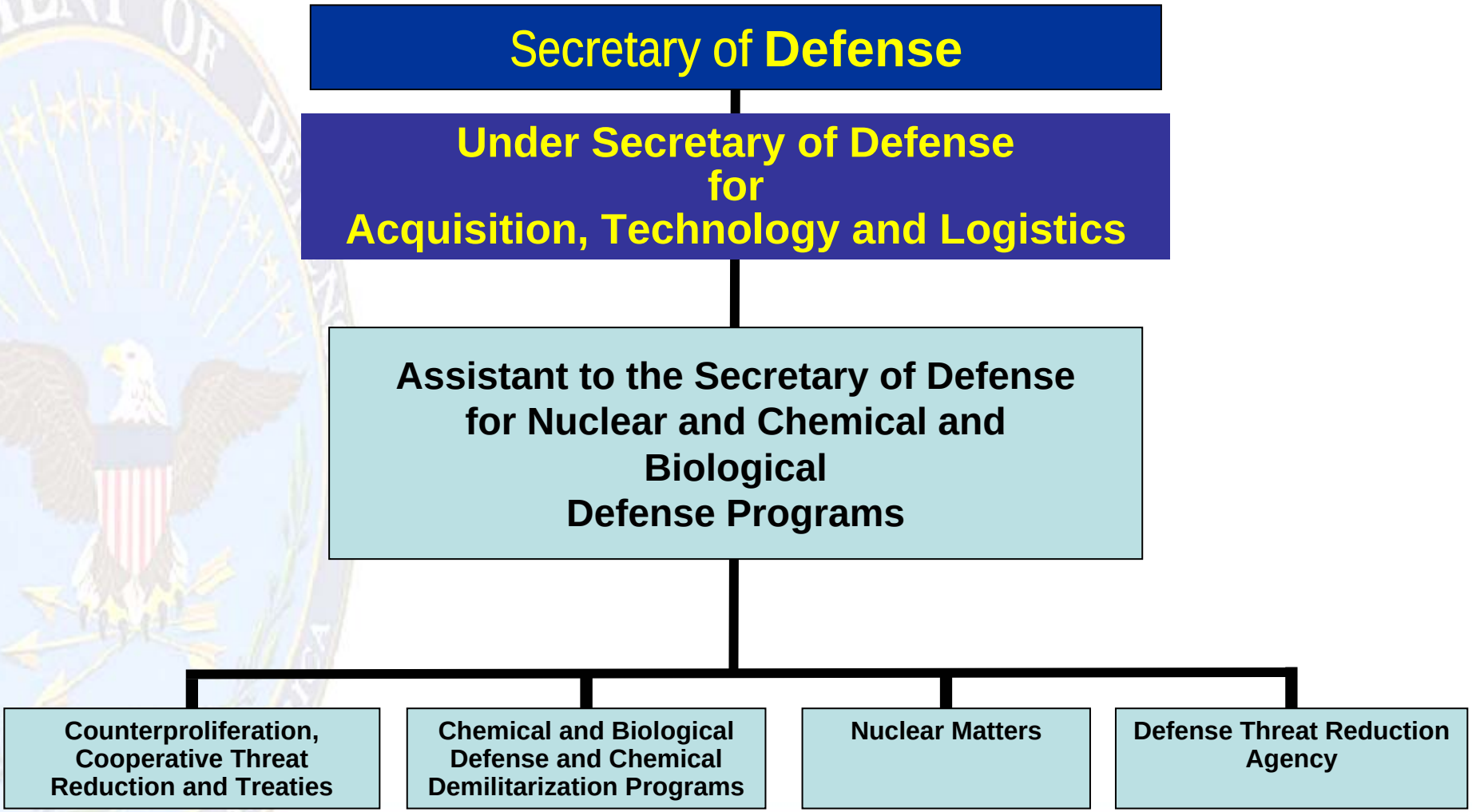
A/ATSD(NCB)

Outline

- ATSD(NCB)
- Strategic Guidance
- Oversight Framework
- R&D Portfolio
- Current Capability Needs
- Emerging Threats

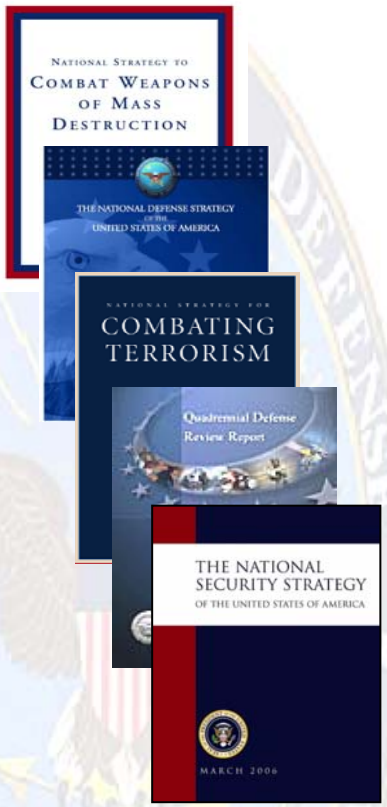

Secretary of Defense
Under Secretary of Defense for Acquisition, Technology and Logistics
Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs
Counterproliferation, Cooperative Threat Reduction and Treaties
Chemical and Biological Defense and Chemical Demilitarization Programs
Nuclear Matters
Defense Threat Reduction Agency

ATSD(NCB)

- **Principal Staff Assistant**
- **Direction and Oversight**
- **Resource Alignment**
- **Integration**

- **Advise the Secretary, Deputy Secretary, and USD(AT&L) on nuclear matters and chemical and biological defense programs.**
- **Provide strategic direction and oversee DoD WMD threat reduction activities, combating WMD.**
- **Assess resource alignment with high level guidance to prevent, defeat, and protect against current and emerging WMD threats.**
- **Ensure research and development, multilateral cooperation, tailored threat reduction strategies and deterrence concepts are applied as integrating functions.**

Strategic Guidance



- **High-level guidance includes three goals related to WMD proliferation:**
  - Prevent WMD proliferation
  - Deter, Defend and Defeat WMD use
  - Mitigate Consequences of WMD use
- **Military framework establishes eight operational missions to accomplish goals**
  - Interdiction, Cooperative Threat Reduction, Security Cooperation
  - Elimination, Offensive Operations, Active Defense
  - Passive Defense, Consequence Management
- **ATSD(NCB) focuses on DoD capabilities to achieve these goals**

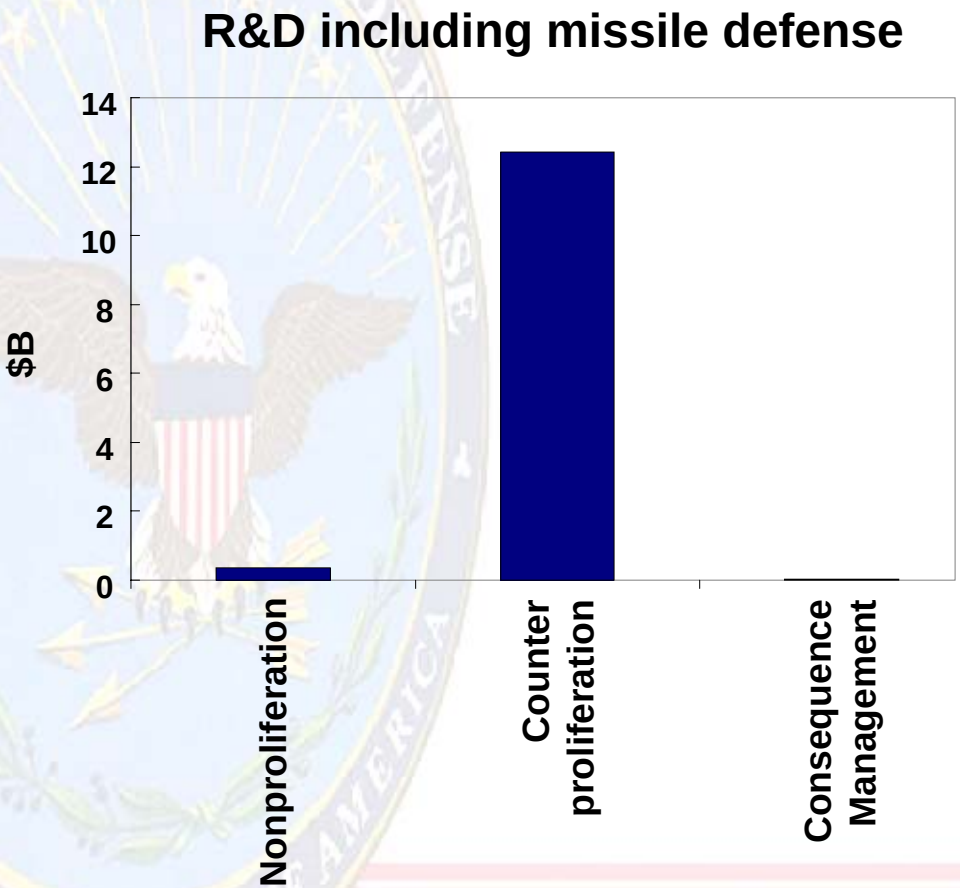
Oversight Framework

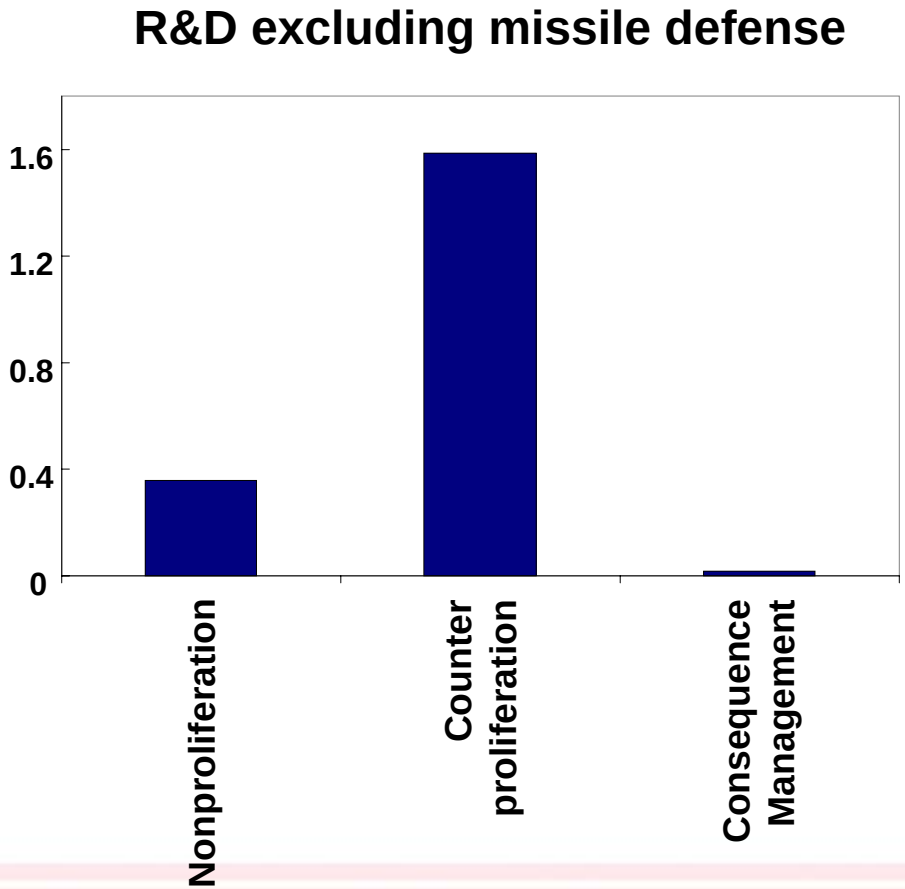
- **WMD threats include potential adversaries who:**
  - Want WMD: Nonproliferation
  - Have WMD: Counterproliferation
  - Use WMD: Consequence Management
- **U.S. needs a spectrum of capabilities:**
  - *Nonproliferation to prevent* WMD spread
    - Threat reduction cooperation
    - Security cooperation and partnership activities
  - *Counterproliferation to defeat* WMD
    - Interdiction
    - Elimination
    - Active defense
    - Offensive operations
    - Passive defense
  - *Consequence Management to protect* against WMD use
    - Consequence management

R&D Portfolio

- Correlated Combating WMD R&D programs with the three pillars and eight mission areas
- Identified mission-unique and cross-cutting technology areas
- Assessed the investment portfolio

FY2007 DoD R&D Investments





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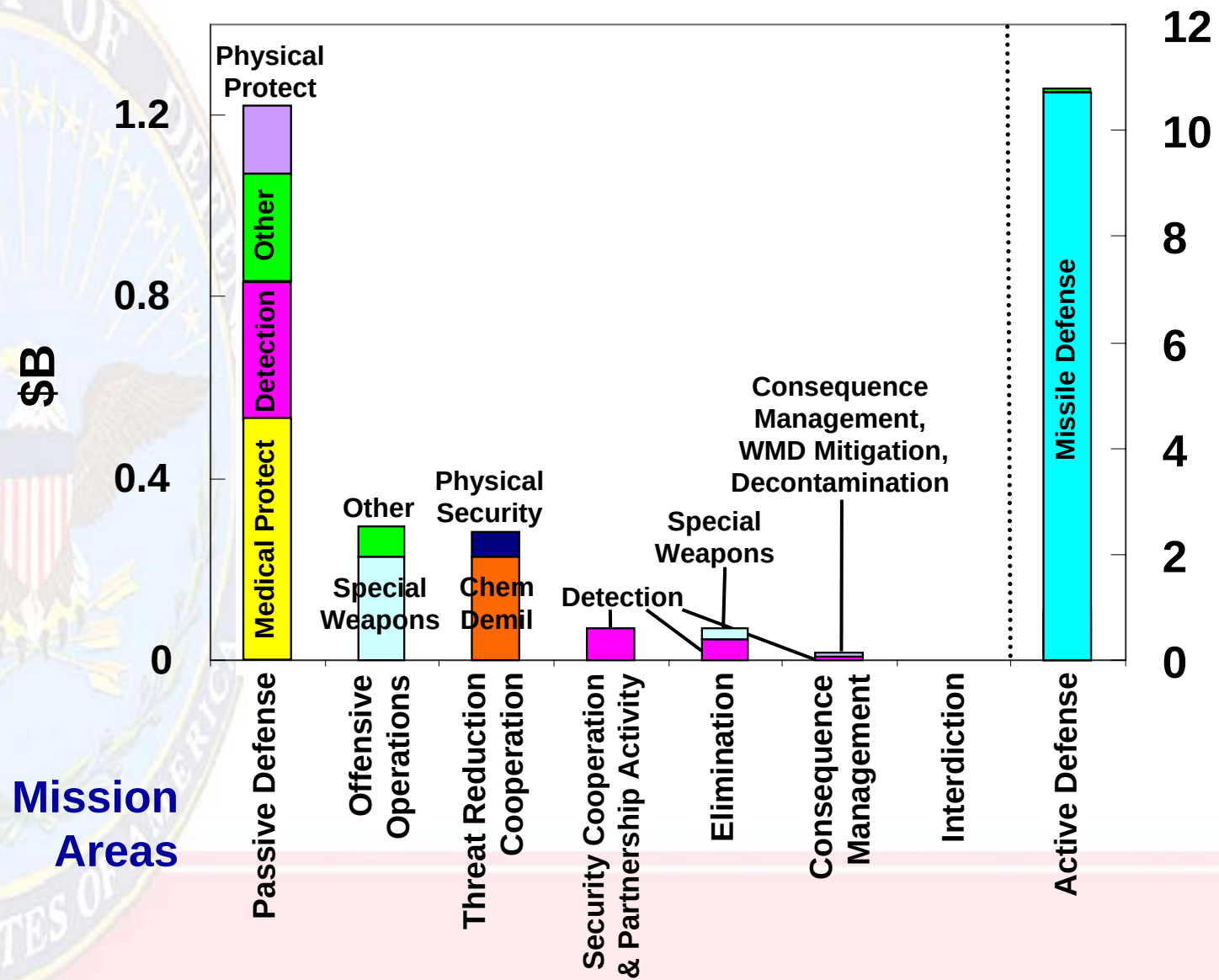
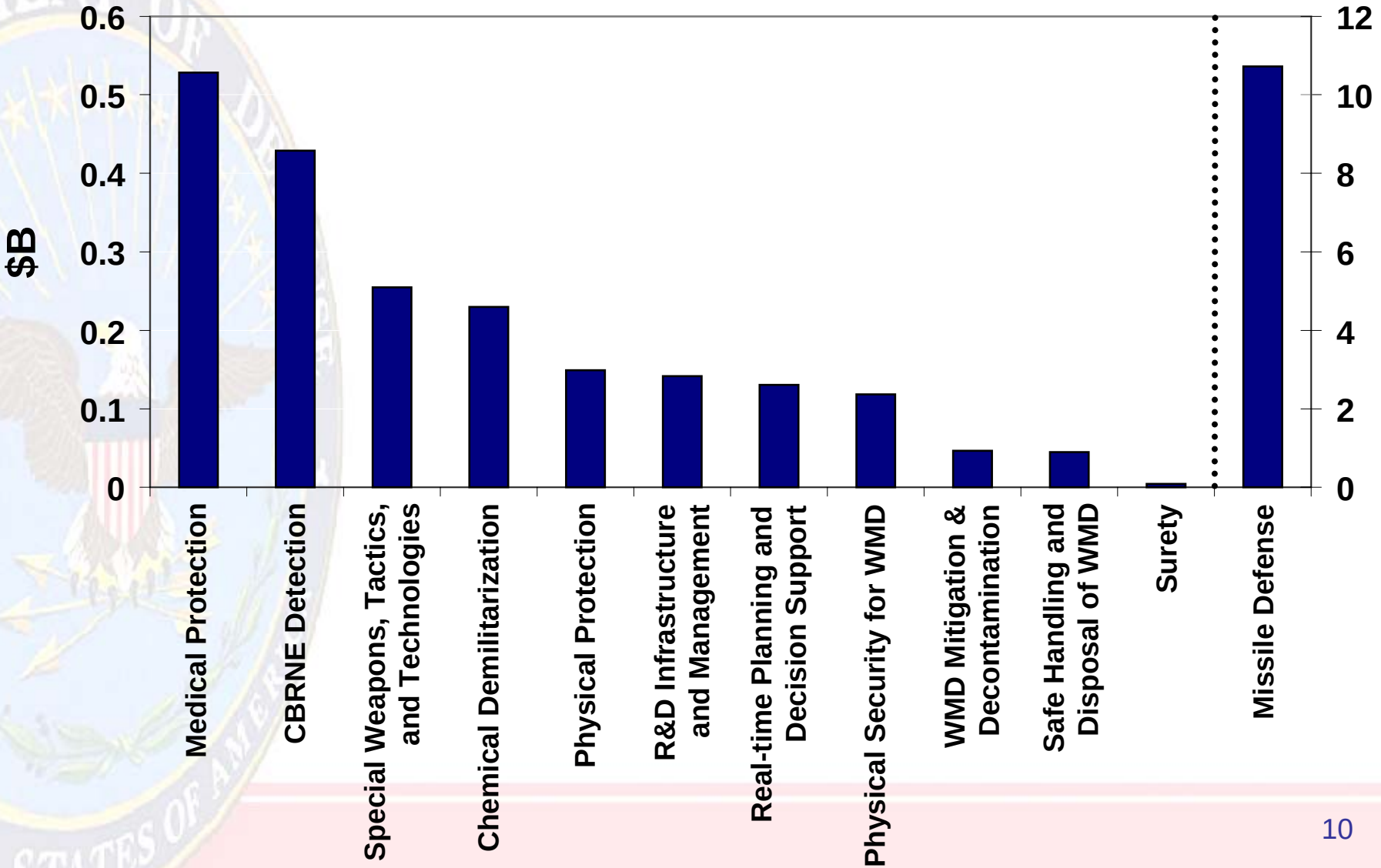


Technology Areas



Crosscutting Technologies

Mission Areas

Technology Areas

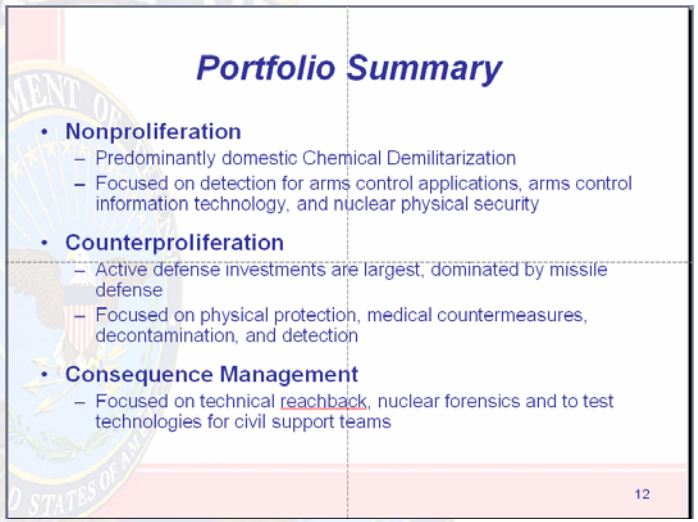
	Security Cooperation	Threat Reduction Cooperation	Interdict-ion	Offensive Operations	Elimination	Active Defense	Passive Defense	Consequence Management
CBRNE detection	✓	✓	✓	✓	✓	✓	✓	✓
Physical methods for protection				✓			✓	✓
Medical protection							✓	✓
Specialized weapons, tactics, and technologies	✓			✓	✓	✓		
Consequence management and WMD effects mitigation/ decontamination		✓		✓	✓	✓	✓	✓
Real-time planning and decision support			✓	✓	✓	✓	✓	✓
Physical security for WMDs	✓	✓	✓	✓	✓	✓		✓
RDA infrastructure and management	✓	✓	✓	✓	✓	✓	✓	✓
International cooperation activities and WMD demilitarization	✓	✓						✓
Safely handle and dispose of WMD (and explosives)		✓	✓	✓	✓			✓
Tailored Strategies	✓	✓	✓	✓	✓	✓	✓	✓

All technology areas support more than one mission

Portfolio Summary

- **Nonproliferation**
  - Predominantly domestic Chemical Demilitarization
  - Focused on detection for arms control applications, arms control information technology, and nuclear physical security
- **Counterproliferation**
  - Active defense investments are largest, dominated by missile defense
  - Focused on physical protection, offensive operations medical countermeasures, decontamination, and detection
- **Consequence Management**
  - Focused on technical reachback, nuclear forensics and technologies for civil support teams

R&D Addresses Command Needs



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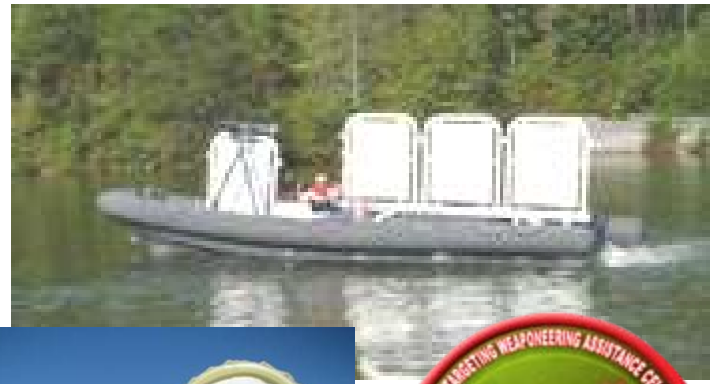
Command Priorities

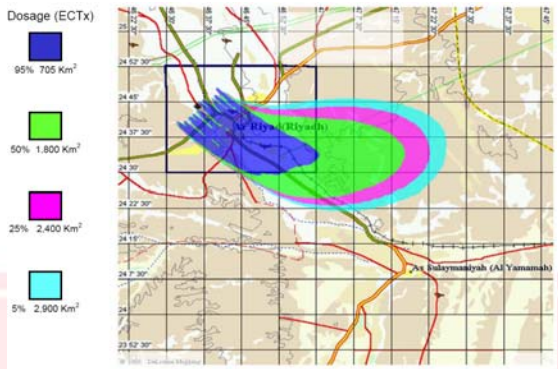
- Persistent surveillance
- Adversarial intent
- Missile defense
- Overcoming integrated air defense systems
- Fast transportation and fast ships
- International military education and training
- Foreign consequence management
- Preferred munitions
- Prompt, hard target defeat capability
- Pandemic preparation

Current Capability Needs

Detection, Identification, and Characterization of CBRN Threats

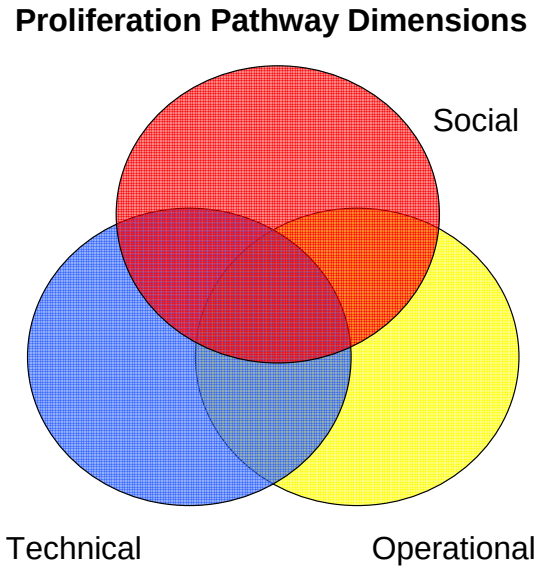
- Detect WMD at operationally relevant distances
- Track WMD and related materials
- Real-time reachback for technical support for detect, identify and characterize
- Application to targeting, weaponeering, bomb damage assessment, treaty compliance, border security, decontamination, demilitarization, force protection, and other operational applications



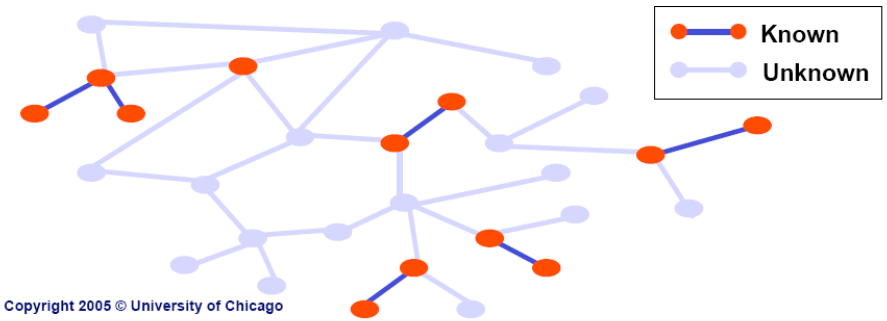


Current Capability Needs
Decision Support and Planning

- Indicators and understanding of adversarial intent
- Rapid processing of intelligence and dissemination to appropriate decision points allowing rapid action
- Information exploitation



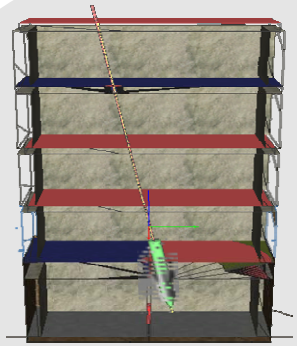
JTAC the joint threat anticipation center



Current Capability Needs

Offensive Operations

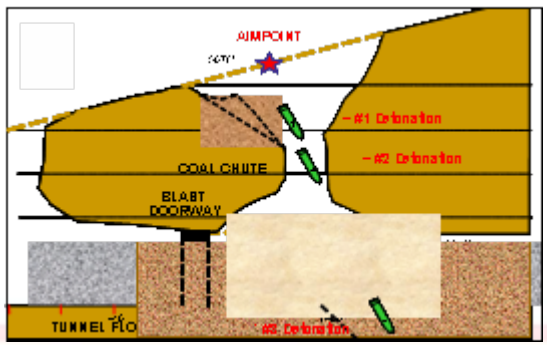
- Defeat WMD targets
  - Hard and deeply buried targets
    - Tunnels
    - Bunkers
  - Agent defeat technologies
- Secure, neutralize, store, and destroy or dispose of WMD



Deep Bunker Targets

Tunnel Targets

Tunnel defeat tests

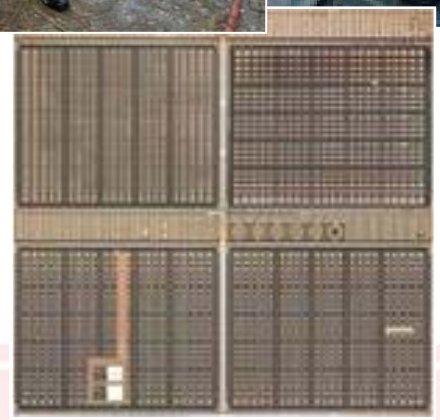


Hard Target Defeat

Tunnel Tests

Current Capability Needs
Protection

- Medical countermeasures
  - Vaccines and broad spectrum therapies
  - Medical prophylaxis
- Medical response, especially active syndromic surveillance coupled to mass treatment and quarantine
  - Bio-surveillance capabilities
- People, facilities, and mission protection



Current Capability Needs

Security Cooperation

- Interagency and international data exchange, coordination, and training
- New partnerships, agreements, and initiatives

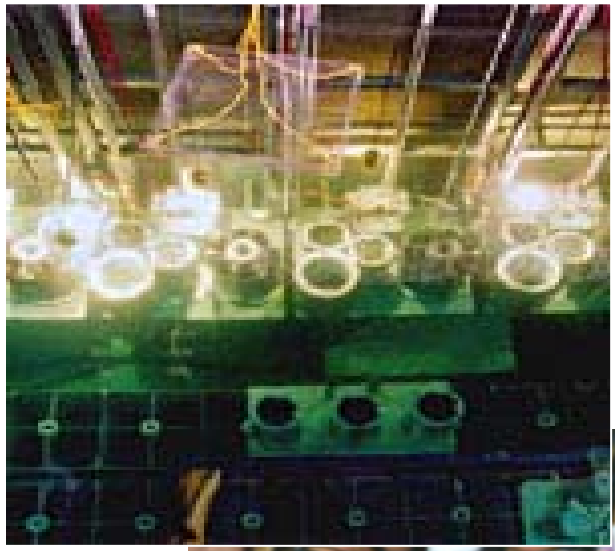
Observations

- CBRN detection investment is significant
  - Challenges: Stand-off detection, identification and characterization
- Decision support tools are embedded in larger systems
  - Challenges: Real-time situational awareness and threat anticipation
- Offensive operations R&D investments are dominated by hard and deeply buried target and agent defeat
- Protection is single largest technology area
  - Medical protection dominates and remains the biggest challenge
- Security cooperation R&D…future requirements?

Emerging Threats

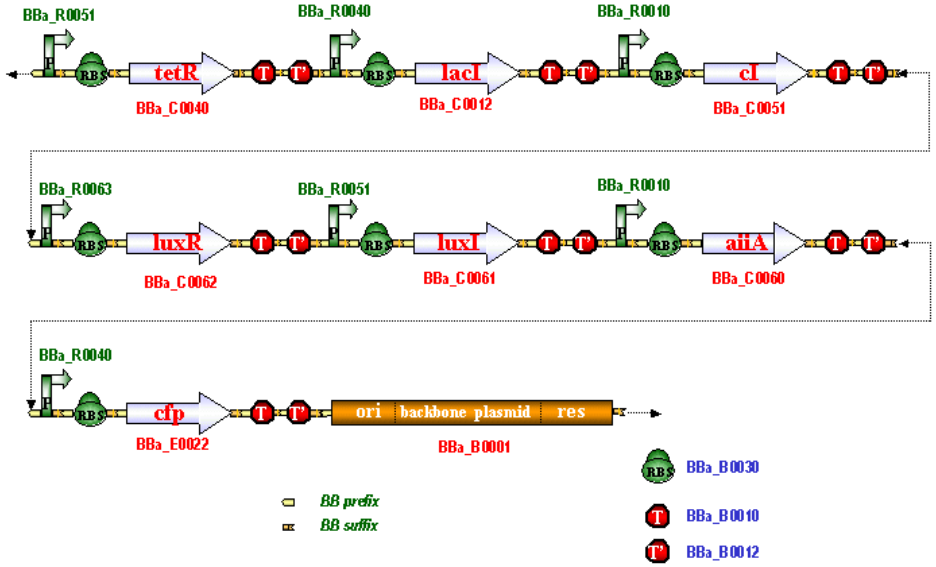
Emerging Threats

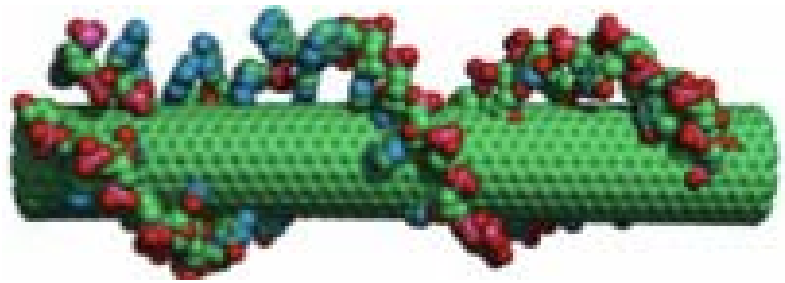
- Nuclear Proliferation
  - New nuclear weapons states
  - Acquisition of nuclear weapons by non-state or sub-state actors
- Natural Pandemics
  - Global connectivity and modern transportation are accelerating vectors for transmission
  - Security and social aspects
  - Emerging public health threats can also become BW threats



Emerging Threats

- Biotechnology
  - Dual-use technology
  - Genetic engineering
  - Synthetic biology
- Nanotechnology
  - Nano-enabled biochemical agents and energetic materials
  - Circumventing vaccines and evasion of medical countermeasures
  - Anti-material agents





Emerging Responses

Responses to emerging threats will require the full spectrum of R&D, operational, intelligence, political measures and international partnerships

ATSD(NCB) Challenges

- Assess and improve the Combating WMD R&D investment strategy
  - Guidance
  - Current needs
  - Emerging threats
- Ensure that R&D communities communicate and collaborate with stakeholders