



Individual Protection Science and Technology



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Protection

Capability Area Program Officer





Agenda

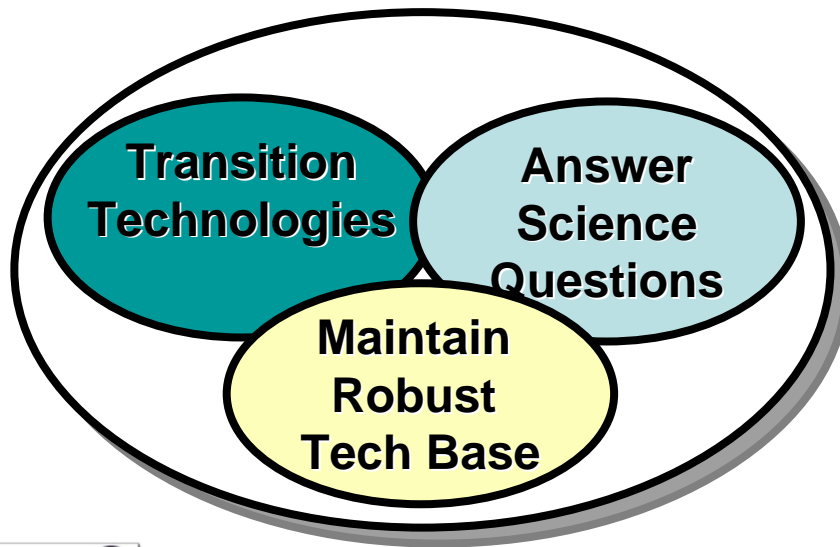
- Objectives
- Gaps and Priorities
- Taxonomy
- Strategy
- FY06 Program
- FY07 Topics
- Acquisition Programs
- Fiscal Summary





Objectives

Develop science and technology to support acquisition programs of record and to meet future defense capability needs.



Mission Space

- *Maneuvering warfighters*
- *Installation protection*
- *Homeland defense*
- *Global war on terrorism*





Summary of Capability Gaps (JRO)

•Overarching Gaps

- Protection/performance against emerging CBRN hazards
- Reduced physiological and logistical burden
- FDA approval
- Expeditionary Collective Protection
- CBRN survivability of Equipment

CPE

- Reduced size, weight and power requirements
- Insufficient quantities account for bulk of overall transportable CP gap
- Hospital & most amphibious ships lack CP capability

Percutaneous

- Reduced heat load and physiological burden
- Complete protection against dusty agent aerosols

Respiratory & Ocular

- Complete protection against toxic industrial chemicals



Prioritize on the user's baseline capability requirements *

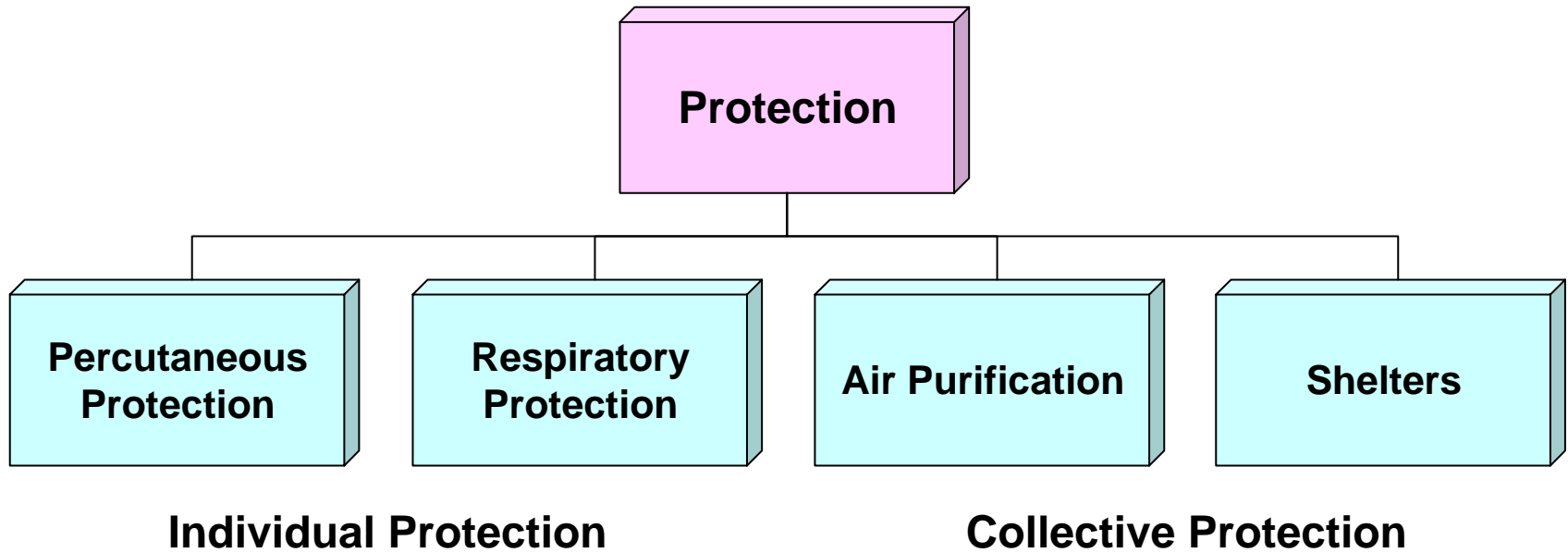
- Stand-off CB Detection (range, agents, & accuracy)
- Integrated Early Warning
- Battlespace Management & Analysis
- Expeditionary Collective Protection
- Decontamination of Emerging Agents
- Decontamination (sensitive equipment, materials compatibility, and vehicle interiors)
- Respiratory Protection (Toxic Industrial Chemicals (TIC) protection)
- Point Detectors (size, accuracy, cost of operation)
- Percutaneous Protection (aerosols and heat burden)
- Fixed Site Decon



* Condensed from Baseline Capability Assessment (BCA)



Capability Area Taxonomy





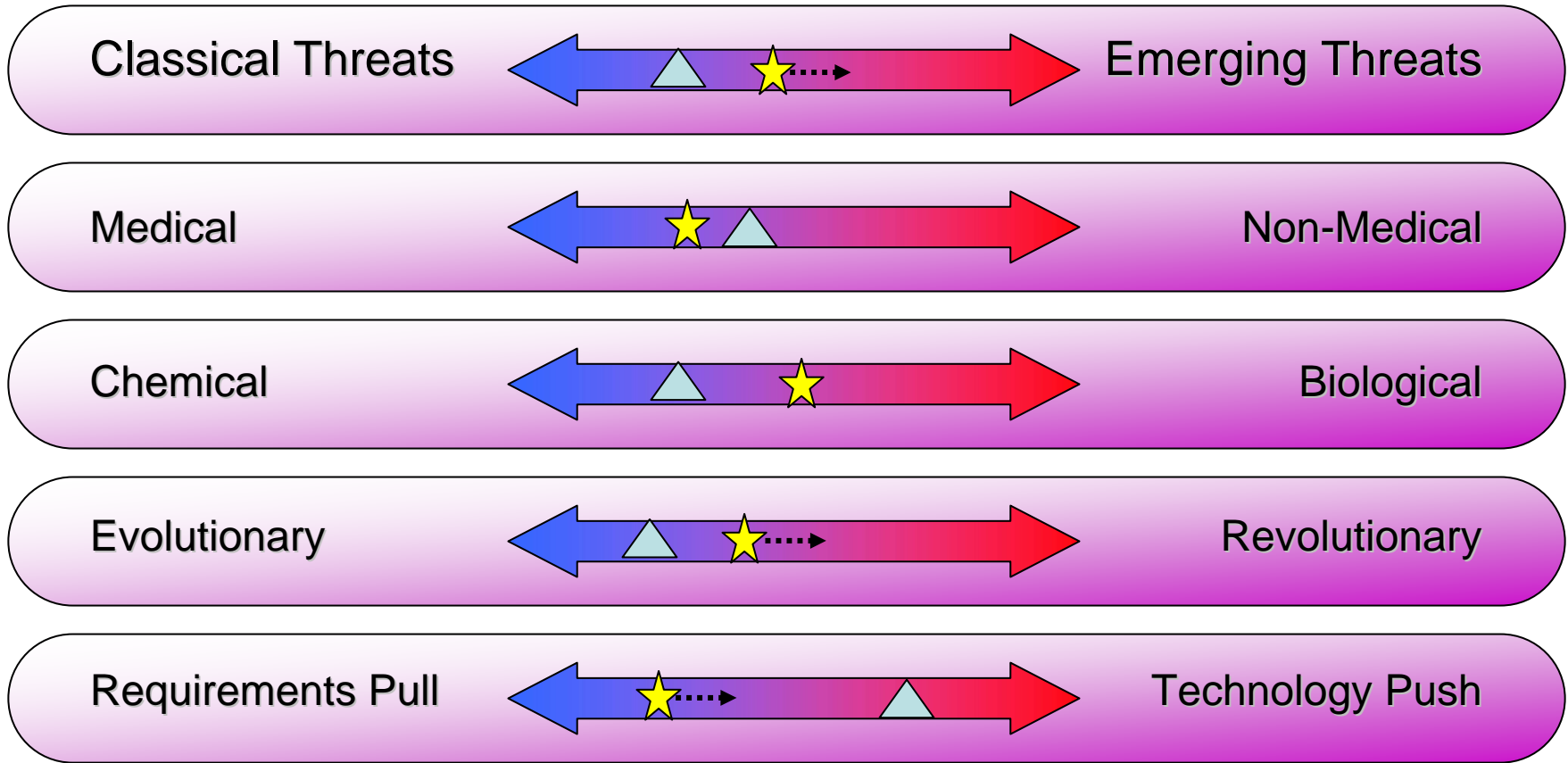
Physical S&T Program Strategy

- Balance between requirements pull and technology push
- Exploit Cutting Edge Technologies
- Find and Fund the Best Performers
- Sustain Long-Term Investment





Multiple Dimensions to Consider for S&T Investment

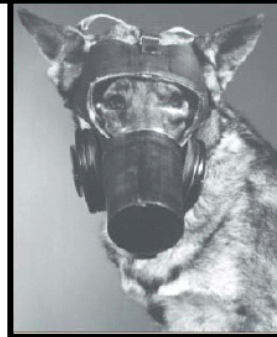
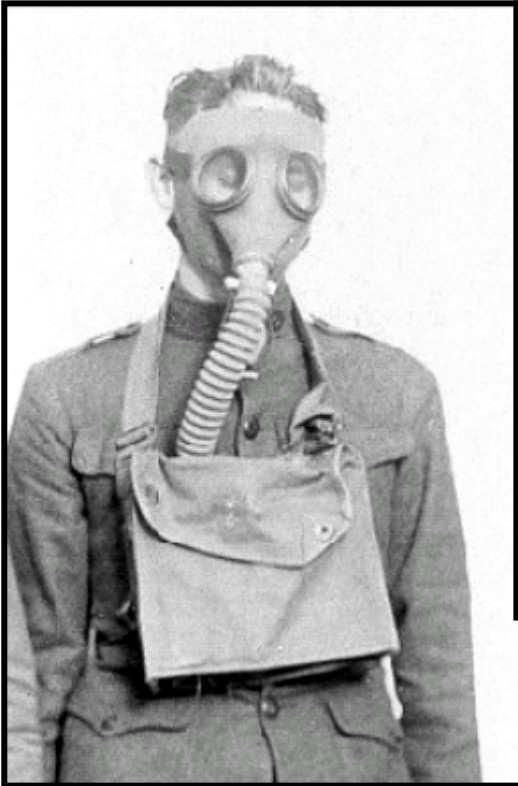


△ ★ **Current**

△ **Old**



Individual Protection Equipment of the Past





Fielded Individual Protection Equipment





Near Term Objectives (FY06-FY08)

Enhanced TIC protection through advanced filtration

Improved confidence and reduced logistics through filter end-of-service-life indicator

Enhanced aerosol protection through improved materials and closures





Mid Term Objectives (FY09-FY11)

Enhanced TIC and aerosol protection through enhanced mask seals

- Overarching model of IPE
- Standardized T&E procedures for IPE
- Better simulants for IPE



In situ neutralization of C&B through reactive materials in clothing materials





Far Term Objectives (FY12+)

Advanced mask concepts for improved comfort and enhanced equipment compatibility

Elastomeric permselective membranes for enhanced aerosol protection and better fit



Non-sorbent based air purification for reduced breathing resistance and broad spectrum protection

Intelligent garments for enhanced moisture vapor transport

Advanced Sensors





Factors Impacting Far Term Development

Threat

- **Type**
- **Concentration**
- **Exposure Time**

Warning

- **Sensor Standoff**
- **Model Prediction**
- **Information Flow**





FY06 IP Technology Program

Protection/performance against emerging CBRN hazards (Overarching)

- Enhanced Technology for Respiratory Protection
- A Dual-Cavity Respirator Offering Increased Levels of Respiratory Protection and Mask-Fit Indication
- Self-Detoxifying Filter Particulate Media for IP and ColPro (Congressional)

Reduced physiological and logistical burden (Overarching)

- Advanced Mask Concepts

Complete protection against toxic industrial chemicals (Respiratory)

- Optimized Adsorbent Compositions and Modeling

Reduced heat load and physiological burden (Percutaneous)

- Intermittent Microclimate Cooling
- Selective and Responsive Nanopore-Filled Membranes (BAA)
- CB Protective Suit Membrane Research (Congressional)





FY06 IP Technology Program

Complete protection against dusty agent aerosols (Percutaneous)

- Self-Detoxifying Materials for CB Protective Clothing
- Effects of High Wind Speed on Agent Penetration of IPE
- Nanowire Mesh Fabrics for CBA Defense (Congressional)

Test and Evaluation

- Standardized Procedure for IPE
- IPE Airflow Mapping
- TIC/Battlefield Set Standard for IPE and COL PRO
- **Overarching IPE Model**
- Simulants for Protective Equipment Testing
- Simulant Correlation to Real Agent
- IPE Field Effects – DSTL
- Model-Based Design of Test Systems for Chemical Protective Clothing (SBIR)
- Improved System and Methods for Evaluating Protective Material Performance Against CWA (SBIR)
- Protection Against Toxic Industrial Chemicals (Congressional)





FY07 IP Technology Topics

Protection/performance against emerging CBRN hazards (Overarching)

- Enhanced aerosol/particulate protection (filters)

Reduced physiological and logistical burden (Overarching)

- Mask comfort
- Residual-life indicator for clothing

Complete protection against toxic industrial chemicals (Respiratory)

Reduced heat load and physiological burden (Percutaneous)

- Controllable, variable protection
- Microclimate cooling

Complete protection against dusty agent aerosols (Percutaneous)

Test and Evaluation

- Swatch test reference material





Transition Programs

Respiratory Protection

- Joint Service General Purpose Mask (JSGPM)
- Joint Service Aircrew Mask (JSAM)
- **Next Generation General Purpose Mask (NGGPM)**

Percutaneous Protection

- Joint Service Lightweight Integrated Suit Technology (JSLIST)
- Joint Protective Aircrew Ensemble (JPACE)
- **Joint Chemical Ensemble (JCE)**





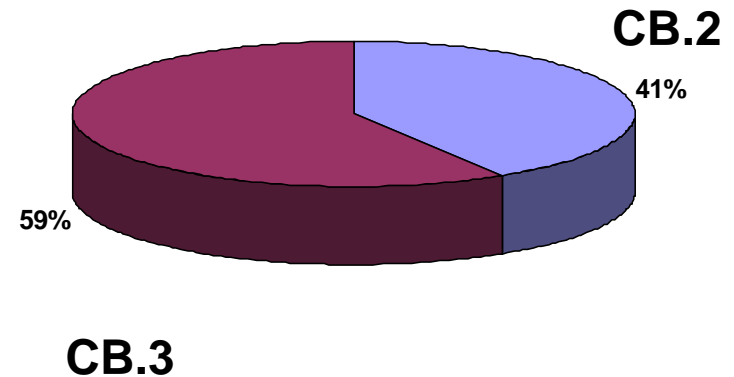
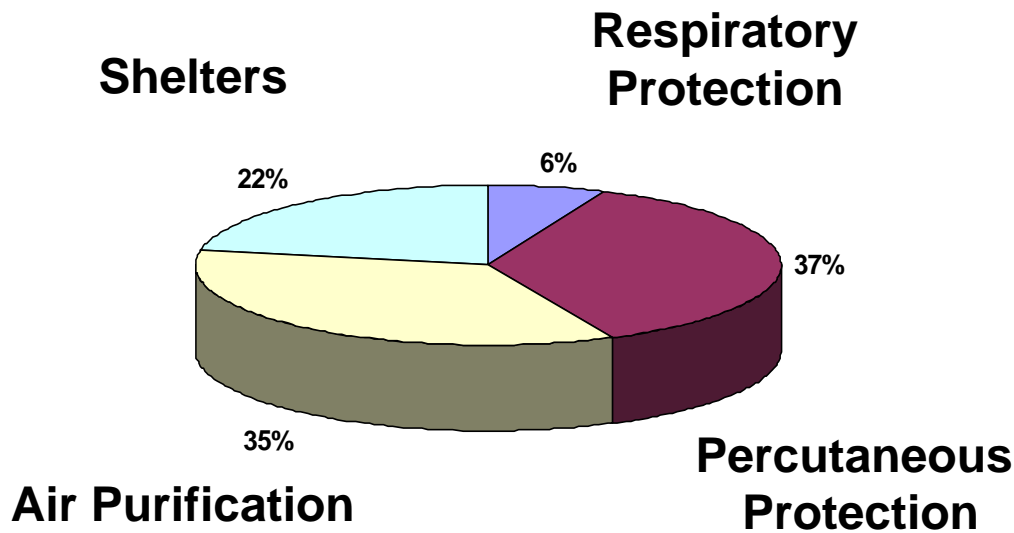
FY06 Core Funding Increases

	FY05(\$M)	FY06(\$M)	Increase
CB.1	6.3	15.7	150%
CB.2	62.1	104.3	68%
CB.3	39.9	60.8	53%
Total	108.2	180.8	67%
Detection	33.9	48.9	44%
Mod-Sim	9.1	42.8	372%
Protection	9.6	21.9	130%
Decon	5.2	10.0	91%
Threat Agent			
Science	31.0	36.6	18%
Basic Rsch/ Transition	19.5	20.7	6%



FY06 Protection Funding Summary

- Core Program (including T&E)



Core Funds by Thrust

Core Funds by Funding Line





The Bottom Line

- Combatant Commanders
- Services

