

# Stakeholders Conference

January 14-17, 2008

S&T Portfolio Director's Panel

**Mr. Robert Hooks**, Director of Transition

**Dr. Roger D. McGinnis, Sr.**, Director of Innovation/HSARPA

**Dr. Starnes Walker**, Director of Research

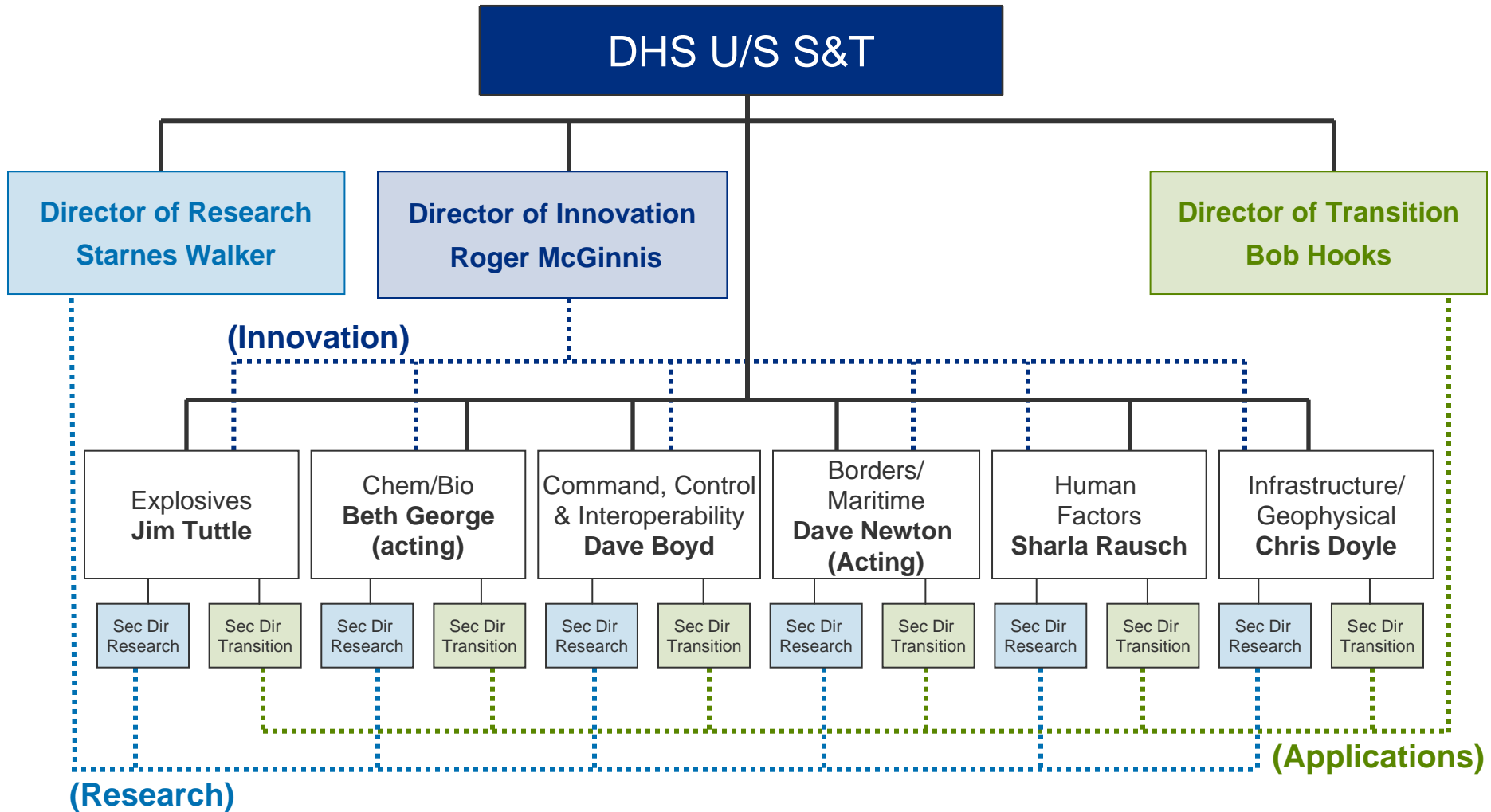
*From Science and Technology... Security and Trust*



# Homeland Security



# S&T Organization



# DHS S&T Investment Portfolio

Balance of Risk, Cost, Impact, and Time to Delivery

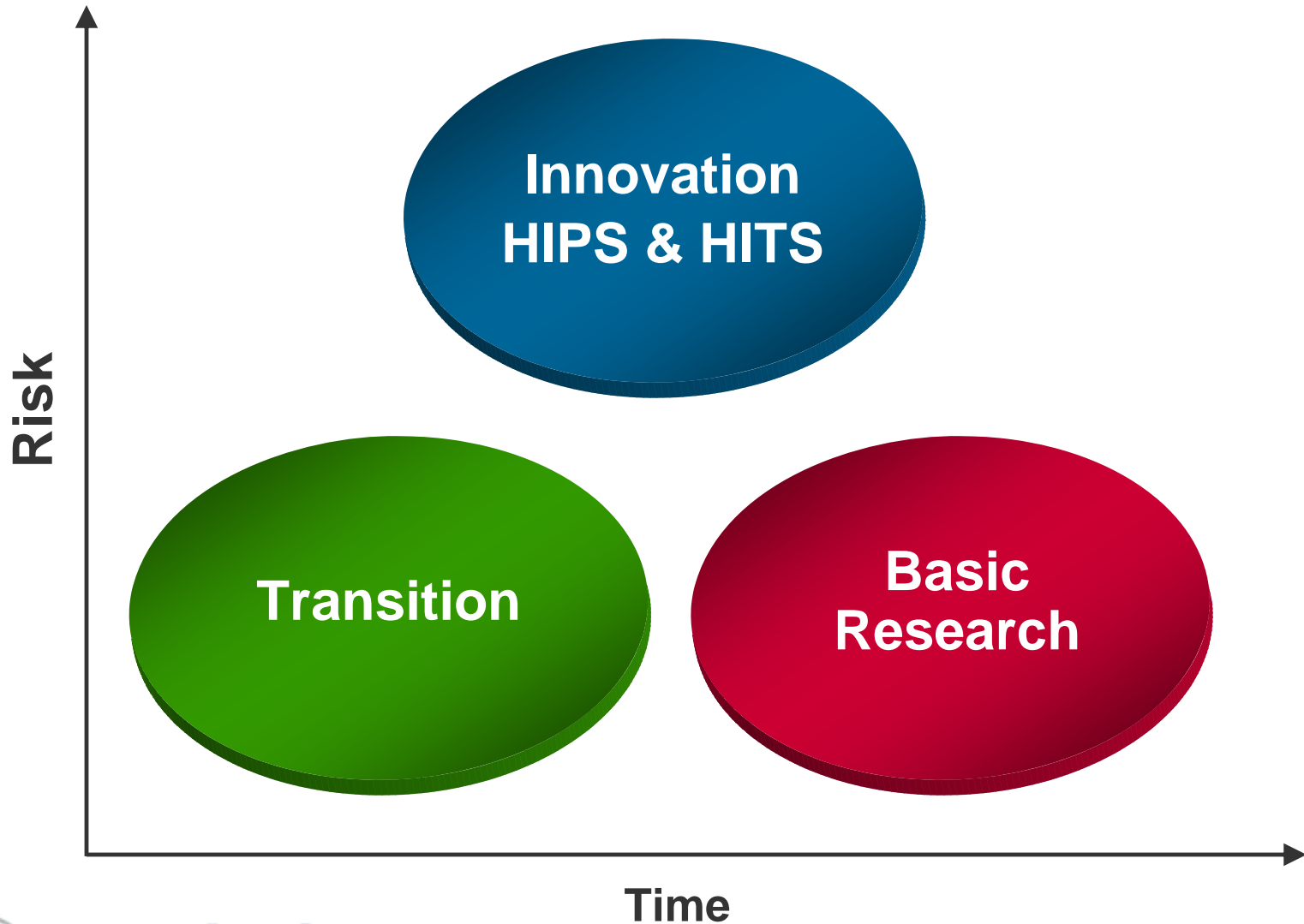
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**Customer Focused, Output Oriented**



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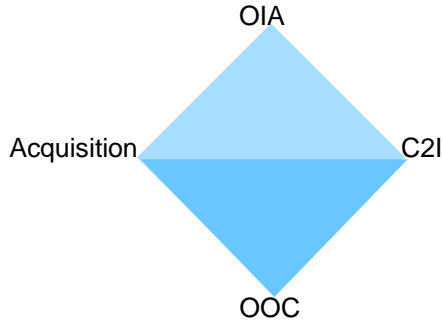
# Complimentary Research Objectives



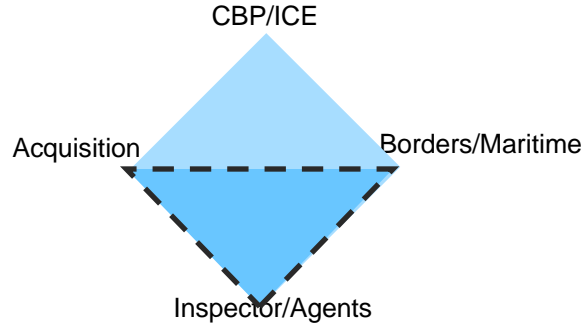
# DHS Requirements/Capability Capstone IPTs

## DHS S&T Product – “Enabling Homeland Capabilities” (EHCs)

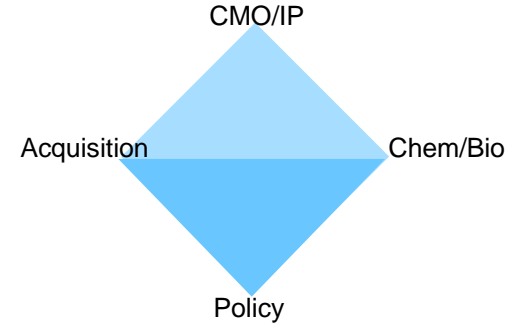
### Information Sharing/Mgmt



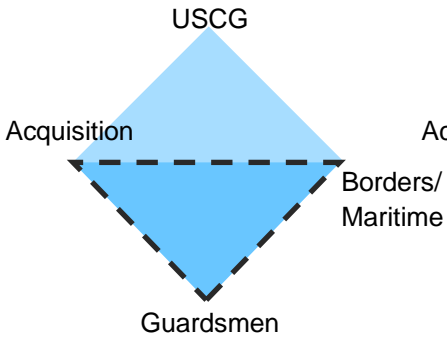
### Border Security



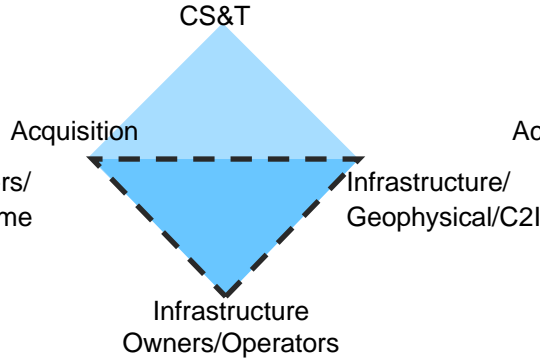
### Chem/Bio Defense



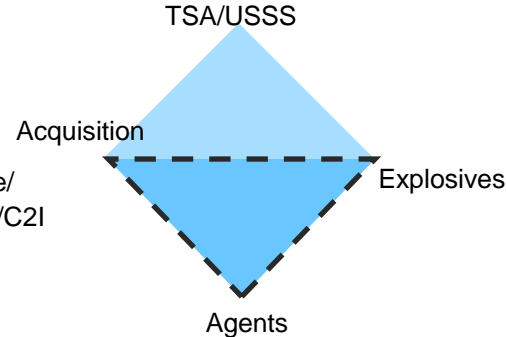
### Maritime Security



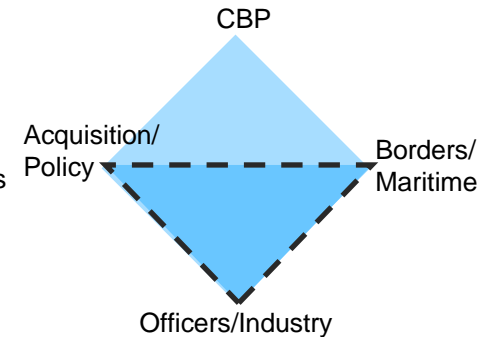
### Cyber Security



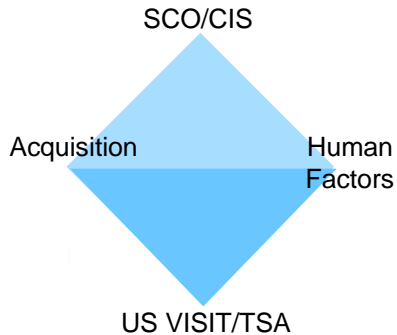
### Explosive Prevention



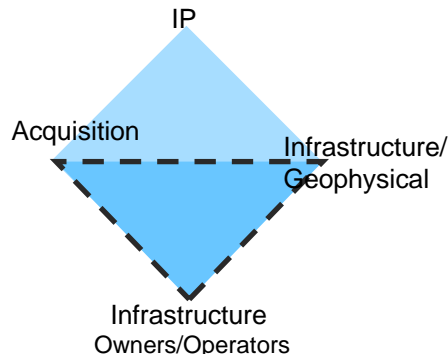
### Cargo Security



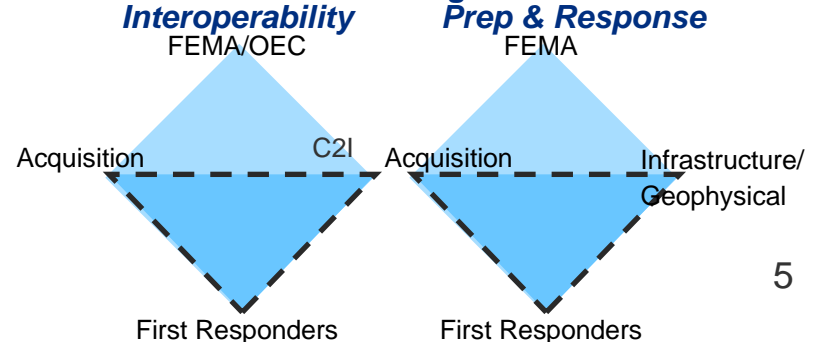
### People Screening



### Infrastructure Protection

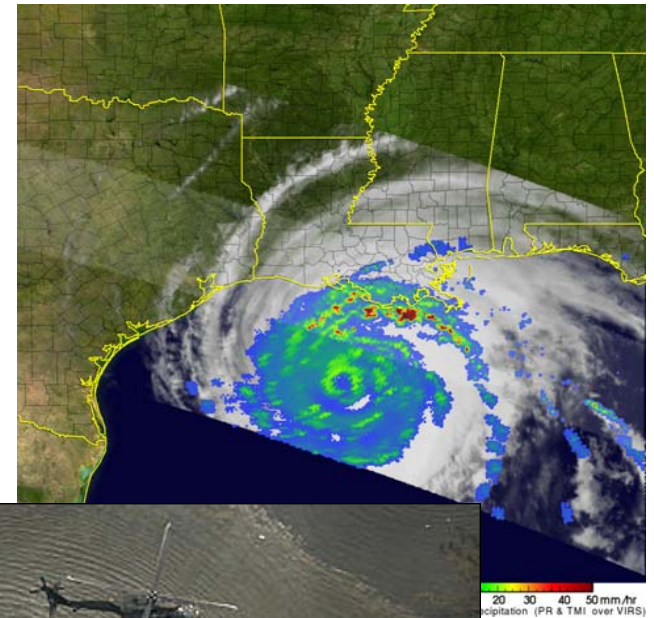


### Incident Management



# Incident Management: Representative Technology Needs

- Integrated Modeling, Mapping and Simulation capability (*IP/Geophysical Division*)
- Personnel Monitoring (Emergency Responder Locator System) capability (*IP/Geophysical Division*)
- Personnel Monitoring (Physiological Monitoring of Firefighters) capability (*IP/Geophysical Division*)
- Incident Management Enterprise System (*IP/Geophysical Division*)
- Logistics management tool (*IP/Geophysical Division*)



# Transition Approaches to Meet End-User Needs

Capstone IPTs  
Identify  
Capability  
Gaps/Mission  
Needs

**TRANSITION PATH**

- Operationally relevant
- Reasonable/low cost
- Fully tested

DHS Component  
Acquisition

Field Agents

Provide Solutions  
Validate Grants & Equip

First  
Responders

Widely  
Distributed  
Product

Provide Solutions/  
Enables Procurement

Private  
Sector



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# DHS S&T Investment Portfolio

Balance of Risk, Cost, Impact, and Time to Delivery

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“A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents die and a new generation grows up that is familiar with it.”

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- Max Planck



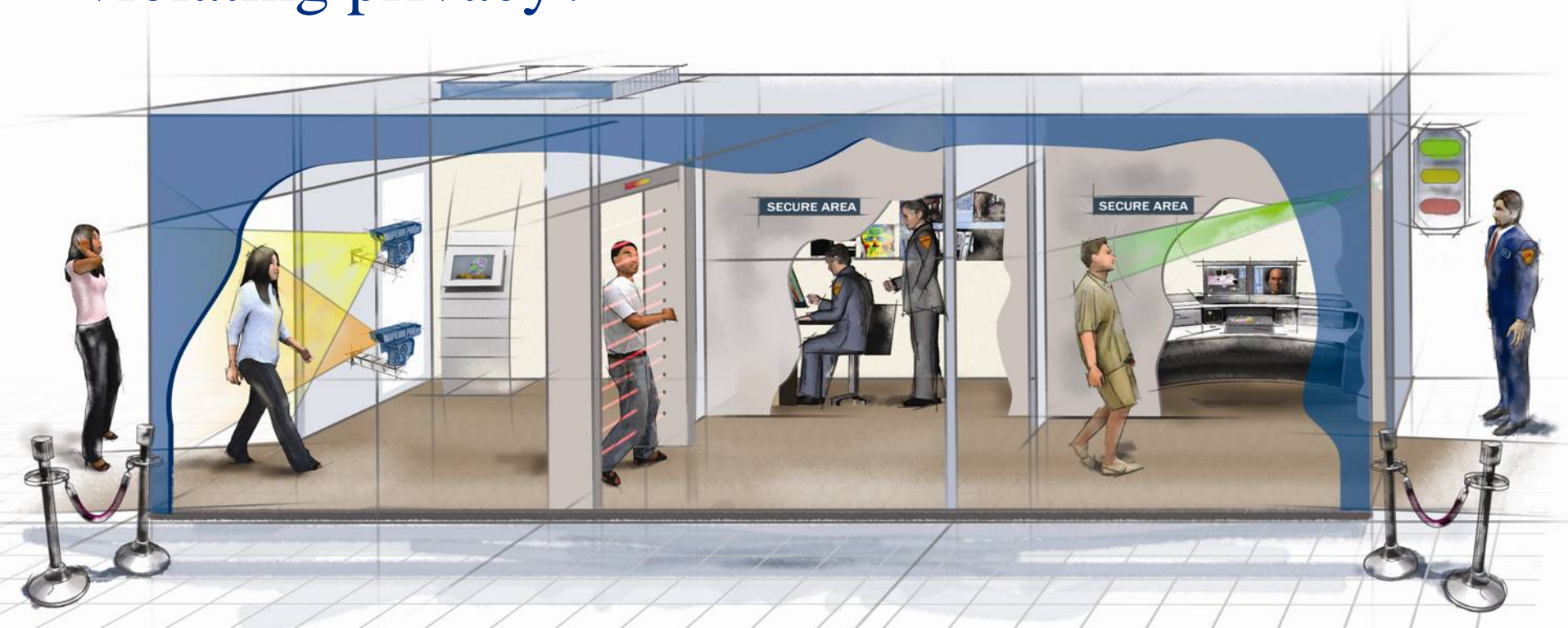
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# HIPS and HITS

**Homeland Innovative Prototypical Solutions (HIPS)**, which are designed to deliver prototype-level demonstrations of game-changing technologies in two to five years. These projects are moderate to high risk, with high payoff

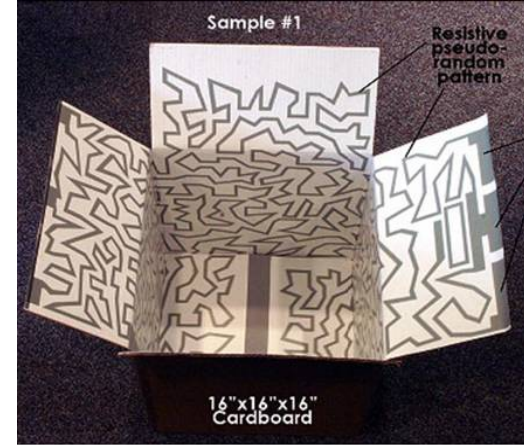
**High Impact Technology Solutions (HITS)**, which are designed to provide proof-of-concept answers within one to three years that could result in high-payoff technology breakthroughs. These projects have considerable risk of failure, however they also offer the potential for significant gains in capability

Multi-Sensor Hostile Intent Behavior Detection systems to increase the reliability of individuals recommended for secondary screening without violating privacy?



# DHS SBIR Program

- **Increases participation of innovative and creative small businesses in Federal research and development programs**
- **Challenges small businesses to bring innovative homeland security solutions to reality**
- **Focuses on near-term commercialization and delivery of operational prototypes**
- **Over 324 contracts awarded**



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Leverages entrepreneurial spirit and innovation of small businesses.

# DHS S&T Investment Portfolio

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# Why DHS S&T Basic Research?

- Develop fundamental scientific understanding or phenomenology
- Respond to future threats where current or near term technical solutions are not available.
- Quickly tap into areas of basic research that could be exploited for homeland security solutions.
- Cost Avoidance



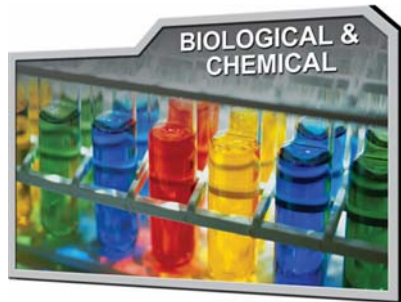
# DHS S&T Director of Research Responsibilities

- Planning, programming, budgeting, and oversight of the DHS S&T Basic Research Program
- Encourage multi-disciplinary, cross cutting initiatives between laboratories / universities / industry
- Establishes Basic Research Program metrics / assesses program performance
- Oversees programs and operation of the University Centers of Excellence, Scholars and Fellowship programs, and DHS S&T In House labs
- Provides guidance for DHS S&T initiatives at Historically Black Colleges / Universities / Minority Institutions / Tribal Colleges
- Advises the DHS S&T Under Secretary on Science and Technology programs and issues

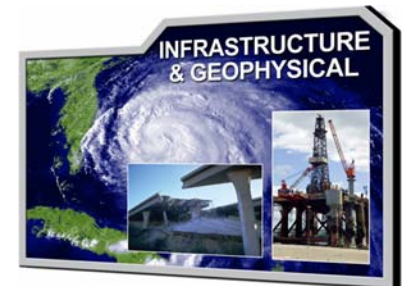


# Basic Research Portfolio

*Discovery and Invention to Enable Future Capabilities*



- Brings the capabilities, talent and resources of the Homeland Security Centers of Excellence, DOE National Laboratories and DHS Labs to bear to address the long-term R&D needs for DHS in sciences of enduring relevance
- This type of focused, protracted research investment has potential to lead to paradigm shifts in the nation's homeland security capabilities



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# Managed Technology Progression



## Exploration of Fundamental Concepts (Enablers)

## Demonstration & Delivery (Outputs)

### DHS Unique/Essential

- Address primary DHS interest areas in S&T
- Opportunity-based investment
- High impacts/surprises
- Develop/maintain core Homeland Security S&T competencies

### Support to Acquisition (EHCs)

- Program of Record Improvements
- Heavily requirements-based
- Generally evolutionary – Deliverable product to customer

### Leap-ahead First Responder Capability

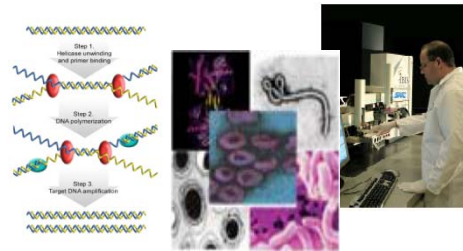
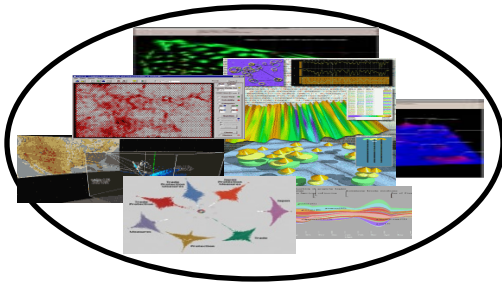
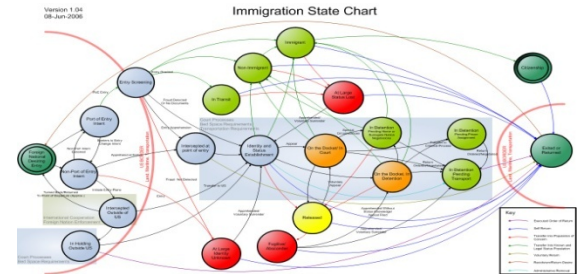
- Concept & need driven
- Transformational
- DHS Leadership priorities



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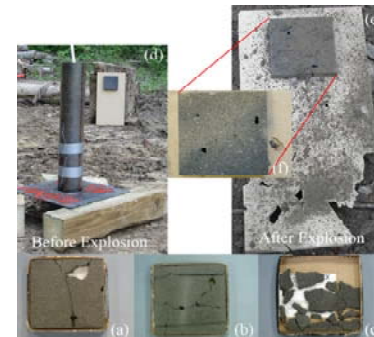
# Examples of Basic Research Activities

- Modeling & Simulation tools to capture complex relationships between immigration and border security for strategic planning
- Assays methods for next-generation biothreat detectors



- Studies of radicalization development within individuals, groups, societies; roles of governments, civic organizations, and communities
- Carbon Materials for Blast Mitigation and Explosive Device Containment

- Information analysis and visualization tools for threat vulnerability, assessment, and response
- Fundamentals of deposition, removal and transport of explosive particles



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# New Initiative - Domestic CIED

- Standoff detection on persons
- System solution for detection in baggage
- Identify individuals with hostile intent
- Homemade or novel explosives
- Novel explosives characterization
- Detect VBIED / large threat mass



- Operational Protocols for training, techniques & tactics
- Blast mitigation in the transit environment
- Response: Assessment / Render Safe / Neutralize explosive threats
- Mitigation of standoff ballistic & guided projectiles in the transportation environment
- Canine explosive detection optimization

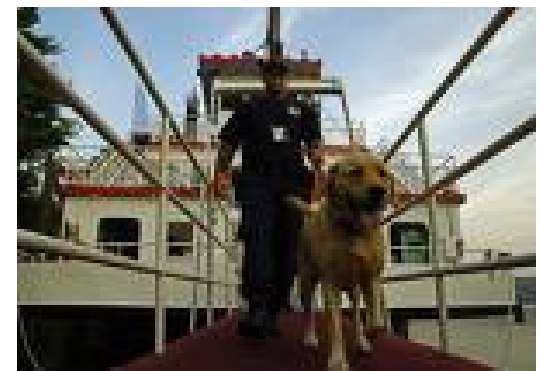
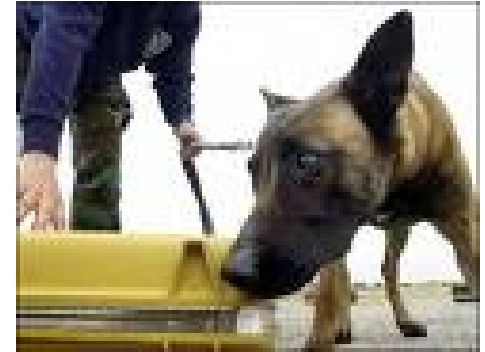


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# Exploring New Methods to Train Canines

*Thrust – To provide a deeper understanding of the potential contributions that trained canines can contribute in support of those on the front lines of homeland security.*

- Researching technologies and methods aimed at improving the performance of working dogs, increasing their results/yields, and extending their working life
- Currently being investigated by DHS S&T and our partners:
  - Best Practices for breeding and training programs
  - Genetic markers for identifying most successful breeds
  - Enhancing accuracy of canine behavioral filters to guide their placement in areas that are best suited to their traits.



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