DHS Science & Technology: Enabling Technology to Better Secure the Nation

National Small Business Conference
Critical infrastructure Opportunities

Houston, Texas · May 16, 2007

Jay M. Cohen
Under Secretary
Science and Technology Directorate

Homeland Security

S&T Goals

Consistent with the Homeland Security Act of 2002

- Accelerate delivery of enhanced technological capabilities to meet requirements and fill capability gaps to support DHS Agencies in accomplishing their mission
- Establish a lean and agile GS-manned, world-class S&T management team to deliver the technological advantage necessary to ensure DHS Agency mission success and prevent technology surprise
- Provide leadership, research and educational opportunities and resources to develop the necessary intellectual basis to enable a national S&T workforce to secure the homeland

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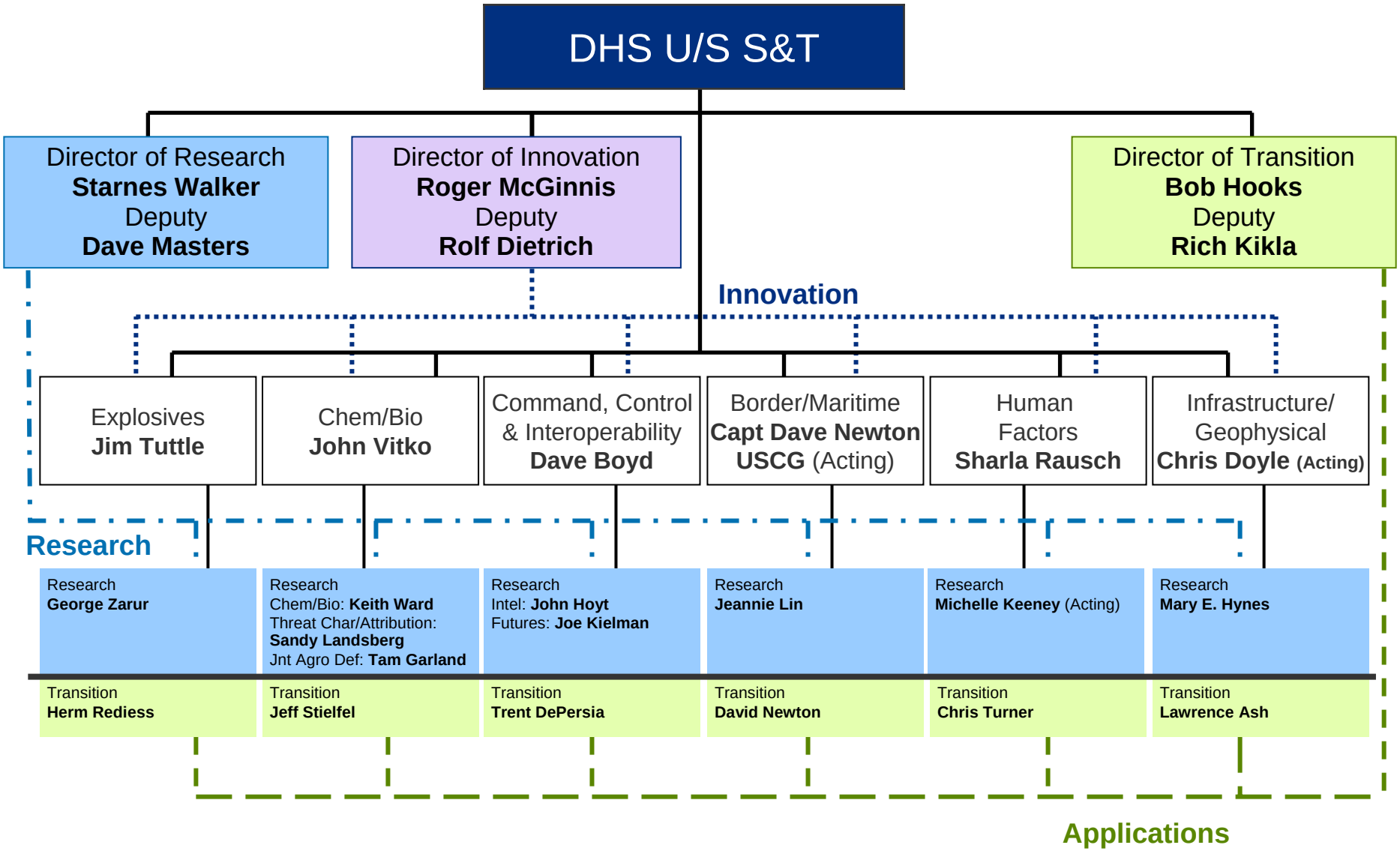
DHS S&T Investment Portfolio

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

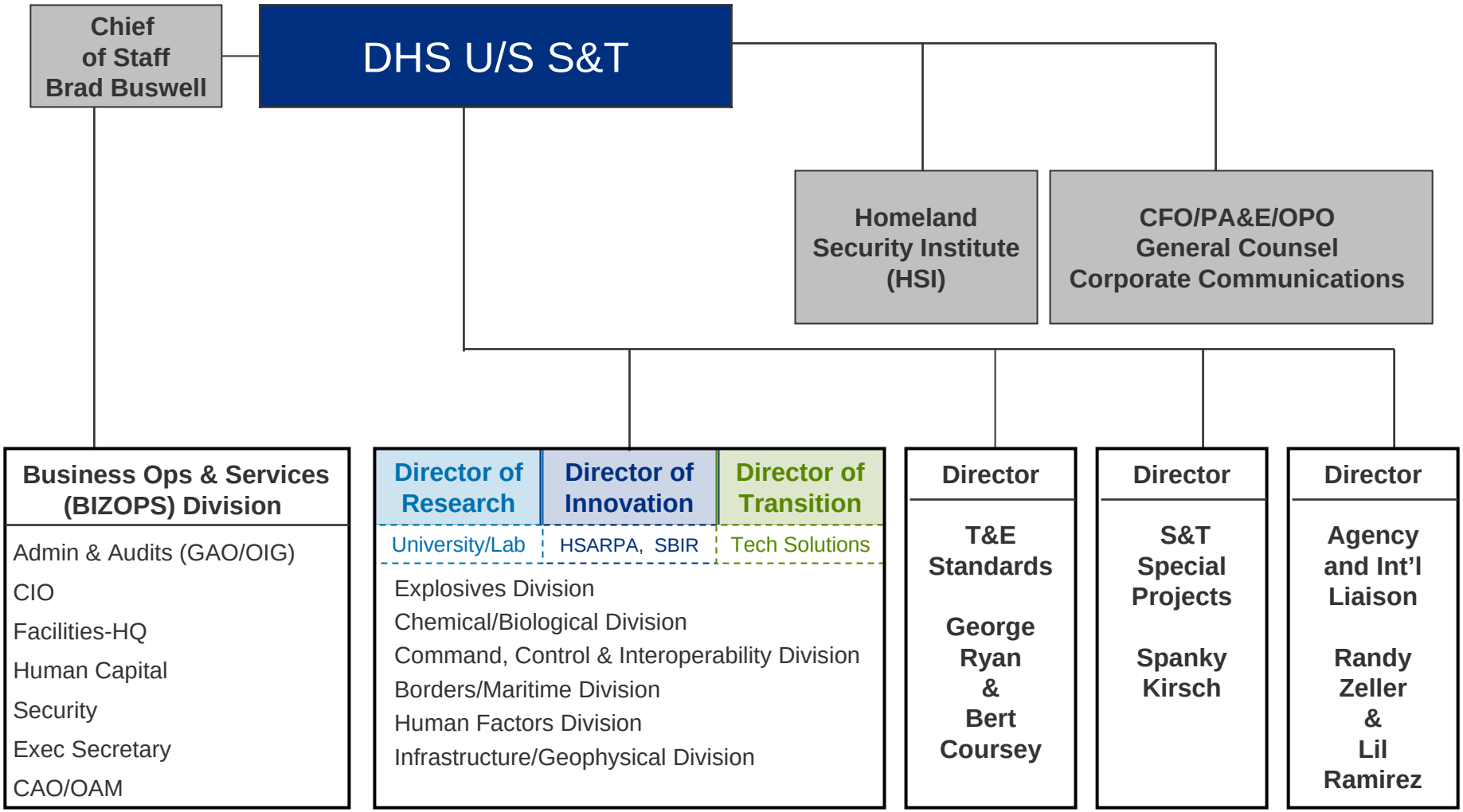
Product Transition (0-3 yrs) ▪ Focused on delivering near-term products/enhancements to acquisition ▪ Customer IPT controlled ▪ Cost, schedule, capability metrics	**Innovative Capabilities (1-5 yrs)** ▪ High-risk/High payoff ▪ "Game changer/Leap ahead" ▪ Prototype, Test and Deploy ▪ HSARPA
Basic Research (>8 yrs) ▪ Enables future paradigm changes ▪ University fundamental research ▪ Gov't lab discovery and invention	**Other (0-8+ yrs)** ▪ Test & Evaluation and Standards ▪ Laboratory Operations & Construction ▪ Required by Administration (HSPDs) ▪ Congressional direction/law

Customer Focused, Output Oriented

S&T Organization



DHS S&T Directorate



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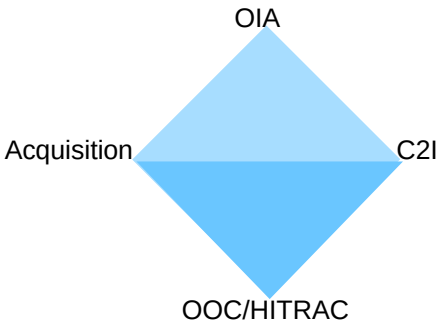
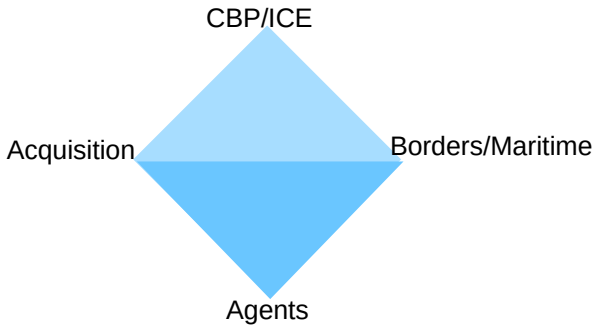
DHS Requirements/Capability Capstone IPTs

DHS S&T Product – "Enabling Homeland Capabilities"

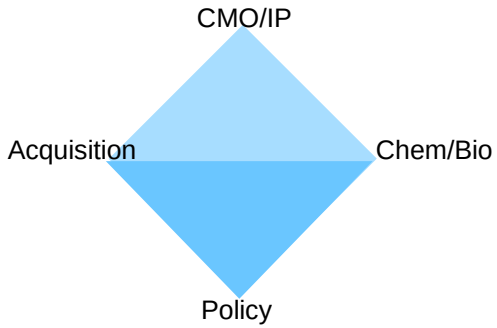
Information Sharing/Mgmt



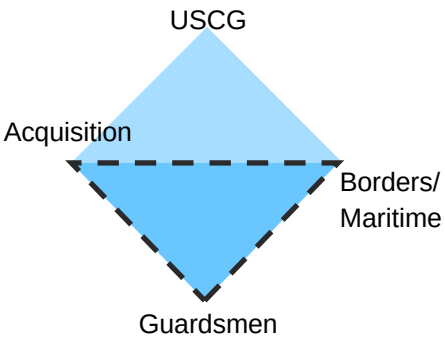
Border Security



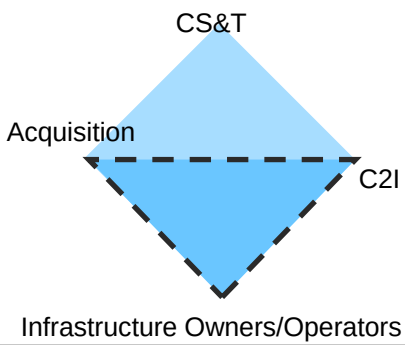
Chem/Bio Defense



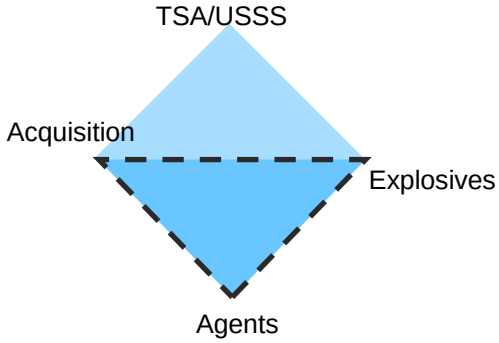
Maritime Security



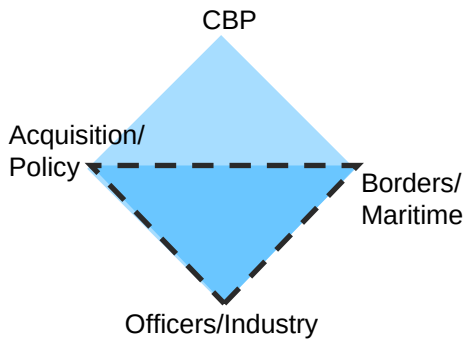
Cyber Security



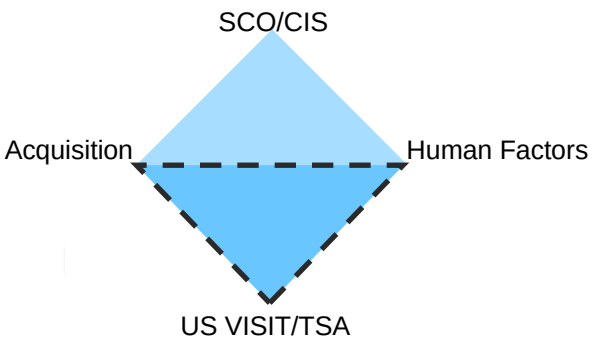
Explosive Prevention



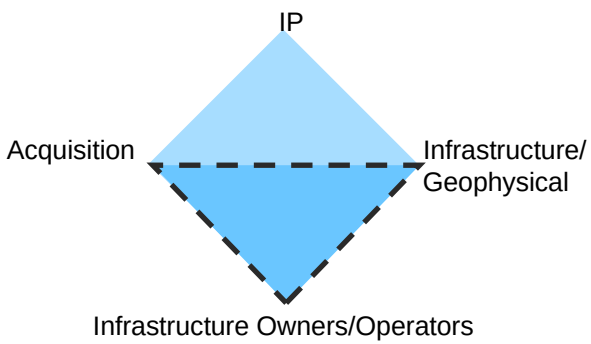
Cargo Security



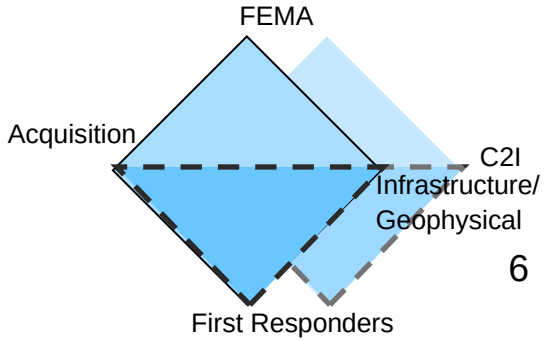
People Screening



Infrastructure Protection



Incident Management



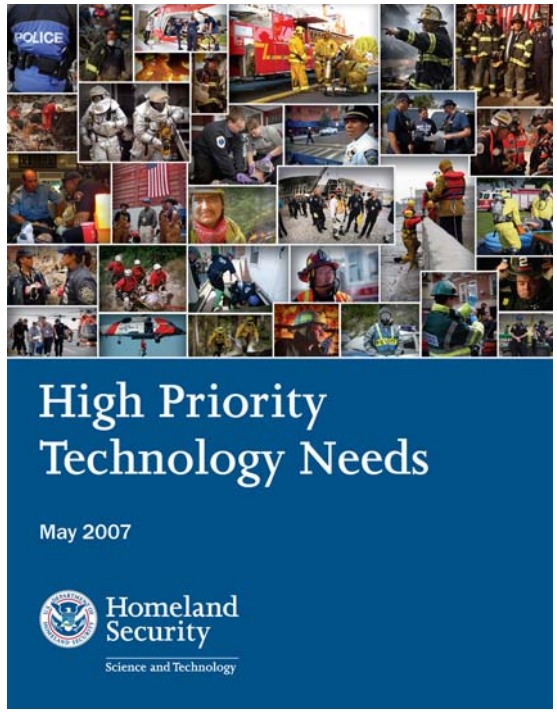
IPT Initial Outcome

High Priority Technology Needs

- 11 Capstone IPTs have identified 77 High Priority Technology Needs for DHS components and their customers
- Identified in new brochure and posted at www.hsarpabaa.com
- Baseline established for conducting an iterative, dynamic IPT process on an annual cycle aligned with DHS funding and acquisition processes

IPT Next Steps:

- Focus on delivering product to customers
- Detail proposed technology solutions
- Clarify deliverable and transition plans
- Develop Technology Transition Agreements to establish customer requirements and technical specifications



Customer Focused…Output Oriented

Infrastructure Protection:
Representative Technology Needs

- Analytical tools to quantify interdependencies and cascading consequences as disruptions occur across critical infrastructure sectors *(IP/Geophysical Division)*
- Effective and affordable blast analysis and protection for critical infrastructure; improved understanding of blast failure mechanisms and protection measures for the most vital critical infrastructure and key resources *(IP/Geophysical Division)*
- Advanced, automated and affordable monitoring and surveillance technologies *(C2I Division)*

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Homeland Security Act of 2002

HSARPA will….

“Support basic and applied homeland Security research to promote *revolutionary* changes in technologies; advance the development, testing and evaluation, and deployment of critical homeland security technologies; and accelerate the prototyping and deployment of technologies that would address homeland security vulnerabilities.”

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HIPS and HITS

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

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

Homeland Innovative Prototypical Solutions (HIPS)

Explosives	Chem/Bio	Command, Control & Interoperability	Borders/ Maritime	Human Factors	Infrastructure/ Geophysical
Project Chloe- High altitude aerial platform existing above civil aviation Counter-MANPADS **SENSIT** – System to identify numerous liquids in baggage **IED Defeat / APE VBIED Defeat** – Detection/prevention and mitigation technologies to counter IEDs		**SCOPE** (Scalable Common Operational Picture Experiment) – Leverages Global Observer JCTD	**Scalable Composite Vessel Prototype (SCVP)** – Lightweight, composite material with high speed hull **SAFECON –** 90 second container screening device	**FAST M2** (Future Attribute Screening Technology Mobile Module) – Relocatable Lab capable of testing for behavioral/ physiological cues of "hostile intent" Double or triple wide trailer tested at various sites around the country	**Resilient Electric Grid** – System that will prevent cascading effects of power surge on electrical grids **Levee Strengthening and Rapid Repair -** rapidly stop a breach in a levee **Storm Surge and Hurricane Mitigation**

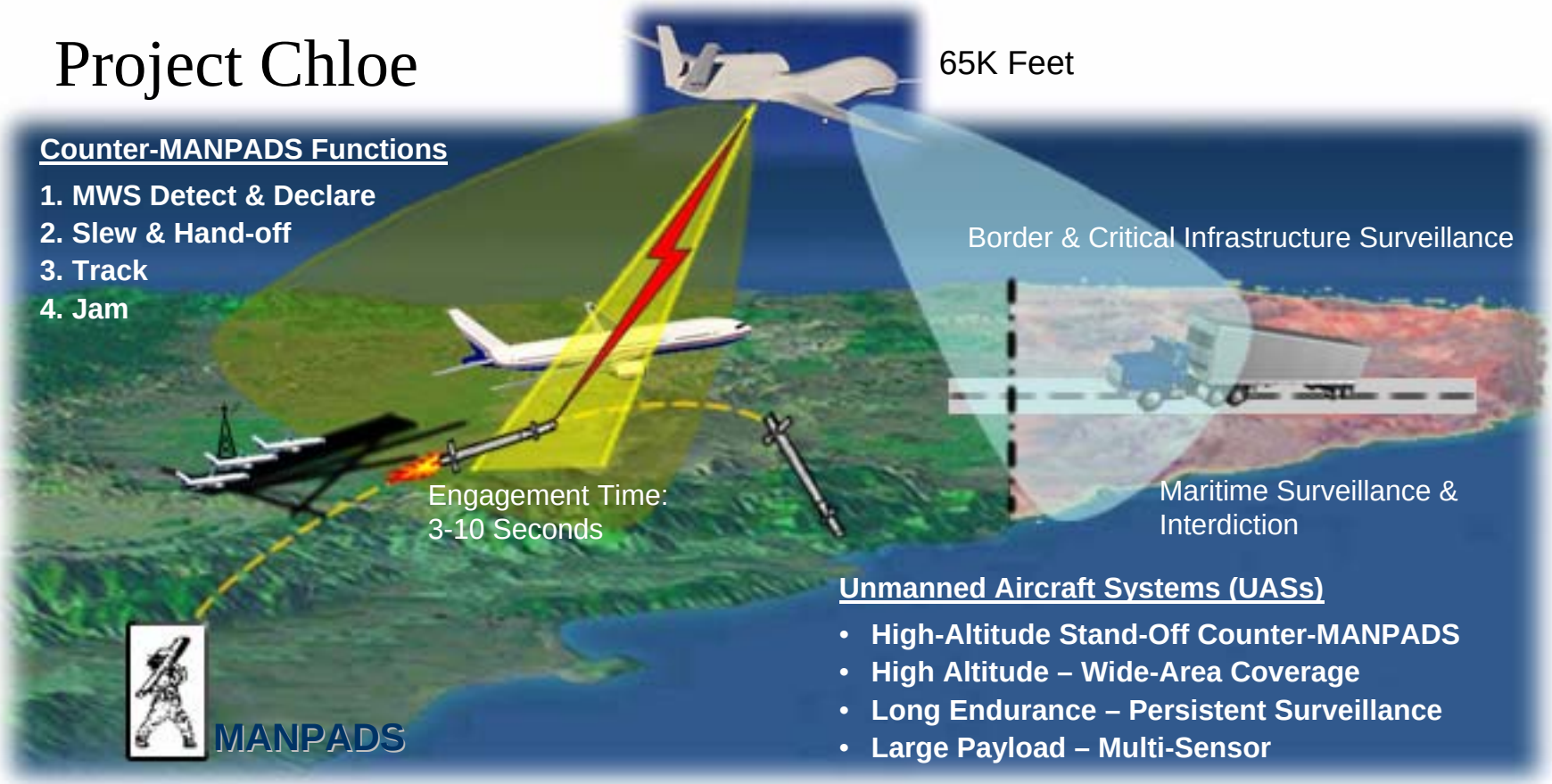
High Impact Technology Solutions (HITS)

	Real Time Bio Detection and Identify **Cell-All -** Ubiquitous Chem/Bio/agent detector	**First Net** - First Responder Reliable Relay Link **Phone Home –** Inter-operative and inexpensive hand-held radios	**Tunnel Detect** – Ability to detect, identify, and confirm illegal and clandestine underground border structures and activities	**Document Validator** –High proficiency scanner that can identity fraudulent docs Leverage USSS system **Biometric Detector** – High proficiency small biometric scanner	**Wide Area Surveillance/ Change Detection for Critical Infrastructure** **Resilient Tunnel**– Tunnel Protection/Blast Mitigation

Homeland Innovative Prototypical Solutions

Counter-MANPADS/Persistent Surveillance

Project Chloe



Operational Characteristics

- Real-time sensor fusion/dissemination
- Multi-user / border surveillance requirements
- Commercial Aircraft MANPADS protection
- Automatic target detection/recognition
- Persistence (24/7, all-weather coverage)

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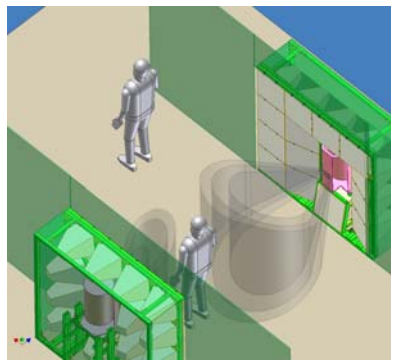
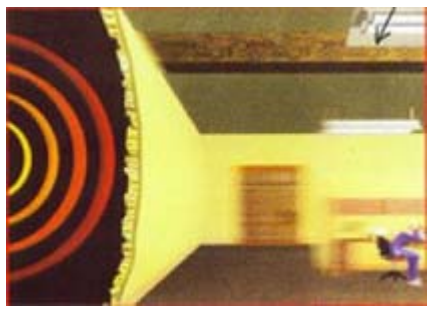
High Impact Technology Solutions

Technologies for Suicide Bomber Defeat & Blast Mitigation

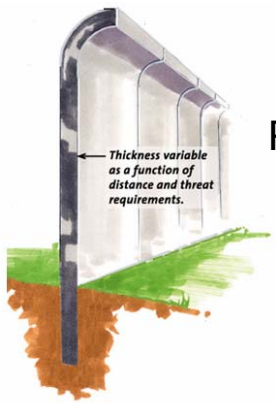


Suicide Bomber & Device Detection

Explosive Device Deactivation



Blast Mitigation



Reactive & Shaping Walls

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High Impact Technology Solutions

Critical Infrastructure Change Detection

Explore Methods to Monitor Critical Infrastructure

Large and Remote Locations

Densely Populated Urban Environments

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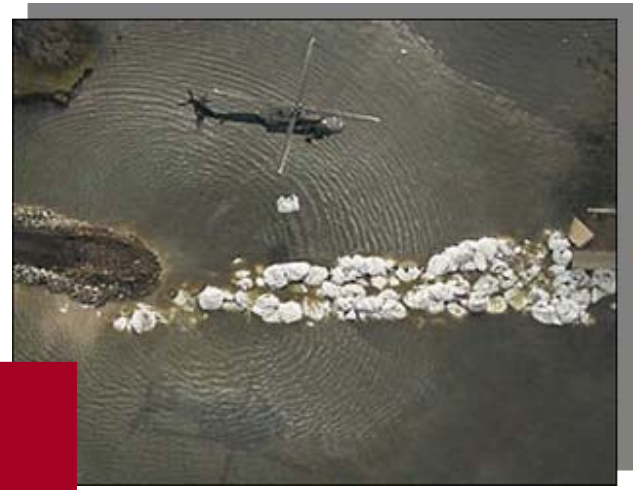
Homeland Innovative Prototypical Solutions

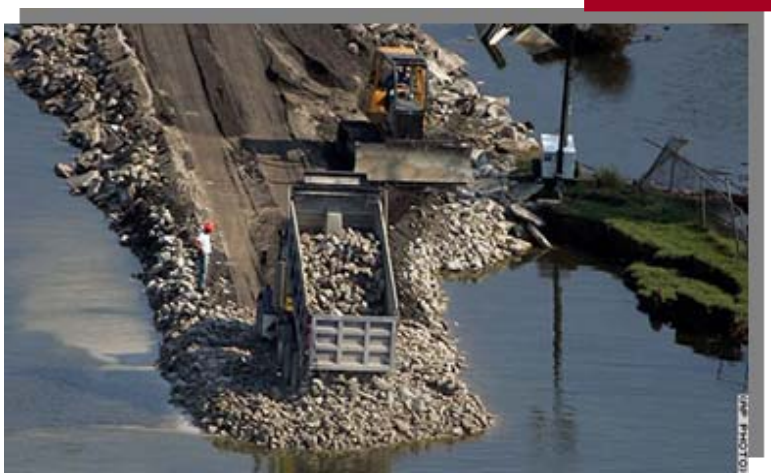
Levee Strengthening and Rapid Repair

Pre-emptive mapping of weak levees

Pre-Flood Deployment of Protective And Rapid Repair Supplies to Problem Locations

Drop-in structures lofted by aircraft





Float-in structure guided by cables

Explosively Emplaced Support Structures

Roll-out protective coverings such as articulated concrete mats

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Homeland Innovative Prototypical Solutions

Levee Strengthening and Rapid Repair

Click to Play Video

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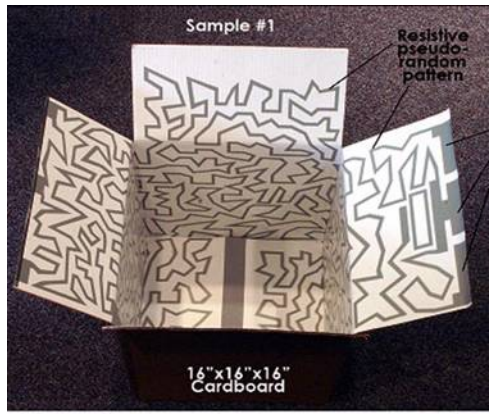
DHS SBIR Program

- 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
- Funded by S&T Directorate and DNDO
- Implemented Cost Match to motivate commercialization



Visit www.dhssbir.com (soon to be .gov)

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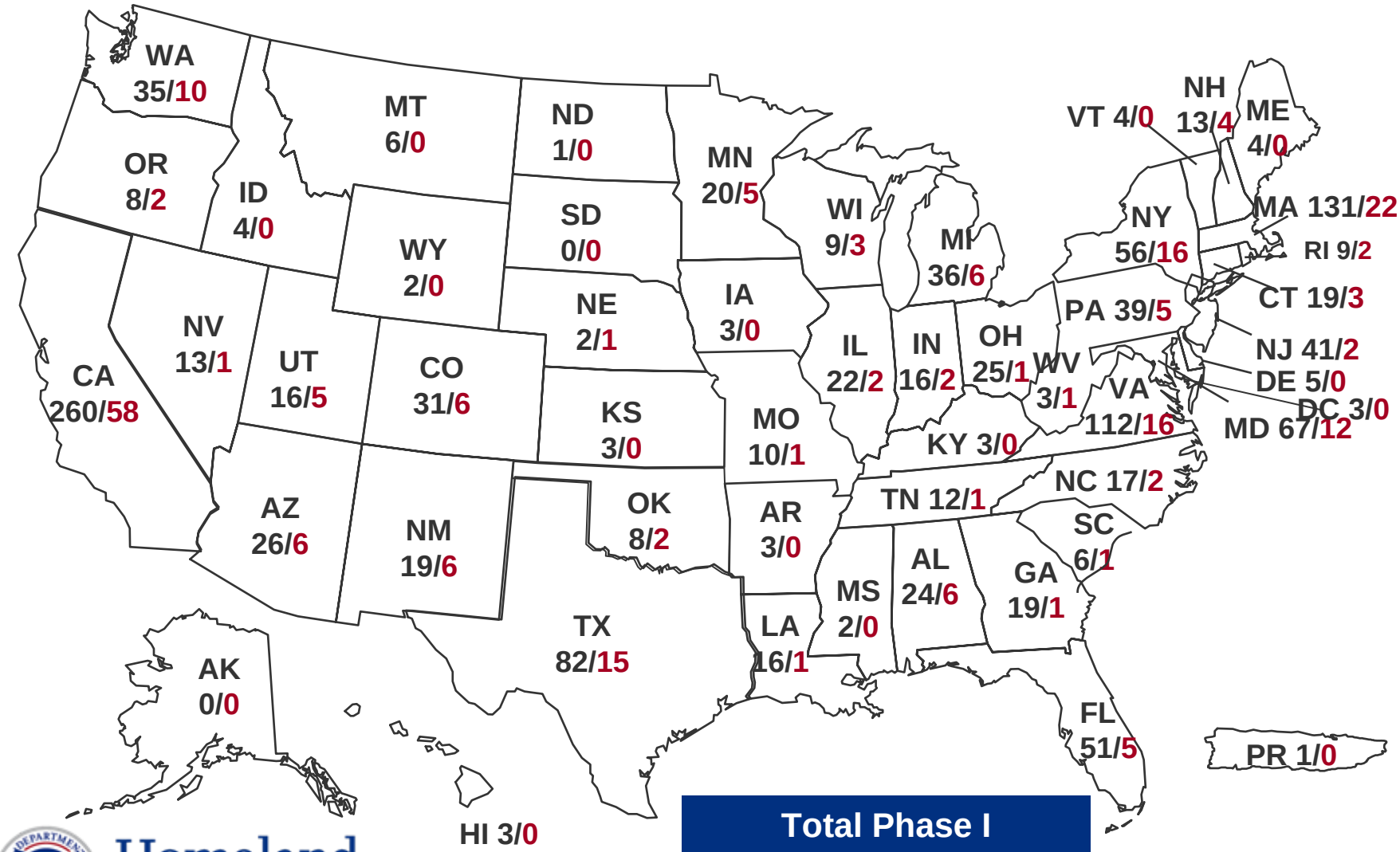
DHS SBIR/STTR Phase I

No. of Submissions vs. Awards per State (Nov. 04- Jan. 06)



Total Phase I Submissions/Awards 1,320/232

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DHS SBIR expects to release its 6.2 SBIR Solicitation in August 2006

DHS announces its 6.1 SBIR/STTR award selections.....

Homeland Security Advanced Research Projects Agency SBIR/STTR Program

Vision: Make America Safer

The top priority for everything HSARPA does is to enhance the safety and security of America's people, institutions and way of life.

SBIR Program:

The Department of Homeland Security (DHS), Homeland Security Advanced Research Projects Agency (HSARPA) launched the Small Business Innovation Research (SBIR) program, in December 2003. Our goal is to increase the participation of innovative and creative small businesses in Federal Research/Research and Development (R/R&D) programs and challenge industry to bring innovative homeland security solutions to reality.

All Federal agencies with an annual extramural R&D budget exceeding $100M are required to participate in the SBIR Program. Each fiscal year, not less than 2.5 percent of the annual extramural budget, is reserved for awards to small businesses for R/R&D through a three phase process

Other Funding Opportunities

Collaboration Opportunities

Topic Recommendations

Done Internet

start Inbox ... C:\Doc... Micros... HSARP... Calcula... update... Micros... 5:07 PM

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DHS SBIR 7.1 S&T Topics

- H-SB07.1-001 Trace Explosives Particle and Vapor Sample Collection
- H-SB07.1-002 Subterranean Response and Evacuation
- H-SB07.1-003 Secure Wrap
- H-SB07.1-004 Mobile Biometrics Screening
- H-SB07.1-005 Responder Wireless Physiological Monitoring Device
- H-SB07.1-006 Enhanced Project “Safe-Cracker”
- H-SB07.1-007 Improved Chemiresistor Sensing Arrays for Detection of Small Molecules Gases

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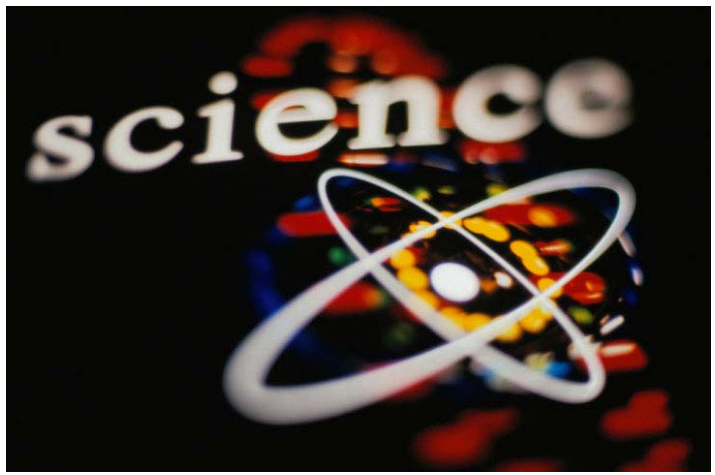
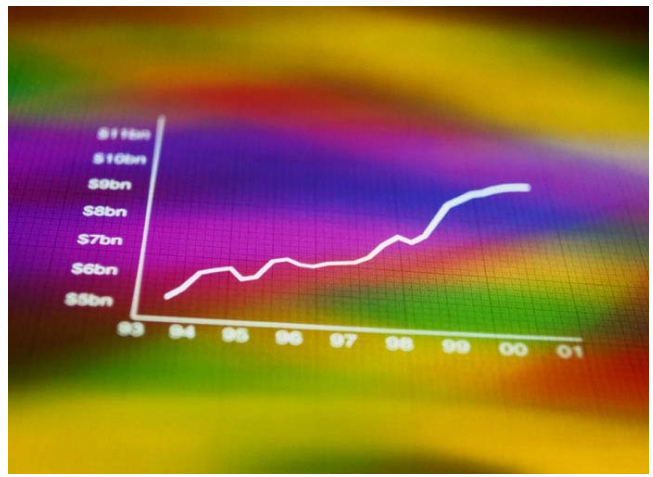
DHS SBIR 7.1 DNDO Topics

- H-SB07.1-008 Source Surveillance
- H-SB07.1-009 Improved Solid-State Neutron Detection Devices
- H-SB07.1-0010 Development of High Reliability Occupancy Sensors





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Key Dates for 7.1 & 7.2 DHS SBIR Solicitation

07.1 Pre-solicitation Posted:	April 4, 2007
Proposals Accepted:	April 20, 2007 – June 5, 2007
Contracts Award:	August 2007 (est.)
07.2 Pre-solicitation Posted:	June 11, 2007 (est.)
Proposals Accepted:	June 26, 2007 - Aug 12, 2007 (est.)
Contracts Awarded:	November 2007 (est.)

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Key Dates for FY 08 DHS SBIR Solicitation

- 08.1 Develop Topics — June 25, 2007
- Topics accepted/solicitation ready — July 1, 2007
- Solicitation sent to OPO — July 15, 2007
- 08.1 Pre-solicitation posted — Sept 1, 2007
- Contracts accepted — Sept 15 – Oct 30 (est.)

- 2 more solicitations in FY 08 in the Jan-Feb 08 and May-Jun 08 timeframe

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DHS SBIR Program Contacts

- DHS SBIR Program
  - Director, Vinny Schaper
  - 202-254-6119
- S&T SBIR Program
  - Program Manager, Lisa Sobolewski
  - 202-254-6768
- DNDO SBIR Program
  - Program Manager, Anu Bowman
  - 202-254-7474

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New Broad Agency Announcements

Released May 1

- IED and Vehicle-Borne Explosive Device Defeat
- First Responder Reliable Link (First NET)
- Document validator
- Biometric detector
- Home Made Explosives Detection System Development
- Emerging Counter-MANPADS Technologies Assessment

For more about BAAs, visit www.FedBizOpps.gov and www.hsarpabaa.com

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The SAFETY Act …

- For anti-terrorism technologies and services
- Provides legal liability protections for Qualified Anti-Terrorism Technologies (QATTs)
- Encourages development and deployment of new and innovative anti-terrorism products and services
- Applies only to Acts of Terrorism

What is Eligible for SAFETY Act Protection?

- Products
- Services
- Software and other forms of intellectual property

…that qualify as Anti-Terrorism Technologies

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S&T Stakeholders Conference

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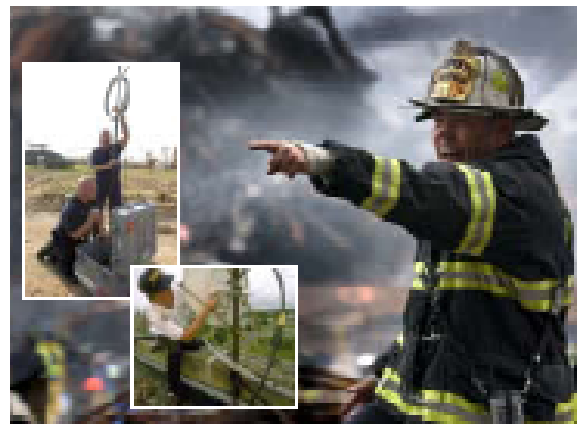
FROM SCIENCE...SECURITY

Explosives

Chemical/Biological

Command, Control, & Interoperability



Borders/Maritime

Human Factors

Infrastructure/Geophysical

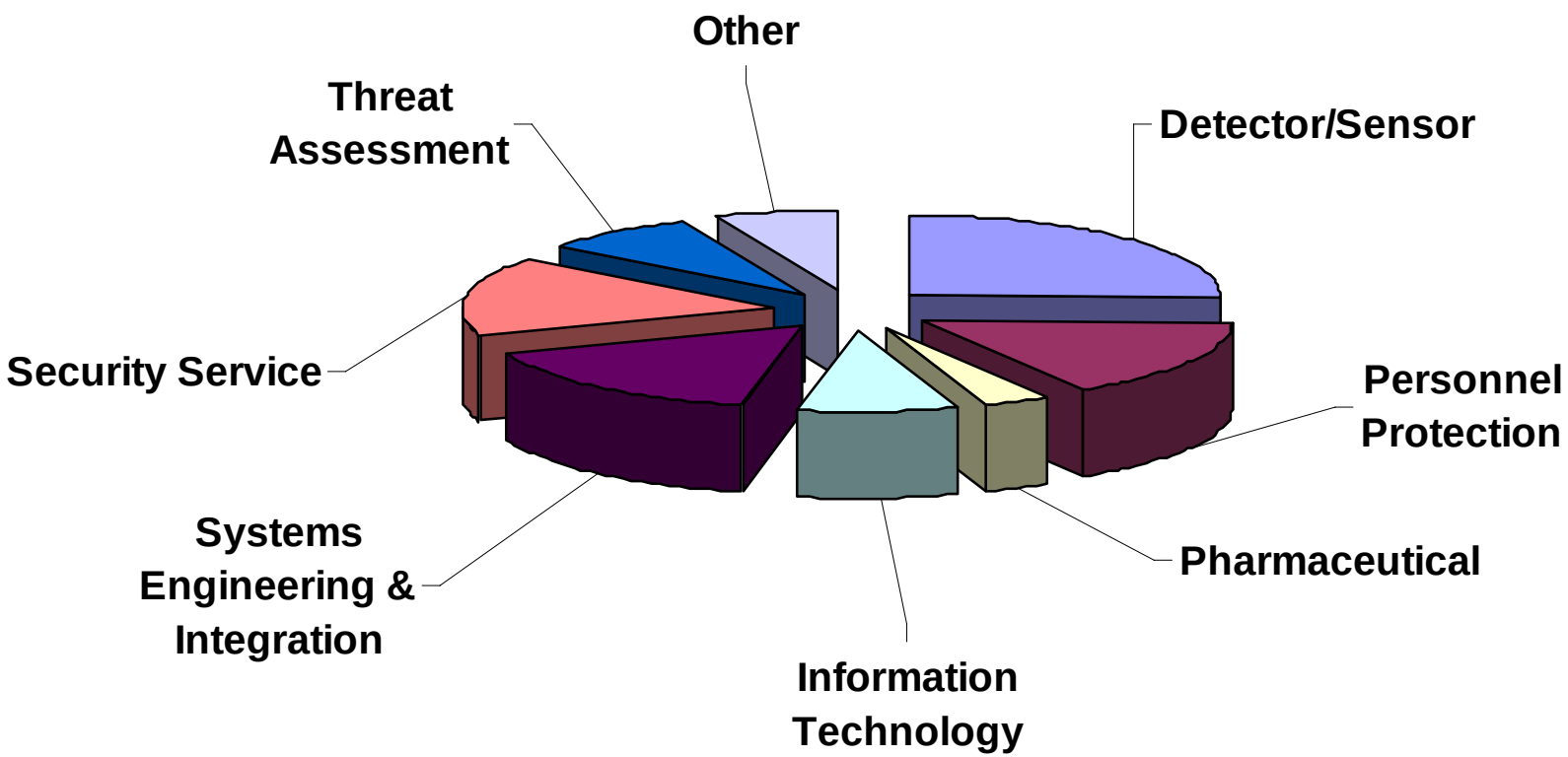
FROM TECHNOLOGY...TRUST

Back-Up slides

Levels of SAFETY Act Protection

- Developmental Testing & Evaluation Designation (DTED)
  - *Has potential*
- Designation (D)
  - *Developmental testing*
- Certification (D&C)
  - *Operational Performance*

Applications by Threat Area



The Final Rule

- *Emphasizes integration* of SAFETY Act considerations in government procurements
- *Eliminates duplicative* government technical evaluations
- *Decreases DHS' processing* times
- *Expands geographic scope* of SAFETY Act protections to some technologies deployed overseas
- *Includes a new category:* Development Testing & Evaluation Designation (DTED)
- *Strengthens confidentiality* protections

High Impact Technology Solutions

Cell-All Ubiquitous Chem/Bio Detect

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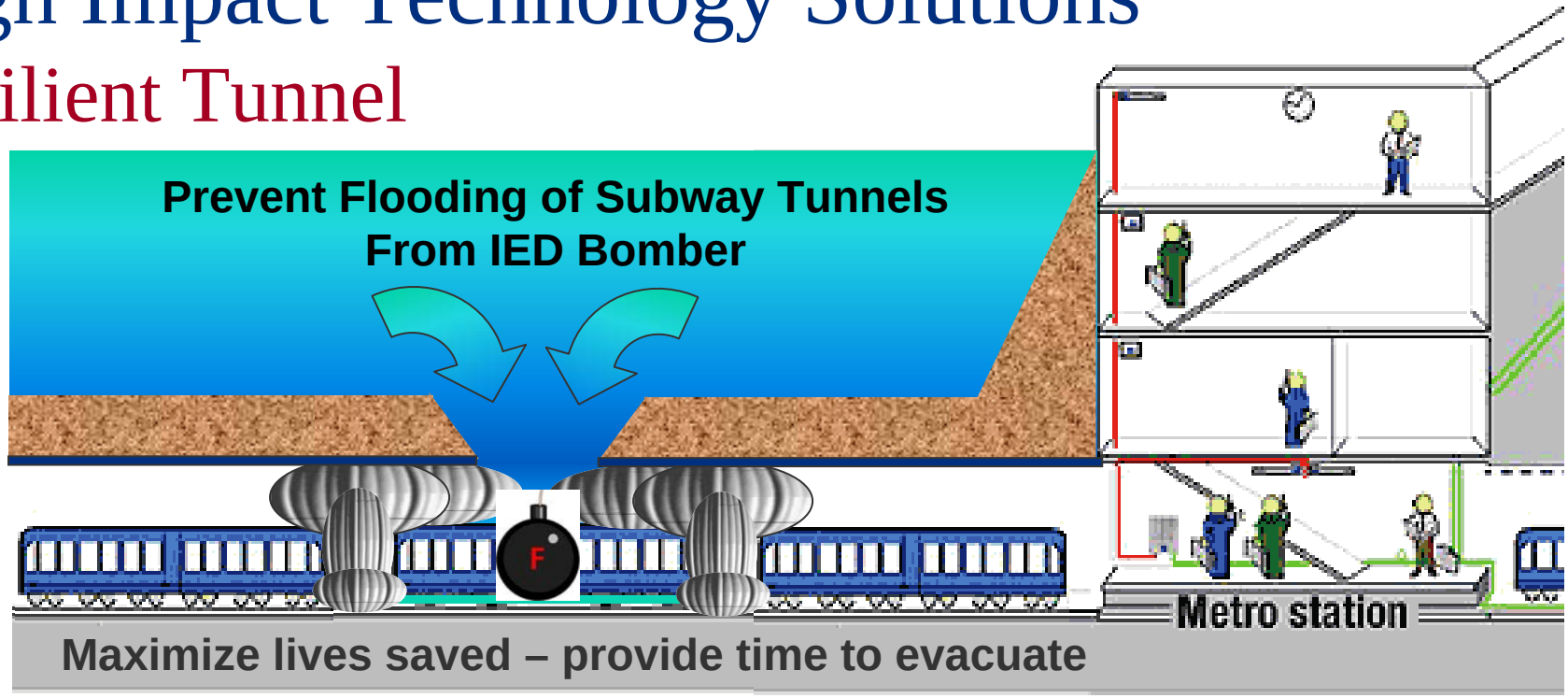
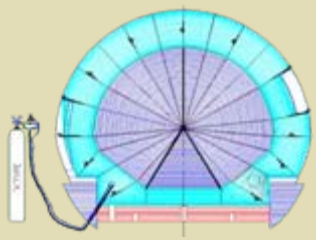
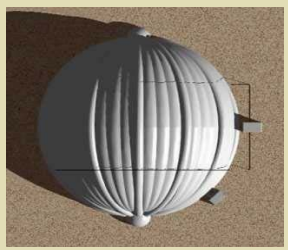
High Impact Technology Solutions

Resilient Tunnel







Recent advances in inflatable structure technology:

- Stronger Materials
- Rapid Inflation
- Lower Cost than Flood Gates
- Sustainable

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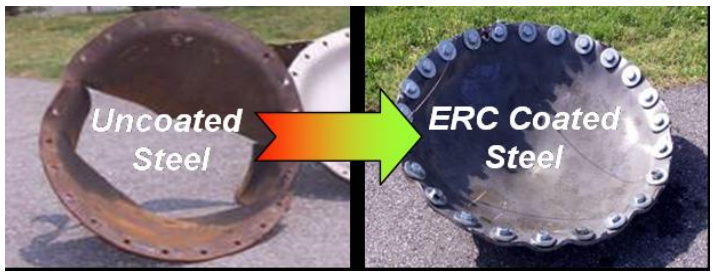
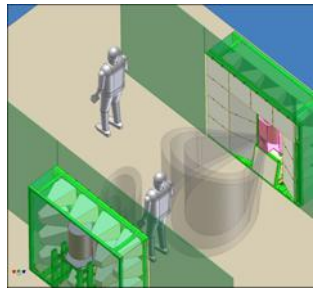
High Innovative Prototype Solutions

Improvised Explosive Devices Defeat

Explosive Resistant Coating





Reactive & Shaping Walls
APE Project

- *Puffers* for explosives trace material detection on people, bags/parcels, and vehicles
- Walk-through/whole-body imaging (e.g., backscatter)
- Advanced Protection Explosive (APE): cancellation methods for explosive shock waves
- Drive-through imaging technology (x-ray, neutron of materials only)

Predict, Detect, Defeat and Destroy IED/VBIED at range (100 yards) to change the calculus of the bomber versus the defender

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Plan for FY 08 SBIR

Utilize Capstone High Priority Technology Areas as SBIR Topic Areas

- The selected IPT identifies the need
  - S&T develops the topic
  - SBIR Program publishes the topic
  - S&T author develops the team of evaluators
  - SBIR pays for Phases I & II….total $850,000 – $1 million
  - Acquisition or S&T pay for follow-up R&D or install
- Supplement HIPs and HITs

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DHS SBIR Funding

- FY 2007……~$25M
  - S&T SBIR……~$18M
  - DNDO SBIR……~$7M
  - Estimates
- FY 2008……~$21M
  - S&T SBIR……~13.5M
  - DNDO……~7.5M

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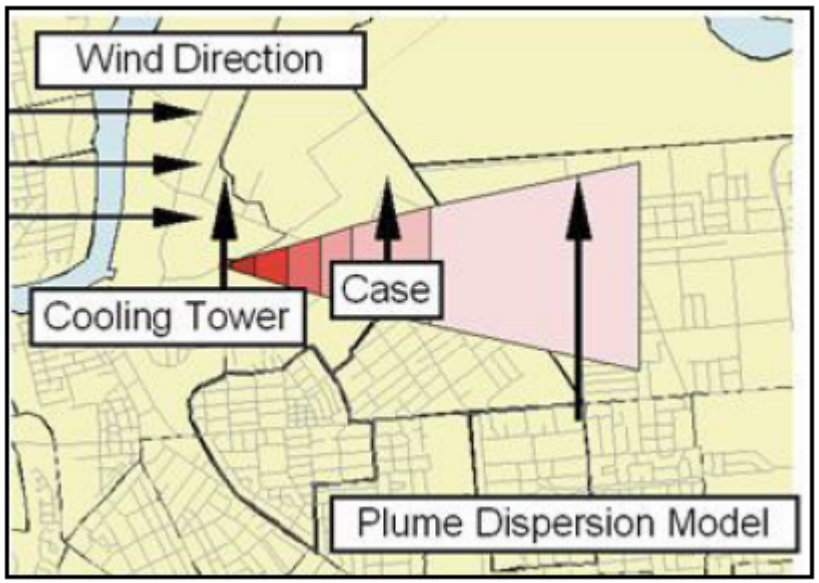
High Impact Technology Solutions
Real Time Bio Detect

Systems to detect biological agents in less than 60 seconds, and then provide RF information transfer to various centers for decision making and corrective action.



VS

Detection via cell culture

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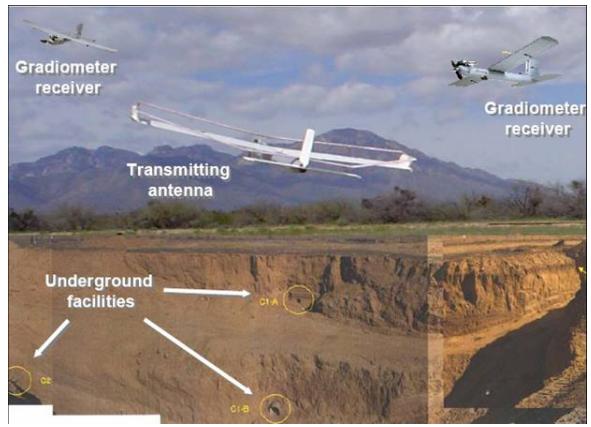
Doing Business with DHS S&T *cont'd*

Additional Open BAAs

- Tunnel Detection Technologies – allows rapid detection of tunnels
- SAFE Container (SAFECON) – detect and identify WMD, explosives and contraband cargo and to detect humans in shipping containers
- Future Attribute Screening Technology (FAST) Demonstration Laboratory – rapid screening of people and their credentials and belongings
- CHLOE - High Altitude Endurance Unmanned Aerial System-Based Counter-MANPADS Technology Assessment



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Open SBIR Solicitation

- Seven technical topic areas aligned with S&T divisions

For SBIR opportunities, visit www.sbir.dhs.gov

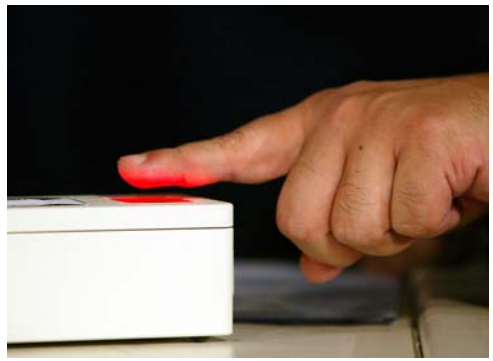
Doing Business with DHS S&T

New BAAs – Released May 1

- IED and Vehicle-Borne Explosive Device Defeat
- First Responder Reliable Link (First NET)
- Document validator
- Biometric detector
- Home Made Explosives Detection System Development
- Emerging Counter-MANPADS Technologies Assessment

For more about BAAs, visit www.FedBizOpps.gov

and www.hsarpabaa.com



Homeland Security