Heartland Security 2007

St. Paul, Minnesota

Homeland Security Readiness: Today and for the Future

Jay H. Cohen
Under Secretary
Department of Homeland Security
Science and Technology Directorate
July 9, 2007

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

Homeland Security

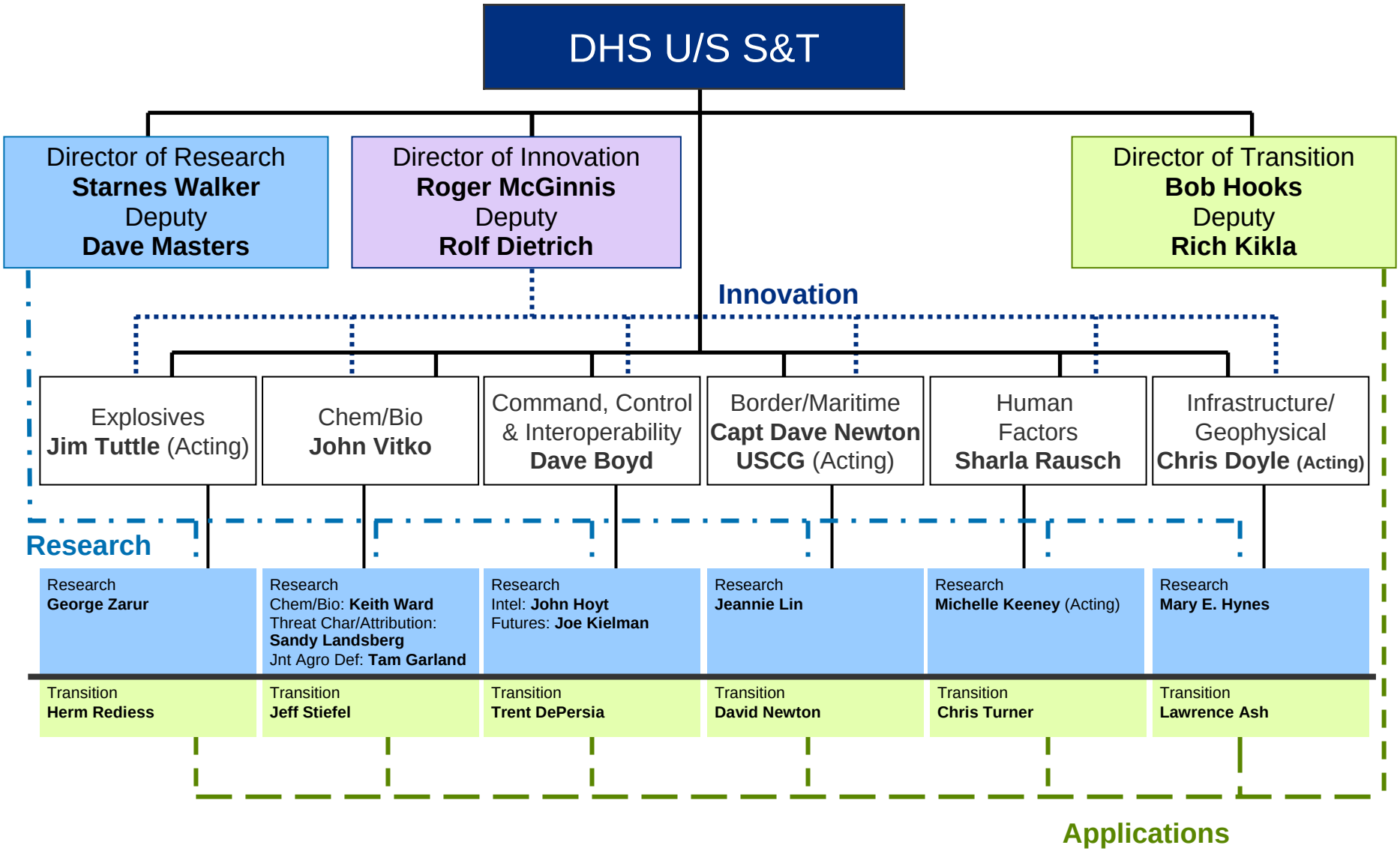
DHS S&T Investment Portfolio

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 ▪ Government 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

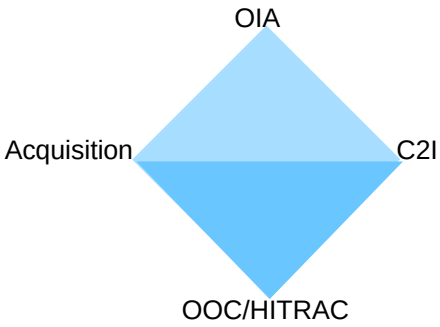
S&T Organization



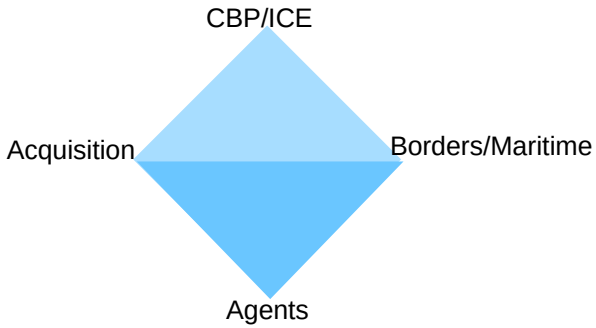
DHS Requirements/Capability Capstone IPTs

DHS S&T Product – "Enabling Homeland Capabilities"

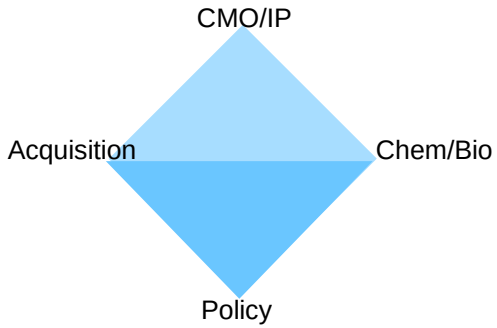
Information Sharing/Mgmt



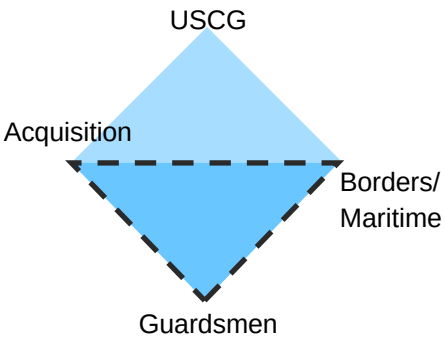
Border Security



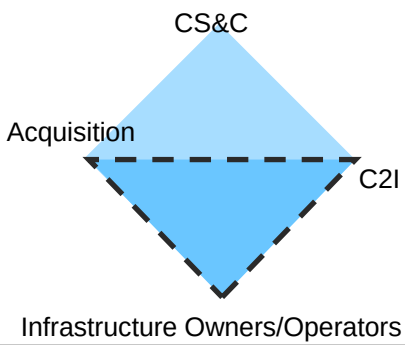
Chem/Bio Defense



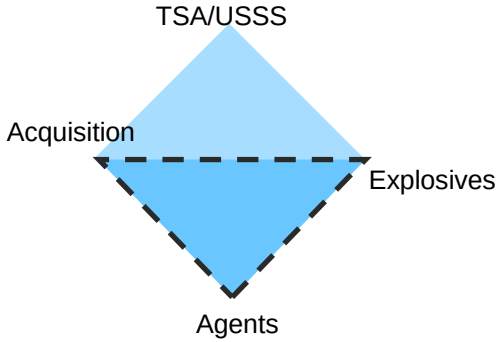
Maritime Security



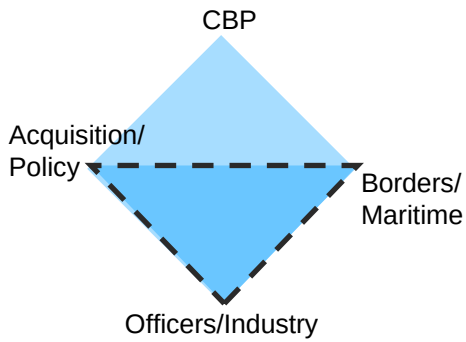
Cyber Security



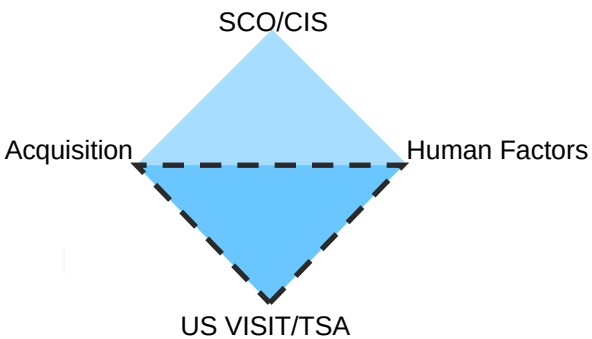
Explosive Prevention



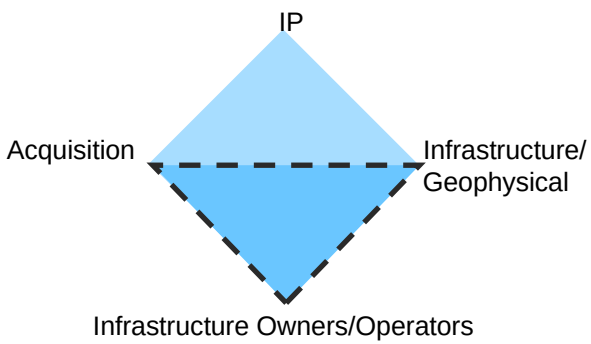
Cargo Security



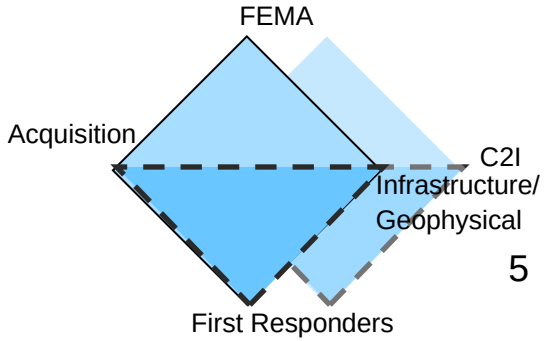
People Screening



Infrastructure Protection



Incident Management



National Center for Food Protection & Defense

- **Focus Areas**
- **Rapid response analysis assessing food ingredients and products from China,** in response to the contamination of animal/pet feed. Will include analysis of the foods that are most restricted in terms of available substitutes.

- **Consequence Modeling System: Modeling of food system contamination events** for vulnerability assessment, intervention/countermeasure evaluation and awareness. Has been expanded to support the NBACC 2008 bioterrorism risk assessment and the FDA/USDA food contamination event models.

- **Sensor for rapid detection of chemicals and toxins**, showing promise as a rapid screen for ricin in complex foods, e.g., fruit juice. Would provide a means of in-plant screening for potential intentional contamination.

Future Alignment: Centers of Excellence

S&T DIVISIONS

Explosives	Chemical/Biological	Command, Control & Interoperability	Borders/Maritime	Human Factors	Infrastructure/ Geophysical
NEW *National Center for Explosives Detection, Mitigation & Response*	National Center for Food Protection and Defense — A Homeland Security Center of Excellence FAZD Center — National Center for Foreign Animal and Zoonotic Disease Defense CAMRA — Center for Advancing Microbial Risk Assessment *Consolidated Chem/Bio Center*	**IDS-UACs** **RVACs** *Consolidated CCI Center*	**NEW** *National Center for Border Security & Immigration* **NEW** *National Center for Maritime, Island & Remote/Extreme Environment Security*	START	PACER — A Homeland Security Center of Excellence **NEW** *National Center for Natural Disasters, Coastal Infrastructure & Emergency Management*

Operations & Analysis

Risk Sciences Branch & HSI Risk Determination

CREATE Homeland Security Center

DHS S&T Laboratories

Environmental Measurements Laboratory

National Biodefense Analysis and Countermeasures Center (NBACC)

Transportation Security Laboratory

Plum Island Animal Disease Center

… S&T has access to these four DHS S&T Labs and 10 DOE National Labs

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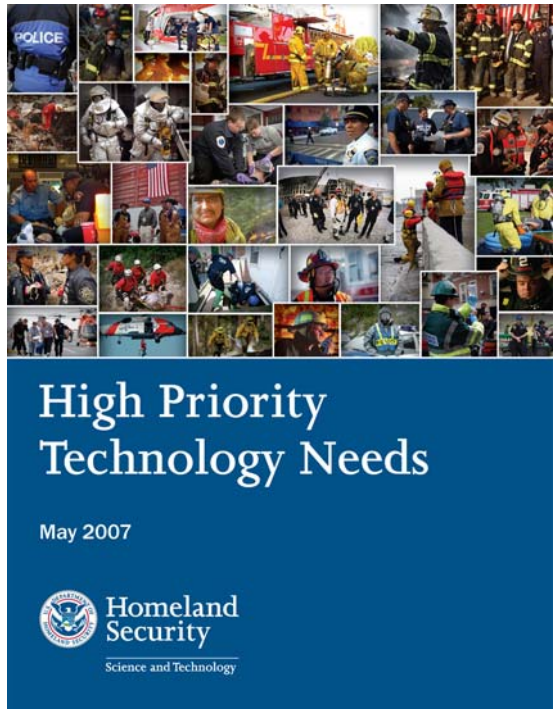
Product Transition: Integrated Product Team Initial Outcome

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

Chem/Bio Defense:
Representative Technology Needs

- Tools to detect and mitigate animal disease breakouts
- Policy net assessments to provide fresh perspectives on fundamental elements of the national biodefense strategy
- Improved tools for integrated CBRN Risk Assessment
- Incident characterization capability for response & restoration
- Improved Chem/Bio Forensic Analysis capability
- National-scale detection architectures and strategies to address outdoor, indoor (e.g., highly trafficked transportation hubs) and critical infrastructure
- Consequence assessments of attacks on chemical facilities and Chem/Bio attacks on other critical infrastructure
- Integrated CBRNE Sensor Reporting capability
- Handheld rapid biological and chemical detection systems
- Detection paradigms and systems for enhanced, emerging and novel biological threats

S&T Lead: Chem-Bio Division

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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 CI/KR *(IP/Geophysical Division)*
- Advanced, automated and affordable monitoring and surveillance technologies *(C2I Division)*

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Interoperability:
Representative Technology Needs

- Development and evaluation of Internet Protocol (IP) enabled backbones
- Test and evaluation of emergent wireless broadband data systems
- Acceleration of development and testing of P25 IP-based interfaces
- Identification and development of message interface standards
- Transition of Land Mobile Radios communication architectures to cellular based architectures
- Evaluation of access technologies
- Development of the complementary test procedures

S&T Lead: 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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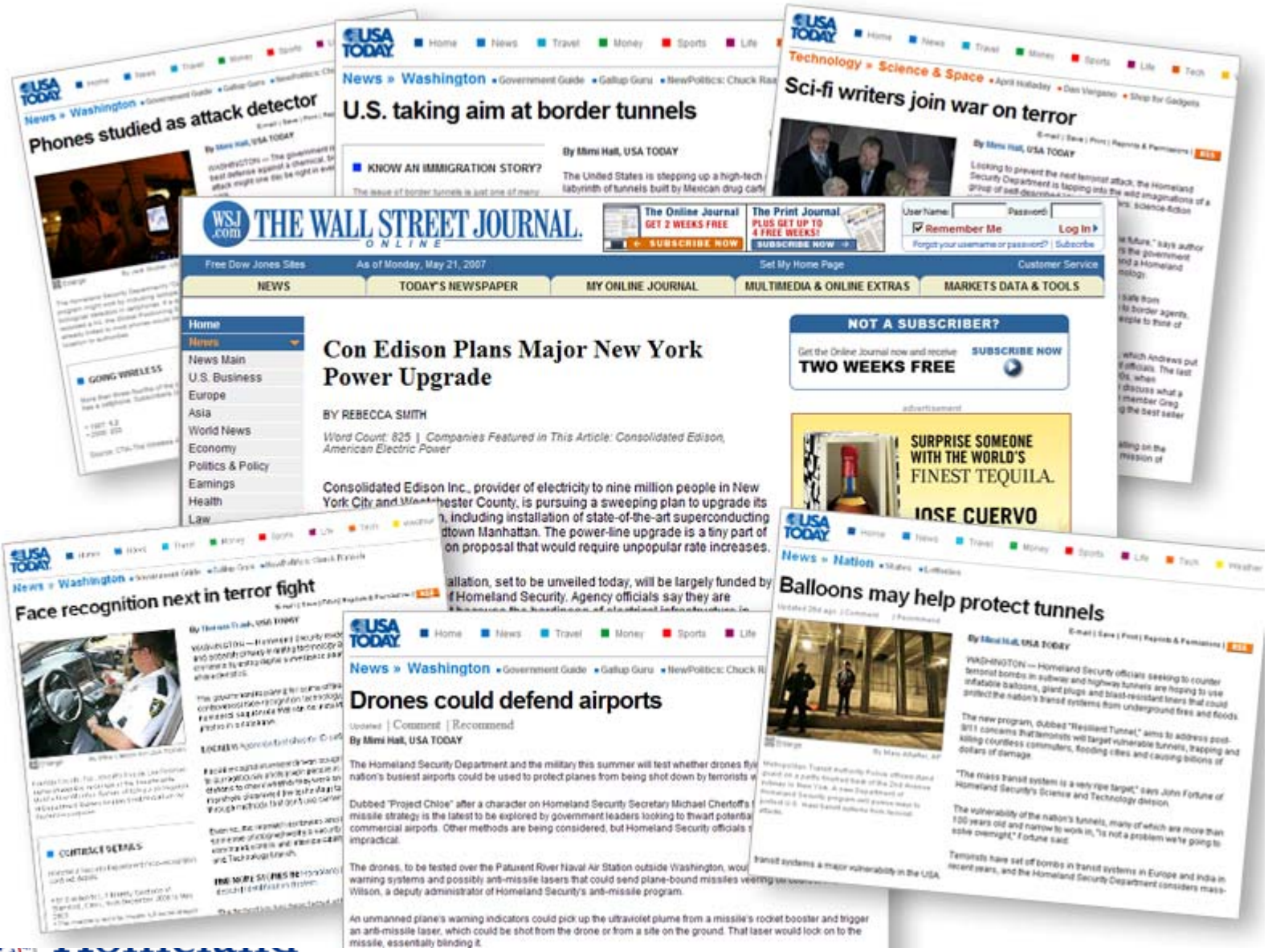
DHS S&T Innovation in the News



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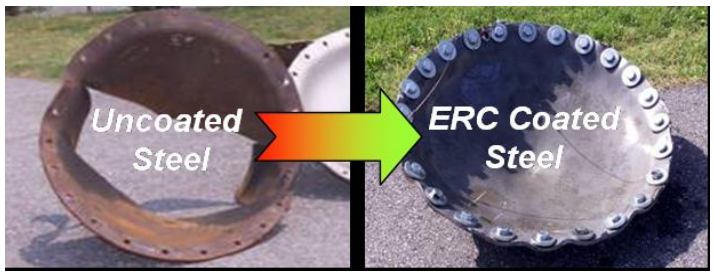
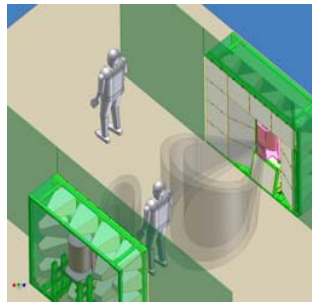
High Impact Technology Solutions

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)

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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Homeland Innovative Prototype Solutions

Future Attribute Screening Technology Mobile Module (FAST M2)

Systems

- Queue management
- Behavioral profiling
- Rapid risk assessment
- Screening methodologies

Operational Characteristics

- Discover screening methods for intent
- Privacy protection for all participants
- Simple to operate and use

Functions

- Identity verification
- Attribute measurement
- Risk determination
- Behavior focused screening

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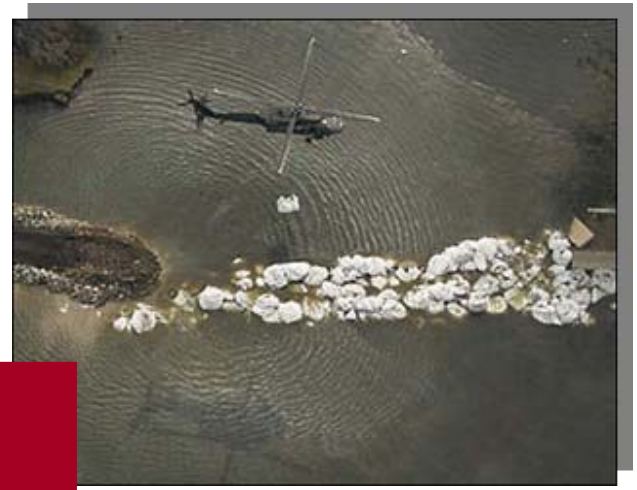
Homeland Innovative Prototypical Solutions

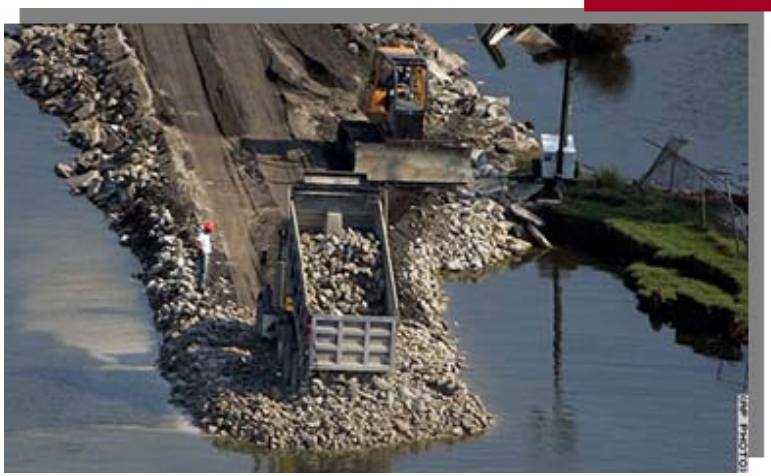
Levee Strengthening and Rapid Repair

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 on image to start video

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Doing Business with DHS S&T

Broad Agency Announcements (BAAs)

Released May 1

- IED and Vehicle-Borne Explosive Device Defeat
- 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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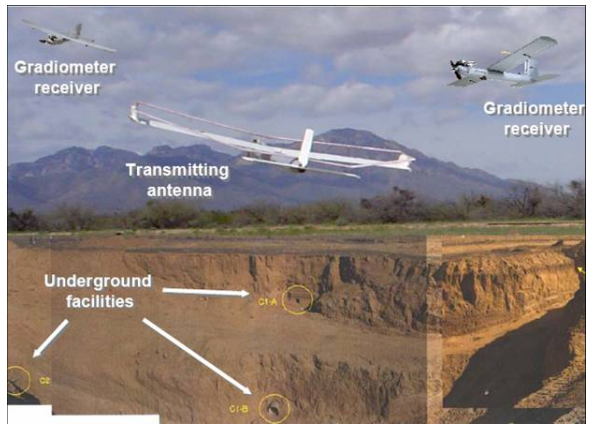
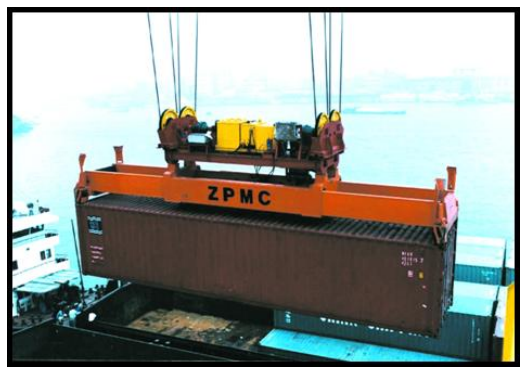
Doing Business with DHS S&T *cont'd*

Additional Open BAAs

- Tunnel Detection Technologies
- SAFE Container (SAFECON) – detect and identify WMD, explosives and contraband cargo and 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 UAV System-Based Counter-MANPADS Technology Assessment

Visit www.FedBizOpps.gov and www.hsarpabaa.com





Active SBIR Program for Small Businesses

- For FY 2007 release: Two solicitations that address multiple technical requirements of the DHS community

Visit www.FedBizOpps.gov and www.sbir.dhs.gov

DHS S&T Conference Update

Coming Up

- International conference, London, December 3-5, 2007
- Conference with first responder focus, southern California, January 2008
- Stakeholders Conference, Washington, DC, May 2008
- International conference, Pacific Rim, late 2008

Homeland Security

S&T Points of Contact

Division	Email
Jim Tuttle	S&T-Explosives@dhs.gov
John Vitko	S&T-ChemBio@dhs.gov
David Boyd	S&T-C2I@dhs.gov
Dave Newton	S&T-BordersMaritime@dhs.gov
Sharla Rausch	S&T-HumanFactors@dhs.gov
Chris Doyle	S&T-InfrastructureGeophysical@dhs.gov
Bob Hooks	S&T-Transition@dhs.gov
Starnes Walker	S&T-Research@dhs.gov
Roger McGinnis	S&T-Innovation@dhs.gov
Lil Ramirez	S&T-InternationalPrograms@dhs.gov

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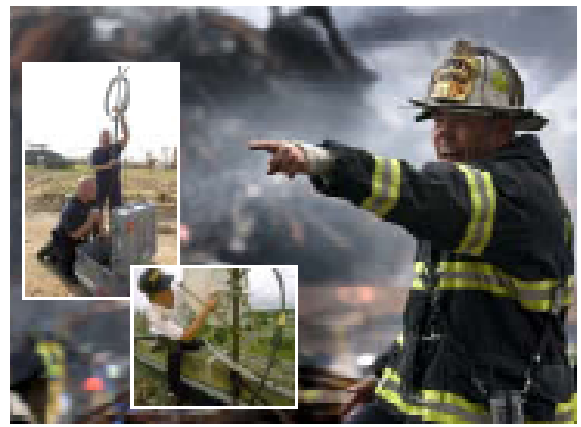
FROM SCIENCE...SECURITY

Explosives

Chemical/Biological

Command, Control, & Interoperability



Borders/Maritime

Human Factors

Infrastructure/Geophysical

FROM TECHNOLOGY...TRUST

Back-Up slides

High Impact Technology Solutions

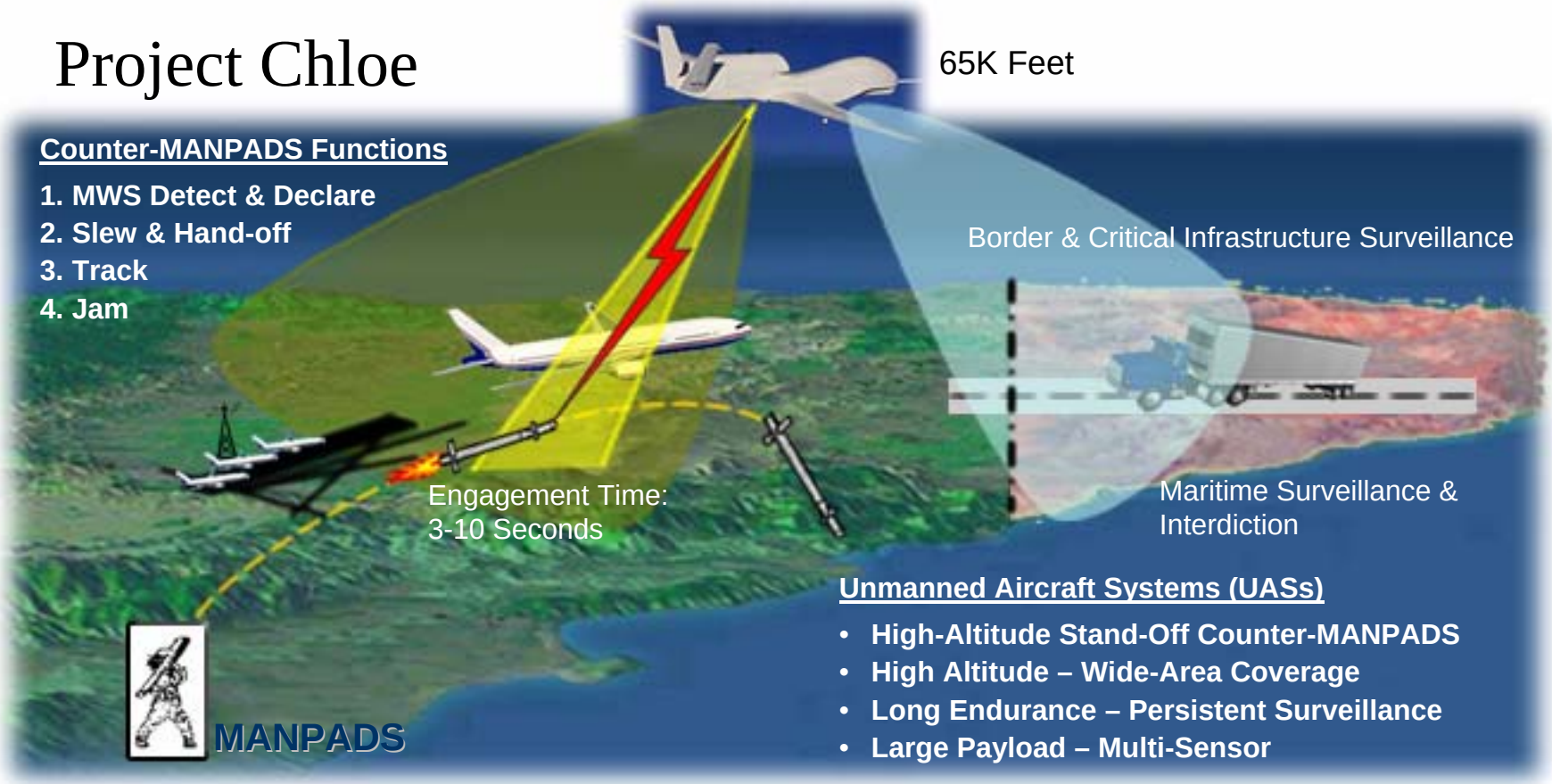
Cell-All Ubiquitous Chem/Bio Detect

Homeland Security

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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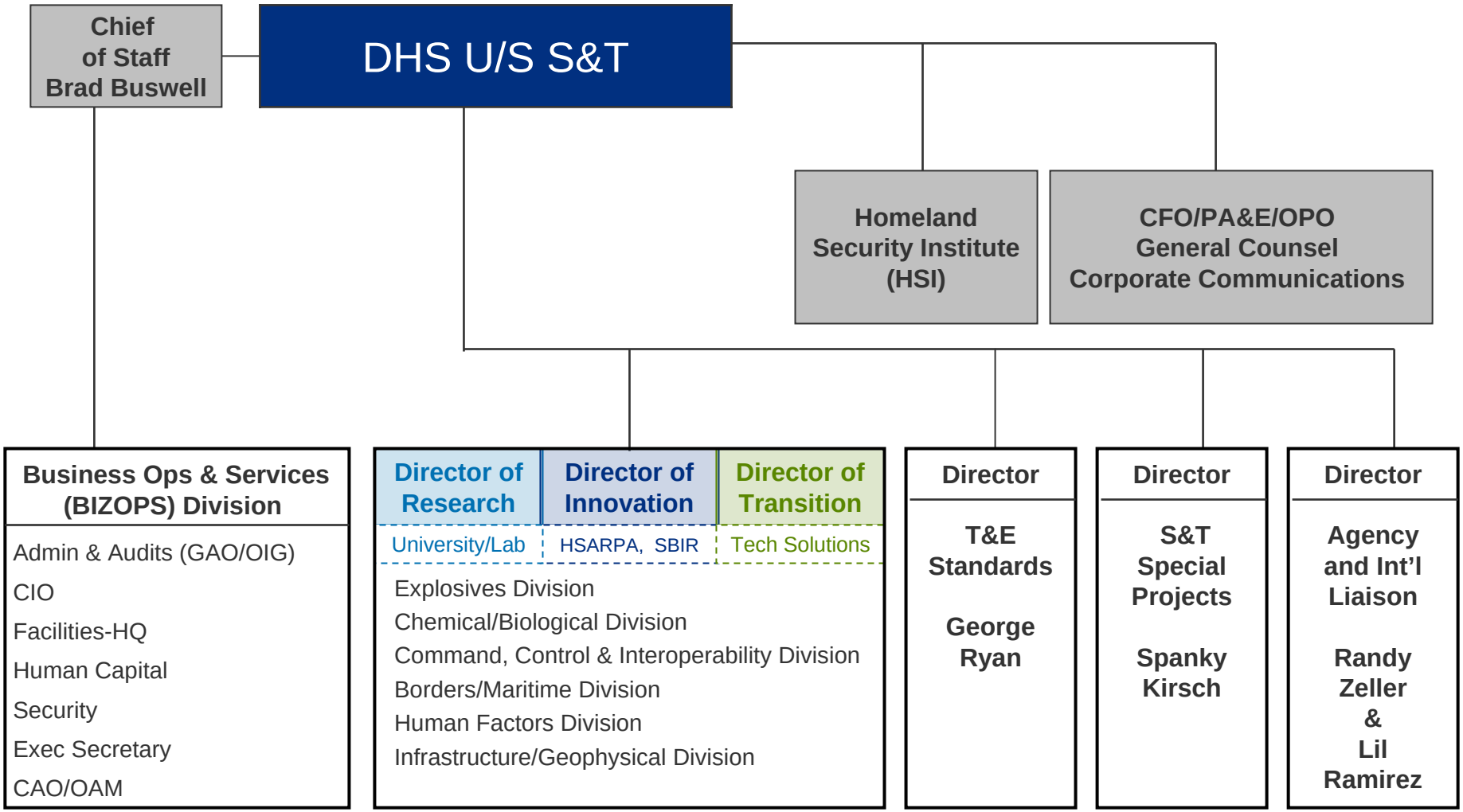
DHS S&T Directorate



Homeland Security

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	**Next Generation Patrol Craft** 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	**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