

An Overview of DHS S&T Chem/Bio Protection & Decontamination

Joint Chemical Biological Decontamination & Protection Conference & Exhibition

October 22-25, 2007

Virginia Beach Convention Center, Virginia Beach, VA

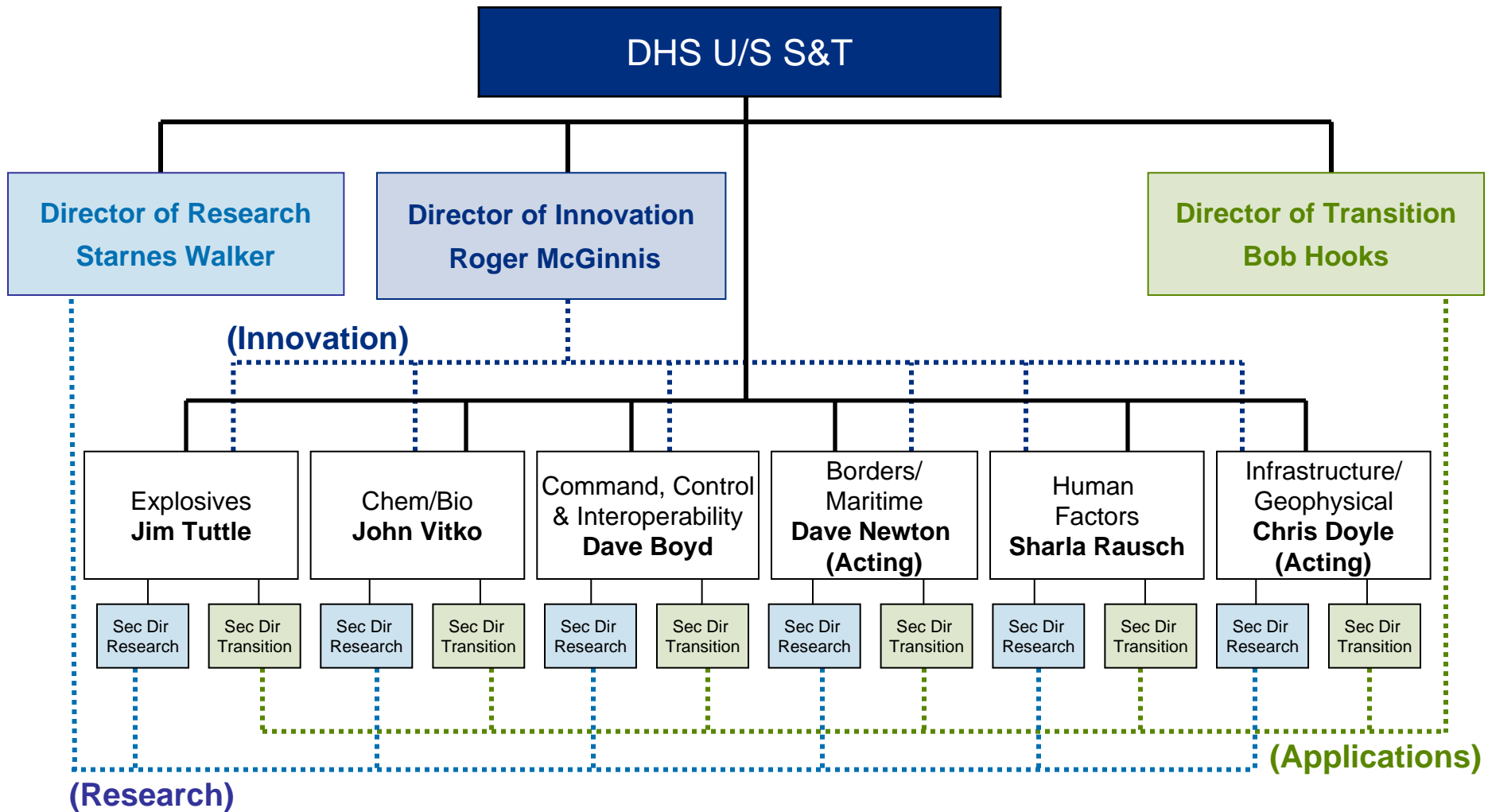
Lance Brooks

Research & Development Branch
Chemical and Biological Division
Science and Technology Directorate
Department of Homeland Security



**Homeland
Security**

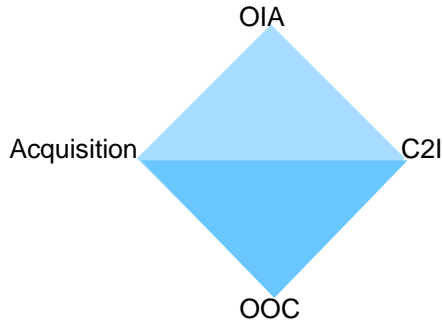
S&T Organization



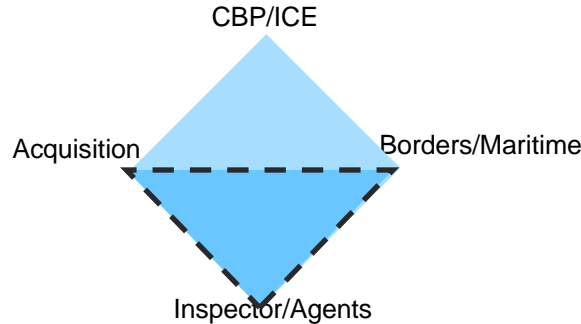
DHS Requirements/Capability Capstone IPTs

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

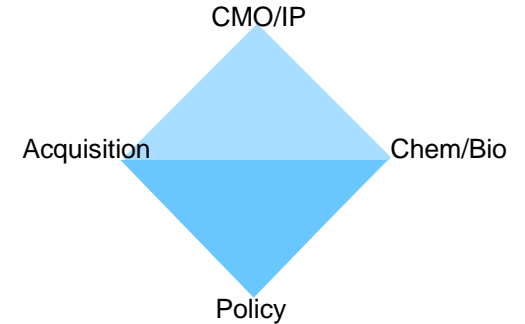
Information Sharing/Mgmt



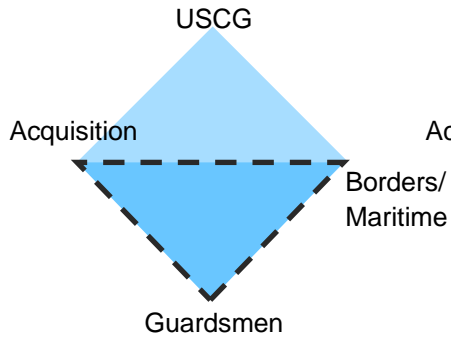
Border Security



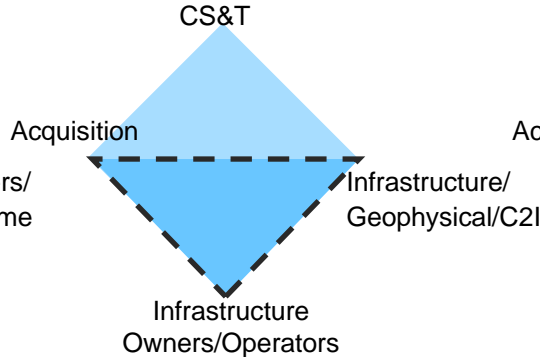
Chem/Bio Defense



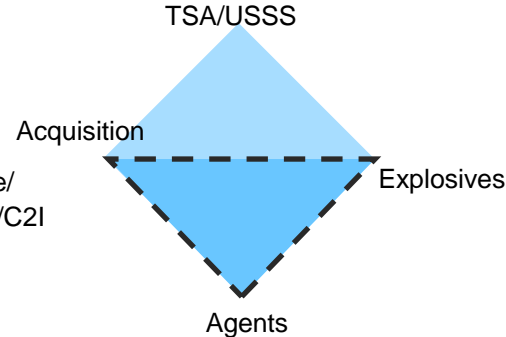
Maritime Security



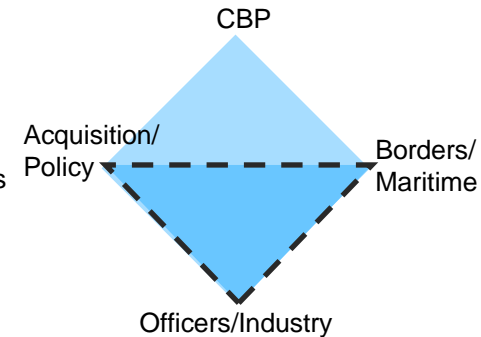
Cyber Security



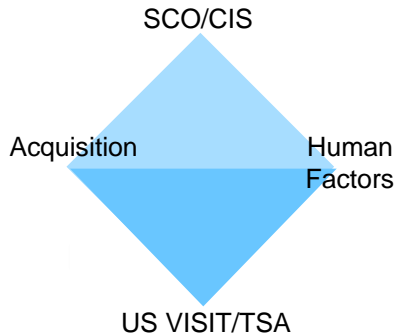
Explosive Prevention



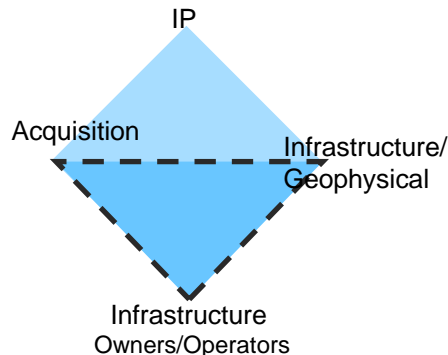
Cargo Security



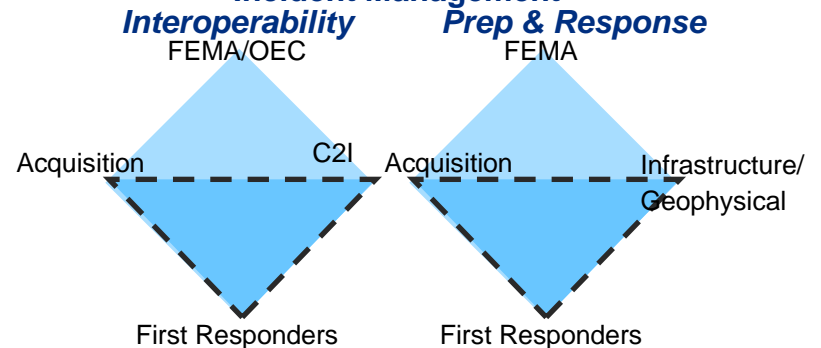
People Screening



Infrastructure Protection



Incident Management



HSPD-10 lays out an integrated end-to-end biodefense strategy

THREAT AWARENESS

- Intel
- **Assessments**
- Anticipate future threats

PREVENT & PROTECT

- Diplomacy
- Interdiction
- **Critical Infrastructure Protection**

SURVEILLANCE & DETECTION

- **Attack Warning**
- **Attribution**

RESPOND & RECOVER

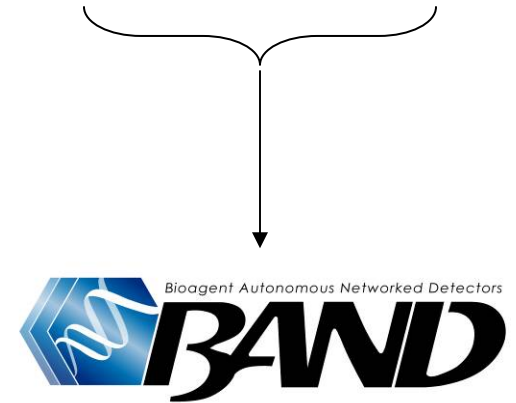
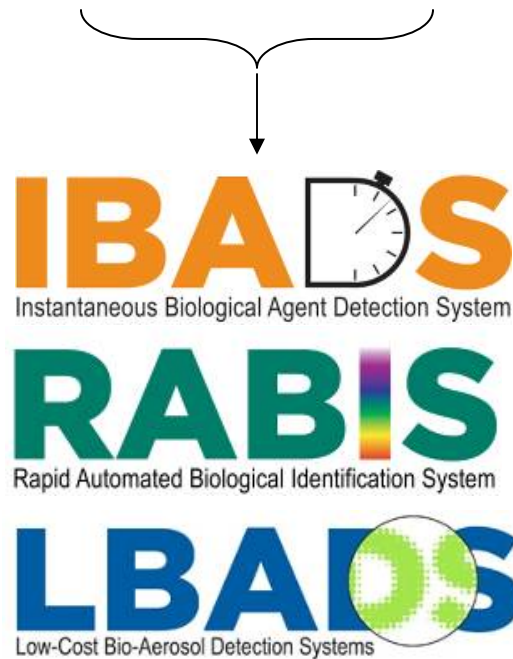
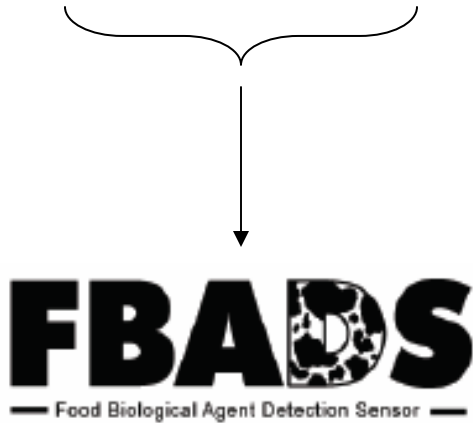
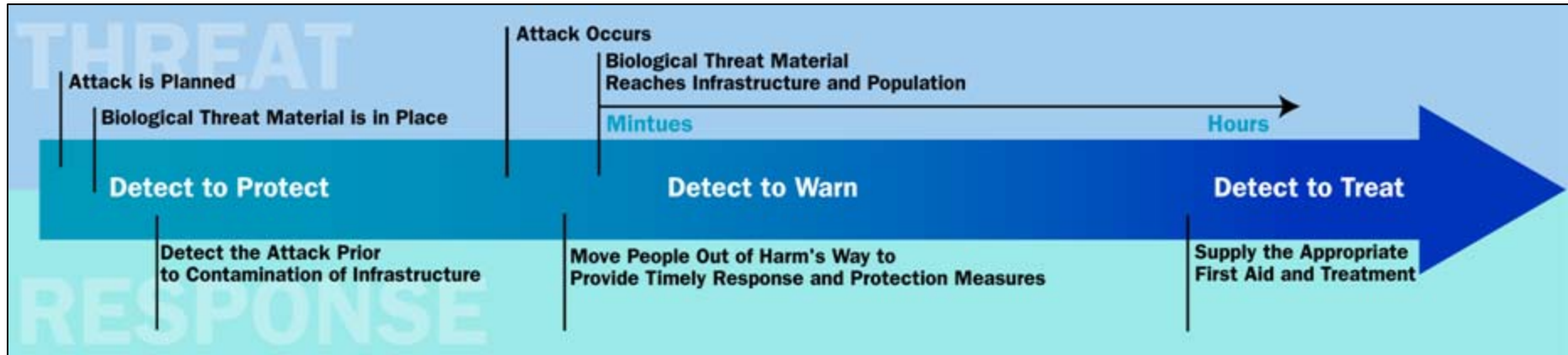
- **Response Planning**
- **Risk Communication**
- Medical CM
- Mass Casualty Care
- Decon

Essential four pillars of national biodefense



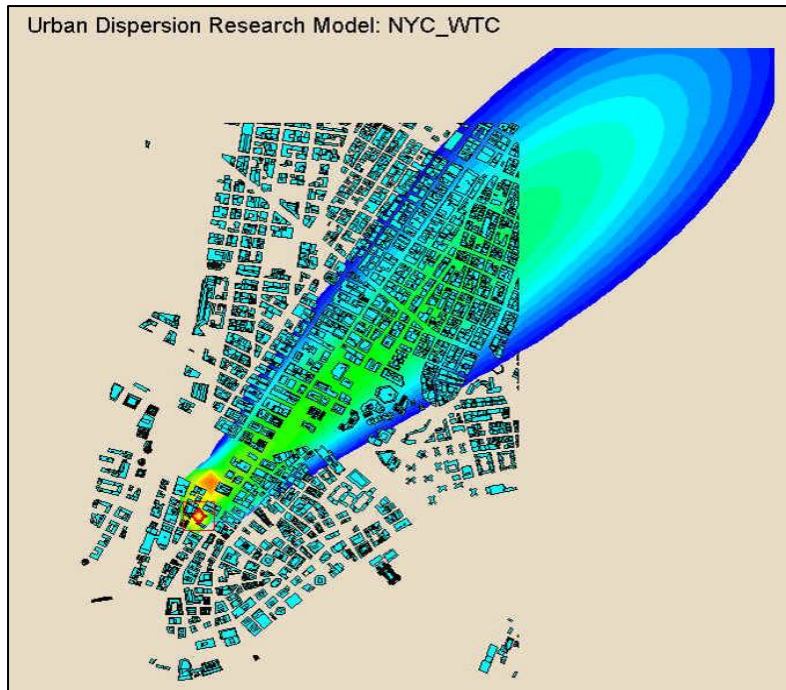
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Biological Detection Paradigms and Timeline



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Systems approaches & decision tools to speed biological response & recovery



Goals

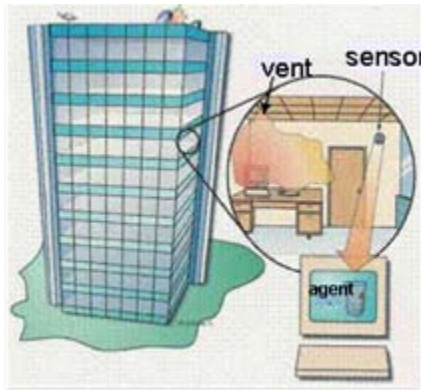
- Demonstrate systems approached to large scale urban decontamination & recovery
- Develop improved operational tools to support response & recovery

Roadmap

- FY07:** share results of Airport Restoration Demo thru a series of workshops
- FY07:** initiate wide area restoration demo (joint effort with DTRA & Seattle)
- FY08:** guidelines & protocols for bioagent sampling
- FY09:** 'demonstrate' wide area restoration
- FY10:** validated interagency sampling plan for anthrax



Chemical Detection is developing systems for facility monitoring & for first responders



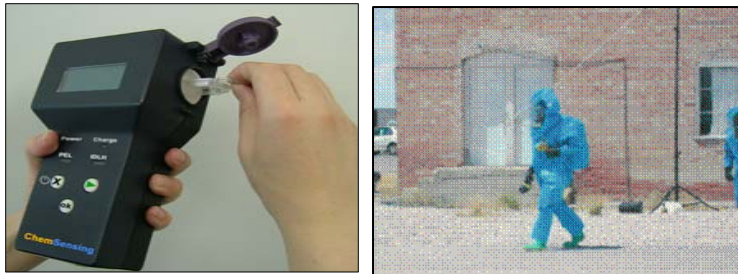
Facility Warning System
(ARFCAM)

Goals

- integrated protection systems for facilities
- rapidly deployable systems for special events and first responders
- detection of low vapor pressure chemicals on surfaces
- integrated CBRN detection architecture
- Commercialize & make available thru DHS Office of Grants & Training (DHS G&T)

Roadmap

- FY04:** transitioned the PROTECT subway system to commercial availability (DHS G&T)
- FY05:** develop a deployable system with ground & air components
- FY06-07:** lab prototypes of next generation facility warning & first responder detection systems
- FY08:** pilot integrated ChemBio architecture
- FY09/10:** fieldable prototypes of ARFCAM, LACIS



Responder Hand-held Detection Tool
(LACIS)

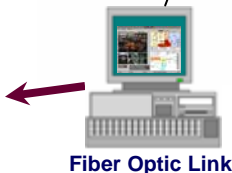
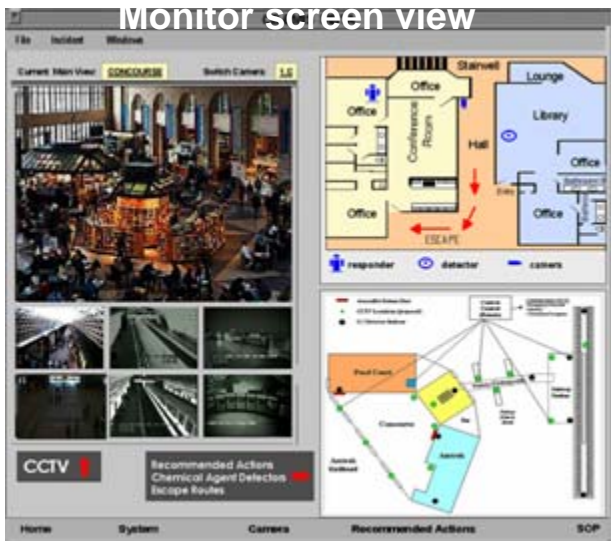
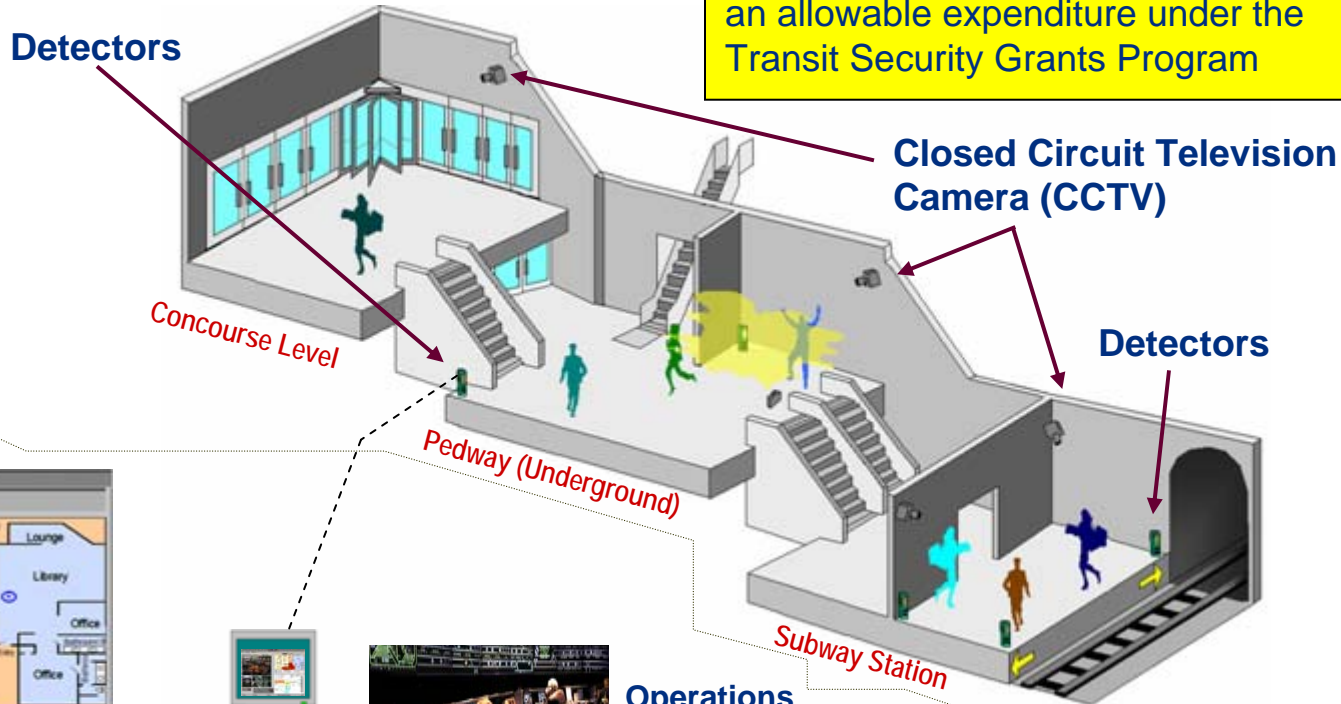


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PROTECT: Chemical Early Warning System for Transit Systems

Demonstration completed 2003

This program has transitioned and is an allowable expenditure under the Transit Security Grants Program



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Standards Chem/Bio

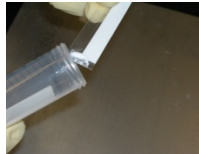
Thrust Area- Overview



Chemical Countermeasures



Biological Countermeasures



Standards

- Chemical agent detectors (ASTM)
- Biological agent detectors (AOAC)
- Personal Protective Equipment (NFPA, NIOSH)
- Urban search & rescue robots (ASTM)
- Interoperable CB Sensors (IEEE 1451)

Programs/projects

1. Chemical Detection Performance Standards.
2. Reference Materials for Testing Biothreat Detection Devices and Instruments: Bacillus anthracis and Ricin
3. Sampling Standards – Revision of ASTM E2458 (Bulk Collection)
4. Experimental Design for a JPEO/DHS Contam/Decon Exercise at INL
5. Validated Raman Libraries for Forensic and Security Applications
6. Chemical Detection Standards for 1st Responders
7. Chemical Decontamination Equipment Performance Standards
8. Chemical PPE Standards

Focus Areas- Current efforts



Protective Equipment



Decontamination



Detection



Operational Equipment



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Standards Chem/Bio - Sampling of Suspicious Powders

(Suspected of Being Biological Agents)

(GAO-05-251) report, argued the need for validated methods in all areas of sampling when contamination is suspected.

- **Anthrax Detection: “Agencies Need to Validate Sampling Activities in Order to Increase Confidence in Negative Results”**



Provides:

- ❑ Guidance and validated protocols to the first responder community and government agencies for employment in the event of suspected contamination by biological agents.
- ❑ *Standard Practices for Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of being Biological Agents from Nonporous Surfaces, ASTM E2458*

In FY 2008:

- ❑ Task group led by NIST working with CDC, EPA, FBI, DOD, IAFC, and the USNG is revising validated national standard for the sampling of suspicious powders that was approved by AOAC and ASTM and released by ASTM.

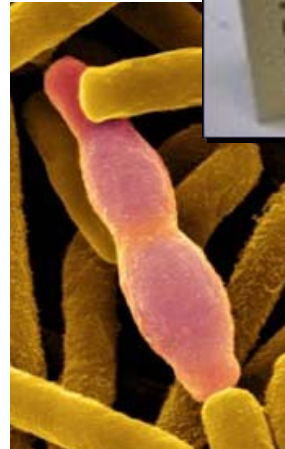


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Standards Chem/Bio - Biological threat detection, sampling and decontamination

Provides:

- Handheld assay acceptance criteria for BA and ricin
- Validated Sampling Planning
- CONTAM/VSP project underway to test sampling planning and airflow modeling



Standards Chem/Bio - Chemical threat detection, sampling and decontamination

Provides:

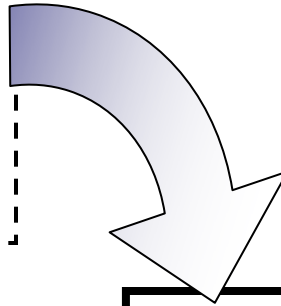
- Standards, simulants and test methods for
 - PPOE
 - Respiratory Protection
 - Detection equipment
 - Decontamination and sampling methods
- Threat catalog including toxic industrial chemicals and materials



Incident Management - Future Path of S&T

Current S&T Programs

- *Modeling Pilot*
- *Adv. 3D Locator Sensor*
- *Innovative PPE Materials*
- *EOC Technologies*
- *UICDS: Arch Study, Dev & Validation*
- *TELL: Arch, Core Req., Concept Demo*



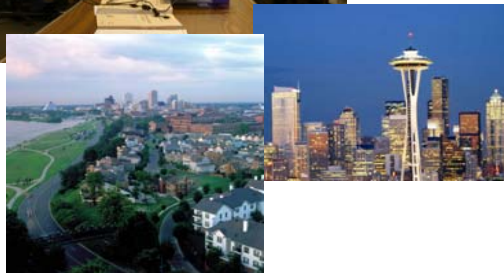
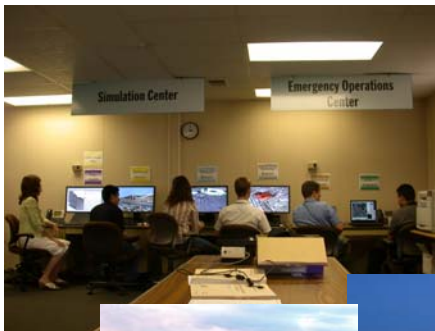
Planned S&T Programs (FY09)

Integrated Modeling, Mapping, & Simulation

Emergency Responder Technology

- *Responder Tracking System*
- *Physiological Monitoring System*

Incident Management Enterprise

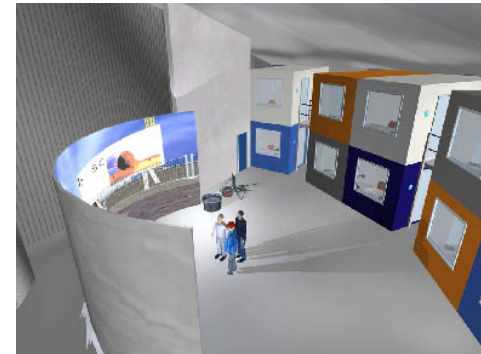


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Incident Management

Integrated Modeling, Mapping, & Simulation

- **Simulation Based Incident Planning and Response**
 - Integrated system to support emergency managers, and decision makers to better understand, be prepared, and plan for emergency operations
- **Modeling elements will focus on all possible hazards (natural and terrorist)**
 - Predictive
 - Mass evacuation route mapping
 - Impact analysis



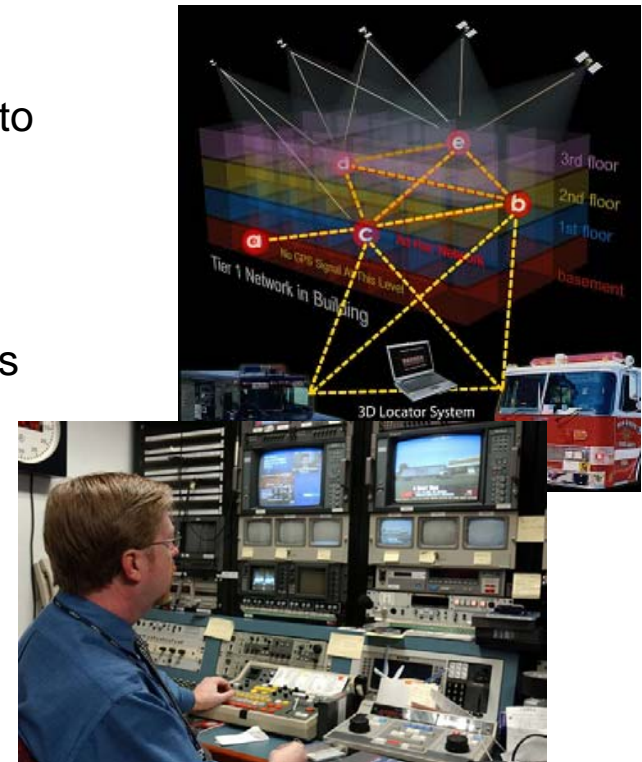
Future Deployment: Pre-Incident planning for local and state governments



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Incident Management Emergency Responder Technology

- **Responder Tracking System**
 - Real-time positioning and status of first responders to incident commanders
- **Physiological Monitoring System**
 - Improve incident commanders situational awareness through real-time health status of first responders



Future Deployment: *Provide technology for the SEL & AEL for jurisdictions to purchase*

Incident Management

Incident Management Enterprise

- **Integrated Enterprise for Incident Management Community**
 - NIMS & NRP compliant technologies
- **Incident Logistics and Resource Tracking**
 - Real-time information for mission critical resources
- **Simulation Training for Incident Commanders**
 - Reproducible scenarios in a virtual training environment
 - Scenario playback and decision analysis for teaching next-generation of incident commanders
- **Open Architecture for Incident Information Collaboration**
 - Seamless link for incident information across all levels of ICS and MAC
 - Unified operational picture for incident commanders and coordination entities in MAC (EOCs, NOC, etc...)



Future Deployment: *FEMA reference specification for Incident Management Systems to adhere to*



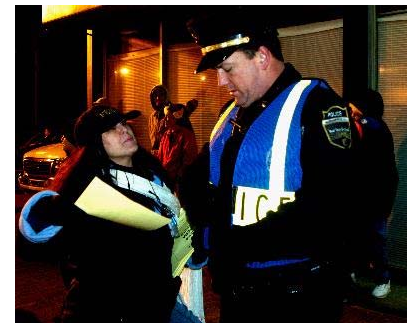
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Incident Management

What the First Responder is Saying

Issues/Concerns when developing technology

- Desire for integrated technologies that can be used everyday
- Contributes to the unified incident common operational picture (COP)
- Supports localities NIMS & NRP Compliance
- Multi-jurisdictional collaboration systems



Concerns/Challenges

- A lot of technology and not enough real estate
- State and Local acceptance

Information needs to be shared



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www.hsarpabaa.com/

For information on S&T Broad Agency Announcements

www.FedBizOpps.gov

Federal Business Opportunities

http://www.dhs.gov/xopnbiz/opportunities/editorial_0617.shtm

Department's unsolicited proposal Web site

techsolutions@dhs.gov

Only first responders are eligible to submit capability gaps to the TechSolutions



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