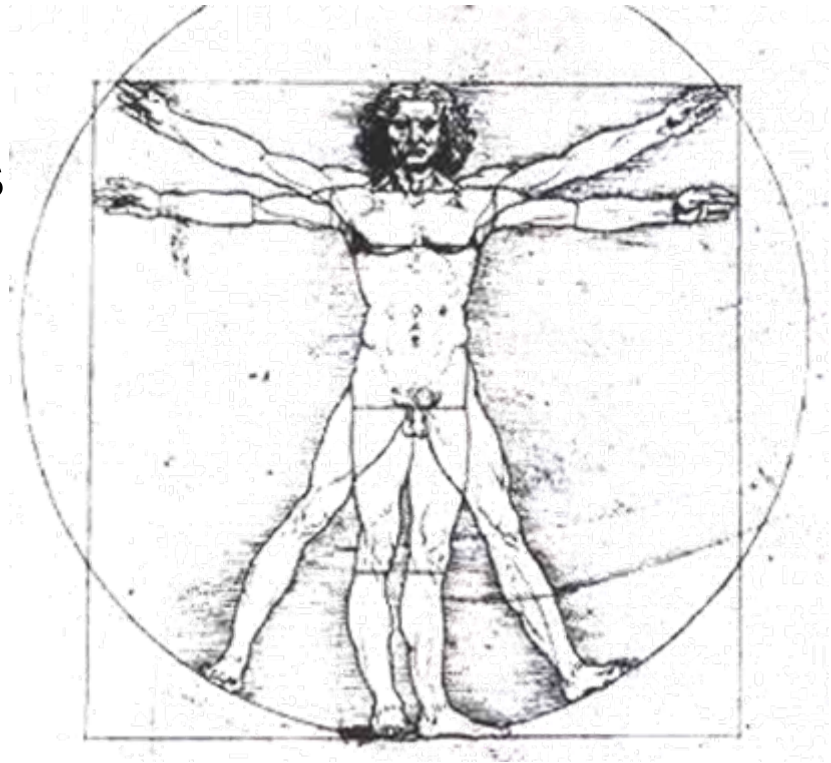


# S&T Stakeholders Conference - West

January 14-17, 2008

## Human Factors Division: Social-Behavioral Threat Analysis

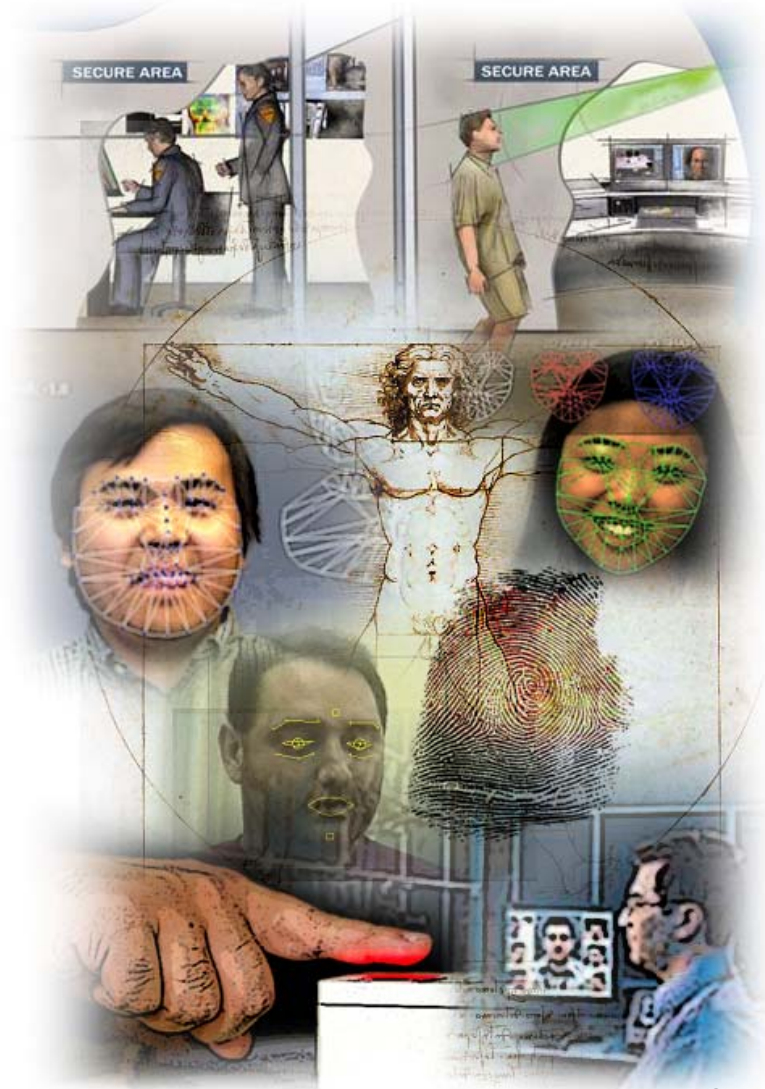
Sharla Rausch, Ph.D., Division Head  
Allison Smith, Ph.D., Radicalization Program Lead  
W. Michael Dunaway, Resilience Program Lead  
Science and Technology Directorate  
Human Factors Division



# Human Factors Division Mission Statement

To apply the social and behavioral sciences to improve detection, analysis, and understanding of the threats posed by individuals, groups, and radical movements; to support the preparedness, response, and recovery of communities impacted by catastrophic events; and to **advance national security by integrating human factors into homeland security technologies.**

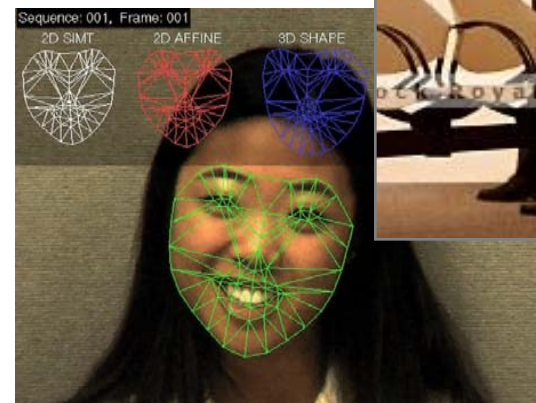
Customers: TSA, US-VISIT, USCIS, ICE, SCO, USSS, FEMA, OI&A, USCG, State & Local, S&T Divisions



# HFD Thrust Areas

The DHS S&T Human Factors Division is comprised of two primary thrust areas, with programs under each:

- Social-Behavioral Threat Analysis
  - Precursors, Signatures, and Deterrence of Radicalization
  - Suspicious Behavior Detection
  - Community Preparedness, Response, and Recovery
- Human-Systems Research & Engineering
  - Personal Identification Systems
  - Technology Acceptance and Integration
  - Human-Systems Optimization



# Human Factors Division Goals

1. Enhance the analytical capability of the Department to understand terrorist motivation, intent and behavior.
2. Improve screening by providing a science-based capability to identify deceptive and suspicious behavior.
3. Enhance the capability to control movement of individuals into and out of the United States and its critical assets through accurate, timely, and easy-to-use biometric identification and credentialing validation tools.
4. Enhance safety, effectiveness, and usability of technology by systematically incorporating user and public input.
5. Mitigate impacts of catastrophic events by delivering capabilities that incorporate social, psychological and economic aspects of community preparedness, response and recovery.

# HFD Research on Precursors, Signatures, and Deterrence of Radicalization – Framing Investments

DHS components and the interagency policy community research priorities:

- Understanding how radicalization develops within individuals, groups, and societies;
- Measuring the level of radicalization in the U.S. homeland;
- Understanding the roles communities, governments, and civic organizations play in moving individuals toward and away from radical violence; and
- Documenting impacts of various media on the spread of radicalization.

Informing DHS policy, intelligence, and operations.

# HFD Research on Precursors, Signatures, and Deterrence of Radicalization – Interaction with START



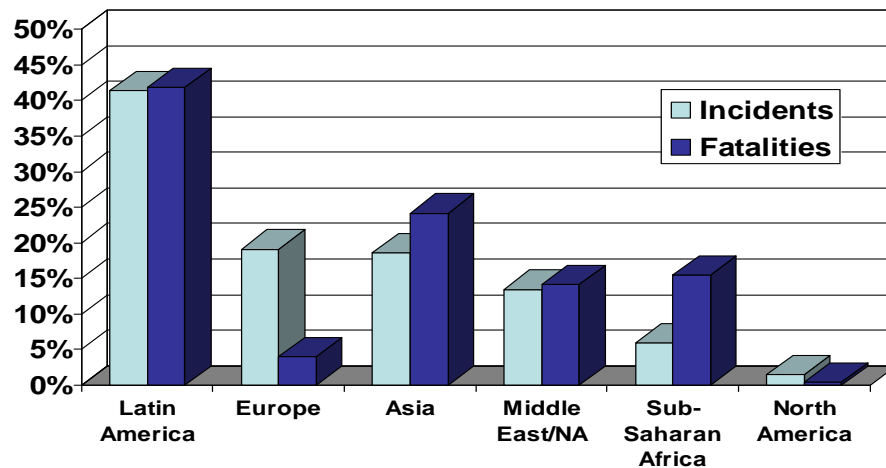
A CENTER OF EXCELLENCE OF THE U.S. DEPARTMENT OF HOMELAND SECURITY BASED AT THE UNIVERSITY OF MARYLAND

- The National Consortium for the Study of Terrorism and Responses to Terrorism (START) is a DHS Center of Excellence that conducts basic social and behavioral science research aimed at understanding the formation and dynamics of terrorist groups, as well as the social and psychological impacts of terrorism. Relevant areas include:
  - Understanding Ethnic Political Violence
  - Developing a U.S. Extremist Crime Database
  - Conducting International Surveys
- START is matrixed to HFD and the knowledge it generates forms a foundation upon which HFD-sponsored projects can be built.

# HFD Research on Precursors, Signatures, and Deterrence of Radicalization – The Global Terrorism Database

- Largest terrorist event database, with more than 80,000 events, and includes worldwide terrorist attacks that have occurred since 1970
- Housed at the DHS Center of Excellence for the Study of Terrorism and Responses to Terrorism (START).
- Provides increased accuracy in terrorist trend analysis with the use of up-to-date data on terrorist activities
- Addresses the need for a comprehensive, up-to-date unclassified database of terrorist incidents for use by researchers and intelligence analysts

Percent of Terrorist Activity in Each Region, 1970-1997



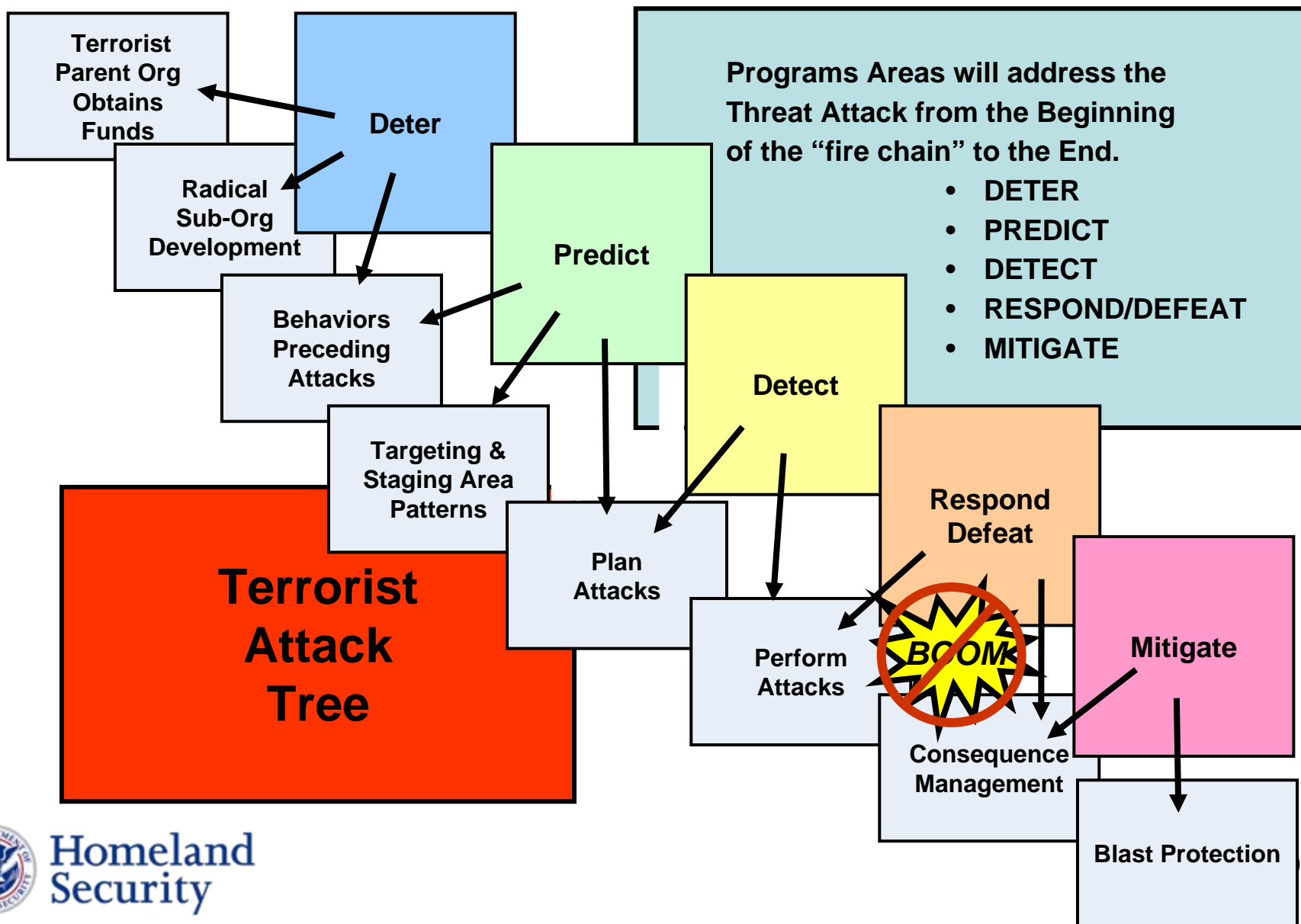
# HFD Research on Precursors, Signatures, and Deterrence of Radicalization – Group Violent Intent Modeling

- Intelligence analysis framework that includes:
  - information extraction of indicators of terrorist intentions
  - systematic estimation of future terrorist behavior based on social and behavioral sciences
  - modeling and simulations of influences on future terrorist behavior
- Enables systematic collection and analysis of information related to understanding terrorist group intent to engage in violence
- Enhances analytical methods for estimating a group's intention to engage in violence
- Increases ability to rapidly assemble and test competing scenarios





# Preventing IED Attacks



# HFD Research on Precursors, Signatures, and Deterrence of Radicalization – Counter-IED

## Program Goals

- Develop actionable indicators to aid the intelligence and law enforcement communities in identifying and deterring those that pose significant threats of IED attacks
- Provide empirical findings to aid policymakers in developing longer term radicalization and IED deterrence efforts

## Approach

- Analyze event databases focused on both international and domestic terrorism
- Study the relationship between community attitudes and the violent activities of radical groups using retrospective data
- Conduct comparative case studies of individuals who have and have not conducted U.S. domestic terrorist incidents
- Evaluate IED countermeasures

# Human Factors Division Goals

1. Enhance the analytical capability of the Department to understand terrorist motivation, intent and behavior.
2. Improve screening by providing a science-based capability to identify deceptive and suspicious behavior.
3. Enhance the capability to control movement of individuals into and out of the United States and its critical assets through accurate, timely, and easy-to-use biometric identification and credentialing validation tools.
4. Enhance safety, effectiveness, and usability of technology by systematically incorporating user and public input.
5. Mitigate impacts of catastrophic events by delivering capabilities that incorporate social, psychological and economic aspects of community preparedness, response and recovery.

# Suspicious Behavior Detection

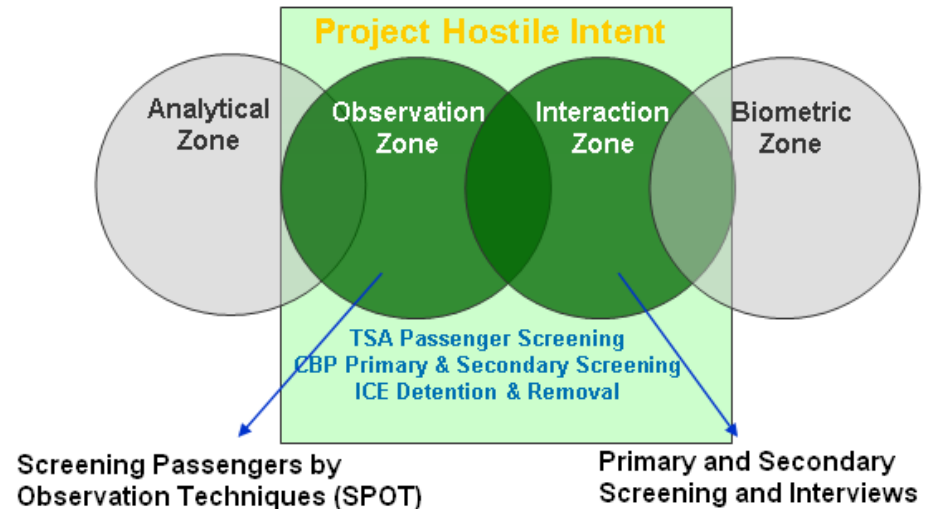
## Project Hostile Intent

### Goal

- Identify deception and hostile intentions in real-time using non-invasive sensors

### Approach

- Validate behavioral indicators of deception and hostile intent
- Develop non-invasive sensor algorithms to detect behavioral indicators in real-time
- Develop a prototype to detect deception and hostile intent in real-time using non-invasive, culturally independent sensors algorithms
- Develop computer-based simulation training

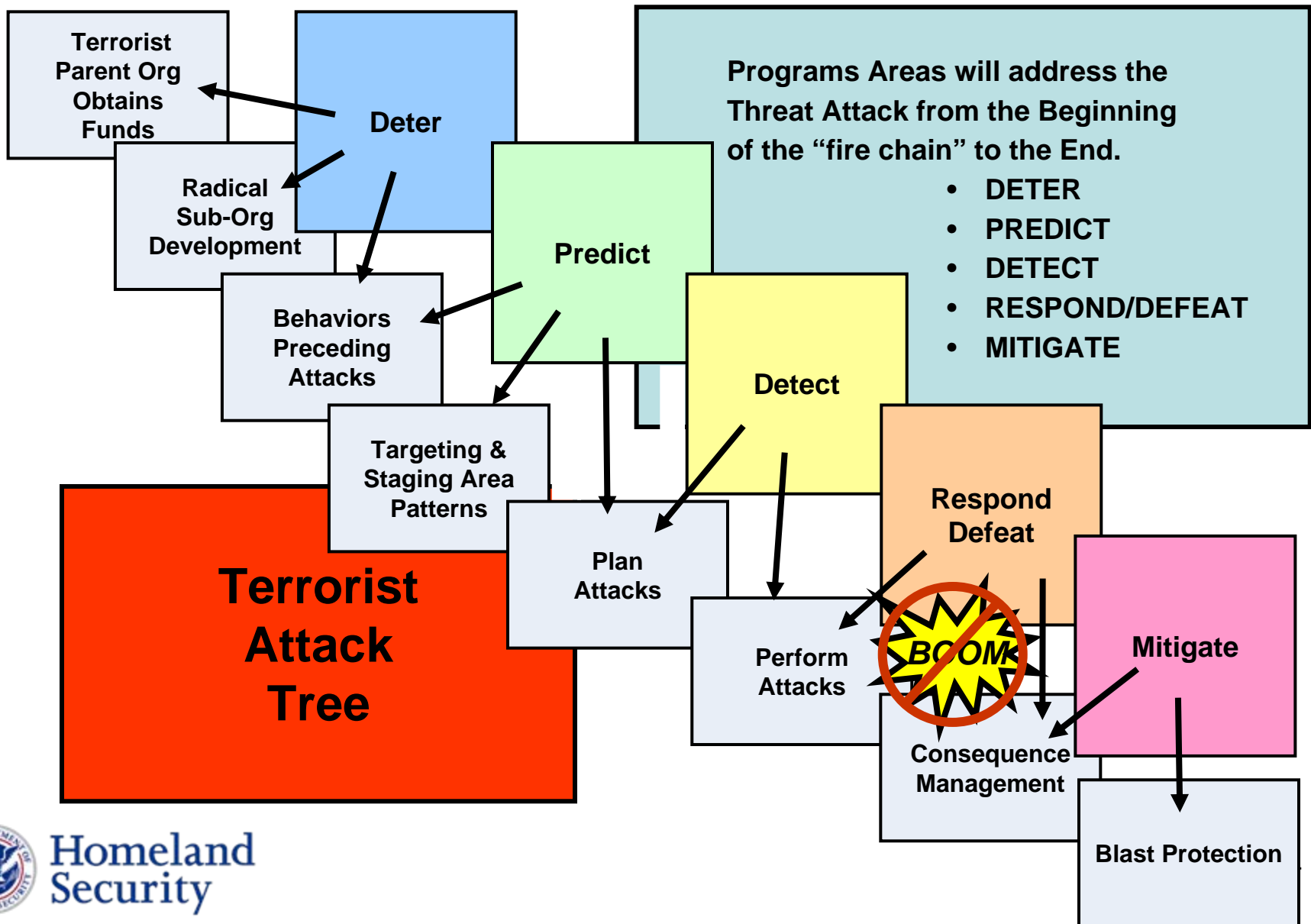


# Suspicious Behavior Detection

## Project Hostile Intent – Accomplishments & Events

- Partial validation of behavioral indicators
  - “Intent to deceive about a future action”
  - Behavioral SPOT indicators for possession of illegal items
- Preliminary validation of TSA’s operational Computer Assisted Passenger Prescreening System (CAPPS) program
- Mobile-SPOT proof of concept demonstration with TSA Behavior Detection Officers
- Interim transition of behavioral indicators of deception embedded into a deception detection training course and support materials
- Upcoming demonstration of preliminary prototype within the TSA PAX 2.0 Exercise
- Upcoming interim transition of cross-cultural behavioral indicators of deception

# Preventing IED Attacks



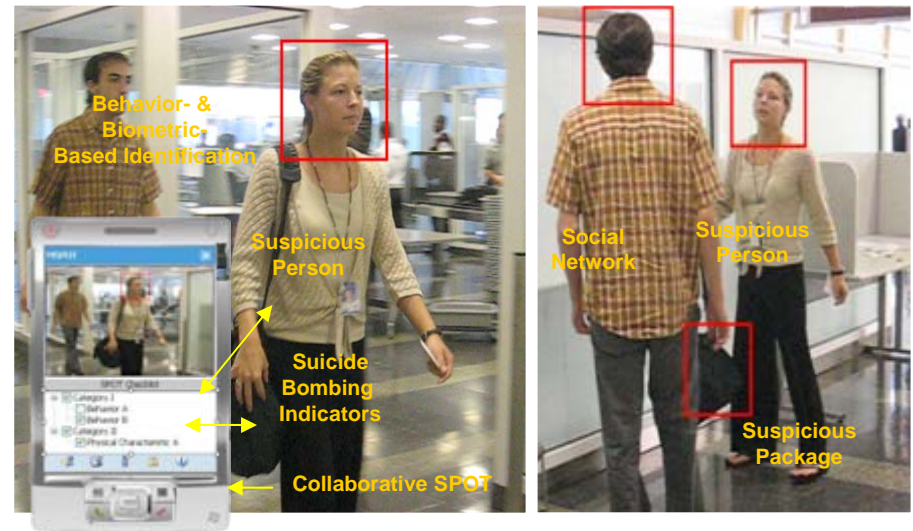
# Suspicious Behavior Detection Counter-IED

## Goal

- Deter potential attacks
- Predict risk
- Intelligently screen

## Approach

- Identify and track suicide bombing behavior & anomalous or suspicious behavior and packages using automation technology
- Leverage validated SPOT indicators to designate and drive automated tracking algorithms
- Extend capability to identify & track potential suicide bombers at longer stand-off distances



# Human Factors Division Goals

1. Enhance the analytical capability of the Department to understand terrorist motivation, intent and behavior.
2. Improve screening by providing a science-based capability to identify deceptive and suspicious behavior.
3. Enhance the capability to control movement of individuals into and out of the United States and its critical assets through accurate, timely, and easy-to-use biometric identification and credentialing validation tools.
4. Enhance safety, effectiveness, and usability of technology by systematically incorporating user and public input.
5. Mitigate impacts of catastrophic events by delivering capabilities that incorporate social, psychological and economic aspects of community preparedness, response and recovery.



# Community Preparedness, Response, and Recovery

## Risk Communication, Public Perception and Public Trust

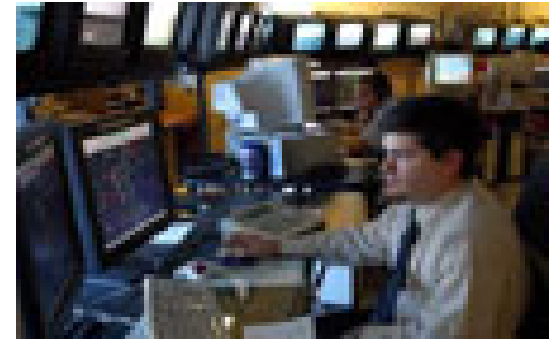
- Develop a methodology for assessing the impact of risk communications and warnings on the public's response during emergency situations
- Determine the effectiveness of various means of emergency communication on affected populations
- Develop a means for assessing the effectiveness of guidance and direction provided by civic leadership
- Incorporate lessons learned into exercises and training methodologies to improve public warnings during civil emergencies and disasters



# Community Preparedness, Response, and Recovery

## Enhancing Emergency Communications and Public Response

- Collect, analyze and classify emergency communications and requests for assistance generated by Texas residents during Hurricanes Katrina and Rita over Texas 211 call system
- Generate a standard template for streamlining the collection of 211 call system information collected by states who operate those systems
- Develop a methodology to overlay call system data onto geospatial mapping to aid in analysis of disaster scenarios, regional evacuation and relief planning, and response procedures



# Community Preparedness, Response, and Recovery

## Future Research

- **Quantitative Index of the Psychosocial Impact of Extreme Events**
  - Develop a quantitative index to assess the psychological and social consequences of man-made and natural disasters and terrorist events
  - Incorporate multiple variables already collected by government agencies, academic institutions and private sector entities
  - Enable psychosocial factors to be considered in risk assessments and preparedness, response, and recovery activities
  - Devise an empirically-based understanding of “recovery” for regions affected by disasters or terrorist events and a means of gauging progress toward restoration of local communities



# Federal Business Opportunities

- Sites where the Office of Procurement Operations (OPO) posts opportunities for perspective suppliers to offer solutions to DHS – S&T's needs:
  - [www.FedBizOpps.gov](http://www.FedBizOpps.gov)
  - [www.HSARPAbaa.com](http://www.HSARPAbaa.com)
  - [www.SBIR.dhs.gov](http://www.SBIR.dhs.gov)
  - [www.Grants.gov](http://www.Grants.gov)

take advantage of...

- **Vendor Notification Service:** Sign up to receive procurement announcements and solicitations/BAA amendment releases, and general procurement announcements. <http://www.fedbizopps.gov>
- **S&T's HSARPA website:** Register to join the HSARPA mailing list to receive various meeting and solicitation announcements. Link to Representative High Priority Technology Areas, where DHS areas of interest can be found. <http://www.hsarpabaa.com>
- **Truly Innovative and Unique Solution:** Refer to Part 15.6 of the Federal Acquisition Regulation (FAR) which provides specific criteria that must be met before a unsolicited proposal can be submitted to Kathy Ferrell. [http://www.acquisition.gov/far/current/html/Subpart%2015\\_6.html](http://www.acquisition.gov/far/current/html/Subpart%2015_6.html)

## Contact Information:

Kathy Ferrell  
Department of Homeland Security  
Office of the Chief Procurement Officer  
245 Murray Dr., Bldg. 410  
Washington, DC 20528  
[unsolicited.proposal@dhs.gov](mailto:unsolicited.proposal@dhs.gov)  
202-447-5576



# Homeland Security