

Department of Homeland Security Science & Technology

Homeland Security Science and Technology Advisory Committee

April 7, 2014



Homeland
Security

Agenda

- Introductions and agenda review**
- ICE briefing (9:15-10:45)**
- Break**
- S&T briefing (11:00-12:10)**
- Break**
- S&T briefing (12:40-2:15)**
- Break**
- HSSTAC feedback and initial recommendations (3:30-4:15)**
- HSSTAC way ahead (4:15-4:30)**

ICE Slides Presented Here

**ICE Slides from
Immigration and Customs
Enforcement (ICE) were
presented here**

Organization of DHS Science & Technology (S&T) Aligned with Mission

- ❑ **Under Secretary and Deputy Under Secretary**
- ❑ **DHS components and other elements that interact with DHS S&T: TSA, CBP, CIS, ICE, USSS, FEMA, USCT, NPPD, DNDO OHA, First Responders**
- ❑ **DHS S&T Organization:**
 - **First Responders Group (FRG) – Interoperability and Compatibility, Technology clearing house, National Urban Security Technology Lab (NUSTL)**
 - **Homeland Security Advanced Research Agency – Borders and Maritime, Chemical/biological, Cyber security, Explosives, Resilient Systems**
 - **Acquisitions Support and Operations Analysis – Research and Development Analysis and Assessment, Transportation Security Lab (TSL), Federally Funded Research & Development Centers Program Management Office, Standards Test and Evaluation**
 - **Research and Development Partnerships – Interagency, International, National Labs (Plum Island, National Biodefense Analysis and Countermeasure Center, Chemical Security Analysis Center, National Bio and Agro Defense Facility), Public-Private Partnerships (Commercialization, LRBA, SAFETY ACT, SBIR) University Programs**
- ❑ **S&T's Value Added Proposition:**
 - **Operationally focused – focused technology options and operational process enhancements**
 - **Innovative – Develop innovative, systems-based solutions to complex homeland Security problems.**
 - **Building partnerships – Technical depth and reach to leverage technology solutions from federal, state, local, and tribal governments, universities, and the private Sector – across the US and internationally.**
- ❑ **NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov**

Operational Focus

CBP, CIS, ICE -

- Rio Grande Valley
- Secure Transit Corridor
- Cargo Security & Screening
- Air Entry/Exit
- Tunnel detection
- Maritime Domain Awareness

State/Local, FEMA

- Multi-Band Radio
- Virtual USA
- Countering Violent Extremism (CVE)
- Next Generation PPE
- FiRST Bomb App
- Disaster Resilience

TSA, FPS

- Homemade Explosives (HME)
- Explosives Detection
- Checked Baggage
- Mobile Biometrics
- Future Checkpoint

NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov

USSS, FBI

- USSS Enhancements
- Cyber Forensics
- Point of Care Diagnostics
- Agro-biodefense & FAD
- National Bioforensics Analysis Center (NBFAC)

Cross Cutting Areas

- Big Data
- Screening & Vetting
- Cloud Security
- DoD Tech Transfer
- SAFETY Act
- Operational Experimentation

Elements of a Successful Program:

- Systems Analysis
- Program Management
- Team Effort
- Operational Need
- Appropriate Resources
- Leadership Focus

❑ S&T Game Changers:

- Advanced manufacturing including 3D printing, Nanotechnology, Micromanufacturing
- Information and Communication Technology (ICT) and Data Proliferation
- Biological Sciences
- Weapons Technology and Robotics
- Energy
- Scientifically informed, Technologically Based Decisions... then modeling simulation

❑ Deliverables:

- Technological Capabilities & knowledge Products
- Acquisition Support and Operational Analysis
- Process Enhancements & Gain Efficiencies
- Understanding of Homeland Security Risk & Opportunities

Nature of Innovation: Both sides get to innovate ... potential for individuals with state-like capabilities

NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov

S&T Partnerships

- ❑ **DHS S&T Interacts with DHS Components to Determine Current Portfolio, Missions, Requirements and Gaps**

- ❑ **Six Types of Partners Feed Into that Interaction:**
 - **Federally Funded Research and Development Centers (FFRDCs)**
 - ❑ DHS internal FFRDCs
 - ❑ DOE National Labs
 - ❑ DoD Labs

 - **International**

 - **DHS S&T Labs**
 - ❑ CSAC, TSL, NUSTL, PIADC, NBACC, NBAF

 - **DHS Centers of Excellences and Academic Institutions**

 - **Private Industry**
 - ❑ Large integrators, Medium & Small Businesses, Industry Organizations, Investment Community

 - **Interagency**

NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov

HSARPA Technical Divisions

- Borders and Maritime Security Division (BMD) - Prevent contraband, criminals and terrorists from entering the United States while permitting the lawful flow of commerce and visitors**
- Chemical/Biological Defense Division (CBD) – Detect and protect against, respond to, and recover from potential biological or chemical events**
- Cyber Security Division (CSD) - Create a safe, secure and resilient cyber environment**
- Explosives Division (EXD) - Detect, prevent and mitigate explosives attacks against people and infrastructure**
- Resilient Systems Division (RSD) - Identify and analyze threats, enhance societal resilience, and integrate human capabilities in technology development. Strengthen situational awareness, emergency response capabilities, and critical infrastructure protection**

First Responders Group (FRG)

FRG's Mission

- Strengthen responders' ability to protect the homeland

Who We Support

- FRG partners with local, tribal, state, and Federal first responders representing over 70,000 agencies nationwide

Focus Areas

- Communications
- Data Sharing
- First Responder Safety and Effectiveness
- Radiological/Nuclear Response and Recovery Research and Development

FRG's Value

- Operationally focused on first responder priority areas
- Gathers requirements from a diverse community
- Conducts multi-functional RDT&E with all functions of the first responder community
- Leverages partnerships across DHS, at all levels of government, and with industry and academia

ASOA Capabilities

Systems Analysis

- Mission Analysis, Operational Analysis, Workforce Efficiency

Systems Engineering

- Requirements Engineering, Technology Transition, Technological Process Integration

Test and Evaluation

- Developmental and Operational Testing, Technology Assessment, Field Experimentation, Transportation Security Lab

Standards

- Concept of Operations, Performance Specifications, Conformity Assessments, Test Methods, Training

Acquisition Planning

- Acquisition Strategy, Transition Planning, Cost Analysis, Technology insertion

Federally Funded Research and Development Centers

- Analysis of Alternatives, Policy/Trade-off /Risk Studies, Enterprise Systems Integration

NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov

Mission: Provide the Homeland Security Enterprise access to science-based capabilities and solutions through trusted partnerships.

Capabilities:

- RDP Rapid Response – Connect existing science and technology programs and networks to rapidly access facilities or knowledge in response to emerging needs, urgent requests, and daily information requirements.**
- Transition & Commercialization – Provide mechanisms and services to support the HSE with the conversion of technologies and knowledge products to the operational world.**
- Technology Foraging – Identify promising research, scientific publications, and existing or emerging technology advancements in government, academia, and industry.**
- Laboratory Facilities and Products – Provide access to and use of multi-disciplinary expertise and infrastructure from DHS, DOE, university, international, and private sector laboratory facilities to perform research and development.**
- Partnership Coordination – Plan, prioritize, and execute the terms and activities of formal executive committees and other advisory groups on behalf of the sponsoring executives.**
- Sponsored Research & Development – Sponsor innovative research and development to deliver customer-driven science and technology solutions and train the next generation of homeland security experts.**

RDP Offices

Office of National Laboratories

- Provides capabilities through five state-of-the-art S&T facilities and partners with Department of Energy's National Labs to combat threats to the nation's security.

Office of University Programs

- Leads university-based Centers of Excellence (COE) network that focuses on multidisciplinary research and education to explore key challenges in homeland security.

Office of Public-Private Partnerships

- Works with private industry to communicate the technical needs of DHS Components and enables and leverages partnerships with the business community to find solutions.

International Cooperative Programs Office

- Pairs U.S. entities engaged in homeland security research with foreign counterparts to actively share expertise and resources in cooperative research programs.

Interagency Office

- Leverages the capabilities and investments of external organizations to address high priority homeland security requirements.

Border Enforcement Analytics Program: Overview of Deliverables

- ❑ Three primary deliverables of the BEAP program**
- ❑ S&T Big Data Test Enclave: Assessing Big Data technologies using operational data in order to prove the efficacy of architectures and tools**
- ❑ Operational Testing: Development, Test & Evaluation of analytical tools**
- ❑ Deployment of Big Data tools to customer: Building a transition path for migration of Big Data technologies**

BEAP Environment

- ❑ **The original slide for this location was a graphic that does not meet 508 compliance. It depicts the expected progression of the Border Enforcement Analytics Program (BEAP) over the next two years, from production and analysis to assessment and transition. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov**

BEAP Geo-coder Update

Product Selection: Phased Assessment

GOTS Products (1), COTS Products (31), Open Source (5)

Assessed in Three Phases:

Discovery Phase

- Identified 37 viable geocoding tools and sent screen questions (where feasible)
- 21 eliminated between discovery and review phase

Review phase

- Follow-on interviews with 16 vendors
- 9 eliminated between review and analysis phase

Analysis Phase

- 3 eliminated

NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov

Cyber Security Forensics Project Overview

- ❑ **S&T began funding specific cyber forensics requirements for law enforcement in 2009**

- ❑ **The project directly engages customers and the greater forensics community through the Cyber Forensics Working Group (CFWG) comprised of federal, state, and local law enforcement representatives**
 - **Members provide needs based on gaps identified in actual casework**
 - **CFWG members provide in-kind support developing requirements, providing technical input, and testing developed tools to ensure a strong final product**
 - **CFWG meets twice each year for project updates and requirement discussions – Next meeting 17 April**
 - **Members discuss and vote on research priorities, S&T market research to determine procurement approach**

- ❑ **HSI Cyber Crimes Center has been an active participant in CFWG since 2009**

CFWG Funded Requirements to Date

FY09 Funded Requirements

- GPS Forensics**
- First Responder Field Kit**
- CyberForensics Electronic Technology Clearinghouse**
- Gaming Systems**
- High-Speed Data Capture – Wireshark**

FY11 Funded Requirements

- Flash Memory (NAND and NOR) Chip Analysis**
- Law Enforcement Forensic Tool Suite**

FY12 Funded Requirements

- Imaging and Parsing of Solid State Drives**
- Disposable Mobile Phone Analysis**
- PIN/PUK Bypass on Encrypted SIM Cards**

FY13 Funded Requirements

- Infotainment/Navigation Forensics**
- Open Source Acquisition and Analysis Tools**

NOTE: Additional requirements not included due to procurement sensitivities

GPS Forensics – Blackthorn3

- Problem – Portable and maritime GPS devices contain information that may be crucial to law enforcement investigations including routes, tracklogs, address books, favorite locations, and paired mobile phone data**
- CSD funded enhancements to a commercial tool and the development of a new ruggedized field kit allowing operators to quickly and easily acquire data regardless of GPS device manufacturer and make decisions while in the field**
- Research and development effort concluded in December 2012 with the transition of 10 field kits, including one to HSI C3**
- Follow-on funding for additional licenses and training for 80 users across 36 agencies. Three training classes at HSI offices and HSI personnel received training and licenses**
- Performer: Berla Corporation**

First Responder Field Kit – Triage-Responder

- Problem – First-on-the-scene law enforcement officers require a simple way to immediately triage computers found at a crime scene prior for lab analysis**
- S&T funded a new product that reduced features from a lab tool, simplified the user interface, and focused on capabilities for non-technical users**
- Focused on prepopulated search profiles for often used cases, such as child pornography**
- Project concluded in June 2012 with transition of 20 kits to CFWG members, including one to HSI C3**
- Performer: ADF Solutions**

High-Speed Data Capture - Wireshark

- Problem – Wireshark is an open-source network protocol analyzer popular with law enforcement which allows a user to capture and interactively browse the traffic running on a computer network – over 500,000 downloads of the tool per month**
- With over 700 authors from over 40 countries, Wireshark’s reliability, security, and veracity as a law enforcement investigative tool must be verified**
- CSD funded the assessment of Wireshark to include evaluation of the security of the system**
- Identified vulnerabilities were reported to developers and resolved**
- Project concluded in January 2013**
- Performer: University of Wisconsin**

Disposable Cell Phone Forensics

- Problem – Disposable phones are frequently used by criminals because they are inexpensive and do not require a contract, credit card, or personal information**
- Acquiring data is challenging because most run proprietary OS and have limited external connections**
- The project concluded in January 2014 and transitioned acquisition tutorials for 15 phone models that are available for free to law enforcement**
- Between August 2013 and January 2014, 830 requests for access were made to the site, and 500 requests were approved**
- Performer: viaForensics**

Flash Memory Chip Analysis

- Problem – Smartphones are frequently submitted as evidence in criminal cases and contain valuable evidence. These phones use NAND flash as their primary memory which is constantly being modified by management functions on the device**
- This project developed NAND acquisition and analysis tools for Android and iOS phones to preserve forensic images and provide a readable presentation of the data acquired from the phone for analysis**
- Successful Phase I and Phase II Small Business Innovation Research (SBIR) project, capability commercially available to law enforcement**
- Performer: viaForensics**

Open Source Acquisition and Analysis

- Problem – Forensics tools are often expensive and may be difficult to acquire, adoption of open source tools requires development**
- Project is building new capabilities into an existing open source tool, Autopsy, to specifically provide law enforcement with stronger timeline and image analysis**
- Developers are working with a small law enforcement user group and have interviewed multiple agencies including HSI C3**
- Performer: Basis Technology**

Solid State Storage Forensics

- Problem – Solid state drives (SSDs) are increasingly prevalent in products such as desktops, laptops, and notepads and over 200 million units will be shipped annually by 2016. SSDs differ significantly from traditional hard drives – spinning, magnetic disks vs. flash chips**
- Research into the development of hardware and software products to allow forensic examiners to view deleted or overwritten data that has been removed from the user addressable space due to flash memory management**
- Phase II SBIR effort, only 6 months into 24 month effort, will transition beta hardware and software tools**
- Performer: S34A**

Computer Forensic Tool Testing and National Software Reference Library

- ❑ **Problem – When using tools to extract digital evidence, law enforcement must be able to testify on the capabilities of the tool**
- ❑ **CSD funds the National Institute of Standards and Technology (NIST) Computer Forensic Tool Testing (CFTT) project to provide a measure of assurance that the tools used by law enforcement in the investigations of computer-related crimes produce valid results**
- ❑ **Also developing a tool catalog that is a reference on tool capabilities that vendors may contribute content**
- ❑ **CSD also funds the National Software Reference Library (NSRL) which is a repository of known software, file profiles, and file signatures for use by law enforcement and other organizations in computer forensics investigations**
- ❑ **Ongoing project to ensure new reports are developed as market expands**

CyberForensics Electronic Technology Clearinghouse (CyberFETCH)

- Problem – The digital forensics community requires a collaborative platform to post and retrieve content, categorize the material they contribute, and network with their peers**
- Site (www.cyberfetch.org) has been operational since May 2012 and has over 200 members**
- NIST Tool Testing Reports are housed on the public facing FETCH site**
- Continue to maintain site and enhance user experience**
- Performer: Exelis**

Global Cyber Security Law Enforcement Technical Symposium (GCSLETS)

- Problem – GCSLETS will bring together government, international, federal, state, and local law enforcement, private sector, and academia partners to discuss cutting edge cybersecurity law enforcement challenges, research projects, and solutions.**
- Building upon success from a 2009 partnership with United States Secret Service, S&T is sponsoring GCSLETS in 2014 and partnering with USSS and HSI**
- Planning invitation only event for July/August 2014**

Agenda.

- S&T briefing (12:40-2:15)**
- Break**
- HSSTAC feedback and initial recommendations (3:30-4:15)**
- HSSTAC way ahead (4:15-4:30)**

Mission Space Supported by BMD

Provide technical knowledge and capability that address DHS operational needs in border, maritime, and cargo security

❑ Operational settings:

- **Areas between Ports of Entry (POEs)**
- **At the POEs (includes cargo and conveyance security, agriculture and trade screening, and passenger admissibility)**
- **Domains:**
 - **Air**
 - **Ground**
 - **Underground**
 - **Water**
 - **Underwater**

Borders & Maritime Security Division

FY 14 Portfolio

Land Border Security

- RAPS/RAMPS**
- Moving Target Indicator**
- Buried Tripwire**
- UGS Classification/Testing**
- Slash CameraPole**
- Mobile Surveillance System Upgrade**
- Small Dark Aircraft**
- Tunnel Activity Monitoring**
- Clandestine Tunnel Detection**
- Tunnel Age**
- Rapid Response Prototyping**

Maritime Border Security

- Coastal Surveillance System**
- Underwater Remote Operated Vehicle
(BIOSwimmer)**
- Detection of People in Water**

Cargo Security

- Maritime Cargo Security Pilot**
- CES/In Bond Cargo Pilot**
- Counterfeit Goods Detection**
- Bulk Currency Detection**
- Pollen Forensics**
- PCR Collection Efficiency**
- Mid-Level Energy Scanning System Upgrade**
- Mobile Backscatter Scanning System Update**

Land Border Security

- Robotic Aircraft for Public Safety (RAPS)**
- Evaluation of commercially available small UAS platforms. RAPS puts each system through a standard set of tests to provide a “Consumer Reports”-like evaluation of each system’s performance for the first responder and homeland security operational communities**
- Small Dark Aircraft Detection**
- Developing and testing sensors/sensor systems to detect, track, and classify low observable (dark) aircraft entering the United States via remote routes. Systems provide quantitative and qualitative information to both local sector and regional/national command centers.**

Land Border Security 1

Tunnel Age Determination

- Providing methods to determine how long ago a clandestine tunnel was built, as well as how recently it had been used. Research is beginning with soil analysis in regions where clandestine tunnels have been discovered to determine if soil testing can in fact determine tunnel age and with what degree of accuracy.**

Clandestine Tunnel Detection

- Geophysical Survey, Modeling & Simulation, Performance Prediction**
Research using modeling and simulation techniques to predict the effectiveness of promising tunnel detection technologies using the actual geophysical conditions found at critical locations along the southwest border. A software modeling and simulation tool is under development with a prototype completed.

Land Border Security 2

In-the-Mouth Tactical Comms

- Jointly with In-Q-Tel and DoD CTTSO TSWG, further developing Sonitus “SoundBite” technology, a wireless, in-the-mouth (ITM) unit that clips to the back molars on one side and transmits sound using bone conduction via the teeth. Enhancements include having device molds tailored to each user’s mouth for added reception and comfort. Integrated with Motorola & Harris tactical radios.**

Maritime Border Security

- Coastal Surveillance System (CSS)**
- CSS will add/enhance capabilities for persistent surveillance, intel analysis, auto alerting and tasking, integration of new data sources, and information sharing at the unclassified level. Capability/efficiency improvements include enhanced maritime domain awareness, increased availability of actionable law enforcement information resulting in increased interdictions and prosecutions.**
- Underwater Remote Operated Vehicle (BIOswimmer)**
- A SBIR effort to develop a biomimetic ROV to enhance underwater surveillance and vessel inspection. The maneuverability of BIOSwimmer allows it to examine areas hard to access with conventional ROVs, such as propulsion gear, rudders, and sea chests. The solution is battery-powered and designed for long-duration operation.**

Cargo Security

Counterfeit Goods Detection

- Provide a means for detection of counterfeit goods, particularly commercial consumer products, along the entire supply chain, including cargo containers, distribution warehouses, points of retail sales, and ad hoc points of sale.

Bulk Currency Detection

- Develop a system to detect large amounts of cash secreted on conveyances or carried by pedestrians crossing borders or entering choke points.

Cargo Security 2

Hand-Held Backscatter X-ray Scanner

- A transportable, hand-held device to assist in the examination of vehicles and conveyances for hidden weapons, contraband, or other hidden items/materials. Powerful enough to penetrate automobile seats, plastic bumpers, and other areas without or with only very thin metallic coverings.

General Aviation Aircraft Scanner

- A device to quickly scan the inner voids of an aircraft (e.g. fuselage, empennage, engine nacelles, etc.). The unit incorporates a commercial backscatter X-ray system, similar to airport passenger screeners, but with additional power to penetrate thin metals.

Low Light Camera and IP Encoder

❑ Problem:

- HSI Technical Operations approached S&T in 2011 with a requirement to develop a low light camera that provides real-time covert video surveillance in all light conditions (with a strong emphasis on low light).
- The camera must pan, tilt, and zoom (PTZ) ; provide high definition imagery; and transmit high resolution video in real time over low-bandwidth networks.

❑ Solution:

- S&T, in partnership with HSI Technical Operations, develop a covert low, light video surveillance camera and IP/HD encoder.
- The technology integrates components from a commercially available cinematography camera with a custom pan, tilt, and zoom platform and encoder for real-time transmission of compressed and encrypted high resolution video over low bandwidth cellular networks.

❑ Status:

- S&T awarded a contract in December 2012 to develop a low light camera and IP/HD encoder. The camera and encoder are both in the final stages of testing by HSI Technical Operations. Section Chief Kelly Oliver is the lead for HSI.
- A camera kit, to include the low light camera, PTZ, lens kit, and an HD encoder, will be available in June 2014.

Low Light Camera

❑ Problem:

- While there are many small, easy-to-conceal cameras on the market today, none offers the full range of capabilities required by today's undercover surveillance operations.
- Officers often require the capability to remotely PTZ a camera while overcoming Internet connectivity issues and low light environments.

❑ Solution:

- A new low-light, PTZ camera developed by S&T FRG provides remote PTZ capabilities over an IP network and operates in environments where little to no light is available. It also emits little or no light for covert operations.

❑ Milestones/Accomplishments:

- Contract awarded in December 2012, and final design document completed in June 2013.
- Prototype build and documentation delivered in November 2013.

❑ Deliverables / Next Steps:

- A demonstration of the final prototype occurred on December 12, 2013, at ICE HSI Technical Operations in Lorton, VA.

❑ ICE Customer:

- HSI Technical Operations and HSI SACs nationwide.

IP Encoder

❑ Problem:

- ICE TechOps desires an IP encoder that will compress and encrypt large video data streams and securely transmit the stream back to a command post in real time.

❑ Solution:

- Develop an IP encoder and integrate it with a modified camera. The IP encoder technology can also be integrated with other surveillance cameras.

❑ Milestones/Accomplishments:

- Contract awarded in Fall 2012 and development work stayed on schedule with milestones met.

❑ Deliverables/Next Steps:

- Demonstration of the final prototype and a briefing about the culmination of the last year of development occurred on December 12, 2013, at ICE HSI Technical Operations.
- The meeting covered a demonstration of the prototypes and instructional and operational matters, plus an ongoing developments discussion following the end of the contract period.

Demonstration

- The original item at this location was a video demonstration of the low-light camera. The video does not meet 508 compliance. For more information, contact Mary Hanson, mary.hanson@hq.dhs.gov**

CBP – ICE: End-to-End Alien Processing

Data flow is shared between DHS and external partners

☐ Task 1 – (CBP/USBP) – Briefed to HSSTAC December 2013

- **Pre-Sally Port Analysis: record check submission, compressed vetting procedure, alien processing completed**

☐ Task 2 – (ICE/ERO) – Current effort

- **Lean Six Sigma Analysis (LSS): adjudication, detention, removal, return**

☐ Task 3 – Requirements for seamless integration between USBP and ERO

Goal is to demonstrate a repeatable systems analysis process that can be successfully applied to this and other problems faced by ICE and CBP.

NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov

Port Isabel Detention Center Systems Analysis (ICE/ERO)

Project Sequence

- Define ICE-validated operational alien processing challenges/problems
- Develop ICE-validated vision and success criteria for ideal alien custody transfer process between CBP/USBP and ICE/ERO
- Describe and compare current ICE/ERO Civil Immigration Enforcement Core Process and CBP/USBP alien detention process with ideal processes
- Determine requirements to enhance alien custody transfer between CBP/USBP and ICE/ERO

Results will enable ICE to make analytically-informed operational and acquisition decisions.

NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov

Office of University Programs - Summary

- ❑ **The Office of University Programs (OUP) provides streamlined access to the expertise of the Nation's colleges and universities to address pressing homeland security needs through its programs:**
 - Centers of Excellence (COEs)
 - Minority Serving Institutions

- ❑ **Budget**
 - From FY09 to FY14, OUP invested about \$30 million in work in border, immigration, and maritime security research and education

- ❑ **University-based COEs offer a variety of capabilities to ICE, such as:**
 - Predictive modeling and simulation
 - Operations research analysis
 - Immigration policy and enforcement
 - Sensor networks and communications
 - Risk and economic analysis
 - Data and visualization analysis
 - Data-driven decision support

DHS Centers of Excellence Leads

1. **Center for Awareness and Localization of Explosives-Related Threats (ALERT) - Northeastern University.**
Examples of Capabilities: Explosives characterization, explosives detection
2. **Coastal Hazards Center (CHC) - University of North Carolina at Chapel Hill, Jackson State University.**
Examples of Capabilities: Emergency management decision support and analysis, coastal hazard modeling
3. **Center for Risk and Economic Analysis of Terrorism Events (CREATE) - University of Southern California.**
Examples of Capabilities: Risk assessment and management, economic assessment
4. **Center for Visualization and Data Analytics (CVADA) - Purdue University, Rutgers University.** Examples of Capabilities: Public safety coalition projects, visual analytics for security applications
5. **Center for Maritime, Island, Remote and Extreme Environment Security (MIREES) - University of Hawaii, Stevens Institute of Technology.** Examples of Capabilities: Coastal radar detection & satellite tracking of ships, layered maritime awareness
6. **National Center for Border Security and Immigration (NCBSI) - University of Arizona, University of Texas at El Paso.** Examples of Capabilities: Screening and tracking; immigration, governance, & border policy.
7. **National Center for Food Protection and Defense (NCFPD) - University of Minnesota.** Examples of Capabilities: Biological and chemical agents behavior, Event modeling.
8. **National Consortium for the Study of Terrorism and Responses to Terrorism (START) - University of Maryland.** Examples of Capabilities: Terrorist recruitment and group formation, community resilience against terrorist threats and attacks
9. **National Center for Zoonotic and Animal Disease Defense (ZADD) - Kansas State University, Texas A&M University.** Examples of Capabilities: Biological detection tools, business continuity and incident command
10. *New Center of Excellence, TBD*

NOTE: This slide was converted from the original graphic to text only in order to meet 508 compliance. For the original graphic, contact Mary Hanson, mary.hanson@hq.dhs.gov

Office of University Programs – Current COE Projects with ICE

❑ National Center for Border Security and Immigration (NCBSI)

- *El Paso Region Open Source Analysis of Interconnecting Tunnels*
 - Homeland Security Investigations (HSI) El Paso sought assistance from NCBSI in collecting and analyzing open source information regarding the number, kind, and use of interconnecting tunnels in the El Paso area. NCBSI will also provide recommendations about areas that may be susceptible to interconnecting and sophisticated tunnels or both.
- *Organization and Networks of Transnational Gangs*
 - Studied transnational criminal gangs in Central America to anticipate methods and approaches that could be used by third-country nationals to commit crime or politically-motivated violence in the United States. The report was delivered to ICE National Gangs Unit.
- *Gripper: Workflow Analysis and Language Technology to Combat Human Trafficking*
 - Develop technology to automatically monitor large data streams (web, social media, and other sources) to recognize when anomalous circumstances occur that might reflect trafficking activity.
- *Technology Solutions for Mitigation of Human Trafficking*
 - Develop a risk assessment tool consisting of questions law enforcement officers may ask to better identify trafficking victims.
 - Create a common portal for the access of publicly available records that will provide a single starting point for all interested parties to find information on trafficking from legal records, media reports, and academic research.

Office of University Programs – Current COE Projects with ICE.

❑ **Center for Visualization and Data Analytics (CVADA)**

- *Automatic Recognition and Interpretation of Gang Graffiti (GARI)*
 - Mobile device application that analyzes gang graffiti to give users historical information and geographical locations of other images, helping to track gang movement, growth, membership, and activity
- *Analytics for Human Trafficking Networks and Victims*
 - Software that performs generic analytics necessary for detection of trafficking, data gathering, and subsequent arrest and prosecution of traffickers and restitution of victims. Will be applicable to several different kinds of trafficking, e.g., sex trafficking of minors, illegal immigrant slavery, illicit money laundering, and drug trafficking, etc.

❑ **Joint COE Efforts:**

- *Unaccompanied Alien Children Project – CREATE, NCBSI, and CVADA*
 - Interdisciplinary project to gain efficiencies in cost and performance for the transportation and placement of unaccompanied alien children apprehended while illegally crossing the border for responsible parties: ICE ERO, CBP, USCIS, OHA, HHS
- *Transnational Criminal Organizations Activity Enhanced Through the Use of Social Media in the El Paso Region – NCBSI and CVADA*
 - Collect, synthesize, and analyze open source information on social media used by transnational criminal organizations to understand the extent of social media exploitation and homeland security vulnerabilities

☐ Resource Optimization

- *Boat Allocation Module (BAM) - CVADA*
 - The BAM project aimed to create a mathematical model that can produce assignments of boats across U.S. Coast Guard (USCG) boat stations so that station mission hour requirements are met (or almost met). These assignments are made under many limiting constraints based on practitioner business rules including budgets, mission-boat type capabilities, minimum boat assignments, etc. In addition, it is valuable to be able to view model outcomes from multiple objectives. The USCG estimates savings of about \$120M over 20 years by using BAM.

- *Assistant for Randomized Monitoring Over Routes (ARMOR) - CREATE*
 - CREATE developed the first version of the ARMOR in 2007 to randomize police vehicle checkpoints and canine unit patrols at LAX. Implementation of ARMOR resulted in increased seizures of illicit drugs and weapons and significant reductions in overtime costs. CREATE proceeded to customize the ARMOR program to meet the needs of other DHS Components, including at the Federal Air Marshall Service and the USCG in Boston and New York City.

❑ Economic Impact Analysis

- *“The Impact on the U.S. Economy of Changes in Wait Times at Ports of Entry” - CREATE*
 - CREATE study for Customs and Border Protection (CBP) found that an increase or decrease in staffing at ports has an impact on wait times and, therefore, on the U.S. economy. ICE HSI expressed interest in modifying the CREATE CBP Wait Times Study to support HSI operational research questions, and has been briefed by CREATE on the Wait Times Study and possible applications to ICE.

❑ Data and Visualization

- *Visual Analytics Law Enforcement Toolkit (VALET) - CVADA*
 - VALET integrates large volumes of criminal, traffic, and civil incident data into a single, interactive interface to help law enforcement decision makers, analysts, and officers identify crime trends and patterns, discover crime anomalies, and assist in allocating law enforcement resources. Integrates multiple datasets onto one visual display.

ONL Manages the S&T Labs and DOE Labs in Support of DHS Missions

- ❑ **S&T Labs (5) Support DHS Core Mission Areas by Addressing Specific Needs in:**
 - **NBACC:** Bioforensic operations and timely biological threat characterization
 - **TSL:** Detection of explosives at transportation hubs
 - **NUSTL:** Test and evaluation of tools for first responders
 - **CSAC:** Timely knowledge products to plan for and respond to chemical threats
 - **PIADC:** Diagnostics and vaccines for foreign animal diseases

- ❑ **DOE National Labs Provide Core Science and Strategic Roadmaps:**
 - Homeland Security Act directs S&T through ONL to **coordinate with DOE labs** as national security assets.
 - DOE operates 17 national laboratories, of which 13 conduct homeland security-related research.
 - The DOE laboratories are utilized to assist in the execution of long-term government R&D objectives with significant scientific and technology content.
 - Solve complex multi-disciplinary problems – have unique capabilities and infrastructure (do not compete with private sector)

Accessing the National Laboratories

- ❑ **The Homeland Security Act of 2002 (P.L. 107-296, Section 309(a) November 25, 2002)**
 - DHS to utilize the DOE National Laboratories and sites to enhance homeland security by providing a core of scientific, technology and engineering expertise to develop innovative and effective homeland security capabilities

- ❑ **Memorandum of Agreement (MOA), dated February 28, 2003**
 - Implements Section 309 of the HSA and provides guidance enabling DHS to gain efficient access to specific DOE capabilities.
 - DHS has equal access to the DOE labs

- ❑ **Master Interagency Agreement, HSHQDC-09-X-00011, dated October 15, 2008**
 - Relates a standard set of terms and conditions for use in all subsequent interagency agreements between DHS and DOE
 - Provides templates for contract terms and conditions (T&Cs) and the statement of work (SOW)

- ❑ **MD-143, Establishing or Contracting with Federally Funded Research and Development Centers (FFRDC) and National Laboratories**
 - Appropriateness Review—requires all IAAs for DHS-sponsored RDT&E at a DOE lab to be reviewed by ONL to ensure the task is within scope of the lab or site's M&O contract with DOE.

- ❑ **ONL Sharepoint site contains process flow and points of contact**

Office of National Laboratories – Summary

- ❑ **The DOE National Laboratories provide ICE support that includes:**
 - **High Performance Computing**
 - **Modeling and Simulation**
 - **Cyber Analytics**
 - **Cyber Forensics**
 - **Data and Visual Analytics**
 - **Systems Analysis**
 - **Operations Analysis**
 - **Common Vetting**
 - **Software Certification and Accreditation**
 - **Scientific and Expert Assessment**

Trade Enforcement Technology Solutions

Provider: Pacific Northwest National Laboratory

Objectives:

- Evaluated available technology solutions applicable to the trade enforcement mission, including cyber forensics tools developed for other government clients. that can be adapted for or transferred to DHS.
- Integrate existing ICE data and identify solutions for analyzing disparate data.

Overall project goals:

- To identify, develop, integrate and optimize an advanced suite of cyber analytics tools that will enhance ICE's ability to disrupt and dismantle narcotics and contraband smuggling networks.

Tagging Tracking and Locating (TTL) Feasibility Study

Provider: Pacific Northwest National Laboratory (PNNL)

Objectives:

- Assess the feasibility, technical risks, and technical barriers to determining the call network associated with a cellular phone.
- Develop an application to extract and wirelessly offload key identification data.

Overall project goals:

- Provide ICE with an in-depth understanding of the state-of-the-art in identification technologies and to provide a tool (or tools) for supporting law enforcement efforts to identify criminal smuggling networks through network analysis of communications

Interagency Office Support to ICE

❑ Interagency Office Operational Experimentation Program

- **Technology Experimentation Events Based on Customer Needs**
 - **Joint Interagency Field Exploration**
 - **Technical Support and Operational Analysis**
 - **Technical Experimentation**
- **Capabilities Identified for S&T/ICE Homeland Security Investigations (HSI) Follow-up**
 - **Lightweight body armor, single-rescuer-evacuation stretcher, sensors, robotics**
- **Next event: Joint interagency Field Exploration 14-3**
 - **5-9 May, Paso Robles, CA**

Interagency Office Support to ICE.

❑ Current Collaboration

- **Autonomous Robotics for Exploring Tunnels**
 - **Current collaboration with ICE San Diego**
- **Pursuing 7 potential ICE-HSI gap solutions**

❑ Future Collaboration Ideas

- **Personal Protective Equipment**
 - **Tactical Assault and Light Operator Suit with DoD**
- **Maritime technologies and sensors**

Afternoon Agenda

- Break**
- HSSTAC feedback and initial recommendations (3:30-4:15)**
- HSSTAC way ahead (4:15-4:30)**