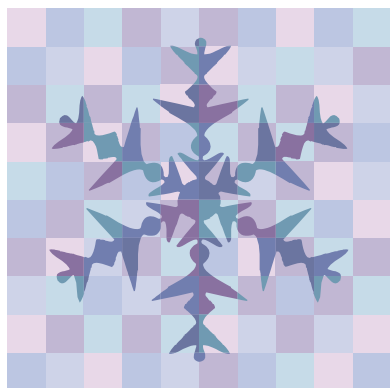


# Transportation Security Laboratory

## “People, Property, Processes & Partnerships”



Presented to:  
Federal Laboratory Consortium  
February 22, 2008

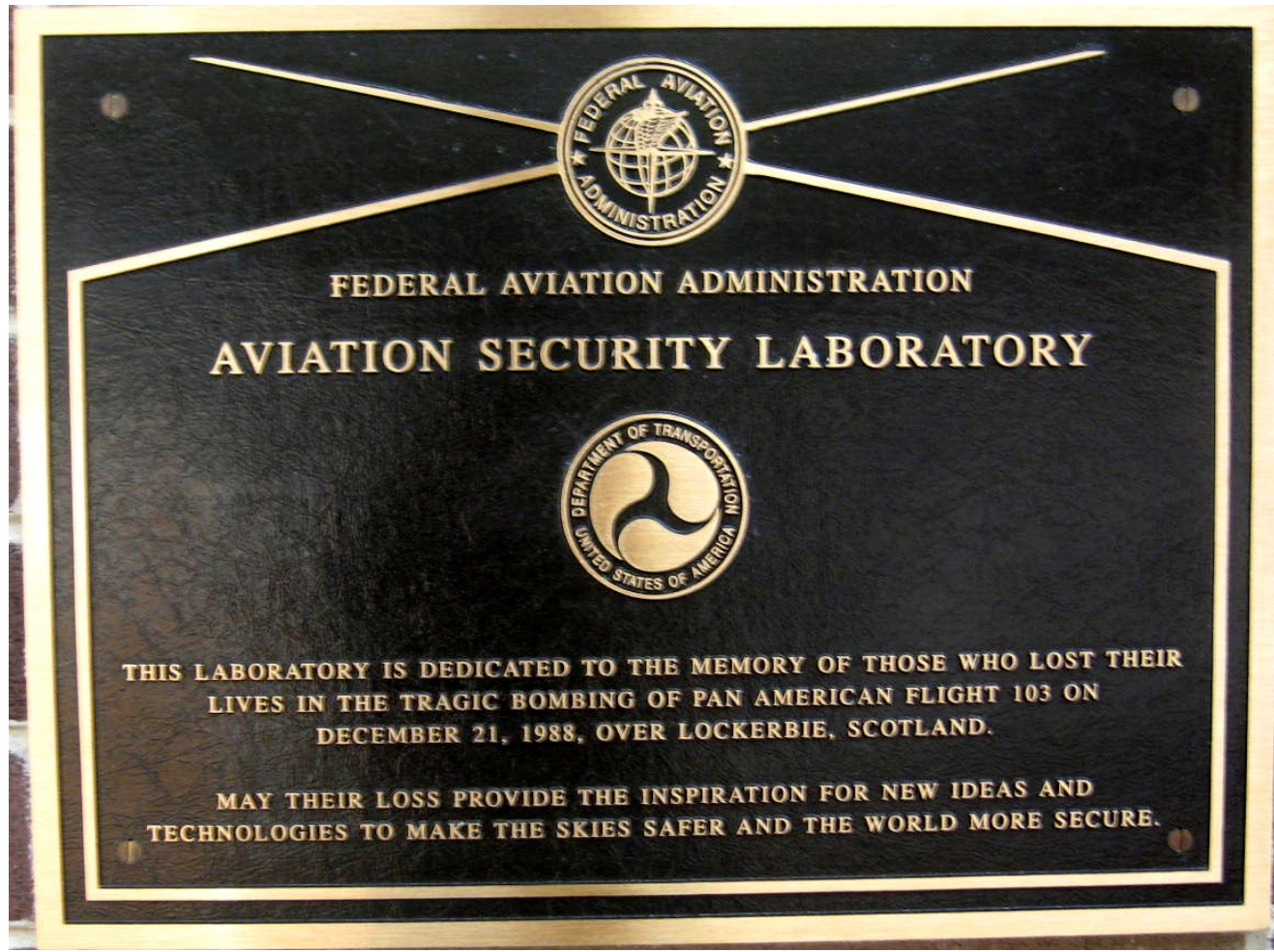
Susan F. Hallowell, Ph.D.  
Director, Transportation Security Laboratory



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# Transportation Security Laboratory



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# Transportation Security Laboratory

- Responsible for research, development, engineering, and test and evaluation activities for transportation security.
- TSL has a rich history of successful product development and technology life-cycle management (from nurturing innovative concepts to breadboard and prototype development to successful deployment of new products.)
- Provide support for equipment deployment, enhance procedures and processes supporting transportation security.
- TSL's mission is evolving to meet the expanding needs of the S&T customer base, especially TSA.



# Transportation Security Genesis

- The Aviation Security Improvement Act of 1990 (**Public Law 101-604**)
  - Directs the FAA to develop technologies to detect explosives in checked baggage
  - Certification of Explosives Detection System
- Aviation and Transportation Security Act of 2001 (**Public Law 107-71**)
  - Airport security a direct Federal responsibility.
  - The **Transportation Security Administration** is an administration of the Department of Transportation.
- Homeland Security Act of 2002 (**Public Law 107-286**)



# TSL Mission

The Transportation Security Laboratory is a **Federal Laboratory** with a core mission of researching, developing, and validating solutions to detect and mitigate the threat of explosives and weapons.



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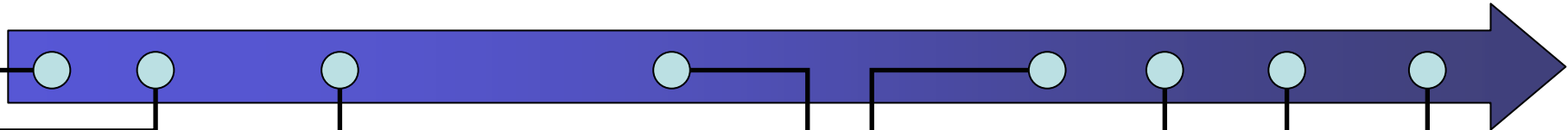
# A Historical Review



- 1992 – EDS Certification criteria published in Federal Register;
- 1994 - First EDS Certified
- 1996 – Creation of Security Equipment Integrated Product Team to deploy Security Technology
  - EDS for checked baggage
  - ETD for carry-on baggage
  - Threat Image Projection



- 2002 – 100% electronic checked baggage screening (over 1200 EDS and over 8000 ETD deployed)
- 2002 – Lab mission expands to all transportation modes
- 2003 to present.....



- 1988 - Pan Am 103 Bombing
- 1990 - Public Law 101-604 (Aviation Security Improvement Act)
- 1992 - Creation of Aviation Security Laboratory (ASL)
- 1996 - TWA 800 Crash; White House Commission on Aviation Safety & Security

- 2001 - 9/11 World Trade Center Bombing; Creation of TSA
- 2002 – ASL moved to TSA and changed to TSL; Creation of DHS
- 2003 – TSA moved to DHS
- 2006 - TSL moved to DHS S&T Directorate



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# A Historical Review



- 2003 to present – TSL has been conducting RDT&E through a Value Configuration of Product Areas, Technology Areas and Lab Capabilities
- Product Areas:
  - Baggage/Parcel Inspection
    - Next Generation EDS
    - Carry-on baggage inspection
  - Personnel Inspection
  - Cargo Inspection
  - Infrastructure Protection
  - Conveyance Protection



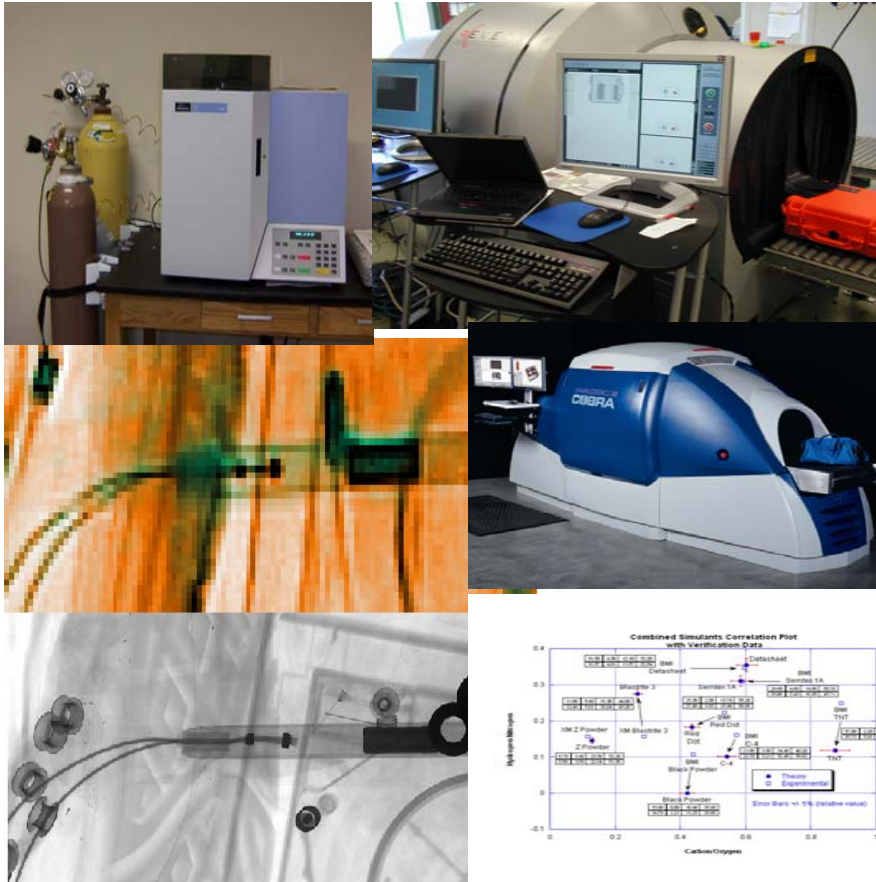
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# What We Do

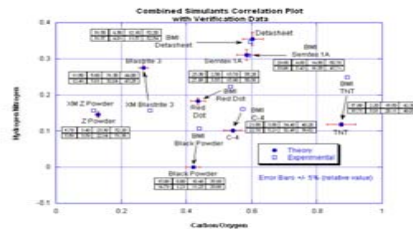


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# Detection in Checked Bag, Carry-on, & Cargo



- Development of EDS certification testing
- Development of qualification testing
- Conduct of DT&E for break-bulk across multiple technologies
  - Bulk detection
  - Trace detection
  - Canine detection
- Explosive simulant development & validation



# TSL Technology Focus Areas

TSL is organized into cross-functional product teams in the following technology areas:

- Bulk Sensors for Explosives and Weapons Detection
- Trace Sensors for Explosives Detection
- Explosives Effects and Survivability
- Human Factors
- Communications and RFID
- Access Control and Analysis Technology

**Bulk Technology**



**Human Factors**



**Communications**



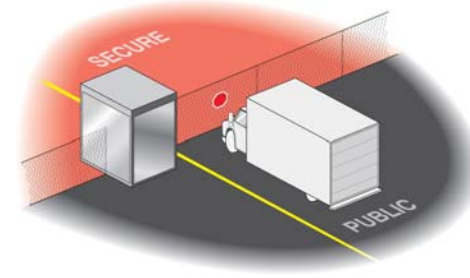
**Trace Technology**



**Explosive Effects**



**Access Control**



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**Bulk Explosive  
Detection Systems  
Lab**



**Human Factors  
Lab**



**Trace Explosives  
Research Lab**



**Trace Explosives  
Detection Lab**



**Bulk Explosives  
Research Lab**



**EDS Certification  
Lab\***

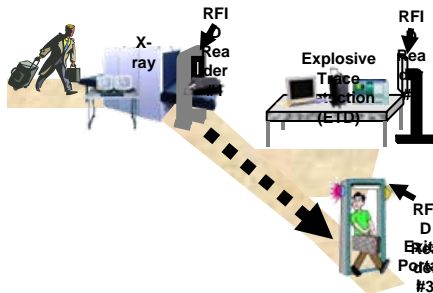
# TSL Lab Capabilities



**IED Fabrication  
Lab**



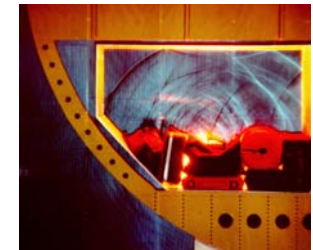
**Simulant  
Development Lab**



**C4I Lab**



**Body Imaging  
Lab**



**Explosive  
Effects Lab**



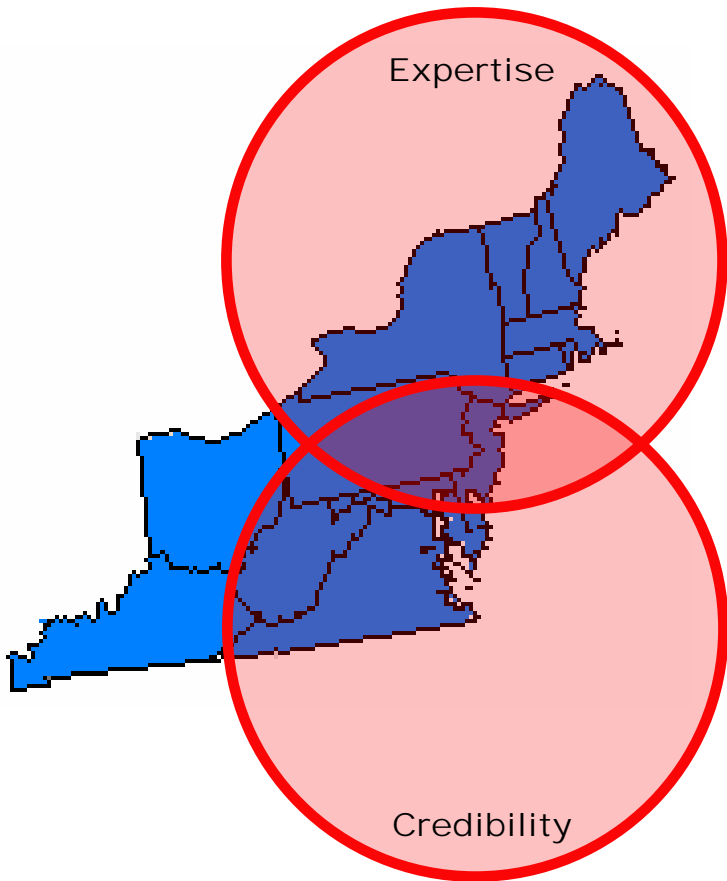
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# Core Capabilities

- People
  - Viewed as world leader in explosives detection with over 1000 person years of experience in RDT&E in explosives detection and mitigation.
- Property
  - Existing laboratory infrastructure within 12 acre secured RDT&E campus
- Processes
  - 100% of all security equipment presently fielded at U.S. airports has been developed, qualified, or certified by TSL.
- Partnerships
  - Vast network of established partners from other government agencies, foreign governments, universities and industry.



# TSL's Core Capabilities: People



## Expertise:

- Bright people working together in cross-functional, product-focused teams.
  - Scientists
  - Engineers
  - Explosives Specialists
  - Domain Experts
  - Project Managers

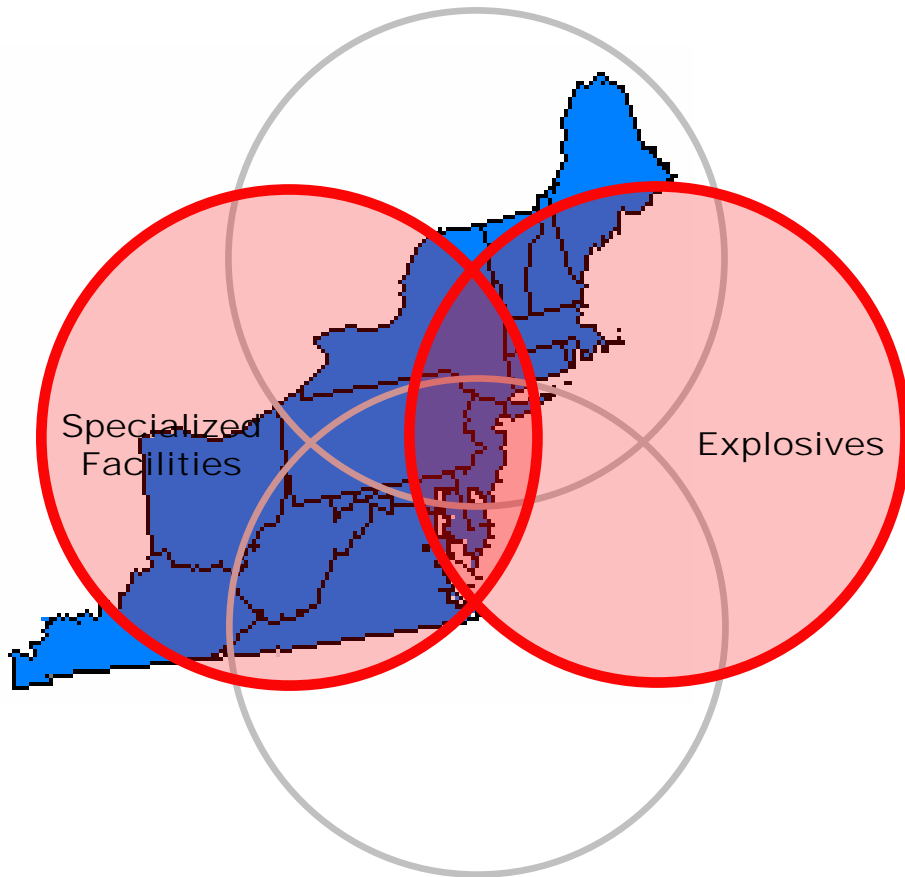
## Credibility:

- As a Federal Lab, TSL serves as the “honest broker” - an impartial government assessor across all technologies.
- TSL provides independent reviews with unquestionable integrity.



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# TSL's Core Capabilities: Property



## Specialized Facilities:

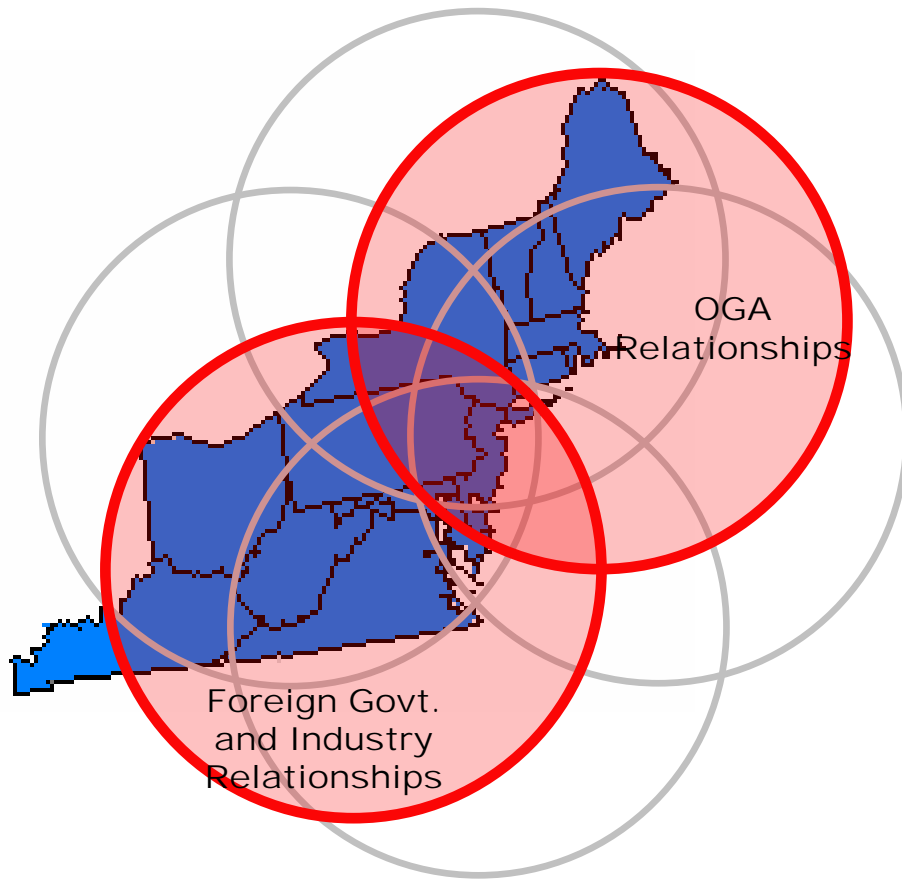
- Over 14,000 ft<sup>2</sup> dedicated to six specialty lab cells
- Over 20,000 ft<sup>2</sup> of office space and over 40,000 ft<sup>2</sup> of flex-space used to support a variety of project needs
- Existing infrastructure enables TSL to be a low cost service provider to DHS.

## Explosives :

- Extensive collection of explosives from around the world with specialized handling and storage facilities.
- Explosive bunker capacity of 2800 lbs of explosives on-site.
- Over 5500 ft<sup>2</sup> of explosive blast certified testing cells



# TSL Core Capabilities: Partnerships



## OGA Relationships:

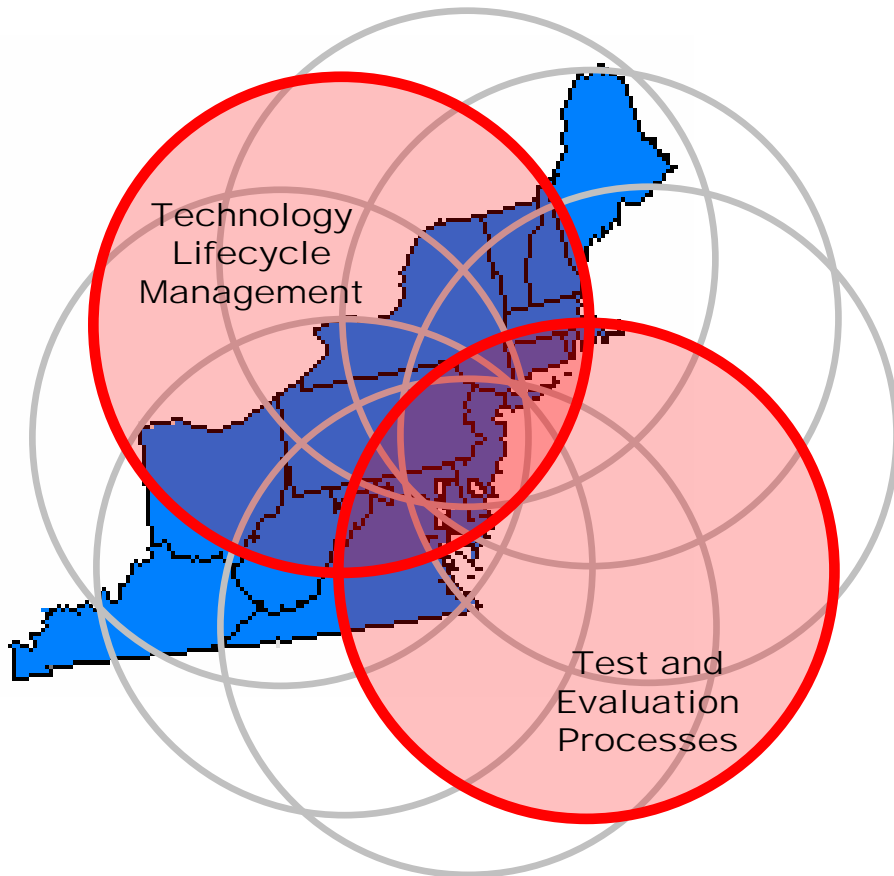
- Leverage mission-fit partnerships producing synergistic value, e.g., DOD (APG, TSWG, JIEDDO), DOT (FAA, FHWA), DOJ (FBI), DOS.

## Foreign Governments and Industry:

- More than 20 countries have relied upon the TSL for consultation in the area of transportation security, e.g. Israel, UK, Canada.
- Strategic outreach to universities for scientific expertise (NSF, COE Explosives, grants).
- More than 50 companies have worked with TSL to develop & improve their products.



# TSL's Core Capabilities: Processes



## Lifecycle Management

- Conception to deployment technology management
- Applied research, development, prototyping, pilot testing & post-deployment support
- Project Management
  - Unique approach by using didactic, cross-functional teams
- Design Control Authority
  - Understand impacts of vendor change requests on fielded equipment & associated testing needed.

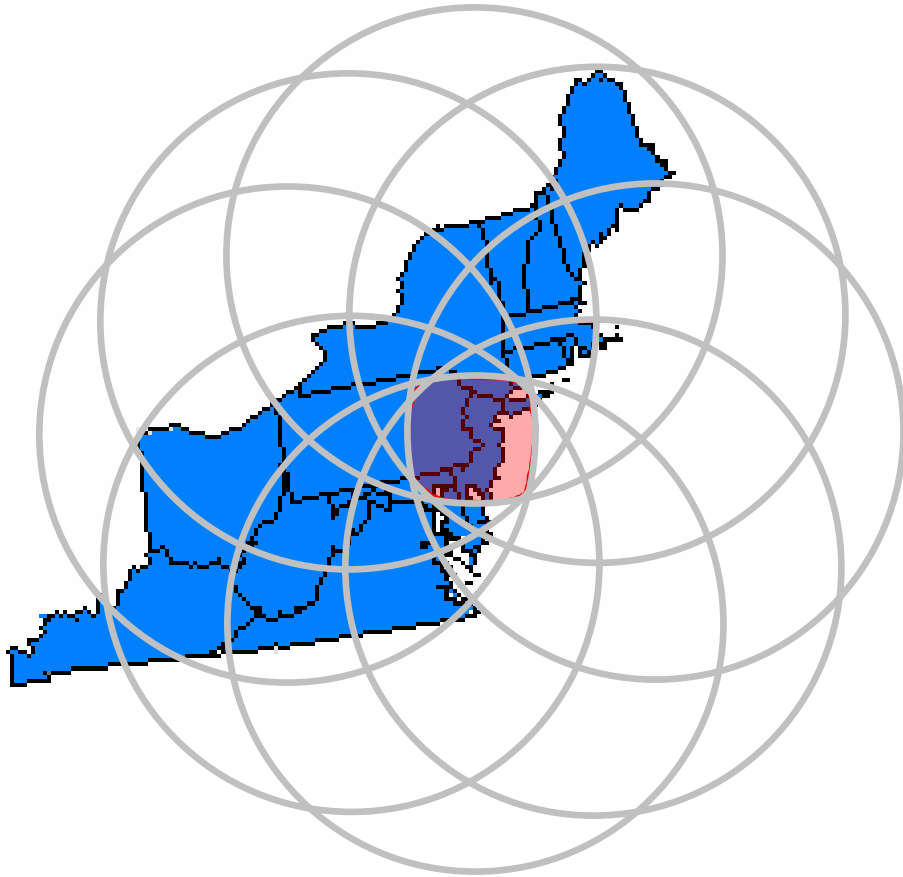
## Test and Evaluation Processes

- Developed processes for:
  - Certification T&E
  - Technology Qualification
  - Laboratory Assessment
- TSL's EDS certification process is viewed as the "Underwriter's Laboratory" Seal for explosive detection equipment.



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# Transportation Security Laboratory



- Is viewed as the worldwide leader in explosives technology.
- Has produced and delivered over 75 major products in four product areas in the last 10 years.
- Is able to rapidly respond to the ever-changing threat and technology needs:
  - Post 9/11 deployment of products (EDS, ETD, EMD, TRX) to all U.S. airports
  - Home made explosives program
  - Myriad “Quick Look” reports
  - Immediate response to operational concerns

**TSL people and infrastructure provide DHS unparalleled capabilities to address the threat of weapons and explosives to homeland security – Today and Tomorrow**



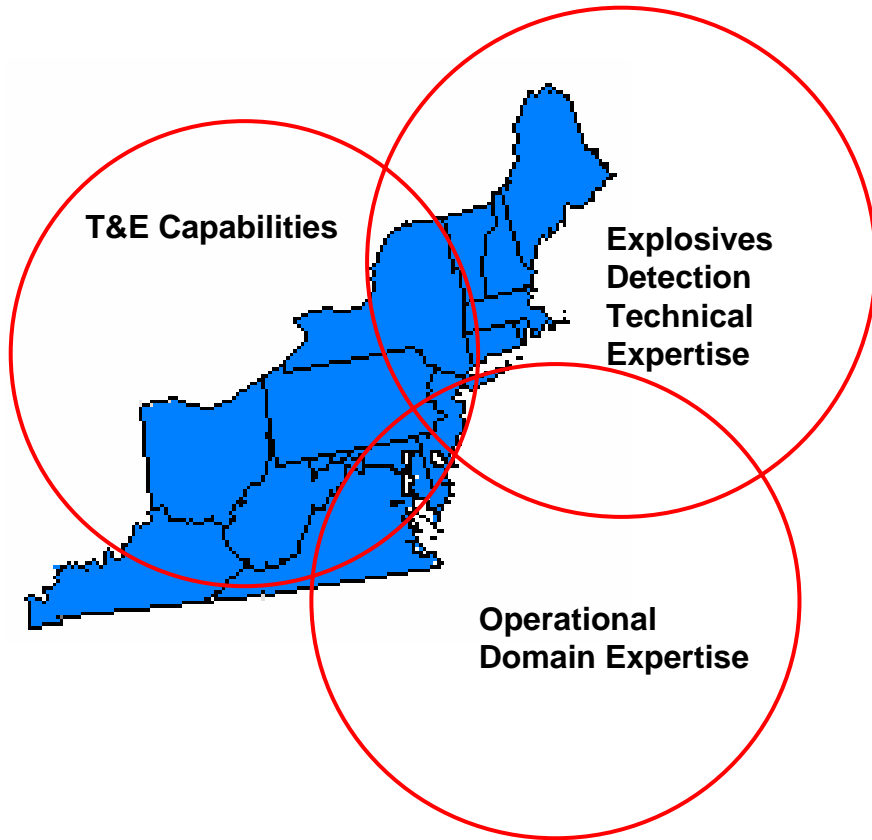
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# Stakeholders

- Customers and End Users
  - DHS Operational Components (TSA and others)
  - State and Local Agencies
  - Industry
  - S&T
  - Other Federal Agencies
  - Other Governments
- Partners
  - Industry
  - End Users



# Investment in TSL provides S&T:



**There is no other asset like the TSL in the world**

- Globally recognized technical knowledge
  - Bulk & Trace detection technologies
  - Weapons detection technologies
  - Explosives expertise
  - World-wide resource for performance data related to explosives detection and mitigation technologies
- Outstanding operational insight
  - Human Factors
  - Training aids
  - Quality control aids
  - CONOPS
- Undisputable T&E expertise
  - DT&E
  - Certification & Qualification T&E
  - Independence

TSL is a national asset: unique in its extensive library of explosives, improvised explosive devices, and its cadre of scientists, engineers, explosive handlers, and others.



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# Homeland Security



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