



# Science & Technology Directorate

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## Transportation Security Laboratory Overview



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# TSL – Lab at a Glance



- TSL works closely with industry counterparts to mature explosives and contraband detection technologies to meet customer requirements.
- Sole laboratory designated for certification testing for TSA. For the most part, security equipment deployed in U.S. airports has passed through TSL for technical support at some point.
- We support technology development with a staff of extensive subject matter expertise in explosive properties, terrorist tactics, and detection technology performance needs.
- We conduct applied research to support T&E so we are ready to test next generation systems as they mature.



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# BLUF

- If you have a technology that offers an opportunity to close a DHS component gap in contraband detection...we want to hear from you!!!!



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# TSL Focus Areas

## *Applied Research Supporting T&E (Core Labs)*

- Test Articles/Test Phantoms
- Test Standards/Test Methodology
- Material Characterization/SSST

## *Developmental Test & Evaluation*

- *X-Ray based technologies (X-ray/CT)*
- *Radiometric based technologies (Metal Detectors/ Bottled Liquid Scanners/MMW technologies)*
- *Chemistry based technologies (Trace Contact Detection /Trace Vapor Detection)*

## *Independent Test & Evaluation*

- *Certification of X-ray, Radiometric, & Chemistry based technologies*
- *Government customer requested Special Studies*

## *Applied Research (Work for Others)*

- Vulnerability Assessments/Requirements Definition
- T&E for non-aviation technologies



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# Working with the TSL

- Industry partners can bring technologies into the TSL via two means:
  - Cooperative Research & Development Agreement (CRADA) with TSL
    - Establishes roles and responsibilities of TSL and industry partner
    - Describes nature of T&E activity TSL and industry partner will conduct
    - Typically reviewed by DHS and industry partner legal teams
  - Contract through DHS S&T HSARPA Division (Explosives, Borders & Maritime)
    - For example, Broad Agency Announcements



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# Technology Optimization Partnership(TOPs)

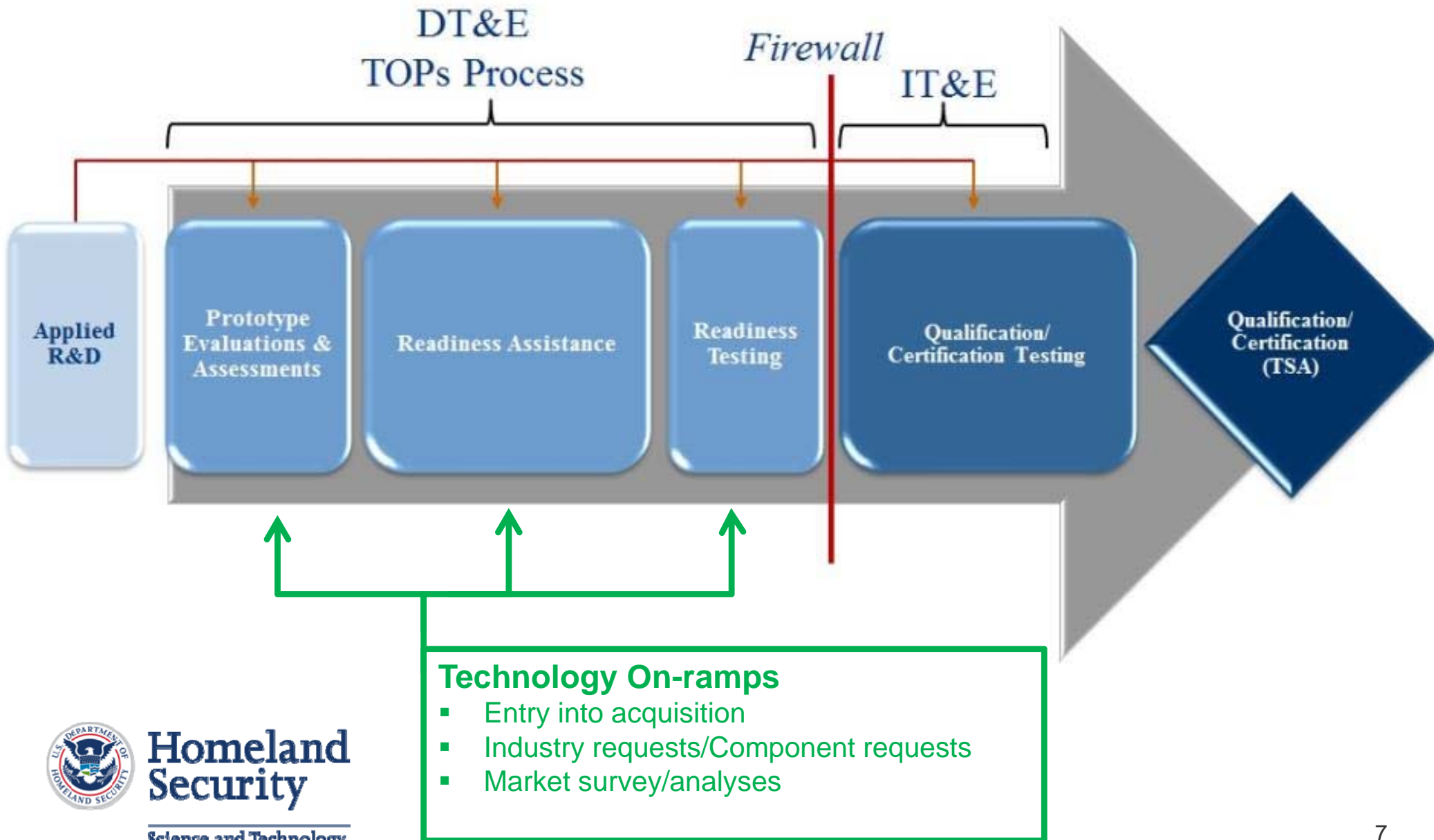
- Designed as an internal public-private partnership to expedite the maturation and deployment of technologies.
  - Reduce time to market for emergent technologies.
  - Close operational gaps
- TOPs provides numerous “on-ramps” into the TSL depending on level of maturity and needs.
  - Prototype Evaluations & Assessments
  - Readiness Assistance
  - Readiness Testing



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# Technology Optimization Partnership(TOPs)



# Prototype Evaluations/Assessments

- For early proof-of-concept, feasibility, or laboratory experiments
- Subject matter expertise guidance provided to the partner to enable technology optimization
- The DT&E group considers the system, and may perform research activities (e.g. to optimize test articles)



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# Readiness Assistance

- For partners providing working prototypes or production ready systems who wish to receive T&E data and development guidance
- Readiness Assistance is *not necessarily* correlated to any particular Acquisition or Certification window.
- Data collection to help determine the technology's limit of detection (LOD) and/or provide industry data/images.
- Test data and information provided to the partner in order to provide development assistance via guidance
- Information provided to government sponsors



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# Readiness Testing

- TSL serves as an evaluator of technology primarily for the vendor involved in a certification/acquisition effort
  - Driven by a component's detection standard
  - Technology evaluated across a broad array of areas
  - Results are provided to TSL IT&E and government sponsor to determine if the system is ready for certification testing.
  - In-depth briefings/feedback to technology developers
- IT&E makes final determination if technology is ready to move into formal certification testing



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# Certification Testing

- TSL serves as a test agent for a component customer.
  - Formal process agreed upon by component and TSL.
  - Driven by detection standard
  - Pass - Fail
  - In-depth briefings to components
  - Minimal briefings to technology developers



(Note: This process occurs outside the TOPs process and typically does not involve CRADAs.)



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# An Average Year at TSL

- Work with 25 OEMs to mature their technologies through CRADAs
- Conduct 15 Certification Readiness Tests on **Checked Bag** EDS for conventional explosives and HMEs.
- Complete 6 field evaluations or lab assessments for **Cargo Screening** technologies
- Advance 3 commercially available **Checkpoint** systems from one TSA tier of detection to the next highest tier of detection.
- Provide readiness assistance for 6 vendors working to mature technologies (AT, AIT, BLS, SSD)
- Independent Test & Evaluation completes
  - 9 EDS Certifications
  - 4 AIT Qualification Tests
  - 6 ETD Qualification Tests
  - 3 Qualification Tests for other technologies
  - 15 Lab Assessments
  - 30 Vulnerability Assessments
- Execute 3 applied research efforts for other government agencies
- Conduct exploratory testing on 4 **Next Generation** screening technologies
- Publish 200 technical reports (Gov)
- Conduct 45 vendor briefs
- Develop 15 invention disclosures
- File 2 patent applications



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# Points of Contact

## ■ Lab Leadership

- Brian L. Krenzien (Acting Executive Director) - (609)813-2709 – [Brian.Krenzien@hq.dhs.gov](mailto:Brian.Krenzien@hq.dhs.gov)
- Dr. Richard Lareau (Acting Technical Director) – (609)813-2760 – [Richard.Lareau@hq.dhs.gov](mailto:Richard.Lareau@hq.dhs.gov)
- Seyhun Byrne – DT&E Division Chief – (609)813-XXXX – [Seyhun.Byrne@hq.dhs.gov](mailto:Seyhun.Byrne@hq.dhs.gov)
- William Petracci – IT&E Division Chief – (609)813-2708 – [William.Petracci@hq.dhs.gov](mailto:William.Petracci@hq.dhs.gov)

## ■ TOPs POCs

- Michael Snyder – X-ray technologies (EDS, AT) – (609)813-2764 – [Michael.Snyder@hq.dhs.gov](mailto:Michael.Snyder@hq.dhs.gov)
- Rob Klueg – Radiometric technologies (AIT, BLS) – (609)813-2872 – [Robert.Klueg@hq.dhs.gov](mailto:Robert.Klueg@hq.dhs.gov)
- Dr. Jason Stairs – Chemistry technologies (ETD, Vapor) – (609)813-2895 – [Jason.Stairs@hq.dhs.gov](mailto:Jason.Stairs@hq.dhs.gov)



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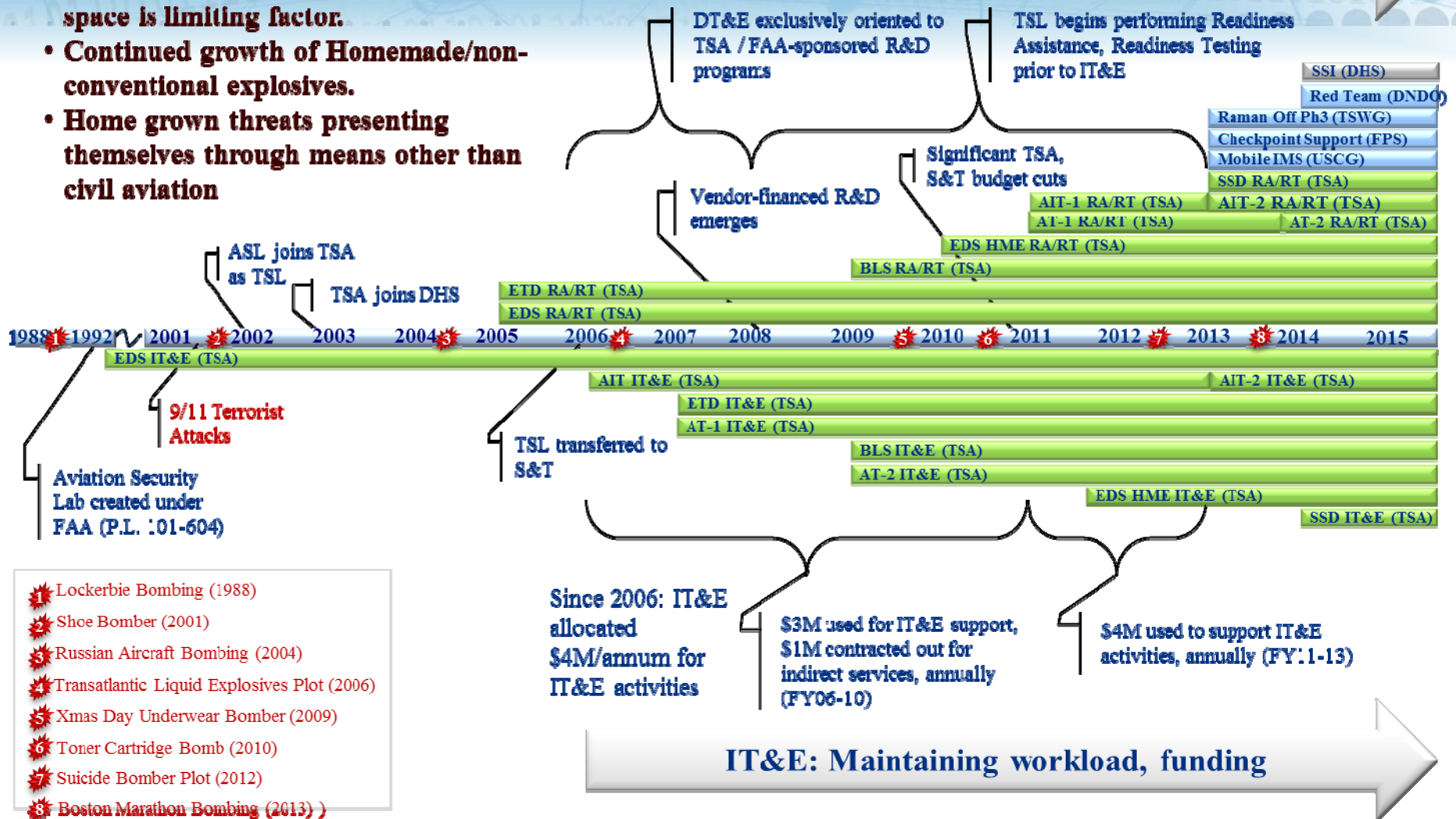
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# Historical Growth

## Challenges: 2015 and Beyond

- Available square footage of TSL lab space is limiting factor.
- Continued growth of Homemade/non-conventional explosives.
- Home grown threats presenting themselves through means other than civil aviation

DT&E: Supporting more focused technology solutions



# TOPs Business Overview

- Gate 3 results in a determination as to what TOPs testing stage each technology enters in at based on TRL.
  - TRL 3 – 4: Exploratory Assessments
  - TRL 4 – 6: Readiness Assistance
  - TRL 6 – 7: Readiness Testing
- Partners who do not make it through a stage-gate are informed.
- Partners who are approved through stage-gates enter into a Cooperative Research and Development Agreement (CRADA) with TSL.

# Why do we exist?

## Enabling Legislation:

- Aviation Security Improvement Act of 1990 (Lockerbie Pan Am 103):
  - “Government shall 1) accelerate & expand research, development & implementation of technologies & procedures to counteract terrorist acts against civil aviation; 2) determine amounts & types of explosives that could cause catastrophic damage to an airplane.”
- White House Commission of Aviation Safety & Security of 1996 (TWA 800):
  - “Government shall develop an action plan to deploy new high technology machines to detect the most sophisticated explosives.”
- Aviation & Transportation Security Act of 2001 (9/11):
  - Established TSA and made it responsible for security in all modes of transportation
- Homeland Security Act of 2002:
  - Established DHS to 1) prevent terrorist attacks in the US; 2) reduce vulnerability of US to terrorism; 3) minimize damage...from terrorist attacks; ... & 7) monitor connections between illegal drug trafficking and terrorism...and otherwise contribute to efforts to interdict illegal drug trafficking.



# Why do we exist?

To address these enabling legislative requirements, TSL provides

- Impartial, independent oversight
  - Certification testing is an inherently government role
- Subject matter expertise
  - Detection characteristics by technology
  - Threat characteristics of interest (physics/chemistry)
  - Vulnerability/mitigation expertise
- Accredited and Repeatable Test & Evaluation procedures
  - ISO 9001
  - A2LA 17025
- Cost effectiveness & Responsiveness
  - Flexibility of government employee workforce