

BACKGROUND

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) [National Urban Security Technology Laboratory \(NUSTL\)](#) provides Research, Development, Test & Evaluation (RDT&E) products and services to prevent, protect against, respond to, and recover from homeland security threats and hazards.

NUSTL works across public safety disciplines, including law enforcement, fire services, emergency medical services, and emergency management officials, to address the most pressing challenges faced by the national first responder community.

MISSION

- Conduct test and evaluation (T&E)—spanning a broad spectrum of technologies, ranging from commercial-off-the-shelf products to emerging capabilities
- Execute research and development (R&D)—resulting in tools and actionable guidance to support first responder missions
- Serve as trusted advisors for the first responder community—providing technical expertise and knowledge to inform decision-making



NUSTL's support ranges from tests of personal protective equipment for first responders and far more complex evaluations of unmanned aircraft systems (UAS) and their countermeasures, to providing actionable guidance and technology advice.

CAPABILITIES

NUSTL requires dedicated resources to maintain modern capabilities and strategic investments in its infrastructure to support dynamic DHS and first responder missions. With services addressing a diverse range of threats and hazards across the homeland security domain, NUSTL equips first responders with information to select and use technologies and tools effectively in protecting our nation's cities. NUSTL serves the broader Homeland Security Enterprise by:

- Providing a full range of T&E services including test planning and execution, focus group facilitation, data collection/analysis, technology demonstrations, and operational experimentations
- Integrating front-line responders into all aspects of the Lab's T&E efforts, ensuring that projects continuously account for and meet operator needs
- Advise on requirements generation, equipment standards, technology marketplace, and concept of operations development
- Producing knowledge products to inform technology acquisition and deployment decisions
- Developing tools and actionable guidance to prepare for and respond to evolving and emerging hazards and threats
- Bridging knowledge gaps between technology developers and first responder end-users, supporting the development of field-ready products
- Supporting training and exercises with technology insertion and evaluation, as well as with subject matter expertise

IMPACT

NUSTL plays a vital role in advancing technology and providing valuable resources to first responders, ultimately leading to safer and more effective emergency response efforts nationwide. The Lab provides first responders with tools, technologies and guidance they can be confident in because they've been developed and tested with end users in mind. This ensures that the solutions provided by NUSTL are practical, effective, and meet the specific needs of those on the front lines. From the lifesaving self-contained breathing apparatus that is used by every firefighter going into a blaze, to complex threat detection systems that ensure the health and safety of the public, NUSTL's work saves lives.

TECHNOLOGY TEST & EVALUATION

CONSUMER REPORTS FOR FIRST RESPONDERS

Many of NUSTL's T&E activities are performed under the System Assessment and Validation for Emergency Responders (SAVER) program. NUSTL surveys the commercial marketplace for technologies that meet responder use cases, and works directly with first responders to assess those technologies in realistic operational settings. The culminating SAVER products provide a life- and cost-saving value proposition to DHS, as well as to federal, state, local, and tribal responders. More than 1,000 technology reports are publicly available on the SAVER website:

www.dhs.gov/science-and-technology/saver.



COUNTERING THREATS FROM UAS

UAS pose significant challenges to air traffic safety and homeland security, as well as potential threats to border security, critical infrastructure, and the general public. NUSTL has assessed the performance and suitability of counter-UAS technologies across a variety of operational settings and end-user applications. Current efforts include evaluating a variety of products for their ability to detect, track, identify, and mitigate various UAS threats to better equip DHS components with technologies that work effectively in challenging urban environments.

Beyond testing and evaluating counter-UAS, NUSTL provides technical expertise and advice to agencies at the federal, state, local, and tribal levels regarding available technologies that are critical for countering malicious UAS threats.

URBAN OPERATIONAL EXPERIMENTATION

NUSTL partners with first responder agencies to test new and emerging technologies that address high priority capability gaps. The most recent 2022 Urban OpEx was marked by a [weeklong series of experiments](#) showcasing technologies including UAS and robotics, an AI-enabled gun detection application, incident management and situational awareness platforms, deployable communications and deployable robotics, and other innovative systems. Technology developers gained valuable insights and feedback from end users to enhance their products for operational deployment.

RESEARCH AND DEVELOPMENT

NUSTL's R&D addresses evolving threats that can impact first responders' ability to save lives, protect themselves, and minimize impacts to the community and economy.

ENERGY INNOVATION AND PUBLIC SAFETY

Public safety agencies face tremendous challenges as they respond to incidents involving Lithium-ion batteries and other advanced energy storage systems. NUSTL's Energy Innovation and Public Safety program aims to protect first responders and the public by providing science-based guidance and tools to address battery fires and hazards related to new and emerging energy storage systems.

RADIOLOGICAL AND NUCLEAR RESPONSE

NUSTL develops technical resources, tools, modeling, and guidance to help state and local agencies initiate a response in the first minutes and hours following a radiological/nuclear incident. The results equip state and local first responders, as well as federal response agencies with operations-focused tools to prepare for and respond to radiological emergencies. For example, NUSTL's [animated videos](#) of operationally-focused missions and tactics in the [RDD Response Guidance: Planning for the First 100 Minutes](#) help local responders and planners implement best practices and response activities during a radiological emergency.

