DHS Science and Technology Directorate
FIRST RESPONDER TECHNOLOGIES

Homeland Security
Science and Technology

RAPID SOLUTIONS FOR RESPONDERS' MOST URGENT NEEDS

OUR CUSTOMERS

OUR IMPACT

PROBLEM: 68% of firefighters get cancer in their lifetimes.

SOLUTION: Smoke and Particulate Resistant Turnout Ensemble

PROBLEM: Percentage of fatalities doubles when response times are more than **5** minutes. The national average response time is **15** minutes.

SOLUTION: Routing Logic Guide

PROBLEM: Overexertion, stress and medical conditions accounted for nearly **60 percent** of firefighter deaths in 2015.

SOLUTION: Wildland Firefighter Advanced Personal Protective System

PROBLEM: Billions of undetected dollars are illegally placed on prepaid cards each year for drugs and human trafficking.

SOLUTION: Prepaid Card Reader (ERAD)

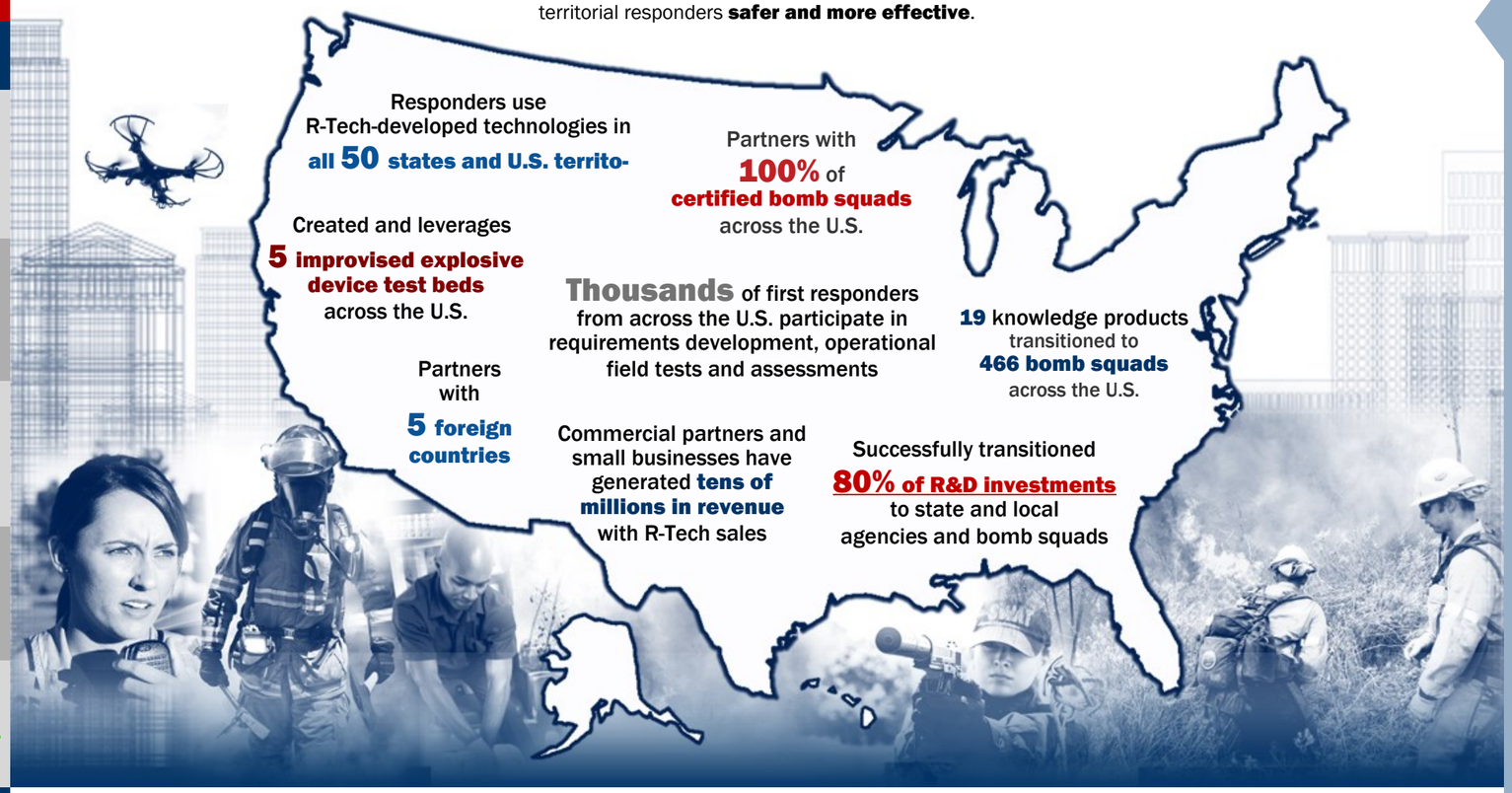
PROBLEM: The number of use-of-force incidents is **reduced by half** for responders with body-worn cameras compared to those without.

SOLUTION: Auto-Activated Body-Worn Camera

FIRST RESPONDER RESOURCE GROUP (FRRG)

S&T's FRRG is an advisory body comprised of 133 first responders of all disciplines from across the U.S. who identify and prioritize critical capability gaps. The gaps then determine the technologies R-Tech funds and develops, with the responders providing feedback at every step. When prototypes are available, FRRG members assess them in real-world operational settings prior to commercialization.

The DHS Science and Technology Directorate (S&T) First Responder Technologies (R-Tech) program provides **rapid technology solutions** that address high-priority first responder capability gaps. R-Tech works with responders at every step and **engages with industry, academia, national laboratories and the innovation community** to ensure technology needs are met and exceeded. With a **mature and proven** requirements gathering, prototype development, field assessment and transition process, R-Tech **solutions are working in the field today** to make DHS components, federal agencies, state, local, tribal and territorial responders **safer and more effective**.



MAKING FIRST RESPONDERS SAFER AND MORE EFFECTIVE

Each day more than 70,000 state, local, tribal, and federal agencies support public safety and emergency response across the nation. Access to technologies that allow them to perform their job safely, efficiently and effectively is critical to their performance and well-being.

LEVERAGING INDUSTRY AND SPURRING INNOVATION

R-Tech partners with industry to rapidly develop technology for high priority, first responder needs. We leverage industry to create innovative approaches and work closely with first responders to ensure desired results.

SECURING COMMUNITIES ACROSS AMERICA

First responders at all levels of service, from local and tribal jurisdictions to state and federal agencies, share their technology needs and R-Tech delivers. Our R&D efforts are strategic investments in the men and women who put their lives on the line every day to protect our communities and our nation.

RETURN ON INVESTMENT

S&T's R-Tech program fulfills first responder technology needs fast. R-Tech quickly translates capability requirements into commercially-available solutions for operational use—when responders are safer, our communities are safer.

Rapid R&D for High-Priority First Responder Gaps

- R-Tech works with responders to identify capability requirements
- R-Tech solicits industry and other key partners to develop solutions
- Critical technology is developed within 12 to 18 months

Assessing and Validating Technology in the Real-World

- Responders from all disciplines inform R&D to ensure technologies meet field needs
- Prototypes are operationally tested in responder duty environments
- Responders are advocates for themselves and colleagues

Technology Transition to Commercial Marketplace

- R-Tech works with R&D partners to plan for technology commercialization
- To date, R-Tech performers have sold approximately 33,000 units for first responder use across the U.S.
- 19 technologies and 19 knowledge products are currently available to first responders and public safety bomb squads

R-TECH BUSINESS UNITS & SUCCESSFUL TRANSITIONS

TECHNOLOGY ASSESSMENTS AND TRANSITION

R-Tech bridges technology development efforts with successful transition and commercialization strategies. Together with S&T's National Urban Security Technology Laboratory and first responders across the country, R-Tech assesses and validates technologies in an operational environment to ensure that responders have access to the technologies that meet their needs, keep them safer and enhance their performance.

REQUIREMENTS GATHERING

R-Tech identifies and prioritizes high-priority technology gaps facing the nation's first responders. From there, R-Tech scans the current technology market, matches the need with vendors who can build solutions, and then invests in the most promising concepts over the next 12-18 months. An additional 6 to 8 months is typically required to transition completed technologies to the commercial marketplace.

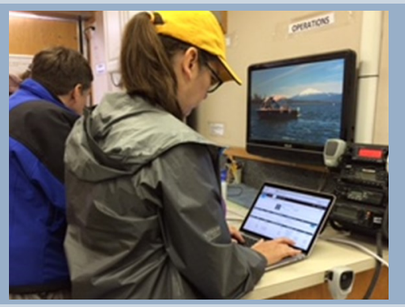
Enhanced Dynamic Geo-Social Environment (EDGE): EDGE is a virtual environment where first responders—single agencies or across agency, jurisdiction, or discipline—can train for a coordinated response to critical incidents, such as active shooters. Launched in June 2017, more than 520 agencies in 48 states and the District of Columbia have requested EDGE access.

Prepaid Card Reader (ERAD): ERAD allows law enforcement to check the balance of suspicious cards—bank credit/debit cards, gift cards, library cards, hotel keys, even Metrorail cards—and put a temporary hold on linked funds until a full investigation can be completed. To date, 780 agencies are using this technology across the U.S., with more than $10 million seized.

EMERGING TECHNOLOGIES

R-Tech develops technologies that improve first responder safety and performance and strengthen their ability to protect the homeland. Sometimes that means enhancing products already on the market, and many times it means leveraging cutting-edge technology to build first-of-its-kind solutions and capabilities.

Radio Internet-Protocol Communications Module (RIC-M): Rather than replacing entire technology suites, which can cost as much as $15,000, RIC-M allows response agencies to easily upgrade and reconfigure legacy communications systems for less than $750—potentially extending the system's life for decades. To date, a total of 358 units have been sold.



Lost Person Locator: The suite of tools puts historical, geographical and statistical data at responders' fingertips to improve search and rescue response. Tools include a GIS and communications software platform, post-incident data collection system, and a mobile app with checklists and missing person behavior profiles. The app has been downloaded more than 4,250 times.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

R-Tech researches advanced materials and develops garments and equipment that protect first responders and increase their safety in hazardous working environments. PPE developed by R-Tech improves radiant thermal protection; shields against punctures, lacerations and exposure to carcinogens; and keeps responders cooler under extreme temperatures.

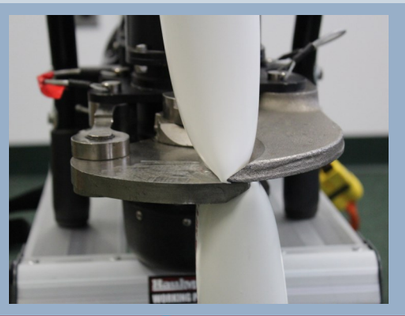
Smoke and Particulate Resistant Turnout Ensemble (SRT): Available since November 2017, SRT affords firefighters the same level of fit, function and comfort as their existing turnout gear with enhanced protection at interfaces (wrists, ankles, chest, stomach and neck) to shield firefighters from exposure to hazardous vapors and carcinogens that can be absorbed into their skin.

Wildland Fire Advanced Personal Protective System (APPS): Wildland Firefighter APPS is an NFPA-certified responder garment system that improves radiant thermal protection; reduces heat stress; and improves the form, fit and function of the garment ensemble. To date, sales total more than $18,000. Most recently, the uniforms were used by firefighters battling California wildfires.

RESPONSE & DEFEAT OPERATIONS SUPPORT (REDOPS)

REDOPS uses an integrated approach to assist public safety bomb squads with responding to, defeating, and rendering safe improvised explosive devises. Working with the Federal Bureau of Investigation, REDOPS draws on expertise from the bomb squad community to develop countermeasures and tools, like the Laminate Window Portal Charge and Power Hawk, that improve safety and efficiency during render safe operations.

Laminate Window Portal Charge: The Laminate Window Portal Charge is a small explosive charge configured to cut an access hole into the laminated glass of a vehicle, for example the windshield, without ejecting large fragments of glass into the vehicle that could set off an improvised explosive device. When deployed, the technology is 100 percent effective.



Powerhawk: Responders use "jaws of life" to rip apart cars—the cutters are configured like a lobster claw, chewing through steel to save victims from harm. Powerhawk is one such shearing tool that has found a new application: bomb killer. R-Tech worked with federal, state, and local public safety bomb technicians to establish that it can, with 99 percent accuracy, cut open pipe bombs, reducing the likelihood of detonation during render safe operations.