The Next Generation First Responder (NGFR) Apex program seeks to help tomorrow’s first responder be better protected, connected and fully aware. When firefighters, law enforcement officers and emergency medical services have enhanced protection, communication and situational awareness, they are better able to save lives and make it home safely. Responders of tomorrow deserve to have the same cutting-edge consumer technologies that civilians routinely use today. By bringing enhanced capabilities to the public safety space and giving responders the options to build the systems they need for their mission and budget, DHS S&T is increasing hometown and homeland security.

### MAKING FIRST RESPONDERS SAFER AND MORE EFFECTIVE

The NGFR Apex program leverages the best of existing and emerging technologies to enhance first responder protection and safety, enable consistent and secure communications, and provide real-time situational awareness to avoid and withstand threats encountered during mission response.

### POWERING INDUSTRY AND SPURRING INNOVATION

Our strategy is simple: by defining a suite of open standards for responder technologies, it is easier for industry to develop and integrate diverse communications and sensor networks for responders. By lowering the barriers to entry, the NGFR Apex program is increasing competition and advancing development of emerging technologies.

### SECURING COMMUNITIES ACROSS AMERICA

Communities rely on first responders, and first responders rely on technologies. NGFR develops the tools that help first responders stay safe, communicate with their peers, and make quick and informed decisions so that when emergencies occur, not a second is wasted in saving lives and securing American communities.

### MAKING RESPONDERS BETTER PROTECTED, CONNECTED AND FULLY AWARE

The NGFR Apex Collaborates with Partners in 44 States and 5 Foreign Countries to Develop and Test Game-Changing Technologies.

NGFR Partners with 250+ Responder Organizations to Define Requirements and Pilot Technologies.

NGFR Industry Partners are 65% Small Businesses.

NGFR Works with Local Responders that Represent 46+ Million Americans. Helping Make Communities Nationwide Safer and More Resilient.

NGFR Includes 40+ Projects for Research, Development, Testing and Evaluation.

NGFR Works with 50+ Federal Partners to Maximize Impact and Save Taxpayer Dollars.

NGFR and Industry Partners Have Conducted 15 Pilot Programs.

### RETURN ON INVESTMENT

By collaborating with responders and industry, NGFR is helping fulfill responder needs faster. The NGFR Apex program is building value for responders, industry and communities by focusing on three specific areas.

#### Maximizing Mission Impact While Reducing Costs

- Lowering barriers to help innovators adopt commercial technologies for first responders faster, increasing the diversity of the First Responder Industrial Base and lowering costs.
- Partnering with the U.S. Coast Guard and U.S. Border Patrol to deploy dual-use NGFR technologies to support federal missions, as well as public safety.
- Leveraging existing public television systems that reach 97% of the U.S. population to support responder communications and sensor networks.

#### Expanding the First Responder Industrial Base

- Helped 26 startups speed up the time-to-market for responder wearable technology through the EMERGE Program—connecting them to investors, manufacturers and responder test beds.
- Partnering with 5 academic institutions to leverage student innovation and research.
- Connected NGFR performers to commercialization partners, increasing the viability of successful transition to the first responder marketplace.

#### NGFR Technologies Get Results in Your Communities

- Expanded Houston-area situational awareness by deploying datacasting during Super Bowl LI, the NCAA Final Four and Hurricane Harvey relief, processing more than 31,000 hours of video.
- Increased communications resiliency in 15 cities across America by demonstrating vulnerabilities and recommending mitigation strategies. Several communities, including Los Angeles and Houston, have successfully implemented these tactics to improve their operational efficiency.
- Augmented rural response capabilities in Grant County, WA, testing deployable networks, drone video surveillance and blue-force tracking, which were successfully used for search and rescue.
The Internet of Things is here—only the responders, but also help incident commanders make decisions that save lives. Enhanced Personal Protective Equipment: First responders operate in hazardous environments and are often exposed to unanticipated threats, such as extreme temperatures, sharp objects, toxic chemicals, bodily fluids, fire or HAZMAT conditions. Through advanced textile research, NGFR’s enhanced duty uniform protects responders from these hazards.

More than any other piece of technology, responders rely on their communications systems to accomplish their mission and stay safe. No matter the emergency, ensuring reliable and resilient voice, video and data communications is a top priority. NGFR’s Connected portfolio targets: interoperable communications systems that can reliably exchange messages; deployable networks to give connectivity anywhere, anytime and in any condition; and universal data and interface standards for public safety to make information sharing easy and secure. Our goal is an open plug-and-play system, so responders can build their own Next Generation First Responder system with industry partners.

The Internet of Things is here—how can we take sensors, video and endless data and turn it into actionable information that helps first responders make better decisions? By integrating wearable sensors and remote monitoring, and then analyzing the data they provide, NGFR’s Fully Aware portfolio can help convey the right information to responders at the right time. Time-sensitive wearables and sensors can provide critical context even before responders arrive on scene, allowing them to jump into the response already knowing what to do. Every minute saved could mean a life saved, and by enabling better informed incident response, NGFR helps increase responder safety and mission effectiveness.

Technology is rapidly developing and the commercial sector is taking government or public safety technologies into game-changing capabilities for responders. NGFR worked with 26 startups through two cycles of the DHS EMERGE program, which uses business accelerators to speed up the delivery of the latest innovative wearable technologies to responders.

NGFR’s Visioning portfolio explores the current and future landscape of technologies that could be applicable to public safety missions, and looks for ways to plug them into NGFR via common data standards and interfaces. Using NGFR’s modular and scalable architecture means that new technologies can be integrated into responder technologies as they are invented and adopted by the community. NGFR works with start-ups from across the country to test out this model, and helps connect them to first responder partners for field testing and marketing.

NGFR’s Assistant for Understanding Data through Reasoning, also risk overwhelming or distracting first responders with information overload. NGFR’s Extraction and Synthesis (AUDREY) is an artificial general intelligence tool to help sift through the data and extract the key insights responders need. AUDREY performs data mining, analysis and reporting, and manages Internet of Things data, with three current pilot programs.

Emerging technologies are more functioning than cellular networks, without bandwidth constraints or commercial cellular costs, and has been successfully deployed to assist with video and information sharing during Super Bowl LI and Hurricane Harvey relief efforts.

The National Urban Security Technology Laboratory (NUSTL), headquartered in Alexandria, Virginia, is a joint partnership between the Federal Bureau of Investigation (FBI) and Department of Homeland Security (DHS) that is targeted to accelerate innovation in advanced technology and cultivate a vibrant technology ecosystem that includes public, academic, private and international entities. NUSTL’s mission is to (1) develop and test advanced technologies and solutions to address homeland security challenges; (2) catalyze the creation of a vibrant advanced technology ecosystem based in the Washington, D.C. area; (3) develop an advanced technology community in the Washington, D.C. area; (4) provide technical assistance and training to Federal, state, territorial, and local law enforcement agencies; and (5) facilitate collaboration among Federal, state, territorial, and local law enforcement agencies.

EMERGE: Startups have the innovation and agility to adapt disruptive technologies into government or public safety capabilities for responders. NGFR worked with 26 startups through two cycles of the DHS EMERGE program, which uses business accelerators to speed up the delivery of the latest innovative wearable technologies to responders.

Smart Cities Integration: Smart responders will work hand-in-hand with Smart Cities to develop apps—enabling greater situational awareness and operational efficiencies, while keeping responders and those they serve safer. NGFR is collaborating with industry partners to integrate Internet of Things technologies into commercial buildings to better detect hazardous conditions and improve search and rescue capabilities during incidents.

Communications Hub: An intelligent communications interface that securely and efficiently routes incoming and outgoing voice, video and data from radio, cellular and on-body sensors—to the destination using the best available communications pipeline. The NGFR Comms Hub streamlines connectivity and leaves responders free to focus on the mission.

Datacasting: Secure, one-to-many broadcasting for voice, video and data uses available public television spectrum rather than broadband. NGFR’s Datacasting provides more functionality than cellular networks, without bandwidth constraints or commercial cellular costs, and has been successfully deployed to assist with video and information sharing during Super Bowl LI and Hurricane Harvey relief efforts.

Physiological Monitoring: First responders may experience significant physiological stress during emergency response. Miniaturized, wearable sensors on responders provide incident command with alerts about an individual’s health status and specific hazards at the incident scene—allowing them to extract at-risk responders before they get injured. NGFR is testing a number of different physiological monitoring solutions.

Fuller Aware—Making Informed Decisions that Save Lives

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