

DHS Science and Technology Directorate Next Generation First Responder Internet of Things Pilot Phase I

First responders need to access the right data at the right time to save lives

Accessing and integrating information from various sources is critical for first responders' situational awareness during emergencies. The variety of data sources, including cell phones, mobile devices, cameras and deployed sensors, grows daily, but their value depends on the ability of users to detect their existence, know their state, locations, descriptions, software interfaces and access rules, and integrate the information they make available.

All this is possible using standard data models and encodings implemented with Internet and Web technologies.

DHS S&T launched its IoT pilot in 2015

The Department of Homeland Security Science and Technology Directorate (S&T) launched the Incident Management Information Sharing (IMIS) pilot to harness the capabilities of Internet of Things (IoT) to improve first responders' situational awareness during emergencies.



The IoT is the rapidly expanding network of objects embedded with sensors able to gather, communicate and exchange data with other devices.

S&T is working with the Integrated Justice Information Systems (IJIS) Institute and the [Open Geospatial Consortium](#) (OGC) to investigate, develop and test candidate architectures, components, and relevant standards using lightweight sensors; and to develop new or enhanced open standards or profiles for interfacing with these sensors.

This partnership has enabled S&T to assemble a working group of nine organizations from around the world, including Botts Innovative Research (Alabama), Com-

pusult (Canada), Envia (United Kingdom), GEO Huntsville (Alabama), Noblis (Virginia), Northrup Grumman (Virginia), SensorUp (Canada), the University of Melbourne (Australia) and 54 North (Germany).



Incident response life cycle and sample chronology: It is critical for first responders to have new types of low-cost wireless sensors that can quickly make a wide range of observations of an incident, its environment and its effects on people, including the responders.

Evolving networking technology enables sensors to connect automatically as soon as they are deployed and satisfy responders' need for updated observations, analyses, alerts and predictions from emergency response information systems and mobile devices. But to take advantage of these sensors, responders need standardized technology that makes sensors easily and immediately identifiable, accessible, usable, and useful across all teams and information management platforms involved in an incident response.

The IoT pilot project is designed to explore technologies and standards for integrating and exchanging data from a variety of sensor types, including physiological monitors, vehicle geospatial position trackers, mobile video cameras, laser rangefinders, and others. The project aims to develop, test and demonstrate the use of these technologies in a real-world scenario created in collaboration with first responders themselves. A scenario and several use cases have been developed to simulate an incident where fire, law enforcement, and emergency medical units would deploy, discover and integrate diverse sensors and platforms to gain situational awareness. The IMIS IoT pilot project is expected to produce initial specifications, profiles, best practices and demonstration designs for connecting sensors and response information systems into an IoT network that is based upon open standards.