

## AUTONOMOUS PLATFORMS FOR SEARCH AND RESCUE

Emergencies can happen anywhere, which is why public safety personnel are trained for search and rescue operations in a variety of environments. Some of the environments are difficult, and conditions can endanger responders and those they aim to rescue. For this reason, one of the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) Smart City IoT Innovation (SCITI - pronounced 'CITY') Labs initiative's focus areas is autonomous platforms (AxPs) for search and rescue operations. The other two focuses include investigating building sensor suites and an on-body communications hub.

The AxPs capability area is led by the Center for Innovative Technology and is currently working with three solution providers to identify prototype capabilities that can be tested in operational environments. Prototypes include sensor packages for AxPs, Wi-Fi finder sensors for smartphones, thermal sensors, sonar navigation for dark environments, and imagery capabilities that can assist in efforts to identify where people may be and hazards within the environment to expedite rescue missions within tunnels or collapsed or damaged structures.

## TESTING AXPS CAPABILITIES & BUSINESS APPROACHES

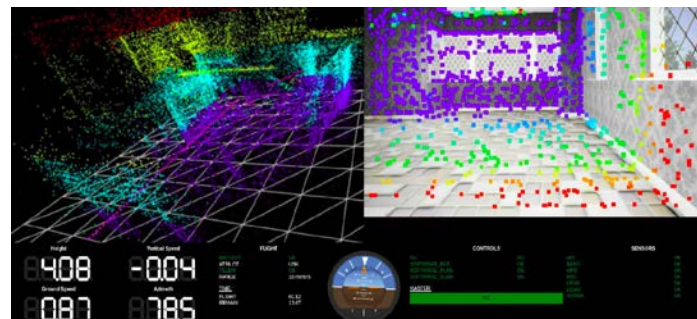
After a highly competitive selection process and design demonstrations in Phase I, three technology developers were selected by the SCITI Labs program to advance initial prototypes for indoor AxPs in Phase II. In fall of 2019, these technologies will be tested in collaboration with DHS and public safety organizations and private sector partners who will be critical to the adoption of these capabilities. The companies will also be evaluated on their business approaches for transitioning these technologies into daily use by operators. Testing will include a building clearance exercise and a 3D mapping exercise.

## OVERVIEW OF AXPS TECHNOLOGIES

*Airgility* is developing multi-mission vehicles. Whether delivering medical supplies, conducting search and rescue operations, or protecting our borders, Airgility is developing a hybrid AxPs that offer broad operational impact and logistics.



*Third Insight's* software converts off-the-shelf AxPs into artificially intelligent (AI), autonomous vehicles. Their AxPs can autonomously explore dangerous environments to find signs of life or to search out and track targets of interest. Video, 3D mapping, and sensor fusion are used to navigate indoors and in environments where GPS is intermittent or unavailable.



*One Engineering's* HALO allows for AI/neural network-based 3D imaging, navigation, and machine reasoning in a GPS denied and confined environment. The system consists of a light weight, flexible body that is fully shielded for indoor use. It is ruggedized and waterproof.

