SBIR Topic Number: H-SB013.2-008

TITLE: Pre-Shot Sniper Detection in Urban Environments

TECHNOLOGY AREAS: Wide Area Surveillance, Sensors, Gunshot detection

OBJECTIVE: To develop a manufacturable prototype that can detect a sniper before the weapon is fired.

DESCRIPTION: DHS is seeking an advanced product that can reliably detect and locate, in all weather conditions that a sniper would operate in, a sniper amongst the clutter of an urban environment before they fire their weapon. Law enforcement establishes security perimeters and controlling items entering the space, but they are also concerned about threats from outside the security perimeters. These threats include snipers. "Pre-shot" detection allows security forces to better dissuade/prevent an adversary from getting the shot off in the first place.

Several factors challenge today's detection technologies. Three factors DHS would like to address with this SBIR topic include, but are not limited to, the following three challenges. First, law enforcement needs the ability to locate a sniper amongst objects and people surrounding them at all times of the day and in all weather conditions. Objects commonly found in an urban environment such as traffic lights, signage, vehicles and building features can be distracting to the detection system and create clutter. People also carry objects and devices that create clutter. Second, a sniper must be detected from a different location than the protection area. Detectors need to protect several high value assets in a wide area such as a large event or a large security zone. Sensors can't always be located next to the high value asset. Finally, the technology must be portable. The need to detect snipers moves from one location to another. Law enforcement needs to set up the technology and make it operational within hours of events and activities, and then the technology needs to be dismantled and moved somewhere else for another event.

The proposed solution must be able to detect and locate a sniper amidst the clutter of an urban environment and in all weather conditions sniper behavior, actions, or weapons before a weapon is fired; 200-1000 yd clear condition range is an example. The proposed solution must be able to detect and locate a weapon trained on a target from outside the weapon's line-of-fire (off-axis); 30 ft away is an example. Wide area coverage is highly desirable; 500 ft diameter security zone is an example. The proposed technology must be sized to be moved and set up by one person and moved with a "two man lift" limit of 75 lb for heavier components.

PHASE I: The Phase I deliverable is a report of the technology proposed, scientific evidence that the technology will work under the conditions discussed above, that is, it will show the ability to detect and locate a sniper in background clutter, in an urban environment, from outside the line-of-fire, in all light and weather conditions. Technology limitations must also be stated in the report.

PHASE II: The Phase II deliverable is a working prototype of the proposed technology that responds to the conditions stated above in Phase I. The prototype should be designed with manufacturing and total cost of ownership in mind. It is not expected in Phase II that the

prototype be production ready, but it should be constructed of material and methods that will facilitate the Phase III activities.

PHASE III: COMMERCIAL APPLICATIONS:
Phase III is the transition from the prototype to a production ready unit ready for use by DHS law enforcement. Law enforcement looks for snipers in all weather conditions, hot and cold, wet and dry. The production units must be designed to operate in conditions that one expects to experience a sniper. Law enforcement moves their operations as the need to protect an area moves. The production units must be designed to be movable and operated by one person.

REFERENCES:
Bourger, C. (2012). Sniper Detection. *Special Operations Technology.* SOTECH 2012 Volume: 10 Issue: 7 (September). http://www.special-operations-technology.com/sotech-home/433-sotech-2012-volume-10-issue-7-september/5911-sniper-detection.html

KEY WORDS: Pre shot, sniper, sniper detection, optical sniper, radar sniper