

# Polestar Technologies, Inc.



**TOTAL DHS SBIR INVESTMENT**  
\$1.1 million

**PHASE III REVENUE**  
\$5M in government contracts and  
commercial sales for its STARE product

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As the threat of concealed explosives increases, the need for novel detection and identification technologies has garnered increasing interest. To answer that call, Polestar Technologies developed the capability of chemical identification of explosives hidden by a person at a distance. Originally designed to assist U.S. troops in conflict zones, the Self-Tracking and Reconnaissance of Explosives (STARE) System detects small amounts of explosive materials concealed beneath clothing, hidden in backpacks or hand-carried baggage. STARE is portable and significantly enhances contemporary security portals. The system is capable of scanning unstructured crowds and automatically alerting threats in real-time when explosive materials are present. The system chemically identifies the explosive and transmits an alarm to the security post when a person carrying explosives is 50 feet away.

Realizing the potential to address its own needs, DHS took an interest in STARE and provided funding via the Small Business Innovation Research (SBIR) program, administered by the DHS Science and Technology Directorate (S&T) to fully automate the existing system for improved explosives detection and identification by security personnel. STARE AID (Automatic Identification Detection), which was the direct result of the SBIR project, included software and algorithms for the automatic detection of explosives while opening a variety of applications in both the government and commercial sectors. Polestar and DHS are currently exploring the use of STARE AID at building entry points.



“This is a very novel technology that doesn’t require an operator sitting by the instrument, but could, in the future be scaled up to meet other needs” says Dr. Ranganathan Shashidhar, Senior Vice President of Research and Technology at Polestar Technologies. “We’ve had talks with some major companies including those in the sports and entertainment industry, and several venture capitalists are helping us take this to the commercial sector.”

While STARE was originally intended for indoor use only, the company has created an outdoor version by replacing the camera with a point detection system. Other organizations have expressed an interest in the use the outdoor system for the stand-off detection of explosives hidden on a person. This system could also be used for scanning people at entry points in airports, sporting events, concerts, or any place where large crowds gather and might be a target for a terrorist. Polestar is also planning a hand-held version of the technology, which can detect metal and non-metal explosives.

Polestar also partnered with DHS through another SBIR project called Portable Imager for Stand-Off Detection of Homemade Explosives. The project aimed to produce images positively identifying the presence of explosives while having the ability to detect and identify different types of military explosives and homemade explosives.

The system processes persons entering a federal building from a stand-off distance at a data collection rate sufficient to image moving subjects. The system’s power and weight allows it to be portable so that it can be deployed at any required location inside or outside the building. Applicable locations include mass transit stations, national security event checkpoints, controlled- entry checkpoints at the entrance to buildings of national importance or sports and entertainment venues.

“The DHS SBIR program was a critical influx for us to take our product to the next level,” explains Dr. Shashidhar. “It opened up all sorts of applications since we automated the product under the DHS SBIR. We are now in talks with United States Special Operations Command, as well as the Army and the Navy.”

Polestar, a woman-owned company, has previously been awarded government contracts with the National Aeronautics and Space Administration and the National Institutes of Health, including projects that saw the development of CO<sub>2</sub>, O<sub>2</sub> and pH sensors that Polestar then modified for the commercial market. Polestar has also supported the Naval Surface Warfare Center by providing protection from chemical and biological contaminants hidden in a variety of packages, in addition to developing a portable soil analyzer to identify contaminants in the soil for the U.S. Department of Energy.