Binational Cooperative Pilot/Israel - U.S. Binational Industrial Research and Development Foundation

September 27, 2021
Fiscal Year 2021 Report to Congress

Homeland Security

Science and Technology Directorate

Foreword from the Senior Official Performing the Duties of the Under Secretary for Science and Technology

September 27, 2021

I am pleased to present the following report, "Binational Cooperative Pilot/Israel – U.S. Binational Industrial Research and Development Foundation," which has been prepared by the Department of Homeland Security (DHS) Science and Technology Directorate.

This document has been compiled pursuant to direction in the Joint Explanatory Statement accompanying the Fiscal Year 2021 DHS Appropriations Act (P.L. 116-260).

Pursuant to congressional requirements, this report is being provided to the following Members of Congress:

The Honorable Lucille Roybal-Allard
Chairwoman, House Appropriations Subcommittee on Homeland Security

The Honorable Chuck Fleischmann
Ranking Member, House Appropriations Subcommittee on Homeland Security

The Honorable Chris Murphy
Chair, Senate Appropriations Subcommittee on Homeland Security

The Honorable Shelley Moore Capito
Ranking Member, Senate Appropriations Subcommittee on Homeland Security

Inquiries relating to this report may be directed to me at (202) 254-8392.

Sincerely,

Kathryn Coulter Mitchell
Senior Official Performing the Duties of the Under
Secretary for the Science and Technology Directorate

Binational Cooperative Pilot/Israel-U.S. Binational Industrial Research and Development Foundation
Fiscal Year 2021 Report

Table of Contents

I.   Legislative Language

This document has been prepared pursuant to direction in the Joint Explanatory Statement accompanying the Fiscal Year (FY) 2021 Department of Homeland Security (DHS) Appropriations Act (P.L. 116-260).

The Joint Explanatory Statement states:

> The agreement supports …$2,000,000 to continue the Binational Cooperative Pilot program. S&T is directed to report to the Committees on the outcomes of grants awarded through this pilot not later than 180 days after the date of enactment of this Act.

II.   Background

The Israel-United States Binational Industrial Research and Development (BIRD) Foundation is a public international organization recognized by presidential Executive Order 12956 (March 13, 1995) as eligible to enjoy the privileges, exemptions, and immunities conferred by the International Organizations Immunities Act (22 U.S.C. 288). The purpose of the BIRD Foundation is to stimulate, promote, and support joint (nondefense) industrial research and development (R&D) of mutual benefit to Israel and the United States.

In 2016, the DHS Science and Technology Directorate (S&T) established a contractual mechanism with the Israel Ministry of Public Security (MOPS) under the 2009 *Agreement between the U.S. and Israel on Cooperation in Science and Technology for Homeland Security Matters* to fund a binational R&D pilot. Initially focused only on first responder technologies, in 2019 the pilot transitioned into the BIRD Homeland Security (BIRD HLS) program. BIRD HLS takes a more comprehensive approach to the S&T mission and, consistent with program guidance, "focus[es] on border security, maritime security, biometrics, cybersecurity, and video analytics among other topics."

The objective of the BIRD HLS program is to stimulate, promote, and support joint, homeland security-focused R&D of mutual benefit to the United States and Israel. Using a comprehensive two-step solicitation process, S&T seeks to develop technologies with significant commercial potential in the field of homeland security. The BIRD HLS program raises awareness of capability gaps within the global innovation ecosystem and helps to build relationships between industry and first responder organizations in Israel and the United States. This effort allows DHS to work with international partners to find innovative technology solutions for homeland security needs.

The BIRD HLS program uses an annual solicitation to identify and develop advanced technologies for the homeland security mission. BIRD HLS supports qualified projects that meet the following basic criteria:

- The two partners are an American company and an unrelated Israeli company.
- The companies agree to share risk, involvement in the project, and rewards.
- The proposed project offers significant innovation and high commercial potential.
- The companies' joint project proposal is reviewed by a group of experts and approved by S&T, MOPS, and BIRD's Board of Governors.
- The maximum conditional grant is $1 million per project, capped at 50 percent of the joint R&D budget proposed by grant awardees.
- The project duration is typically 1-2 years but may be as long as 3-4 years, if deemed necessary for reaching commercial readiness.

The program is funded by the United States (S&T) and Israel (MOPS) and is managed by the BIRD Foundation.

III. Binational Cooperative Overview

Under the BIRD Framework, three "BIRD First Responders" Calls for Proposals were issued between FY 2016 and FY 2018 in alignment with DHS first responder capability gaps, and three "BIRD HLS" Calls for Proposals were issued between FY 2019 and FY 2021 in alignment with broader DHS homeland security capability gaps. S&T and MOPS have contributed a combined total of $9.65 million over the first five solicitation cycles with contribution amounts for the sixth cycle still pending. To date, the 10 projects selected for funding total $8.92 million, with the remaining funds directed to exchange-rate differences and project administration. Government funding is leveraged by a 50-percent match from private-sector funding totaling at least $20 million. Funding information for each specific project is included in Section VI of this report.

Since 2016, S&T and MOPS have worked together to fund technology collaborations between U.S. and Israeli partners that address the homeland security needs of both countries. The BIRD HLS program has been successful in raising awareness of homeland security capability gaps within the global innovation ecosystem and in building relationships between industry and homeland security organizations, both in Israel and the United States.

S&T specifically benefits from involvement in this program by encouraging the development and commercialization of U.S. technologies that otherwise might not be developed outside the awards made via the BIRD HLS program. This program allows S&T to work with Israeli partners to find innovative technology solutions for homeland security needs.

IV. Explanation of Current Activity

S&T and MOPS continue to coordinate on BIRD HLS, working to establish an updated 2021 project agreement between the two countries that centers on the homeland security enterprise. This project agreement improves the parties' capabilities—through joint or coordinated funding, cooperative review, and management of innovative research, development, and test and evaluation projects—to share information and to conduct other activities that may be set out in technical agreements pursuant to the project agreement.

In addition to the updated agreement with MOPS, in February 2021, S&T also awarded an Other Transaction Agreement (OTA) directly with the BIRD Foundation to formalize and build upon the Foundation's ongoing BIRD HLS program support. The OTA with BIRD streamlines S&T access to the BIRD Foundation and reduces the time required for funding to reach the Foundation, which previously was accomplished via S&T's agreement with MOPS. The BIRD Foundation will continue to provide support throughout the entire BIRD HLS solicitation lifecycle to include managing the calls for executive summaries and proposals, electronic executive summary and proposal submissions, evaluations, final proposal selections, post-award tracking, and all related reporting requirements.

The BIRD Foundation, S&T, and MOPS worked closely together to plan for the 2021 cycle. The list of homeland security-based problem sets and capability gaps, jointly agreed upon between S&T and MOPS, includes:

- Law enforcement-supporting technologies to combat cybercrime;
- Technologies and methods to secure critical infrastructure and public facilities ("soft targets");
- Technologies focused on safe and secure cities;
- Border protection, including maritime security (e.g., biometrics, screening systems, robotics);
- Unmanned aerial systems (UAS); and
- Advanced first responder technologies (such as command and control (C2), video analytics, communications, and personal protective equipment).

2021 BIRD HLS Action Timeline

January 25, 2021	2021 BIRD HLS Call for Proposals released
April 27, 2021	Deadline for executive summary submissions
June 15, 2021	Deadline for full proposal submissions
August 2021	Final award decisions

S&T signed the new OTA with the BIRD Foundation in February 2021. S&T and MOPS currently are updating the technical annex for the 2021 cycle. Final award decisions will be made at the annual BIRD Board of Governor's meeting in August 2021.

V. FY 2021 Next Steps

Following the receipt of proposals associated with the 2021 BIRD HLS Call for Proposals, S&T will work diligently to evaluate the proposals. At the annual BIRD Board of Governor's meeting, to be held in August, S&T and MOPS leadership will finalize selections of an anticipated one to three projects to complete the BIRD HLS 2021 cycle.

To continue to maintain visibility into the awarded projects, S&T will communicate regularly with, and conduct virtual meetings and/or site visits to, the U.S.-based companies to supplement the BIRD Foundation's comprehensive reviews. S&T will receive status reports to include research progress and financial expenditures. Twice per year, the BIRD Foundation also will submit technical, financial, and commercialization/utilization reports to S&T and MOPS on the activities funded by BIRD HLS.

VI. BIRD First Responder Pilot Funding 2016-2020

Technical Topic	Locating and Monitoring
Project Title	**Indoor Positioning, Locating, and Reporting System**
Project Description	In emergency response situations, first responders need positioning and communication solutions to assist evacuation and rescue operations. Successful emergency response to those in need is dependent upon a responder's ability to receive accurate location information quickly and to communicate with the response team. This project sought to develop a smartphone platform that can provide three-dimensional (3D) location services, physiological status, and local hazard indicators, and that can allow emergency response personnel to communicate with one another.
Project Specifics	The outcome of this joint project is a smartphone platform technology, providing indoor 3D location, physiological status, voice, local hazard indicators, and interresponder communications. The U.S. company provides the indoor navigation; the Israeli company provides the other elements.
U.S. Company	**OptoKnowledge, (Torrance, California):** Developed vision-based navigation and mapping technologies for environments where global positioning system (GPS) is not available, applying these to indoor navigation and mapping for first responder situational awareness.
Israeli Company	**SayVU:** Provides real-time reporting and event-management systems through accessible life-saving technologies.
Commercialization Potential	Contender at Urban Navigation Technologies contest, http://cttsc-x.com/the-contest; discussions with Motorola Innovation; and demonstration to corporate chief technology officers.
Award Amount	$950,000
Project Start Date	December 1, 2016
Project Duration	30 months
Project Status	Project is complete; however, the joint capability requires further development to reach full maturity. A prototype Android application including developed navigation components has been developed using the phone sensors.
Commercialization/ Transition Progress	The Israeli partner continues selling its solution to existing and new customers, including elements developed in the project. The U.S. partner reports working to apply its technology to an autonomous utility vehicle project including using the navigation algorithms developed under the project.

Technical Topic	Communications/Search and Rescue (SAR)
Project Title	**Unmanned Search and Rescue Systems**
Project Description	In the event of an emergency or disaster where first responders are called to assist in rescue efforts, unmanned vehicles can play an important part in assessing the disaster impact and threat landscape of an incident. Unmanned ground vehicles (UGV) enable remote teams to monitor hazardous environments and active threats in real time and to empower first responders to assess and prepare for recovery and threat mitigation efforts. This project sought to develop a UGV that allows emergency response teams to identify hazards and to monitor active threats via remote video and audio streaming.
Project Specifics	The outcome of the joint project was the development of a UGV equipped with a variety of sensors integrated with communication systems that create network streaming of video and audio. More specifically, the project developed a handheld controller with a video screen to enhance control capabilities of the UGVs. This resulted in the ability to enable (1) fully integrated operation of UGV with command and control (C2) and first responder teams and (2) connection of the local area network via long-distance broadband wireless links to an emergency operations center to enable UGV real-time video streaming.
U.S. Company	**Mantaro Networks, (Germantown, Maryland):** Develops and provides telepresence robotic systems for commercial businesses, healthcare, construction, and law enforcement. In addition, provides custom engineering and design services for Internet of Things and custom robotic products, applying its expertise in communications and radiofrequency engineering.
Israeli Company	**Beeper Communication:** Provider of emergency communication and critical messaging services for military and homeland security organizations, combining satellite and ground radiofrequency transmission to provide comprehensive and reliable coverage.
Commercialization Potential	Companies attended the Association of the United States Army tradeshow in Washington, D.C. (military applications); companies reported overall that they found much interest among potential users for demonstrations and provided input to define system requirements.
Award Amount	$950,000
Project Start Date	July 1, 2017
Project Duration	18 months + 3-month extension
Project Status	Project completed.
Commercialization/ Transition Progress	Mantaro Networks is now able to provide an improved communication capability to other applications, using Beeper's technology. Launch of a new product including this capability

	is expected soon. A new company, Beeper Broadband Technology Ltd., was established and the technology developed by Beeper now is being marketed under the brand BBT.live for seamless network connectivity. A customer recently purchased the first BBT.live product, which includes the low-latency technology developed in the project.

Technical Topic	**Public Safety Off-Network Broadband Communication**
Project Title	**Public Safety Off-Network Broadband Communications using Multi-Hop Long-Term Evolution (LTE) Direct Proximity Services (ProSE) Technology**
Project Description	It is imperative that first responders can communicate with one another quickly and effectively in the event of an emergency. With the tremendous changes in emergency communications using smartphones and similar devices, public safety organizations are also responsible for addressing the network service challenges to communicate through voice, video, and data over extended ranges. This project sought to enhance smartphone communication capabilities for public safety officials through the development of an extended-range, off-network broadband communication solution.
Project Specifics	The purpose of this joint project was to develop a public safety off-network broadband communication solution, based upon the LTE ProSe standard for device-to-device connectivity, with a unique multihop technology for extended-range connectivity. This technology will enable first responders to continue getting broadband services (voice, video, and data) from their colleagues, within a one-kilometer radius, by using their existing smartphones.
U.S. Company	**M87, (Bellevue, Washington):** Commercializing a groundbreaking, patent-pending software technology that makes wireless networks higher performing, more efficient, and easier to use.
Israeli Company	**Elbit Systems Land and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR), Elbit Systems Ltd:** Develops and implements advanced C4ISR systems and integrated intelligence and communication systems.
Commercialization Potential	The companies focused on the first responders market and offered new tools and capabilities available nationwide, anytime, even without cellular LTE coverage (off-network).
Award Amount	$900,000
Project Start Date	November 1, 2017
Duration	18 months (Terminated at 12 months)
Project Status	Project was terminated early.

Commercialization/ Transition Progress	The project was terminated early because M87 was acquired by another company and the priorities of the company changed. The companies were able to demonstrate message transfer in 2 hops (using 3 devices) at a distance of 330 meters in multiple floors in a fully off-line setting.

Technical Topic	**Autonomous Drone-Based SAR**
Project Title	**Autonomous Drone-Based Search and Rescue**
Project Description	After a disaster or incident, time is a precious commodity in rescue and recovery efforts. UAS can be an effective life-saving tool with the ability to scan a scene remotely for signs of life to identify and locate casualties and fatalities. This project seeks to develop UAS software and hardware that will enhance the detection and evaluation of human lives in an SAR scenario.
Project Specifics	The outcome of this joint project is a system to assist and enhance the use of UAS and autonomy in SAR missions. The product is an onboard software and hardware kit designed to enhance the capabilities of a multirotor UAS for victim detection, health evaluation, and communication.
U.S. Company	**Sinclair College, (Dayton, Ohio):** Sinclair's National UAS Training and Certification Center represents one of the most comprehensive and pioneering facilities for the advancement of UAS training and applied research support.
Israeli Company	**Simlat:** A leading provider of innovative, next-generation training solutions for UAS. These training solution systems enable training for any platform, payload, and mission.
Award Amount	$950,000
Project Start Date	May 1, 2017
Project Duration	44 months
Project Status	Project completed December 2020.
Commercialization/ Transition Progress	Developed payload (branded "Specto Lite"), which can be lowered from a drone by cables, including two-way audio communication and video, and which was demonstrated in flight tests in the United States and in Israel. Presentations to the Israel Fire and Rescue Services; project-related products and services being offered by Sinclair and Simlat to open solicitations in Ohio.

Technical Topic	**Drone-based/Cellular SAR**
Project Title	**Autonomous Drone-Based Search and Rescue**
Project Description	After a disaster or incident occurs, the ability to locate persons trapped beneath rubble or other structures can be both arduous and inefficient if emergency responders don't know for whom to look or where they are located. However, with the prevalence of smartphones in everyday life, emergency responders can utilize

	aerial technology to survey a disaster area and detect cellular signals to locate trapped victims. This project seeks to develop an advanced drone technology that can locate victims accurately using signals from cellular phones.
Project Specifics	The outcome of this joint project is the "Advanced Res-Q-Cell," an advanced drone-mounted SAR system for locating victims under ruins and in disaster areas by the accurate location of their cellular phones.
U.S. Company	**TLC Solutions, (St. Augustine, Florida):** Provides secure wireless network solutions designed specifically for portability, ease-of-use, and tactical communications applications across a variety of standards.
Israeli Company	**Elta Systems:** A group and subsidiary of Israel Aerospace Industries, Elta Systems is an Israeli defense electronics company and is in the field of intelligence, surveillance, early warning and control, homeland security, self-protection and self-defense, and fire control applications.
Commercialization Potential	The SAR equipment market is projected to grow from an estimated $113.62 billion in 2017 to $125.6 billion by 2022, at a compound annual growth rate of $2.03 billion. The factors expected to drive the market in the coming years are increased focus of countries on the safety of their citizens and rising terrorism and insurgency. The companies view the market for the Res-Q-Cell System as worldwide and include all the national and international agencies. A list of agencies may be found in the "Search and Rescue Contacts" website https://sarcontacts.info/. The target price for an integrated product (after full commercialization and excluding the installation platform) is estimated to be about $400,000.
Award Amount	$950,000
Project Start Date	October 1, 2018
Project Duration	24 months + 6-month extension
Project Status	Project completed March 31, 2021. Multiple flight tests with various flight scenarios were conducted using 2 drones over a training area that contained "human-made" wreckages and concrete building ruins. The latest software version was verified and tested. The companies plan to start advertising and meeting with relevant agencies and users in the coming months following Coronavirus Disease 2019 (COVID-19) pandemic delays.

Technical Topic	**First Responders Communications**
Project Title	**First Responders Emergency Radio Repeater System (FRRS) for Existing High-Rise Buildings**

Project Description	Geographical and structural obstacles can obstruct the communication device signals of emergency response teams when conducting rescue efforts in high-rise buildings, especially in dense urban areas. Infrastructure obstacles, including reinforced concrete and structural steel, hinder radio signal strength and communication. First responders rely on portable radios to communicate with C2 centers, to account for personnel, and to communicate risks to other first responders while performing crucial rescue operations. This project seeks to enhance radio communication for first responders by developing a radio repeater that can receive and retransmit radio signals at a higher power, so that it can cover a greater distance.
Project Specifics	The outcome of this joint project is the development of an FRRS, which is a combination of a radio receiver and a radio transmitter that enables signals to cover longer distances for high-rise buildings.
U.S. Company	**Allstate Sprinkler Corp. (Bronx, New York):** A fire protection contractor servicing the New York City Metropolitan area.
Israeli Company	**HiRiseTech:** Provides developers, building owners, general contractors, construction managers, and low voltage contractors with turnkey emergency responder radio coverage system solutions, specifically configured for each structure. Designs, installs, and maintains each system while meeting the most stringent building code requirements regarding public safety radio communications.
Award Amount	$950,000
Project Start Date	September 1, 2018
Project Duration	24 months + 10-month extension
Project Status	The companies received an additional 4-month extension (for a total of 10 months) to complete the project given the COVID-19 pandemic and the travel restrictions. The companies have selected the high-rise building in New York City to do the pilot and have received all necessary permits. The development of the system's building blocks required for the pilot has been completed and installation and testing started in March 2021. The pilot was finalized at the end of June 2021.

Technical Topic	**Unmanned Aerial Systems**
Project Title	**Multimission, Multitype HLS Drone Command and Control Capability**
Project Description	The main goal of this project is to develop a C2 center for multimission, multitype drones designated for homeland security complex operations. The solution is based on an open-architecture system with a vehicle-agnostic approach, enabling the simultaneous operation of several drones designated for

	several missions (in a specific location), and the ability to perform different types missions by controlling an overall aerial view (similar to aerial control agencies), allowing observance and control of several drones and allocation of a relevant mission to each one.
Project Specifics	The focus of this project is to allow first responders and other security agencies faster and more effective emergency management. Using drones in complex operations will reduce on-the-job risks by allowing a safer and much faster execution of multimissions than with traditional methods, and a C2 capability will help in saving lives.
U.S. Company	**Easy Aerial (Brooklyn, New York):** Focused on developing, producing, and deploying fully autonomous drone-based solutions for perimeter security and incident management.
Israeli Company	**Blue White Robotics:** Specializes in autonomous and unmanned technologies, from research and testing to full operational capabilities in the air, land, and sea.
Commercialization Potential	The commercial prospect for this project is significant, because the companies plan to develop a complementary system to their current solution. They identified the need for a multimission, multitype drone C2 capability among their current clients, mainly the U.S. Air Force and DHS. The UAS drones' C2 platform will increase their portfolio and competitiveness, will enable use of the drones in complex scenarios, and will provide more benefit from their existing and additional drones.
Award Amount	$900,000
Project Start Date	February 1, 2020
Project Duration	18 months + 6-month extension
Project Status	First demo is planned for June 2021. Users' demos are planned with U.S. Customs and Border Protection, BNSF Railway and with the Israel Fire and Rescue Authority. Project is ongoing as planned, with an extension granted due to delays associated with COVID-19.

Technical Topic	**Advanced First Responder Technologies**
Project Title	**A Fully Turnkey Artificial Intelligence (AI)-Based Analytics Video Security Solution for Remote Sites**
Project Description	Video camera security has progressed over the last few decades from analog systems to Internet Protocol-based systems, which has enabled more sophisticated digital video analytic capabilities. This project is targeting the development of an AI solution for remote sites, providing cost-effective, high reliability, high accuracy, and highly scalable True Cloud full video detection, deterrence, and alerting solution-as-a-service (SaaS) security.
Project Specifics	The expected outcome is a system that can provide central command video monitoring stations (policing forces, security

	services, etc.) with a highly reliable, centrally managed, bandwidth-conserving, low information technology overhead, military-grade cybersecure cloud SaaS with AI-based video analytics running at remote sites with minimum electrical, computing, and connectivity resources.
U.S. Company	**LiveView Technologies (Orem, Utah):** An enterprise cloud software vendor providing a platform-as-a-service cloud solution for remote video and analytic data gathering, processing, and delivery
Israeli Company	**Cawamo:** Developed an innovative AI-based, easy to use, and cost-effective video analytic solution that turns any security camera into a smart, accurate, automated alert system.
Commercialization Potential	Providing video security at remote sites is very difficult because of a lack of telecommunications and electricity utility infrastructure and the rugged nature of the environment. The combined focus of these companies on technology development and market know-how not only will result in a solution that cost-effectively provides high reliability and accuracy in video monitoring, but also can commercialize to remote site surveillance.
Award Amount	$900,000
Project Start Date	February 1, 2020
Project Duration	18 months
Project Status	Project is ongoing as planned. Cawamo devised algorithm packages to maximize the power of the Edge analytics engines for detection. LiveView Technologies integrated analytics hardware configuration and tracking it to their existing management portal. An end-to-end proof-of-concept LiveUnit has been developed and deployed in the field for testing, training, and subsequent development.

Technical Topic	**Advanced First Responder Technologies**
Project Title	**FLARE (Firefighter Location and Rescue Equipment) – IL-US Enclosure Ruggedization and Beta Test with Israel Fire and Rescue Authority**
Project Description	FLARE serves as a firefighter's "black box," providing real-time indoor location tracking by utilizing state-of-the-art sensors, communication technologies, and software package. FLARE creates a self-contained mesh network that monitors, records, and reports a firefighter's movements, location, and surrounding temperature in real time.
Project Specifics	The FLARE device is unique in that the enclosure needs to withstand high temperatures and the device seals need to be just as temperature inert as the outer shell polymer. To provide the best protection, the device will be a fully sealed unit that charges

	wirelessly and is rated at a minimum of Ingress Protection Code 68. Currently, nothing is available on the market that provides first responders with the level of accuracy that FLARE can provide. Innovating the enclosure to resist as much thermal penetration as possible will ensure that no first responders are lost.
U.S. Company	**3AM Innovations, (New York):** Specializes in software design, hardware design, product delivery, and product maintenance. Developed a patented system that monitors and alerts key personnel to potential and immediate firefighter safety problems.
Israeli Company	**S.H. Goren Management and Innovation Ltd.:** Specializing in providing full solutions using advanced technologies in the fields of safety and firefighting.
Commercialization Potential	The U.S. company is developing a much-needed solution for firefighters, which can provide location information, while surviving high-temperature environments. The contribution of the Israeli company in the R&D phase is relatively modest, but there is a great fit for the planned pilot phase and possible implementation in Israel. The companies also have a letter of interest with the Israel Fire and Rescue Authority to perform a beta test of the system and. upon a successful test, will look to purchase 2,000 units.
Award Amount	$470,000
Project Start Date	August 1, 2020
Project Duration	12 months + 12-month extension
Project Status	Project ongoing with extension due to COVID-19-associated manufacturing delays, but the companies expect the project to proceed as originally proposed.

Technical Topic	**Weapons Detection**
Project Title	**Concealed Weapons and Threat Detection Solution for Public Safety Market**
Project Description	Liberty Defense Technologies (LDT) developed the HEXWAVE platform that generates images of people walking by, to enable effective detection of weapons (metallic and nonmetallic) and explosives. Levitection developed an early-warning threat detection platform that operates without disturbing the natural flow of people. In this project, LDT's HEXWAVE platform will be matched with Levitection's Q platform to supply early-warning detection by Q, additional detection/confirmation by HEXWAVE, and a fusion of both subsystems to detect while reducing false alarms.
Project Specifics	LDT's HEXWAVE platform operates across the ultra-wide-band (6–10.6ghz) portion of the electromagnetic spectrum to generate

	images of people walking by, with enough spatial resolution (15mm) to enable effective detection. Levitection's Q detects weapons within an area of up to 400 square meters in front of any entranceway, based on radio frequency in the 70-80ghz range, to instantaneously track up to 200 people in the scene.
U.S. Company	**Liberty Defense Technologies, (Peachtree Corners, Georgia):** Provides security solutions for concealed weapons detection in high-volume foot traffic areas. The company has an exclusive license from Massachusetts Institute of Technology, as well as a technology transfer agreement, for patents related to active 3D radar imaging technology.
Israeli Company	**Levitection Ltd.:** Focuses on the protection of airports, transportation hubs, and entertainment facilities, enabling people to pass quickly and naturally through security, while detecting weapons and explosives. Its patented technology "Q" is an early warning platform, developed to enable secure, undisturbed people flow.
Commercialization Potential	Several governments and private security organizations have identified the need for screening technologies that enable coverage (wide-open area detection), throughput (inspect dozens of people simultaneously), an AI-based solution (to provide accurate multi-angle, multi-view perspectives), and are cost-effective. LDT has relationships with security executives across the globe and plans to have direct sales in the U.S. & Canada. The company has agreements for beta testing in locations such as Greater Toronto Airports Authority, Port of Tampa Bay, Virginia Capital Police, Hindu Temple, and Rogers Centre Vancouver, among others. Levitection has established similar engagements in the Middle East and Europe.
Award Amount	$1,000,000
Project Start Date	Expected Start Date: May 2021
Project Duration	18 months
Project Status	Contracting in process

Appendix: Abbreviations

Abbreviation	Definition
3D	Three-Dimensional
AI	Artificial Intelligence
BIRD	Binational Industrial Research and Development
BIRD HLS	BIRD Homeland Security
C2	Command and Control
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
COVID-19	Coronavirus Disease 2019
DHS	Department of Homeland Security
FLARE	Firefighter Location and Rescue Equipment
FRRS	First Responders Emergency Radio Repeater System
FY	Fiscal Year
LDT	Liberty Defense Technologies
LTE	Long-Term Evolution
MOPS	Ministry of Public Security
OTA	Other Transaction Agreement
ProSe	Proximity Services
R&D	Research and Development
S&T	Science and Technology Directorate
SAR	Search and Rescue
SaaS	Solution-as-a-Service
UAS	Unmanned Aerial System
UGV	Unmanned Ground Vehicle