



**ARMY TECHNOLOGY
TRANSFER PROGRAM**

2023 Annual Report

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Research and technology collaborations in support of Army modernization

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Prepared by:
Office of the Deputy Assistant Secretary of the Army (Research and Technology)
Arlington, Virginia
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Executive Summary

The Army Science and Technology (S&T) enterprise identifies, develops, and demonstrates technology options that inform and enable effective and affordable capabilities for the Warfighter. Technology Transfer (T2) is essential to the technology delivery mission of Army laboratories. Army T2 is a trusted innovation pathway augmenting the unique capabilities of Army laboratories through effective research and technology partnering focused on mission effectiveness, soldier capability enhancements, and the collateral benefits to industry, academia, and the United States taxpayers.

The Army Technology Transfer Program (ATTP) supports the Army in achieving its mission by combining the Army's research, development, test, and evaluation (RDT&E) resources, capabilities, and expertise with those of our academic and industry partners in order to deliver technologies through various T2 partnering mechanisms. T2 partnerships are essential to ensuring that the Army is positioned for discovery and maturation of critical technologies and allow Army laboratories to leverage private research capital in the research, development, testing, and engineering of game-changing technologies. These partnerships add expertise, augment capabilities, enhance facilities, and provide other resources for the exploration, development, and potential commercialization of civilian or dual-use technologies. This is accomplished through T2 agreements such as Cooperative Research and Development Agreements (CRADAs) and Patent License Agreements (PLAs), which leverage an Army or joint-owned invention and commercial interest to make a manufactured commercial product that can be used or adapted for military purposes.

Twenty-one Army laboratories and technical centers participate in the ATTP, typically executing more than 500 new CRADAs, and over 100 patents and PLAs, annually. In Fiscal Year (FY) 2023, Army T2 recorded 1,040 active CRADAs, 1,139 active patents and 130 active PLAs, and 85 new patent applications. Additionally, Army T2 had 260 active Education Partnership Agreements (EPAs), which allow Army laboratories to partner with educational institutions and academic researchers to leverage academic research methods to solve Army challenges. The impact and outcomes of Army T2 partnerships are highlighted in numerous success stories and notable awards.



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New Deputy Assistant Secretary of the Army for Research and Technology



Mr. Christopher Manning
*Deputy Assistant Secretary of
(Research and Technology)*

“The fundamental outcome of Army research and technology investments is the transition of technology innovations to the Warfighter. The Army Technology Transfer Program offers Army laboratories and prospective partners expedient and mutually beneficial research and technology agreements that enhance Army’s ability to discover, develop, demonstrate, manufacture, and transition technology innovations to the warfighter.”

— MR. CHRIS MANNING
DASA(R&T)

Mr. Christopher Manning was selected as the Deputy Assistant Secretary of the Army for Research and Technology DASA(R&T) and Army Chief Scientist in November 2023. He is responsible for policy and oversight of the Army’s Research and Technology program. In this position, Mr. Manning is charged with identifying, developing, and demonstrating technology options that inform and enable effective and affordable capabilities for the Soldier. His science and technology (S&T) portfolio covers basic research to demonstrating component, subsystem, manufacturing technology, and technology system prototypes. The S&T portfolio is executed by the Army’s research, development and engineering laboratories and centers; academia; and industrial and international partners.

During his career, Mr. Manning has served in a variety of leadership and technical roles within the acquisition and research and development communities, including assignments with the U.S. Army Combat Capabilities Development Command (DEVCOM) Headquarters, Communications Electronics Research, Development and Engineering Center; Program Executive Office Command, Control, Communications – Tactical; Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology); and Program Executive Office Intelligence, Electronic Warfare, and Sensors. Most recently, Mr. Manning served as the Deputy Director for Force Development, Deputy Chief of Staff, G-8.

With his experience in the research, development and engineering of experimental and state-of-the art capabilities for warfighter needs, Mr. Manning supports an ecosystem that further enriches Army research and development through partnerships with industry and academia, forged through the Army’s Technology Transfer Program.



DASA(RT)

Research and Technology Collaborations in Support of Army Modernization

Army laboratories and technical centers use technology transfer (T2) agreements for partnering with commercial, academic, or other private entities. These agreements include Cooperative Research and Development Agreements (CRADAs), licensing of Army patents, Commercial Test Agreements (CTAs) and Educational Partnership Agreements (EPAs), and other agreements. T2 collaborations enhance Army's research, development, test, and engineering capabilities by leveraging the private capital of the partner, including but not limited to, personnel, services, facilities, equipment, intellectual property, or resources. T2 is vital to the Army's mission of developing new technologies and promoting technology commercialization as the Army seeks to modernize and maintain its technological advantage. Public-Private collaborations offer an innovative approach to modernization.

The Army science and technology (S&T) enterprise is guided by and aligned to higher level Army, Department of Defense (DoD) and National strategies and priorities. The Army executes an investment strategy that delivers technology for force modernization. To support this effort, the Army is aligning its research centers and laboratories to priority modernization efforts and emphasizing the Critical Technology Areas detailed in the Under Secretary of Defense for Research and Engineering's Strategic Vision. The Army's six modernization priorities (i.e., Long Range Precision Fires; Next Generation Combat Vehicle; Future Vertical Lift; Network; Air and Missile Defense; and Soldier Lethality) will drive materiel development for the Multi-Domain Operations capable force. There are 14 critical technology areas vital to maintaining the United States' national security. These critical technology areas include: Biotechnology; Quantum Science, Future Generation Wireless Technology (FutureG); Advanced Materials; Trusted Artificial Intelligence (AI) and Autonomy; Integrated Network System-of-Systems; Microelectronics; Space Technology; Renewable Energy Generation and Storage; Advance Computing and Software; Human-Machine Interfaces; Directed Energy; Hypersonics; and Integrated Sensing and Cyber. Research and technology collaborations allow Army laboratories to leverage private research capital in these game-changing technologies.

Army T2 enables Army modernization by engaging private partners in research, development, testing, and engineering partnerships and collaborative activities, which adds expertise, augments capabilities, enhances facilities, and provides resources for the exploration of emerging technologies. Additionally, Army T2 agreements can leverage commercial interest in technologies developed in Army laboratories through Patent License Agreements (PLAs), which include business plans to mature the patented invention into a manufactured commercial product that can be used or adapted for military purposes.



Army T2 Enterprise



Honorable Douglas Bush,
*Assistant Secretary of the Army
(Acquisition, Logistics,
and Technology)*



Mr. Christopher Manning,
*Deputy Assistant Secretary of
(Research and Technology)*



Dr. Ellen Holthoff,
*Army Director for
Technology Transfer*

The Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA(ALT)) is the Office of Primary Responsibility for the Army Technology Transfer Program (ATTP) and is responsible for Department of the Army policy and guidance regarding all T2 activities. These responsibilities have been delegated to the Army Director for Technology Transfer (ADTT).

The ADTT resides in the office of the DASA(R&T) and serves as the Army agency representative in all matters concerning T2. The ADTT monitors the ATTP to ensure compliance with DoD T2 policy and law, provides policy guidance on T2, and presides over the Army Laboratory Quality Enhancement Program (A-LQEP) T2 subpanel. The A-LQEP T2 subpanel is chartered to improve the productivity, effectiveness, and impact of the ATTP. This subpanel enhances Army T2 through policy input and feedback, providing legal clarifications, resolving business questions, and sharing best practices to optimize the impacts of research and technology collaborations on Army modernization.

The laboratory commanders or directors have the responsibility and the authority to enter into CRADAs and to license, assign, or waive rights to intellectual property (IP) developed by the organization. Each Army T2-designated laboratory has an Office of Research and Technology Applications (ORTA). ORTAs participate in the A-LQEP T2 subpanel. ORTAs are the essential focal point for collaborations between federal laboratories and external partners. The ATTP includes 21 T2-designated laboratories and centers with unique capabilities and facilities located across 23 states.



T2-Designated Laboratories and Centers Available for Partnership

ARMY MEDICAL

U.S. Army Aeromedical Research Laboratory (USAARL)	Alabama
U.S. Army Research Institute of Environmental Medicine (USARIEM)	Massachusetts

U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER (ERDC)

Headquarters	Mississippi
Coastal and Hydraulics Laboratory (CHL)	Mississippi
CHL Field Research Facility	North Carolina
CHL Joint Airborne Lidar Bathymetry	Mississippi
Technical Center of Expertise Cold Regions Research and Engineering Laboratory (CRREL)	New Hampshire
CRREL Alaska Research Office	Alaska
Construction Engineering Research Laboratory (CERL)	Illinois
Environmental Laboratory (EL)	Mississippi
EL Lewisville Aquatic Ecosystem Research Facility	Texas
Geospatial Research Laboratory (GRL)	Virginia
Geotechnical and Structures Laboratory (GSL)	Mississippi
GSL Treat Island Natural Weather Station	Maine
Information Technology Laboratory (ITL)	Mississippi

U.S. ARMY SPACE AND MISSILE DEVELOPMENT COMMAND TECHNICAL CENTER (SMDTC)

Alabama

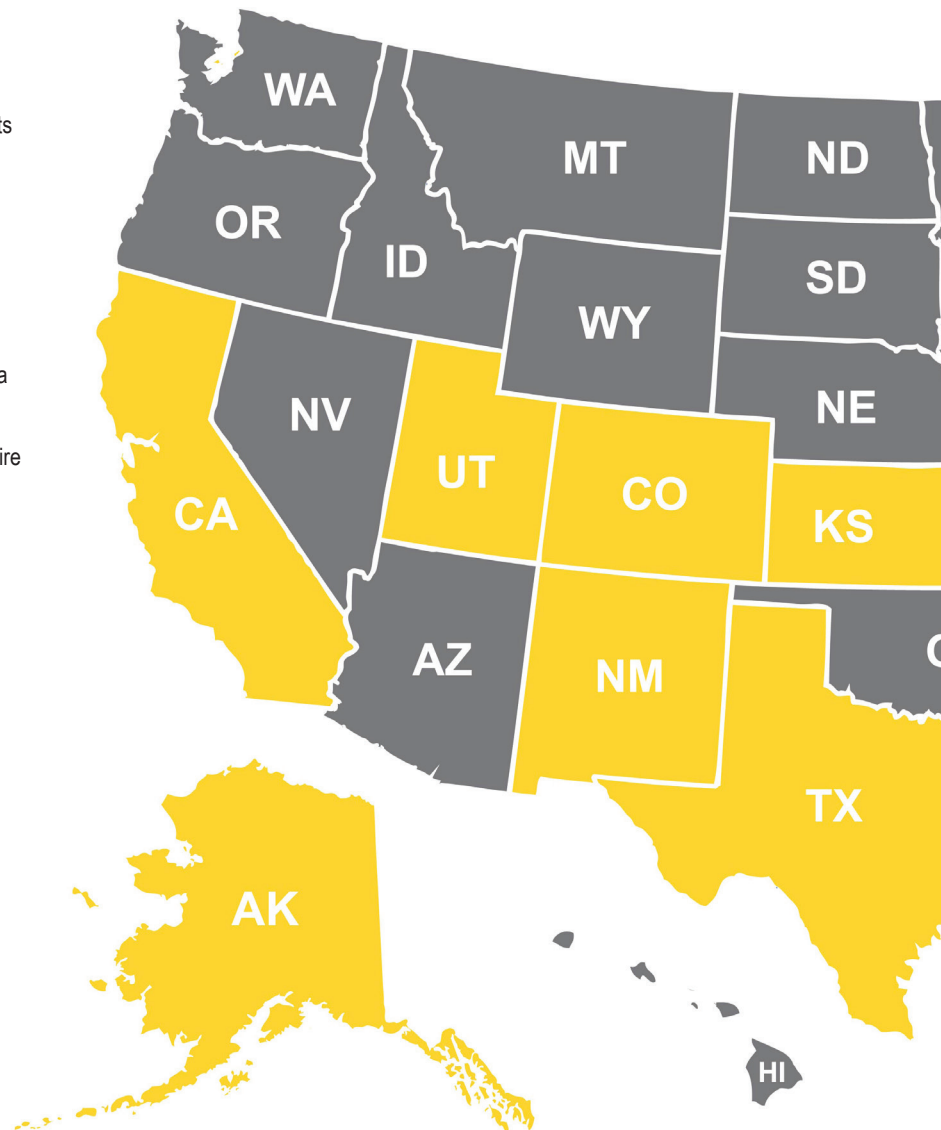
U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES (ARI)

Virginia

ARI Basic Research Unit	Virginia
ARI Emerging Research Unit	Virginia
ARI Fort Cavazos Research Unit (Unit Training)	Texas
ARI Fort Leavenworth Research Unit (Leader Development)	Kansas
ARI Fort Moore Research Unit (Institutional Training)	Georgia
ARI Predictive Analytics and Modeling Research Unit	Virginia
ARI Scientific Coordination Office	Virginia
ARI Selection and Assignment Research Unit	Virginia

ARMY ANALYTICS GROUP (AAG)

California



U.S. ARMY MEDICAL CENTER OF EXCELLENCE (MEDCoE)

Texas

U.S. MILITARY ACADEMY WEST POINT (USMA)

New York

JOINT PROGRAM EXECUTIVE OFFICE FOR CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR DEFENSE (JPEO-CBRND)

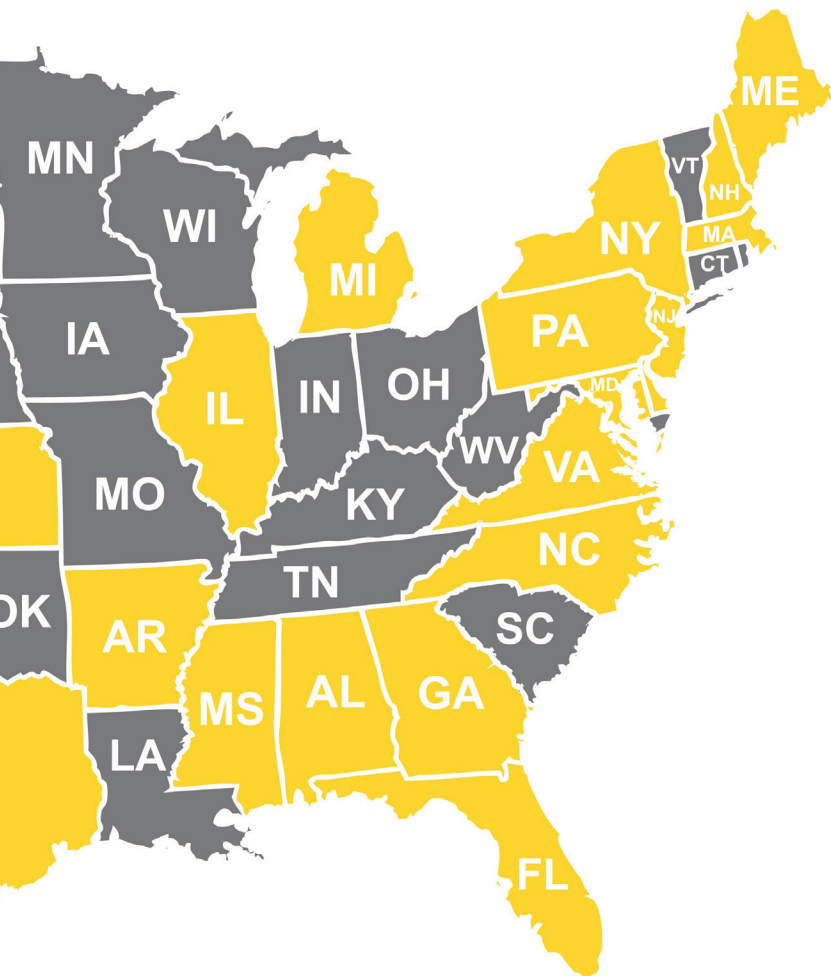
Maryland

U.S. ARMY CYBER (ARCYBER) TECHNICAL WARFARE CENTER

Georgia



Army T2 Enterprise



ARMY ARTIFICIAL INTELLIGENCE INTEGRATION CENTER (AI2C)

U.S. ARMY TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT ACTIVITY (USATA) ARMY PRIMARY STANDARDS LABORATORY (APSL)

U.S. ARMY CRIMINAL INVESTIGATION LABORATORY (USACIL)

U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND (DEVCOM)

Headquarters

Armaments Center (AC)

AC Watervliet Arsenal

AC Benét Laboratories

AC Firing Tables and Ballistics Division

AC Rock Island Arsenal

Pennsylvania

Alabama

Georgia

Maryland

New Jersey

New York

New York

Maryland

Illinois

Army Research Laboratory (ARL)

ARL Army Research Office

ARL White Sands Missile Range

ARL Central

ARL Northeast

ARL South

ARL West

Aviation and Missile Center (AvMC)

AvMC Technology Development Directorate

AvMC Systems Readiness Directorate

AvMC Software, Simulation, Systems Engineering
and Integration Directorate

Chemical Biological Center (CBC)

CBC Pine Bluff Arsenal

CBC Rock Island Arsenal

CBC Dugway Proving Ground

Command, Control, Computers, Communications,
Cyber, Intelligence, Surveillance, and
Reconnaissance (C5ISR) Center

DEVCOM Analysis Center (DAC)

DAC White Sands Missile Range

DAC Redstone Arsenal

DAC Detroit Arsenal

Ground Vehicle Systems Center (GVSC)

GVSC Occupant Protection Laboratory

GVSC Bridging Simulation Laboratory

GVSC Freshwater Treatment and Test Facility

GVSC Army Petroleum Laboratory

GVSC Fuels and Lubricants Research Facility at
Southwest Research Institute

GVSC Rapid Evaluation Capability

Soldier Center (SC)

SC Simulation and Training Technology Center

Maryland

North Carolina

New Mexico

Illinois

Massachusetts

Texas

California

Alabama

Alabama, California,
Virginia

Texas

Colorado

Maryland

Arkansas

Illinois

Utah

Maryland

Maryland

New Mexico

Alabama

Michigan

Michigan

Michigan

Michigan

Michigan

Pennsylvania

Texas

Michigan

Massachusetts

Florida

U.S. ARMY TEST AND EVALUATION COMMAND (ATEC)

Headquarters

Army Evaluation Center

Aberdeen Test Center

Cold Regions Test Center

Dugway Proving Ground

Electronic Proving Ground

Operational Test Command

Redstone Test Center

White Sands Missile Range

Yuma Proving Ground

Maryland

Maryland

Maryland

Alaska

Utah

Arizona

Texas

Alabama

New Mexico

Arizona



2023 Army T2 Metrics

Army T2 augments Army laboratory's research capabilities through various collaborations sharing expertise, material, equipment, facilities, IP, and other resources. Army T2 also leverages interests in the commercial applications of Army patented technologies to manufacture products for commercial or military sales. Industry and academic partners can engage with the Army in many ways, including CRADAs, EPAs, Partnership Intermediary Agreements (PIAs), IP / PLAs, and CTAs. The Army engages in the following Army T2 mechanisms with a variety of partners.



1,040
CRADAs
\$33.5M Revenue



260
EPAs



500
CTAs



7
PIAs



129
**New Invention
Disclosures**



85
**Patent Applications
Filed**



91
**Patents
Issued**



1,139
**Total Active
Patents**



130
**Active License
Agreements**
\$694,888 Income



3
**Active Software
Licenses**
\$6,022 Income



Cooperative Research and Development Agreements (CRADAs)

A CRADA allows the laboratory and the partner to provide personnel, services, facilities, equipment, IP, or other resources with or without reimbursement (funds are not paid to the non-federal party) toward the conduct of specified research and development (R&D) efforts consistent with the mission of the laboratory. CRADAs may not include a procurement contract or cooperative agreement. CRADAs provide an easy way for Army laboratories to engage in research and technology collaborations with private partners. Both the Army and the partner may benefit from a CRADA in a variety of ways.

BENEFITS TO THE ARMY AND PARTNERS:

- Accelerate technology maturation;
- Solve specific technical challenges;
- Access Army laboratory facilities and equipment;
- Mutually beneficial discovery and innovation;
- Create new teams and professional connections;
- Reduce technical risk of new technology development;
- Leverage external expertise, ideas, investment and resources;
- Share resulting technical data, demonstrations, innovations, inventions, and prototypes;
- Expand the defense industrial base to include non-traditional defense contractors;
- Leverage commercialization potential of inventions developed under the CRADA;
- Access partner’s means of advanced development, manufacturing, and commercialization; and
- Share resources and capabilities to accelerate technology development and defray R&D costs.



CRADAs

FY21	FY22	FY23
1,934	1,811	1,040*
\$22.7M Revenue	\$33.5M Revenue	\$5.88M* Revenue

* Army CRADAs and CRADA revenue decreased in FY23 due to the Medical Research and Development Command transition to Defense Health Agency.



Educational Partnership Agreements (EPAs)

EPAs allow Army laboratories to partner with educational institutions and academic researchers.

BENEFITS TO THE ARMY:

- Cultivate educational and research opportunities in Science, Technology, Engineering, and Mathematics (STEM) programs relevant to Army S&T programs;
- Involve faculty and students as an extension of resources to Army laboratories to solve essential Army challenges;
- Provide academic teaching opportunities for Army scientists and engineers (S&Es), attract talent, and form relationships with the next generation of S&Es; and
- Leverage academic research methods to solve Army challenges.

USE CASES FOR ACADEMIC PARTNERS:

- Loan or allow students and faculty to use laboratory equipment and facilities;
- Provide technical assistance to academic institutions, which can enhance teaching and research;
- Involve students and faculty in research projects side by side with Army S&Es;
- Receive loaned or transferred surplus Army scientific equipment for student and faculty for academic research; and
- Aid in the educational experience of students of all levels by providing a mechanism by which those can benefit from the staff expertise and unique facilities and equipment at Army laboratories.



EPAs

FY21	FY22	FY23
253	285	260*

* Army EPAs decreased in FY23 due to the Medical Research and Development Command transition to Defense Health Agency.



Commercial Test Agreements (CTAs)

CTAs allow Army laboratories to provide testing services for a fee to a private partner. CTAs provide access to unique, world-class Army laboratories, test capabilities, and facilities.

BENEFITS TO THE ARMY:

- Reduce costs by providing facilities or services for a fee;
- May transfer test materials, equipment, models, computer software, data and other technologies;
- Increase return from equipment and facilities investments; and
- Government purpose use of the testing data depending on terms in the agreement.

USE CASES FOR NON-FEDERAL ENTITIES:

- Access to unique test facilities and equipment;
- Access to Army expertise through test feasibility; developing test requirements; conducting test planning, scheduling, and budgeting; designing, building, and installing test hardware and equipment; and acquiring, processing, and analyzing test data;
- Army laboratory may provide samples, drawings, information, equipment, materials;
- Results of tests performed under a CTA will not be disclosed to third parties without the consent of the customer; and
- Use of resources is on a noninterference basis of the laboratory supporting its mission and must not constitute undue competition with the private sector.



CTAs

FY21	FY22	FY23
567	455	500



Intellectual Property (IP) and Patent License Agreements (PLAs)






Army laboratories generate inventions in the course of R&D projects. The laboratory ORTA promotes T2 training to laboratory S&Es, including how to recognize, identify, report, and file for patent protection. IP plays an important role in the Army's ability to modernize its weapons systems, maintain technological overmatch, and support long-term sustainment. PLAs are the mechanism for continued development and commercialization of Army inventions. Each Army laboratory maintains a patent portfolio to market inventions by its S&Es. When licensed and commercialized, the inventions benefit consumers with new or improved products.

BENEFITS TO THE ARMY:

- Leverage commercial interest including profit incentives and willingness to take risks for product development, manufacturing, marketing, and selling Army technologies;
- Enhancements from products made by industry using licensed Army technologies resulting in military sales;
- Contribute to U.S. defense manufacturing and economic growth. For example, a recent economic impact study conducted by TechLink reported sales from Army license agreements exceeding \$6 billion; and
- Royalties are shared between the inventor and the laboratory.

USE CASES FOR LICENSEES:

- Profits and sales of new products and services, including both commercial and U.S. military sales;
- Potential for outside investment funding directly related to the licensed Army technology; and
- Potential royalties from sublicensing the licensed Army technology.

					
FISCAL YEAR	New Invention Disclosures	Patent Applications Filed	Patents Issued	Total Active Patents	Active License Agreements
FY21	131	153	135	1,595	233 / \$3.1M Income
FY22	121	118	118	1,517	220 / \$2.5M Income
FY23	129	85	91	1,139	130 / \$695K Income

* Army Patents and PLAs decreased in FY23 due to the Medical Research and Development Command transition to Defense Health Agency.



Partnership Intermediary Agreements (PIAs)

A PIA is an agreement between an Army laboratory and an agency or entity funded or chartered by state or local government. A partnership intermediary engages in activities to increase the likelihood of successful marketing and formation of commercial partnerships between Army laboratories and non-government organizations.

BENEFITS TO THE ARMY:

- Market Army technologies and capabilities;
- Conduct outreach events;
- Perform market research for Army-developed technologies;
- Find licensees and assist them with business plans;
- Increase T2 to commercial partners and technology transition to Army customers; and
- Advocate, connect, inform, and facilitate linkage to manufacturers, small businesses, apprentice programs, etc.

USE CASES FOR NON-FEDERAL ENTITIES:

- Facilitate an understanding of Army needs and interests;
- Find partners to leverage Army technologies and promote technology licensing and CRADA opportunities;
- Research and evaluate markets, help create opportunities for designs and prototypes of Army technology and promote manufacturing capabilities; and
- Facilitate the brokering of license agreements between the Army laboratories and industry, academia, and non-profits.

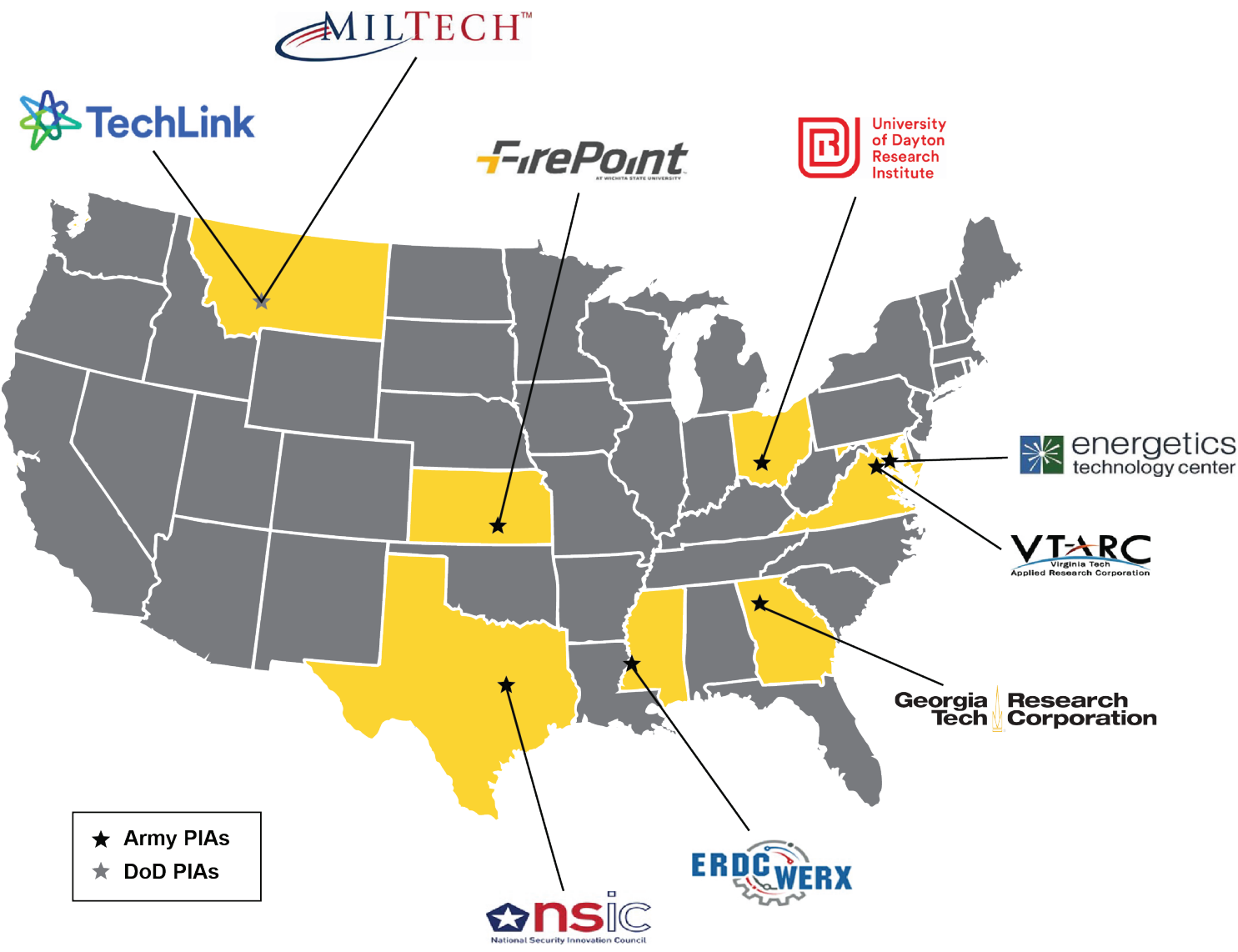


PIAs

FY21	FY22	FY23
7	10	7



Army and DoD PIA Locations



DoD PIAs

The Department of Air Force Technology Transfer and Transition Program Office currently manages two Partnership Intermediaries sponsored by the Office of the Secretary of Defense (OSD) with Montana State University (MSU), TechLink and MilTech.



DoD PIA – TECHLINK

In 1999, TechLink became the Department of Defense's first national Partnership Intermediary for Technology Transfer. TechLink's core activities occur between where laboratory intellectual property enters the public domain and where technology transfer agreements are executed between laboratories and businesses. TechLink helps realize the impact generated and expected from DoD research investments by connecting innovation from DoD laboratories to the National Security Industrial Base / Innovation Ecosystem in a cost-effective manner, ensuring an increased return on investment to the DoD and the U.S. taxpayer. TechLink's primary activity is marketing new inventions from the DoD and navigating businesses and entrepreneurs through the licensing process. TechLink has facilitated partnerships with DoD laboratories, connecting them with companies nationwide for technology licensing, transfer, and joint R&D activities, brokering valuable DoD T2 agreements that support the warfighter and U.S. economy.

TECHLINK TECH TRANSFER UNIVERSITY

The TechLink Tech Transfer Foundations course was launched in the fall of 2022 and three cohorts have been completed to date. The content in this course is geared toward those new to the ORTA profession and is a great opportunity to gain best practices for conducting T2 within their laboratories. ORTAs learn various approaches for successfully engaging with stakeholder groups, such as S&Es, legal counsel, and industry partners. The in-person capstone event allows participants to engage with other ORTAs and T2 professionals from across the DoD, learn from T2 experts and T2 Service leads, and work in small groups on collaboration and commercialization partnering scenarios. In 2023, there were 38 Army enrollees representing 15 different laboratories, three of which (ATEC, USACIL, AI2C) were recently designated as laboratories under the auspices of the ATTP.

TECHLINK T2 PARTNERSHIPS IN ACTION

In FY 2023, TechLink assisted Army laboratories with 31 technology transfer agreements, including 10 patent license agreements, 13 CRADAs, and 8 other agreements (e.g., limited purpose CRADAs, material transfer agreements, other contracts). Examples of TechLink support to Army laboratories in FY23 include a marketing campaign for a Power Meter Module developed at DEVCOM ARL and Focused Industry Day at DEVCOM GVSC, focused on industry partner licensing of the Zeus Silicon Carbide Inverter. This event resulted in at least three companies interested in licensing the technology.





DoD PIA – MILTECH

MilTech, located at Montana State University, was established as a DoD national Partnership Intermediary in 2004. The mission of MilTech is to accelerate the transition of new technology to the U.S. Government. For example, MilTech assists DoD customers in identifying promising technologies that are in the developmental phase in DoD and other federal laboratories, university laboratories, and the private sector that could be efficiently and cost-effectively transitioned to the battlefield with the investment of additional RDT&E funding, and helps small businesses that have licensed, co-developed, and/or developed innovative DoD technology with DoD RDT&E funding to transition this technology to DoD operational use more rapidly, reliably, and cost-effectively by helping these companies to overcome technical hurdles and by providing manufacturing, design, and business assistance. MilTech has a broad network of industry partners and provides hands-on, industry experienced product design, prototyping, and manufacturing expertise to help the DoD accelerate the transition of technology to the U.S. warfighter. Since 2004, MilTech has performed over 600 technology acceleration and transition projects for all DoD Services, the Office of the Secretary of Defense, and Joint and Special Programs.

MILTECH T2 PARTNERSHIPS IN ACTION

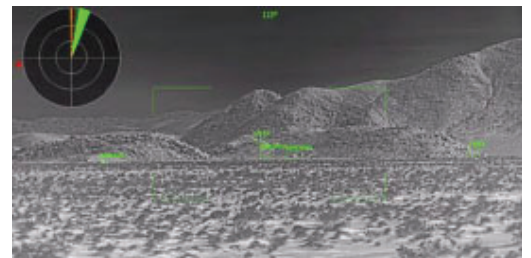
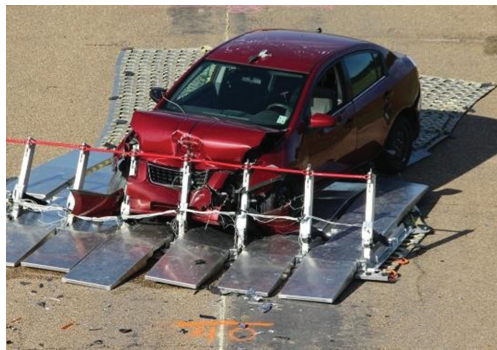
In FY23, MilTech completed a total of 23 Army-sponsored projects. For example, MilTech assisted DEVCOM Soldier Center with collecting information on the deformation and constraint predictions for Female Body Armor in varying tactical postures. MilTech partnered with University of Michigan, Transportation Research Institute (UMTRI) to identify female shape data across postures and the effects of close-fitting ensembles and equipment on the female body. MilTech helped provide tools for rapid 3D data analysis and physics-based modeling of flesh deformation. Data from over 70 females varying in body mass index (BMI) sizes was collected and analyzed by UMTRI and the data provided to DEVCOM Soldier Center for continued improvement of gear and size predictability.

MilTech also supported Program Executive Office (PEO) Soldier Program Manager Soldier Protection Equipment (SPE) with adding two new categories, High Contrast and Single Lens Prescription, to the Authorized Protective Eyewear List (APEL). MilTech engaged the Manufacturing Extension Partnership (MEP) network to find vendors interested in working with MilTech to meet the objectives of SPE. By providing samples for both single lens prescription eyewear and tinted eyewear, SPE was able to validate performance metrics and then use the samples, from multiple vendors, to drive the requirements.



FY23 Army Technology Transfer Program Success Stories

T2 agreements help to leverage shared research interests, capabilities, expertise and identify research products (e.g., inventions, innovations, knowledge) which may have commercial or public value. The success stories that follow in this report provide examples of how T2 is supporting Army modernization.



ERDC Technology Transfer Professional Receives DoD George Linsteadt Award for Excellence in Technology Transfer



The Office of the Assistant Secretary of Defense for Research and Engineering (OASD(R&E)) bestows the Linsteadt Award annually to recognize DoD T2 professionals who embody Mr. Linsteadt's legacy in shaping the DoD T2 community while simultaneously highlighting initiatives that have had a significant impact on the DoD T2 program. OASD(R&E) continues its tradition of championing DoD research, science, technology, engineering, and innovation efforts to maintain the United States military's technological advantage through the Linsteadt Award.

The 2023 recipient of the George F. Linsteadt Award for Excellence in Technology Transfer is Antisa (Tisa) Webb, the Chief of the Technology, Knowledge and Outreach Division for the Office of Research and Technology Transfer at the Army Corps of Engineers Engineer Research and Development Center. Tisa is responsible for ERDC's Technology Transfer program and Intellectual Property Portfolio, as well as lead for technology advancements efforts including: ERDC's Partnership Intermediary, ERDCWEXX; technology infusion through ERDC-University (a Career Developmental Assignment for USACE employees); and improvements to ERDC business processes and technology transfer processes (T2 Portal). She also serves as ERDC's Knowledge Manager which includes Discover ERDC, Inside ERDC, and other knowledge management tools.

In a recognition ceremony at the Pentagon, Steven G. Wax, performing the duties of Assistant Secretary of Defense for Science and Technology, underscored the critical work performed by technology transfer professionals across the DOD.

"Our defense technology and transition activities help ensure our warfighters maintain the technological advantage, while at the same time supporting the American economy," he said. "Our [technology transfer] professionals across the department [...] make this happen." "Mr. Linsteadt was a pioneer of [technology transfer]," Wax said. "The recipient of this award embodies the vision and spirit of Mr. Linsteadt. They are forward-thinking DOD [technology transfer] professionals that pioneer technology transfer and strive to find innovative ways to use [technology transfer] to enhance the ability of DOD to meet its warfighting mission."



Wax recognized Webb's efforts to develop an innovation-to-impact strategy focused on taking a market-based approach to managing the ERDC's portfolio, fostering an innovation culture and pursuing forward-thinking outreach and deal making. Those efforts have fueled economic growth among the ERDC's private sector partners through sales growth, new job creation and new funding awards.

Original Article: <https://www.defense.gov/News/News-Stories/Article/Article/3579519/dod-recognizes-technology-transfer-professionals/>



DEVCOM Soldier Center Event Honors Patent Inventors for Warfighter Innovations

A ceremony held in December 2022 honored patent inventors at the DEVCOM SC, underscoring the center's commitment to innovations benefitting the warfighter.

In Fiscal Year 2022, DEVCOM SC scientists and engineers achieved yet another year of outstanding advances, earning numerous patents for technologies benefitting the warfighter. The patents were the result of the creativity and expertise of DEVCOM SC's scientists and engineers combined, in some cases, with their collaborations with partners in academia and industry.

Yoojeong Kim, Innovation and Outreach team lead at DEVCOM SC, proposed having an annual patent award ceremony to recognize and foster innovation.

"Recognizing our talented and innovative scientists and engineers is important, because it fosters an innovative environment and provides motivation and incentive for creating cutting-edge technologies," said Kim. "Patents protect the intellectual properties generated by the DEVCOM SC scientists and engineers and prevent others from obtaining patents to our inventions. In addition, technology transfer of patents benefits both the taxpayer and the DoD, as products can be developed for public use, thereby potentially increasing the general public's access to new technologies, as well as ensuring product availability for warfighters and generating jobs and revenues."

Sheri Mennillo serves as the technology transfer manager for DEVCOM SC's Office of Research and Technology Applications.

"I am delighted that we had the opportunity to showcase some of the meaningful patent-protected technologies invented at DEVCOM Soldier Center," said Mennillo. "Our organization continues to strive to seek patent protection in a manner that will best drive federally supported research and development forward, spur economic growth in the community and nationwide, and precipitate a positive impact on the protection, optimization and lethality of the warfighter."

Douglas Tamilio, director of DEVCOM SC, summed up the importance of the organization's innovative contributions to the warfighter.

"The innovative efforts of our scientists and engineers have resulted in leading-edge technologies that support and advance Soldier performance and capabilities," said Tamilio. "The patents underscore our commitment to creating and advancing solutions that ensure America's warfighters are optimized, protected, and lethal."



Original Article: https://www.army.mil/article/264659/devcom_soldier_center_event_honors_patent_inventors_for_warfighter_innovations



New, Shortened Blast Attenuator Device for 120mm Mortar Designed by DEVCOM Armaments Center

Engineers at the U.S. Army's DEVCOM AC have designed a new bolt-on muzzle cone for the 120mm mortar tube. The device was patented on March 21, 2023. The cone, known as a Blast Attenuator Device (BAD), helps protect soldiers from blasting their eardrums. Importantly, because it is shorter, it doesn't get in the crew's way when they are hanging rounds. The total length is 122mm or 4.8 inches.

"When high-pressure propellant gases are ejected from a cannon muzzle, they displace the ambient air around the muzzle, thereby forming a blast wave. This negative effect of this displaced gas is called blast overpressure (BOP) and at its peak, can reach decibel values well beyond safe limits. High BOP levels may have severe adverse effect on the crew, including significant hearing damage and damage to other body organs," according to the new patent. "Accordingly, many military organizations limit the amount and intensity of BOP exposure. For example, the U.S. Department of Defense uses the MIL-STD-1474E standard to determine the level of BOP that poses a danger and the permissible exposure levels of BOP per day."

"Past solutions to mitigate BOP effects involved projecting high-pressure gas flow forward of the weapon. However, in existing designs the length of the attenuator is a severe drawback. Current attenuators are not acceptable for use on multiple systems due to the length of the attenuator. In particular, these approaches are not suitable for weapon systems in which projectiles are loaded from the muzzle end, as in mortar weapon systems. The use of such attenuators in these systems presents a physical impediment to the user." The dimensions described in the new Army patent are for a 120mm mortar. However, according to the inventors, the new design may be scaled for other calibers, including the ubiquitous 60mm and 81mm mortar tubes.



Original Article: <https://techlinkcenter.org/news/new-muzzle-cone-for-120mm-mortar-designed-by-us-army>



Scottsboro City Schools Enter Partnership with DEVCOM Aviation and Missile Center

On March 20, 2023, Scottsboro City Schools officially signed a partnership with DEVCOM AvMC.

“This is a wonderful opportunity not only for our students but for the City of Scottsboro. We hope to bring greater collaboration among our county schools and our already established partnership with them and their Career Innovation Center and we also want to look at more opportunities, we have some great ones at Northeast Alabama Community College and we’re thankful for all of those partnerships. We’re extremely thankful of all of the partnerships that already exist and we look forward to expanding on those in the future because we know that all of those will lead towards our future relationships and our kids,” Scottsboro City Schools Superintendent Amy Childress said.



When speaking of the Army side of the partnership, Director for DEVCOM AvMC Jeffrey Langhout laid out the importance of young people getting into the STEM field.

“This is a critical path for us. I cannot understate enough the need for young people to go into the STEM field, It’s a national security issue. We need our young people to want to go into STEM and the best way to know how to do that is to expose them to these things early,” Langhout said. “(This partnership) gives the formal opportunity for the 3,000 engineers that live in my formation to give back and there’s a number of them that come from Jackson County.”

Director of Federal Programs and Secondary Instruction Jason Hass said that the conversations for this partnership began in September, with Hass speaking with DEVCOM’s “We Build it Better Program” center lead Melissa Jackson and Manufacturing Technology Branch Chief for DEVCOM’s Manufacturing Science and Technology Division Jamie White about the expansion of Scottsboro City School’s Career Tech program.

“Currently, we have six programs but there are many, many more and, of course, there’s a lot of potential in Scottsboro city,” Hass said.

Hass, White and Jackson met a couple of times and also visited the Advanced Manufacturing Innovation and Integration Center in Huntsville where Hass said his eyes were opened as to what they can do in Scottsboro.

With the partnership, Hass hopes to expand career tech into Advanced, Modern and Precision Manufacturing, implementing a Cybersecurity program into their high school and Aerospace Engineering.

“We want to give our kids the opportunity because we have excellent students that are very, very smart that can do these things,” Hass said.

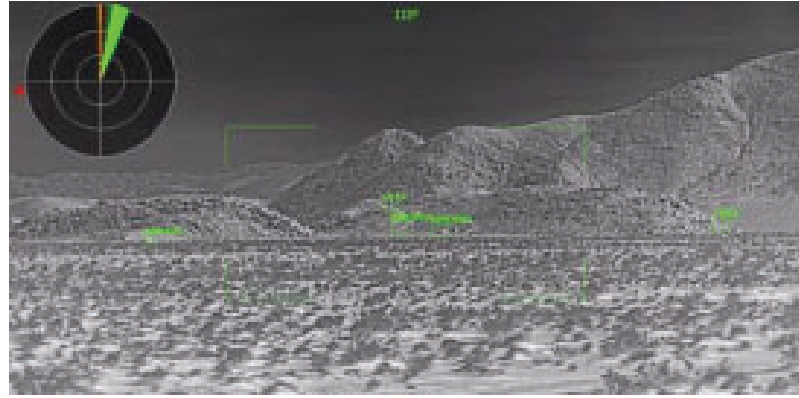
Original Article: https://jcsentinel.com/news/article_0cb8690c-c8e0-11ed-b5e9-4356838b8891.html



DEVCOM C5ISR Center Signs Industry Partnerships in Support of Advanced Capabilities for Future Ground Combat Platforms

DEVCOM C5ISR Center executed CRADAs in FY23 with three industry partners in support of the Next Generation Combat Vehicle Cross Functional Team's (NGCV CFT) primary modernization efforts. The CRADAs established partnerships to support critical automation capabilities for the design of future armored platforms.

Aided Target Detection and Recognition (AiTDR) software is a critical enabling capability that will automate and expedite the detection and classification of threat personnel and vehicles in complex tactical environments. By employing state-of-the-art Machine Learning algorithms trained to locate potential threats, users will have enhanced survivability and lethality. With integration of advanced sensor payloads and AiTDR processing, the time to interrogate threats will be reduced in addition to relieving burden from the crew.



In order to facilitate mature AiTDR software inclusion in future ground platforms, it was critical that CRADAs were established between C5ISR Center and key industry partners. Though the vendors are not explicitly required to leverage Government-provided data products, the performance of C5ISR AiTDR algorithms have been demonstrated as state-of-the-art.

Though nontraditional, the establishment of CRADAs directly with industry platform developers will ensure that proven technology gets integrated into early system designs, qualified, and ultimately into the hands of the soldiers.

Emerging armored ground combat platforms are not the only vehicles that are able to leverage advanced target detection and recognition algorithms. C5ISR Center also established CRADAs with two additional vendors to enhance the lethality and autonomy of today's current tactical vehicle fleet. C5ISR's advanced sensors and AiTDR software are also a fundamental enabler for future robotic platforms.



DEVCOM Chemical Biological Center Partners with IndyGeneUS to Advance the Development of the Pocket Detection Pouch

A CRADA was approved between IndyGeneUS AI and DEVCOM CBC to commercialize the Pocket Detection Pouch (PDP) to deliver rapid identification of potential exposure to environmental and infectious hazards in a small form factor device for military and civilian first responders.

Using commercially available liquid and paper-based toxic and infectious agent detection assays inside this credit card-sized, multi-channelled soft polymer pouch, the PDP can deliver eye-readable “yes/no” answers, some in less than 15 minutes.

“The PDP helps us “think outside the tube” to reduce the size, weight and power (SWAP) burden on warfighters or first responders needing to detect hazardous materials in their environment, said Jennifer Sekowski, PhD, co-inventor of the PDP.

“As a retired Combat Medic, it’s humbling for me to serve and protect our military forces from afar with the Pocket Detection Pouch,” said Yusuf Henriques, CEO and founder of IndyGeneUS AI.

The first patent in the PDP intellectual property family recently received approval, clearing the path to commercialization. Potential benefits of the PDP are not limited to the Armed Forces. “We are also exploring a variety of non-military applications to assist civilian first-responders and citizens who may have been exposed to hazardous materials,” said Bradford Wilson, PhD, CSO and co-founder of IndyGeneUS AI.



Original Article: <https://www.einpresswire.com/article/637615723/indygeneus-inks-development-partnership-with-us-army>
<https://www.army.mil/article/271298>



U.S. Army and L3Harris Sign MOSA Agreement for Next Generation Ground Combat Vehicles

L3Harris announced a CRADA with DEVCOM GVSC to collaborate on the Army's modular open systems approach (MOSA) for next-generation ground combat vehicles.

The Department of Defense's MOSA strategy aims to shorten development timelines, reduce costs, and ensure warfighters are mission ready across land, air and sea.

Under the agreement signed in March 2023, L3Harris will aid DEVCOM GVSC to enhance designs and reduce risks associated with developing future vehicle technologies.

L3Harris will also assist in demonstrating and validating technical feasibility for the rapid modernization of modular open system capabilities.

The CRADA enables data sharing and collaboration with the U.S. Army's science and technology efforts. It also assists in future industry adherence to MOSA standards.

"Our multi-domain, open-systems expertise and ground vehicle investment expands our position within the market," L3Harris Strategy and Product Development Director Hugh McFadden stated.

"As a result, we're providing cutting-edge technology and increasing the speed of its implementation to the U.S. Army's Next Generation Combat Vehicles."



Original Article: <https://www.thedefensepost.com/2023/03/29/us-mosa-combat-vehicle-agreement/>



U.S. Army and Shell Collaborate on Energy Solutions

In August 2023, DEVCOM Commander Major General Miles Brown and Shell Global Solutions President Dr. Selda Gunsel signed a five-year CRADA, solidifying the Army's commitment to its Climate Strategy and the unique opportunity to improve our Nation's defense capabilities and become a more efficient force, while securing a sustainable, cleaner future for our planet.

Over the next five years, DEVCOM and Shell will explore current and emerging technologies in areas of mutual interest including electric vehicles, novel battery chemistries and storage capacities, and fuels of the future.



Original Article: https://www.linkedin.com/posts/usarmydevcom_armypartnerships-crada-teamdevcom-activity-7102288793696645121-UIEy?trk=public_profile_like_view



AI in Space: West Point Advances Astronaut Healthcare

In the vast expanse of space, where expert medical help is millions of miles away, a new hero emerges – not in a spacesuit, but rather as a digital lifeline. A recent research project spearheaded by a dynamic team at the U.S. Army Military Academy at West Point, in collaboration with the National Aeronautics and Space Administration (NASA), is revolutionizing the way astronauts handle medical emergencies on the International Space Station (ISS).

The question defines our moment: could artificial intelligence (AI) outperform a thousand-page medical manual in making technical medical diagnoses? The Robotics Research Center, in collaboration with Nahlia, Inc. undertook the question. West Point has worked with Nahlia to support the development and technology transfer of the Autonomous Medical Response Agent (AMRA) software for Army medical needs in austere environments.



Nahlia, Inc. received a Small Business Innovation Research (SBIR) award in collaboration with NASA to better help to non-medical specialists with diagnosis than a medical manual. Recognizing the need for specialized expertise in testing AMRA's effectiveness and efficiency, Nahlia, Inc. strategically partnered with West Point because of West Point's extensive intellectual capital in human-computer interaction, particularly with its Electrical Engineering and Computer Science (EECS) and Behavioral Science and Leadership (BS&L) departments. Both departments claim robust research efforts on human-robot interactions, with EECS housing the West Point Robotics Research Center (RRC).

Additionally, West Point's unique cadet population, with their robust training schedules and project-based learning efforts, make them ideal for supporting this research effort. West Point RRC researchers used AMRA to provide early, objective data on clinical decision support to non-medical users. West Point cadets excelled in evaluating the utility of this technology, finding that AMRA allowed cadets, none of whom received medical training, to make diagnostic assessments more quickly and more accurately.

These results underscore the potential of AI in enhancing decision-making in high-pressure situations, particularly in the isolated confines of space. West Point faculty provided crucial collaborative feedback in re-designing AMRA's interface to increase feasibility for potential users.

This collaboration has positioned the Army to transition a piece of technology into potential Army usage. Because of this success, RRC has requested additional funding from NASA to support further exploration of AMRA's utilization. In addition to these research findings, cadets gained vital operational expertise in cutting-edge technology, furthering Army knowledge and strengthening its relationships with a key industry partner. This surge of scholarly activity has been made possible by the robust CRADA between West Point and Nahlia, serving as a testament to the power of technology transfer in advancing scientific inquiry.



Interagency Collaboration Achieves Far-Reaching Perimeter Security Solutions

The collaboration between ERDC and two components of the Department of Homeland Security is a testament to the power of cooperation across agencies to deliver impactful technologies to the nation. ERDC Perimeter Security Solutions were originally developed with funding from the U.S. Army to meet the needs of the future warfighter to be agile in urban settings by providing a perimeter that could be rapidly deployed, quickly recovered, and easily moved. Specifically, ERDC's Geotechnical and Structures Laboratory (GSL) developed the following:

Deployable Expedient Traffic Entry Regulator (DETER) provides an active vehicle barrier that serves as an expedient access control solution to protect critical assets and soft targets from vehicular attacks.

Aggressor Vehicle Entry Readiness Technology (AVERT) is an active, friction-based vehicle-barrier using man-portable components and mechanical operation for rapid deployment to mitigate hostile vehicle threats.

Ready Armor Protection Instant Deployment (RAPID) is an accordion-like security wall for quickly establishing physical barriers with ballistic protection in urban environments.

RAPID and AVERT were demonstrated at two events in New York City in 2019, opportunities that gave the GSL team valuable feedback from soldiers and the New York Police Department. More importantly, the demonstrations caught the attention of DHS. Specifically, the Office for Bombing Prevention (OBP) within DHS's Cybersecurity and Infrastructure Security Agency (CISA) expressed an interest in procuring the technologies. CISA's OBP saw the potential to use the perimeter technologies, not only for the future warfighter, but also for today's civilian law enforcement and homeland security needs.

After connecting with OBP, ERDC entered a five-year interagency agreement with the DHS S&T Directorate to further develop the Perimeter Security Solutions technologies with the new focus on the civilian sector. With funding from DHS S&T, ERDC was able to start the process of demonstrating technologies at public events to assess them in an operational environment with the new user focus in mind.

In April 2023, DETER and RAPID were deployed at the 88th annual NFL Draft in Kansas City, Missouri, to see how the technologies needed to be tailored to fit the needs of U.S. law enforcement. ERDC researchers received valuable feedback from end users, including law enforcement, NFL security contacts, and local security officials.

This interagency collaboration has been valuable because it resulted in the rapid development of the perimeter technologies, including taking technologies originally developed for the battlefield and tailoring them for U.S. domestic security. This collaboration has furthered partnerships, to include CRADAs and commercial licenses. Thanks to the visibility of the NFL Draft demonstration, the Secret Service is interested in purchasing RAPID. In addition, the interagency team was able to secure an opportunity to demonstrate DETER at the next Indianapolis 500 (Indy 500).



Army Aviation Technology Supporting California Firefighters

It is a tool developed for Army pilots – and now it is also helping to train firefighters to combat blazes in California.

The Cockpit Academic Procedural Tool – Enhanced Visual Control System, or CAPT-EVCS, was developed by the DEVCOM AvMC to provide pilots an opportunity to sit in a UH-60M Black Hawk system, interact with the controls, displays, and visualization as if in the actual aircraft. The system, a classroom enhancer, was designed to look, feel and even smell like a helicopter.

The California Department of Forestry and Fire Protection employs the civilian version of the UH-60M, the S-70I Fire Hawk, which has a similar cockpit functionality to the UH-60M. To both familiarize and train their pilots, CAL FIRE was sending them to out-of-state simulator facilities, a time-consuming effort. The talk in aviation circles was that the Army had another option to support aircraft familiarization. CAPT-EVCS's hardware is commercially available but its software, known as Aircraft Avionics Procedural Software, is developed by DEVCOM AvMC's Software, Simulation, Systems Engineering and Integration Directorate. Josh DuPont with S3I's Aviation Crew Station branch arranged to send them UH-60M AAPS. But they needed more.



“There is firefighting equipment on their helicopters and they did not have that part (of the software),” said Nick Nickles, UH-60M Crew Station Lead for DEVCOM AvMC. “So that brought up the CRADA.”

The CRADA allowed DEVCOM AvMC to enhance CAPT-EVCS software to support CAL FIRE's additional mission set. While most of the software would be reused, CAL FIRE's mission required additional tools. The partnership between DEVCOM AvMC and CAL FIRE is testament to how beneficial collaboration can be for the Army with civilian agency partners. And the California sky isn't even the limit for CAPT-EVCS, Nickles said that other first responder departments who employ the same helicopters can benefit from the system.

As for the Aviation Crew Stations branch, DuPont said that the added software features created for CAL FIRE were always capabilities that the team wanted CAPT-EVCS to have, but they were limited by Army budgetary restrictions. However, with CAL FIRE funding the project, it is a win-win for everyone. “As they grow the modularity of the software, that's software that comes back to the Army for free,” Nickles said.

Original Article: https://www.army.mil/article/268907/army_aviation_technology_supporting_california_firefighters



FY23 Army Technology Transfer Program Highlights

ARMY T2 WEBSITE DEVELOPMENT AND LAUNCH

A new website was launched in July 2023 providing a public face for Army T2. The site is a resource for non-Federal entities to learn how they can collaborate with Army laboratories. The site describes various partnership mechanisms as well as information and resources on Army research priorities, laboratory core competencies, facilities, opportunities, and outreach events. This site also provides ORTA resources including information on T2 education and training opportunities, best practices, and policy references. <https://www.t2.army.mil/>

T2 TRAINING FOR SCIENTISTS AND ENGINEERS

ORTAs provide training for laboratory S&Es to promote invention reporting, the potential R&D gains and resources from partnering with industry or academia, and recognizing T2 as a pathway to technology transition. The T2 training offered to the S&E workforce is laboratory-dependent and may include one-on-one counseling, Lunch and Learn opportunities, and/or larger training sessions with participation from the entire S&E workforce.

In May 2023, the DEVCOM SC ORTA coordinated a visit from TechLink to DEVCOM SC. A primary part of the visit centered on an “Innovator Awareness Training,” which was attended by over 200 workforce members either in person or virtually. The session covered topics including an introduction to technology transfer and intellectual property, protection of DoD intellectual property, identification of DoD innovations, primary tools for technology transfer, and innovator incentives. The overarching goal of this training was to convey to the workforce that it is not necessary for each workforce member to become an expert in technology transfer, but to simply gain enough information about the process to understand when to reach out to the ORTA for support. The DEVCOM SC ORTA has made the recorded session available as an on-demand training in the Army Total Employee Development System.



The Federal T2 Community

Federal Laboratory Consortium for Technology Transfer (FLC)



FEDERAL LABORATORY CONSORTIUM FOR TECHNOLOGY TRANSFER (FLC)

The FLC was organized in 1974 and formally chartered by the Federal Technology Transfer Act of 1986 to promote and strengthen T2 nationwide. The FLC is now a nationwide network of more than 300 federal laboratories, agencies and research centers that fosters commercialization best practice strategies and opportunities for accelerating federal technologies from out of the laboratories and into the marketplace.

The FLC's mission is to promote, educate, and facilitate federal T2 among its member laboratories and institutions so they can easily reach their commercialization goals, and create social and economic impacts with new innovative technologies. The FLC provides various resources, education and training, tools, and services to ensure federal laboratories are better able to create partnerships, navigate the commercialization process, and achieve market success.



FY23 FLC Awards – Army Winners

The FLC recognizes outstanding work in accomplishing T2 from the national laboratories to the public and private sectors with several prestigious awards. The FLC Awards Program annually recognizes federal laboratories and their industry partners for outstanding T2 achievements. The FLC's 30 plus years of advancing T2 would not have been possible without the creativity and dedication of the federal scientists and inventors recognized through the FLC Awards Program.

Each year, the FLC presents numerous awards to federal laboratory employees, including Technology Transfer Innovation, Impact, Excellence in Technology Transfer, Interagency Partnership, State and Local Economic Development Award, Rookie of the Year, Outstanding Technology Transfer Professional, Technology Focus, and Laboratory Director of the Year. The FLC awards are ranked as some of the most prestigious honors in the T2 field.

In FY 2023, the Army received four FLC Awards, including an Excellence in Technology Transfer Award, an Impact Award, an Interagency Partnership Award, and an Outstanding Researcher/Small Research Team Award.



AWARDS

EXCELLENCE IN TECHNOLOGY TRANSFER

Recognizes employees of FLC member laboratories and non-laboratory staff who have accomplished outstanding work in the process of transferring federally developed technology.



EXCELLENCE IN TECHNOLOGY TRANSFER

SUBMAT: A Temporary Roadway System Ingeniously Solves a Long-Standing Problem

THE PROBLEM: When ships offload heavy equipment and supplies on ocean shores without fixed ports, the process often takes several days as ships avoid getting bogged down in the soft, wet sand in the littoral zone, the area that is underwater only during high tide. Many military ships address this issue by using the U.S. Army's Trident Pier, a roadway connecting the vessel to the beach. However, the pier is made of thousands of pounds of complex steel parts that take dozens of people weeks to assemble. Commercially available alternatives are hard to anchor, have a propensity to float, and are subject to scouring, when the sand and supporting material washes away.

THE SOLUTION: SUBMAT (Submersible Matting System) is like an air mattress that is filled with beach sand, pumped through lightweight, portable trash pumps. The result is a more-than-2,000 square foot surface that remains stable — on sandy, rocky, and coral beaches as well as steep- and shallow-sloped shorelines — amid waves as high as 13 feet and is durable enough to support heavy battle tanks and other military vehicles during offloading. SUBMAT is cost-effective and portable, made of inexpensive, readily available materials and designed to fold to fit in a compact space. Requiring only the mat, the trash pump and beach sand, SUBMAT can be installed by eight soldiers in less than a day. To disassemble, the sand is emptied from the mat back onto the beach, leaving no environmental footprint.

THE TECH TRANSFER MECHANISM: Under an Other Transaction (OT) agreement, a team of engineers in the Department of Defense (DoD) U.S. Army Engineer Research and Development Center (ERDC) Geotechnical and Structures Lab and the Coastal and Hydraulics Lab began development with Shavers-Whittle Construction LLC (SWC). The OT agreement included milestones that triggered rounds of funding, creating flexibility to work quickly or slow down when necessary. The follow-on Blanket Purchase Agreement (BPA) allowed SWC to produce more prototypes for testing and other purposes. SWC established the spin-off Nearshore Logistics LLC to continue R&D while bringing SUBMAT to a strategic market under a non-exclusive patent license that was fully executed in 2023. A Cooperative Research and Development Agreement (CRADA), also completed in 2023, allows Nearshore to continue advancing this technology and exploring non-military uses.

THE TECH TRANSFER EXCELLENCE: This transfer benefited from exceptional collaboration between ERDC engineers and SWC and the supportive design of the OT and follow-on agreements. The OT's tiered structure encouraged success while managing expenditure. The agreement also enabled collaborators to develop the project scope and adjust the contract as needed, creating crucial flexibility in the challenging early development stages. The follow-on BPA facilitated a speedy agreement execution, accelerating the commercialization timeframe. Leveraging the momentum from the OT agreement, the invention disclosure was reported in July 2022, a provisional patent application was filed in December 2022 and, within 16 months, ERDC had both a CRADA and a patent license executed with Nearshore.

THE OUTCOMES: SUBMAT addresses a problem that has plagued logistics operations for decades, making offloading faster, easier and more efficient to save time, resources and possibly lives. For the military, this creates a significant advantage in wartime, peacekeeping and relief operations; SUBMAT has been successfully demonstrated at military installations in Florida, Virginia and the Philippines. For non-military applications, the technology could be used for temporary boat ramps, piers and emergency access roadways, and its production creates jobs and contributes to the growth of the U.S. economy.

7 | 2024 FLC Awards



THE LAB:

**Geotechnical and Structures Lab
and Coastal and Hydraulics Lab**
Department of Defense
U.S. Army Engineer Research and
Development Center

THE PARTNER:

Nearshore Logistics LLC

THE TEAM:

**Timothy Rushing, PhD
Zachary Tyler
Stanley Boc
Chris Rayer
Larry Schemmel
Alicia Bounds
Allison Hudson
Christie Bell
Melissa Keen**



**Go to
Honors Gallery**

PHOTO CAPTIONS:

Figure 1: A U.S. Army landing craft reaches SUBMAT's edge and drops its ramp for offloading.

Figure 2: SUBMATs that each measure 100 feet x 21 feet x 9 inches fit into 8-by-5-foot shipping containers.

Figure 3: U.S. Navy sailors fill up SUBMAT to conduct Joint Logistics Over-the-Shore (JLOTS) exercises.

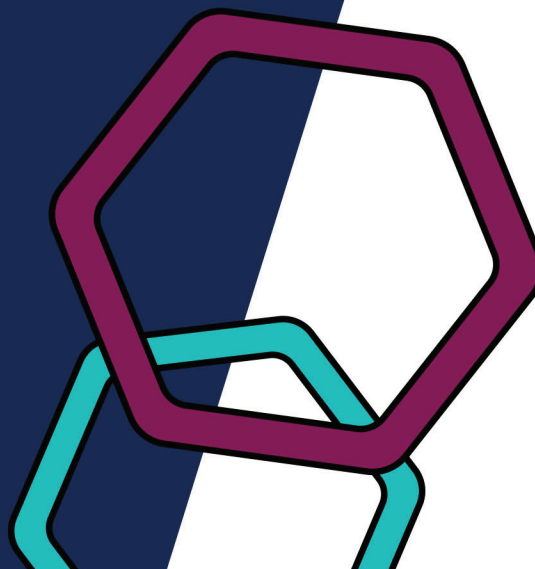
Figure 4: SUBMAT supporting an M1A1 tank.



AWARDS

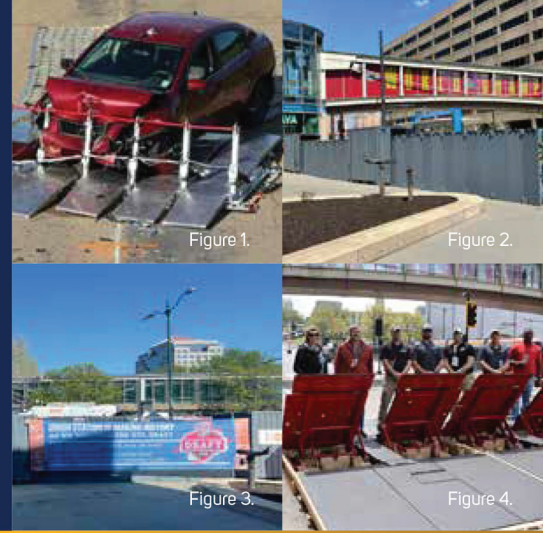
INTERAGENCY PARTNERSHIP

Recognizes agency and/or laboratory employees from at least two agencies who have collaboratively accomplished outstanding work in transferring technology.



INTERAGENCY PARTNERSHIP

ERDC-DHS Collaboration Achieves Far-Reaching Perimeter Security Solutions



THE PROBLEM: The U.S. Army anticipated that 30 years down the road, as cities keep growing, the Army will be unable to avoid conflicts in urban areas and will not stay in one place for a long period of time. Thus, the Army needed something to provide protection that could be deployed instantly, recovered quickly, and moved easily. The Geotechnical and Structures Laboratory (GSL), within the U.S. Army Engineer Research and Development Center (ERDC), developed the Perimeter Security Solutions technologies to address this need: Aggressor Vehicle Entry Readiness Technology (AVERT) is a barrier to mitigate hostile vehicle threats, Ready Armor Protection Instant Deployment (RAPID) is an accordion-like security wall for ballistic protection in urban environments, and Deployable Expedient Traffic Entry Regulator (DETER) provides an active vehicle barrier to protect critical assets and soft targets from vehicular attacks.

THE SOLUTION: ERDC originally developed its Perimeter Security Solutions to meet the needs of the future warfighter, but the Department of Homeland Security (DHS) saw the potential to tailor this technology solution for civilian law enforcement and homeland security needs. The Office for Bombing Prevention (OBP), within DHS's Cybersecurity and Infrastructure Security Agency (CISA), collaborated with the ERDC to adapt the perimeter technologies for civilian protection. As a result of the partnership, in 2023, DETER and RAPID were both deployed at the 88th annual NFL Draft in Kansas City, Missouri.

THE TECH TRANSFER MECHANISM: The ERDC demonstrated RAPID and AVERT at two events in 2019, where the technology caught the attention of members of the OBP, who saw the potential to develop the technologies with a new focus on the civilian sector. The ERDC entered into a five-year interagency agreement with DHS's Science & Technology Directorate (S&T). With help from the OPB and funding from S&T, the ERDC tested the technologies at public events to assess them in an operational environment with the new user focus in mind.

THE OUTCOMES: This interagency collaboration resulted in the rapid development of these perimeter technologies, including taking technologies originally developed for the warfighter and tailoring them for homeland security. The high-visibility demonstration of DETER and RAPID at the 2023 NFL Draft was a huge success and a testament to the commitment to collaboration and respect on all sides. ERDC researchers received valuable feedback from law enforcement, NFL security contacts and local security officials. This success is also leading to further partnerships, including through Cooperative Research and Development Agreements and commercial licenses. Thanks to the visibility of the NFL Draft demonstration, at the time of publication, the Secret Service is interested in purchasing RAPID and the team is scheduled to demonstrate DETER at the next Indianapolis 500. The agencies involved, the commercial companies licensing the technologies and the American public all stand to benefit from this expanding collaboration.



THE LABS:

Geotechnical and Structures Laboratory
Department of Defense
U.S. Army Engineer Research and Development Center

Cybersecurity and Infrastructure Security Agency, Office for Bombing Prevention
Department of Homeland Security

THE TEAM:

Justin Roberts
Omar Esquelin-Mangual
August Johnson
William Hossley
James Davis
Ali Fadel (DHS Science and Technology Directorate)
Eric Keenan



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PHOTO CAPTION:

Figure 1. AVERT uses a mat connected to the barrier to stop an aggressor vehicle by friction, reducing the vehicle's traction to the ground.

Figure 2. RAPID kits deployed at the 88th annual NFL Draft demonstration in April.

Figure 3. Exterior view of RAPID kits deployed at the NFL Draft demonstration in April.

Figure 4. The interagency team that worked on the demonstration at the NFL Draft in front of DETER.



AWARDS

IMPACT AWARD

Honors FLC member laboratories whose technology transfer efforts have made a tangible and lasting impact on the populace or marketplace, ranging from a local to global scale. The focus of this award is to recognize the powerful impact technology transfer can have, no matter how simple or complex the technology transfer effort.



IMPACT AWARD

Rapidly Deployed Modular Protective System Guard Tower for Counterinsurgency Operations

THE PROBLEM: Severe combat conditions during the wars in Afghanistan and Iraq highlighted the need for a portable guard tower. The U.S. Army and other armed forces needed a tower that could be quickly set up to protect them from a wide range of threats during counterinsurgency operations. Existing options were limited to low-tech guard towers of lumber and sandbags, which were not readily available and required significant manpower to build, or large concrete or prefabricated towers, which were expensive and required trucks and cranes. There was no logistically practical solution for remote deployment that provided adequate protection from bullets and explosives.

THE SOLUTION: The U.S. Army Engineer Research and Development Center (ERDC) developed the Modular Protective System Guard Tower (MPS-GT), a lightweight, rapidly constructable tower that is more efficient, safer, and more cost-effective than previous options. The versatile tower can be used as an elevated guard tower, a ground-level fighting position, an inspection station, and other purposes to keep warfighters safe in remote, austere environments. At less than 8,000 pounds, the MPS-GT can be transported by helicopter, truck or warship to remote locations, where five workers can assemble the structure in an hour using only an instruction booklet — no tools, experience or training required. The MPS-GT is designed to be disassembled and re-used for years. The tower's multi-layered armor panel system leverages ERDC's existing MPS technology, which can be tailored to provide blast and ballistic protection that matches threat levels.

THE TECH TRANSFER MECHANISM: The inventor spent nearly five years developing and optimizing the MPS-GT. To get the technology into military hands, it had to be thoroughly tested and approved. Over a two-year period, the towers were tested at multiple military bases by scores of soldiers in all environments; the experiment captured soldiers' feedback, range of motion and other human factors. In 2016, 32 towers were deployed to support the effort to defeat the Islamic State group. The towers made it possible to quickly establish U.S. military outposts in areas where the U.S. previously had no presence or infrastructure. At the time of this publication, all 32 towers are still deployed. For soldiers in those environments — who before this tower was available often had only bags of dirt stacked around them — it provides a much better level of protection and a feeling of security. The MPS-GT was patented in 2019. In 2023, Edwards Design & Fabrication Inc. worked with ERDC and intermediaries TechLink and ERDCWERX to sign a non-exclusive license for MPS-GT. Edwards has since acquired three more licenses for similar solutions.

THE IMPACT: The MPS-GT has opened the door for faster deployments into remote combat environments. The technology's impact on the strategic market is evident by the multiple purchases, inquiries and intellectual property license requests for the MPS-GT. Although MPS-GT was originally developed for defense, it became apparent that this technology also had broader applications. The towers can be used as military bases or command centers, diplomatic facilities at borders, communications centers after natural disasters, entry control and processing centers for refugee camps, security screening checkpoints for law enforcement and many more applications.



THE LAB:

Geotechnical and Structures Lab
Department of Defense
U.S. Army Engineer Research
and Development Center

THE PARTNER:

Edwards Design & Fabrication Inc.

THE TEAM:

**Bradford Steed; Tyler Oesch, PhD;
Matthew Holmer; Amy Douglass (formerly
Allen); Andrew Edwards; Jason Edwards;
Eric Fox; Christie Bell; Brian C. Jones**



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PHOTO CAPTION:

Figure 1. To collect warfighter feedback and confirm operational effectiveness, the MPS Guard Tower was deployed in a simulated combat outpost at the Army Expeditionary Warfighter Experiment at Fort Moore, Georgia. Credit: Matthew Holmer

Figure 2. The blast-resistant capabilities of the MPS Guard Tower were evaluated by subjecting it to blast loads from vehicle-borne improvised explosive devices at Fort Johnson, Louisiana. Credit: Matthew Holmer

Figure 3. During testing, the MPS Guard Tower was assembled and used under a variety of conditions, including low-light conditions at night at Camp Roberts, California. Credit: Tyler Oesch

Figure 4. The effectiveness of the MPS Guard Tower to be used as a fighting position was evaluated by mounting various weapons systems (including the 240B machine gun, M2 .50-caliber machine gun, remotely operated 338 Lapua sniper rifle and Common Remotely Operated Weapon Station .50-caliber machine gun) and conducting live-fire testing. Credit: Matthew Holmer



AWARDS

INDIVIDUAL AND SMALL TEAM AWARDS



ROOKIE OF THE YEAR

Recognizes the efforts of an individual FLC laboratory technology transfer professional (or team) who has demonstrated outstanding work in the field of technology transfer in a manner significantly over and above what was called for in the normal course of their work during the past year.

OUTSTANDING RESEARCHER/ SMALL RESEARCH TEAM

Awarded to a researcher or small research team who has made the most significant contributions to federal technology transfer.

OUTSTANDING TECHNOLOGY TRANSFER PROFESSIONAL

Recognizes the efforts of an FLC laboratory technology transfer professional (or team) who has demonstrated outstanding work in transferring a technology in a manner significantly over and above what was called for in the normal course of their work.

LAB DIRECTOR OF THE YEAR

Honors a laboratory director who has made maximum contributions to the overall enhancement of technology transfer for economic development.

HAROLD METCALF SERVICE AWARD

Recognizes an FLC member laboratory employee who has provided sustained significant service to the FLC as an organization.



OUTSTANDING SMALL RESEARCH TEAM

Sustainment Management System (SMS) Team

Transforming Facility Management from Military to Mainstream



The Construction Engineering Research Laboratory (CERL) Sustainment Management System (SMS) Team led the way for innovation in software technology transfer at the U.S. Army Engineer Research and Development Center (ERDC). The SMS Team developed and transferred a platform technology that delivers mission-critical software to support the Department of Defense (DoD) and other federal agencies. The SMS suite of web-based software applications help property asset management stakeholders maintain existing infrastructure efficiently to cut costs and protect resources for government and commercial users.

Lance Marrano and Matthew Walters, who consecutively led the interdisciplinary SMS Team of engineers and software engineers who developed and maintain SMS, redefined the software commercialization process. Though the ownership of SMS software remained in-house at CERL, Marrano and Walters saw value in leveraging several technology transfer mechanisms to improve the accessibility of the software for external partners.

SMS Team researchers developed the BUILDER® tool as part of its SMS suite and patented its processes in 2006. BUILDER helps improve long-term evaluation and maintenance of building infrastructure by using data to assess and project the life expectancy of the facilities, providing a schedule for facility repairs and investment. To transfer the BUILDER technology to users, the SMS Team used technology transfer mechanisms such as Cooperative Research and Development Agreements (CRADAs), patent license agreements and interagency partnerships. Additionally, the team developed informal alliances with groups including the National Academy of Sciences and hosted user summits to showcase BUILDER's capabilities. These technology transfer activities resulted in five CRADAs and over a dozen licenses with nine commercial licensing partners.

At the time of publication, users at the DoD, Coast Guard, Department of State, Department of Commerce and Department of Agriculture have used BUILDER to assess nearly 2.3 billion square feet of federal facilities. The tool has proved so valuable that the DoD required its facility managers to use the tool for all facility conditions assessments, and in 2019, the U.S. Office of Management and Budget called BUILDER vital to federal budgeting plans.

Private industry also benefits from the SMS Team's technology transfer efforts. Colorado-based Digon Systems and Maryland's Golden Wolf established CRADAs with CERL to improve and refine BUILDER's capabilities in the areas of condition assessments, asset management and portfolio capital investment planning. AECOM, CardnoTEC, Tetra Tech and others licensed BUILDER to provide asset management services to their clients.

What began as an essential tool for the military to assess facility needs while keeping assessment costs down and maintaining military readiness is making facility management more efficient for everyone.

"We're fortunate to develop innovations based on information technology, which allows us to disseminate them widely," Marrano said. "We can take what we have learned about facilities and asset management and provide maximum reach for this capability for the DoD and other federal agencies and make it available to municipalities, universities and other users."

PHOTO CAPTION:

The SMS Team at an offsite planning meeting in 2021.



THE LAB:

Construction Engineering Research Laboratory (CERL)
Department of Defense
U.S. Army Engineer Research and Development Center

TEAM LEADERS:

Lance Marrano
Matthew Walters



Marrano and Walters redefined the software commercialization process, leveraging several technology transfer mechanisms to improve the accessibility of the software for external partners.



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Army Technology Transfer Program Plans for FY24

T2 TRAINING FOR SCIENTISTS AND ENGINEERS

In FY24, the ATTP will continue to develop and implement T2 training for S&Es at our T2-designated laboratories in order to promote T2 activities and improve familiarity with engaging and working with external partners. The training is intended to help S&Es understand the importance of T2 and that T2 activities are always an implicit part of any research or engineering activity. Raising the awareness of Army scientists, engineers, and other technical professionals to the statutory and regulatory requirements to include T2 considerations in their technical work is the purpose of this training.

ARMY CRADA ECONOMIC IMPACT STUDY

TechLink is currently assessing the economic and mission impact of approximately 6,500 Army CRADAs executed between 2001 and 2021. The data gathering phase is approximately 64% complete and the final report is expected to be delivered at the end of FY24. The assessment is expected to reveal significant impact to the U.S. economy and defense mission and demonstrate the effectiveness of CRADAs with industry to advance Army laboratory technology towards military transition as well as commercial end users.

IP AND T2 DATA MANAGEMENT SYSTEM

Army Senior Leaders and research, requirements, acquisition, and sustainment professionals have poor visibility on Army IP assets and products resulting from S&T and T2 activities due to decades of incompatible and outdated IP management processes. Digital transformation and modernization of the Army's business processes to track IP, T2 activities, and data rights provide enterprise visibility on the development of the products Army laboratories and PEOs are investing in, identify technological gaps, and align our modernization enterprise accordingly. The ADTT is procuring and piloting a cloud-based, enterprise-wide, COTS IP and T2 data management system. The system will automate various IP management functions including, invention reporting, patent docketing and maintenance, and will capture inventions resulting from government-funded research, including Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) inventions. The system will store all Army T2 agreements, metadata, and generate customizable reports. If feasible, the system will be offered to other Army and DoD organizations.

The Army anticipates contract award by the summer of 2024 and initial operating capability within two (2) years. The Army anticipates full operating capability within two (2) years of initial operating capability.



ARMY STANDARD CRADA TEMPLATE

A recent T2 Impact Study by TechLink strongly recommends standardizing T2 agreement templates across DoD. Adopting a generic standard CRADA across the Army will enhance business friendliness, make future software automation more feasible, and can leverage interservice lessons and updates, and will take a large step toward a standard DoD CRADA. Army CRADAs and all other T2 agreements will maintain clause options and situational flexibility.



