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Commercialization: Pushing the Idea

"Some of the best ideas for new products come from those who know a better way to do the job, but who lack the business acumen or capital," says Nick Tomlin, deputy director of the National Institute of Justice's (NIJ's) Office of Law Enforcement Technology Commercialization (OLETC), part of the National Law Enforcement and Corrections Technology Center system. "We give their ideas a push to get them out to the field more quickly. Since 1995, our mission has been to put technology into the hands of law enforcement and corrections."

OLETC's decision to provide commercialization assistance to a particular technology depends on whether that technology will add genuine value to the public safety field and falls within the needs and priorities established by the Law Enforcement and Corrections Technology Advisory Council (LECTAC). LECTAC is a national body of more than 100 criminal justice and public safety professionals representing local, State, and Federal agencies; associations; and courts. The advisory council also has representatives from Canada, the United Kingdom, and Israel. Tomlin says that if a technology meets the criteria, OLETC stands ready to provide market research and evaluation; application and competitive analysis; and information on intellectual property, licensing, strategic partnerships, and capital formation. OLETC also provides operational demonstration opportunities and coaches participants in project management and commercialization planning.

In addition to its day-to-day commercialization assistance initiatives, Tomlin says OLETC hosts three to four Commercialization Planning Workshops® each year for entrepreneurs with little experience in commercializing a product or for established businesses that want to pursue the public safety market. These 5-day workshops give technologists the tools and knowledge they need to take their ideas or products to market. OLETC also sponsors a yearly National Commercialization Conference to bring manufacturers and venture capitalists together with technologists and inventors.

But the ultimate opportunity to demonstrate new technologies and receive feedback, Tomlin says, occurs at the annual Mock Prison Riot at the former West Virginia Penitentiary in Moundsville. The event brings together hundreds of corrections officers and tactical teams to use and assess new technologies in realistic situations. Organized by NIJ, OLETC, the National Corrections and Law Enforcement Training and Technology Center, and the West Virginia Division of Corrections, the 2003 Mock Prison Riot on April 27–30 is expected to showcase 75 different technologies for almost 1,200 law enforcement and corrections professionals.

For more information about the commercialization assistance and activities offered through the Office of Law Enforcement Technology Commercialization or the technologies mentioned in this article, call 888–306–5328 or log on to the center's website, www.oletc.org. For information about the Law Enforcement and Corrections Technology Advisory Council, contact Jeff Vining, 800–248–2742, or e-mail, jvining@nlectc.org.

What could an orthopedic surgeon, a manufacturer of hearing equipment, an engineer from Ireland, and a former patrol officer possibly have in common?

Three things. They developed technologies they thought would benefit law enforcement and corrections officers, they lacked the experience or knowledge to bring these technologies into the criminal justice market, and they received commercialization assistance from the Office of Law Enforcement Technology Commercialization (OLETC).

Hand-in-Glove Fit

While the overall rate of AIDS[1] in the prison population is five times greater than that of the general population in the United States, an even larger problem may be hepatitis C, an incurable liver infection that can be spread through contact with blood and is generally contracted through intravenous drug use and shared needles. An estimated 1.4 million prisoners infected with hepatitis C travel in and out of the Nation's prisons and jails each year.[2] Needle-stick injuries occur often in law

enforcement, too, and less than 40 percent of officers injured seek medical attention.[3] Every time an officer pats down a suspect or inmate, that officer runs a risk of serious illness, even death.

Arizona surgeon Dr. Neal Gimbel had been experimenting with puncture-resistant gloves to protect medical staff from needle sticks and bloodborne diseases since the early 1980s. He worked on his ideas using hand molds and a vat of latex, first in his garage laboratory and then in corporate laboratory facilities. His perseverance paid off in 1995, when he received the first of four patents, and with the help of private investors launched the Gimbel Glove Company.

In 1999, Gimbel contacted the National Institute of Justice (NIJ) on how to approach the public safety market with the puncture-resistant gloves developed for the medical community. NIJ referred him to OLETC for help. OLETC invited Gimbel to bring his protective gloves to that year's Mock Prison Riot.

"The Mock Prison Riot is a great opportunity to do shoe-leather type of research for anyone marketing to the public safety community," says Wayne Barte, OLETC project manager. "If your product can't stand the rigors of real-life exercises, don't bring it. If these people don't like something, they'll tell you. They are very honest. They need to be—their lives depend on it."

Although the puncture-resistant gloves received strong positive feedback at the mock riot, sales were slow. "Law enforcement is an industry with well-connected, mature relationships that are hard to crack regardless of how good a new product may be," Barte says. "The company had sales representatives direct calling agencies with more than 100 officers and telemarketers calling smaller agencies, but they weren't making much headway. They were a small startup company out of Phoenix and no one ever heard of them before."

The company, according to Barte, needed a well-connected distribution partner that could get the gloves into the market. In keeping with its mission to get ideas into the marketplace, OLETC arranged for company president Gordon Pardy to meet with a representative from the Hatch Corporation, which has sold protective gear for more than 10 years. The gloves fit into Hatch's product line, and in May 2001, the two companies became partners in the marketing, sale, and distribution of the Gimbel Frisk and Search Gloves.

"We received invaluable assistance from OLETC," Pardy says. "We needed feedback from our potential [public safety] users, and we needed to learn how to adapt our marketing strategy from the medical community, which we knew, to that of the public safety market."

Hear It With Your Bones

More and more, law enforcement and corrections officers are sharing the same equipment needs as firefighters and other emergency response personnel. The ability to communicate over high noise levels is as much a priority with firefighters as it is with police. Also, corrections officers must work daily in cell blocks—open areas of steel and concrete, where the confusing din of shouting and clanging during a disturbance makes officer communication extremely difficult. OLETC and the Fire Fighting Task Force (FFTF) are helping to commercialize a technology originally developed for the U.S. Navy SEALs that allows all branches of public safety to communicate over high noise levels.

"You literally hear with your bones," says Harold Holsopple, president of Sensory Devices, whose company licensed the technology used to develop the Radioear tactical headset.

According to Holsopple, bone conduction technology bypasses the outer ear, sending and receiving audio signals via vibrations in the skull or cheek bones instead. It leaves the ears either uncovered and alert to surrounding sounds or covered and protected against background noise, as the user prefers. The perception of speaking and hearing is the same as in normal conversation. Because the microphone and receiver work by "hearing" with the bone structure of the head, tactical officers who do not want to be heard by suspects can communicate with each other in a hushed whisper that is easily heard by other members of the team. Also, because sound is transmitted through the bones, officers can maintain clear radio communication with each other with minimum interference from ambient noise in situations with very high noise levels.

The origin of the Radioear headset goes back a few years to when FFTF coordinator Robert Saba visited the U.S. Naval Coastal Station in Panama City, Florida, in search of potential technologies for use by firefighters. There, he came across the "head contact microphone," a technology developed by Naval Surface Warfare Center engineer Frank Downs at the request of the U.S. Navy SEALs. The SEALs were looking for a miniature waterproof microphone to use in full-face masks to overcome wind noise on high-speed boats. Saba immediately recognized its potential for firefighting applications.

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[1] Maruschak, Laura, *HIV in Prisons and Jails, 1999,* Bulletin, U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, July 2001.

[2] *Hepatitis C and Incarcerated Populations: The Next Wave for Correctional Health Initiatives,* Washington, DC: Association of State and Territorial Health Officials, November 2000.

[3] Lorentz, J., L. Hill, and B. Samimi, "Occupational Needlestick Injuries in a Metropolitan Police Force," *American Journal of Preventive Medicine* 18 (2) (February 2000).

In early 1998, Saba and Downs took a prototype of the head contact microphone, which had been incorporated into a firefighter's helmet, to Pittsburgh, Pennsylvania, for feedback from potential users. The technology, which was patented by the U.S. Navy, had been vividly demonstrated at a Metropolitan Fire Chiefs Conference in San Diego, California, when a fire company created 110 decibels of noise by running a chain saw, a pumper, and other equipment outside the hotel where the conference was taking place. A firefighter standing outside spoke into a standard radio and was unintelligible to the listeners in the hotel, but when he spoke while wearing the prototype head contact microphone, he was easily understood.

After reading about the prototype helmet in a Pittsburgh newspaper, the vice president of Sensory Devices contacted Saba. In July 1998, the company began licensing discussions with the Navy, and the company was licensed to develop and manufacture the microphone the following April.

Sensory Devices already had developed communication headsets that used electromagnetic bone vibration, but only for reception. The company relied on standard air microphones for transmission. With the new technology, however, Sensory Devices was able to incorporate bone-conduction microphones for transmission.

Recognizing how valuable this hands-free communication technology would be to law enforcement and corrections officers, as well as to firefighters, Saba invited Sensory Devices to demonstrate the technology at the 2000 Mock Prison Riot. Although the original mission of the FFTF was to develop technologies to assist and protect firefighters on the job, it has since developed a formal relationship between OLETC, the Federal Laboratory Consortium, and the National Aeronautics and Space Administration's Center for Technology Commercialization to include the needs of law enforcement and corrections professionals.

"The introduction of the Radioear headsets at the mock riot was positive beyond expectation," Holsopple says. "We did demonstration after demonstration."

As a result of the mock riot, the Minnesota Department of Corrections ordered a number of the devices for evaluation and has since ordered more. Lt. Carol Krippner, Special Operations Response Team Commander at the State's St. Cloud facility, has used the headsets in training. "The ability to communicate quietly, without open mikes, in a stealthy entry like a hostage situation is important," she says. "The team can be right on the other side of the wall from the inmates, getting directives from a commander. They know when they're given the green light to go in, and there's no beeps or feedback that you'd have on the open mike to alert the inmates." Conversely, in dynamic entries with a lot of noise, flashbangs, smoke, and lack of visual contact, Krippner says that team leaders can still communicate without problems.

Sensory Devices brought the headsets to the mock prison riots in 2001 and 2002, and will be returning for the 2003 event, during which the devices will be used and evaluated in various riot scenarios.

No Barring This Door

While installing vandal-proof sprinkler heads in an Irish prison, John Cosgrove of Clane, County Kildare, was asked by the warden if he knew a way to prevent inmates from barricading the doors and jamming the locks. Cosgrove, a mechanical engineer who holds international patents, went home, drew up some plans, tinkered with them, and built a prototype for a new type of door-frame system.

"Imagine a situation where inmates have their shoulders to the cell door while they're beating the living daylights out of an officer inside the cell," Cosgrove says. "It takes time to gain access in those circumstances, but with this door, an officer can gain access within 15 seconds."

Essentially, Cosgrove says, he designed a system that has a door within a double frame—a moving frame and a frame that's fixed to the wall. The door frame has hinges and security locks on either side of it. When the moving interior frame is unlocked, the door that normally opens into the room can then be opened out into the corridor, safely and quickly. Officers can access the barricaded area faster, without force and without damaging the door's hardware. After use, the door can be returned to full service within 15 minutes or less. In addition to its utility as a cell door, Cosgrove says, it is effective for use in passageways, clinics, and offices in jails and prisons where it can prevent prisoners from commandeering a corridor and creating unsafe, "no go" areas in a riot situation.

Cosgrove says that marketing to law enforcement and corrections in Ireland and England does not differ markedly from the process in the United States. However, one important difference arises when it comes to his barricade-proof door: Unlike cell doors in Ireland, most cell doors in U.S. correctional facilities open out into the corridor, preventing them from being barricaded from inside. This means, however, that prisons and jails in the United States are built with corridors 8 to 10 feet wider to allow safe passage when the cell doors are opened. By using a door that instead opens into the cell, Cosgrove says the cost of building a correctional facility could be reduced by 10 percent because the corridors would be narrower and thus reduce the amount of square footage. Correctional facilities with reduced square footage, he

says, would have lower maintenance, lighting, heating, and cooling costs.

In addition to showcasing the door at the various mock riots, OLETC provided Cosgrove with information and research assistance, performed market research, and knocked on a number of doors in pursuit of manufacturing partners. In 2001, Cosgrove and Maximum Security Products entered into a manufacturing license agreement that will allow the barricade-proof door to be manufactured in the United States for the North American market.

Code 3 "Back" Up

The Quebec Occupational Health and Safety Research Institute found that inadequate seats in police patrol cars can cause lower back pain.[4] *Driving can increase back pain in some people due to different forces—acceleration, deceleration, swaying—that act on the body when the car is in motion and the feet are being used to drive the car and cannot be placed on the floor to stabilize the body.*[5] *Add to those forces the hard equipment normally carried by officers on their duty belts, some of which presses against their backs and makes it impossible to get normal lumbar support. The result is back problems.*

Fernando Cuen used to spend up to 8 hours a day in his patrol car. Eventually he developed back problems so disabling he retired. The problem? An officer's duty belt often carries more than 20 pounds of equipment, and patrol vehicle seats are not designed to provide back support when the duty belt prevents the lower back from making contact with the seat. Although little documented research exists, anecdotal evidence shows that back pain is a real problem for officers who spend many hours in their vehicles. Cuen pondered the problem and came up with a design for a device. The Code-3 Squeeze™—in California, Code 3 signifies a priority call—is an ergonomic device designed to reduce back injuries by literally squeezing vehicle seats to allow room for duty belts and their accessories. Cuen says a 10-gauge, cold, rolled-steel bar clamps around the lower back of the seat, compressing the lower portion and creating a concave space where the equipment can fit. A padded cloth slipcover fits over the metal bar to provide protection from heat or cold and a pneumatic pump can be used to inflate three air bladders, allowing the officer to customize his or her back support.

Cuen, who had never been in business before, attended one of OLETC's Commercialization Planning Workshops. The result was the signing of a nationwide distribution agreement with the Enforcement Technology Group, which will market the device under the name Alleviator.

[4] Côté, Michèle, *Auto Patrol Duty and Back Problems in Quebec Police Officers,* Montreal: Quebec Occupational Health and Safety Research Institute, 1999.

[5] Hedge, Alan, *Driving and Back Care,* http://www.spineuniverse.com/displayarticle.php/article1541.html.

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