

THE

Journal

of California Law Enforcement

Volume 50 No. 2, 2016

Recruiting Amputee
Veterans – Changing
Perceptions and
Changing Lives

Law Enforcement
Rolls Out Drones

Robots and Cops:
Connect the Dots



CALIFORNIA
PEACE OFFICERS'
ASSOCIATION

Instructions to Contributing Authors

The *Journal of California Law Enforcement* welcomes articles relevant to the area of law enforcement from its readers.

The following guidelines should be observed:

Articles should be submitted by e-mail to cseva@cpoa.org. Articles should be between 1000-3000 words. A short biographical sketch (3-4 sentences) and photograph of the author should be submitted with the article. The article should be written in APA style. Photographs can be in black and white or in color, but will be reproduced in black and white. We strongly recommend the use of graphs, charts, tables, illustrations, or photographs.

Authors will receive a complimentary copy of the *Journal of California Law Enforcement* in which their article appears and a letter of appreciation will be sent to the author's department head.

Send articles to Cailin Seva, editor, *Journal of California Law Enforcement*, cseva@cpoa.org.

Executive Committee

President

SCOTT JONES

Sheriff, Sacramento County Sheriff's Department

1st Vice President

DAVID MCGILL

Deputy Chief, Newport Beach Police Department

2nd Vice President

MITCH MCCANN

Chief, Simi Valley Police Department

3rd Vice President

JOE FARROW

Commissioner, California Highway Patrol

Treasurer

MARC COOPWOOD

Captain, Sacramento Police Department

Immediate Past President

MARK YOKOYAMA

Chief, Alhambra Police Department

Executive Director

CAROL LEVERONI, CAE

This *Journal of California Law Enforcement* will be an agenda-setting publication for the law enforcement profession, providing a serious source of original thinking that will advance the performance of agencies and their leaders.

Opinions expressed in the Journal of California Law Enforcement are those of the authors. CPOA state board, appointees, staff and its membership does not endorse trademarked products mentioned in the Journal; their inclusion is solely at the discretion of the authors.

Editor

CAILIN SEVA

California Peace Officers' Association

Articles Reviewed By

JEFF NOBLE

Journal Subcommittee Chair

Publications & Public Affairs Committee

The Journal of California Law Enforcement is published quarterly by the California Peace Officers' Association. 555 Capitol Mall, Suite 1495, Sacramento, CA 95814

The annual paper subscription rate is \$40 for CPOA members and \$55 for nonmembers. Digital rates can be found at CPOA.org.

THE Journal

of California Law Enforcement
Volume 50 No 2

6. **Recruiting Amputee Veterans – Changing Perceptions and Changing Lives**
Captain Mike Hartmann, Ventura County Sheriff's Office

12. **Law Enforcement Rolls Out Drones: What Will be the Limitations the Policy Makers and the Public Impose**
Captain Scott Rudisil, Fullerton Police Department

20. **Robots and Cops: Connect the Dots**
Lieutenant Mark Salazar, Fresno Police Department

Recruiting Amputee Veterans – Changing Perceptions and Changing Lives

By: Captain Mike Hartmann, Ventura County Sheriff's Office

Steve Austin was a hero to many children who religiously tuned in to watch the television series *The Six Million Dollar Man* between 1974 and 1978. After Austin, the ace test pilot, suffered catastrophic injuries in a plane crash, the government decided, "...we have the technology to rebuild this man...better, stronger, faster" (Internet Movie Database, n.d.). At the time, the idea of someone becoming better, stronger, and faster through prosthetic technology was nothing more than science fiction.



Medical technology is advancing at a blinding rate. This includes research and technologies in the field of prosthetics. According to Dr. Steve Collins from the Massachusetts Institute of Technology, "Prosthesis technology is advancing quickly, and I do believe amputees will be much more capable in seven years" (S. Collins, personal communication, April 26, 2016). Is it possible that those who have suffered limb amputations will be rebuilt in the same manner as Steve Austin? If so, will law enforcement leaders find themselves on the leading edge of a recruiting pool with unexplored depths?

The War Wounded

Since the horrific events of 9/11, the United States has been entrenched in the global war on terror. Thousands of American service members have found themselves in battle theaters in Iraq, Afghanistan, and surrounding areas in support of our nation's mission. Many of these veterans later feel the call for invocation into the law enforcement profession once they leave military service. This is a natural transition because police officers and military veterans are "kindred spirits". According to veteran police sergeant with the Pinal County Sheriff's Office, Mark Clark, both "wear their uniforms with pride. Both don their uniforms to be part of a larger team of professionals protecting those who can't protect themselves at great personal risk. And, both operate within a command structure" (Clark, 2014, p. 1). The dream of a career in law enforcement, however, has been all but dashed for many of these brave men and women who suffer significant traumatic injury while serving, particularly the amputation of one or more limbs.

Battle wounded veterans are returning in unprecedented numbers. Advances in battlefield medicine have resulted in many of our war-injured surviving wounds that

Captain Mike Hartmann is an eight year naval veteran and 21 year veteran of the Ventura County Sheriff's Office. He currently manages the East County Investigations Bureau. Mike has experience in detention services, patrol and investigations. Mike has served as a member of his agency's Veterans Affairs Committee, providing support to department members serving in the military abroad, and is passionate about supporting our nation's returning war veterans.

would likely have resulted in fatalities in prior wars and conflicts. While this increased survival rate is a credit to military medicine, the nation is seeing an influx of severely disabled veterans in need of treatment, long term care, and employment (Bilmes, 2007, p. 2). According to a recent article in The Huffington Post, there are “more than 1,500 Americans [who] have lost an arm or leg in the wars in Iraq or Afghanistan, and hundreds more who have suffered amputations of multiple limbs” (Wood, 2012, p. 1). The Bureau of Labor Statistics does not specifically track what percentage of law enforcement officers are veterans (Peterson, 2013, p. 1). However, according to Donna Smith, a personnel analyst with the Ventura County Sheriff’s Office, about 16% of that agency’s more than 11,000 deputy sheriff applicants were military veterans in their most recent survey in 2013 (Smith, D., personal communication, May 13, 2016). It stands to reason that thousands who have suffered so much now populate our nation’s military hospitals and rehabilitation centers, searching for their places in the world and their futures. Of that number, many may have had dreams of careers in law enforcement. Historically, prosthetic limbs were an immediate disqualifier from employment as a sworn peace officer. That norm, though, is about to change.

Prosthetic Limbs – Myth and Reality

With the rapid evolution of prosthetic technology, there will be a time when men and women could be equipped with bionic limbs, though not likely with super human strength. According to Dr. Thomas Sugar from the University of Arizona, “that technology (e.g., super human strength) will be out there, but it is in the distant future” (T. Sugar, personal communication, April, 27 2016).

Currently, amputees are fitted with prosthetics with more and more capabilities. For example, one of the most difficult challenges for an above-knee leg amputee to do is pick up the limb and easily navigate obstacles. Recent technology pairs robotics with prosthetics and anticipates the movements of the amputee. This advancement enables the amputee to push off the ground and navigate obstacles like changing terrain or stairs with little extra effort (Burke, 2012, p. 2). Previously, the amputee would have to focus on the obstacle and slowly navigate it. These advances allow the user to move freely and traverse obstacles in a manner required for law enforcement officers and other professions that require similar mobility.

Leg prosthesis technology is advancing, and the knee is a key component to balance. An above knee amputation impedes a lot of the control needed for activities such as running and jumping. For the equipment to function at the level of the natural limb, “engineering that is 99.999% accurate is needed. Currently, leg prosthetics function at about 85% accuracy; if an amputee were to walk 10,000 steps in a day, the device would make 1,500 mistakes” (T. Sugar, personal communication, April 27, 2016). Notwithstanding, the future is bright. When one looks at the advancement of leg prosthesis over the next five to seven years, there “is a strong possibility that users will be able to walk and run at the same efficiency as non-amputees” (S. Collins, personal communication, April 26, 2016). This technology will level the playing field for amputees desiring to enter law enforcement, and being a leg amputee will no longer be an issue.

The dexterity requirements associated with arm and hand prosthesis pose

their own significant challenges when trying to create a limb that performs as well as or better than the natural limb it replaced. A sense of touch is essential for upper-limb prosthesis; without appropriate sensory feedback, the user has difficulty perceiving limb position and limb movement. Researchers are working to implement and improve haptic technology in prosthetic devices. Haptic technology is the “science of applying tactile sensation to human interaction with computers” and permits users to feel and manipulate objects (Yadav & Krishnaiah, 2013, p. 139). Over the past nine years, military veterans have field-tested a neuroprosthetic arm that was about the same size and weight of a natural arm and was equipped with robotic technology. The test found that “about 90 percent were able to do things they couldn’t do with a less-sophisticated artificial limb, like using a key, putting food in their mouths, or unzipping their pants” (Kirsner, 2014, p. 2). While there have been advances in these areas, haptic technology is still relatively new, and upper-limb prostheses are still some distance from the open market. Even with the advances in direct neural control of prosthetic limbs, the more dexterous maneuvers remain uncertain, with that technology most likely being 20 years out (S. Collins, personal communication, April 26, 2016). Regardless of the promise this technology brings, a prosthetic hand with the tactile ability needed to perform functions such as gun trigger pull, control holds, or other use of force does not seem likely in the foreseeable future. Generally, the lack of tactile ability would be a disqualifying factor for employment in law enforcement. “We cannot trust that the hand will do what we want every time we want it to, and not do what we don’t want it to.” (T. Sugar, personal communication, April, 27 2016). As law enforcement officers are often required to use both hands during force incidents, this concern remains even if the user has a prosthetic on his or her off hand. This concern is not as prevalent when considering leg amputees who in many cases can meet the requirements and challenges of the job.

Amputee Cops

According to a 2015 article discussing the hiring of veterans into police agencies “As the wars in Afghanistan and Iraq wind down...a number of veterans will, like some Vietnam veterans a generation earlier, see law enforcement as a comfortable complement to their military service.” (Eldridge, 2013, p. 1) Currently, though, veterans who have suffered amputation are not part of this equation. The physical requirements of the profession coupled with the limitations of current prosthetic technology discourage law enforcement agencies from looking to these people as possible applicants, but these applicants should not be dismissed outright. If they are, law enforcement agencies are likely missing excellent viable applicants. According to Ventura County Assistant Sheriff, Steve DeCesari, “We have recruited at military bases and look for veteran applicants. But, we have not specifically recruited amputee veterans. As long as they can meet the same requirements as all the other applicants, it might be something to explore. It is very important that we do not lower our hiring standards, particularly for sworn officers.” (DeCesari, S. personal communication, May 11, 2016).

Recruiting qualified and dedicated applicants has long been a challenge for police agencies across the United States. Historically, law enforcement agencies have

found the recruiting pool to be quite wide, with ample applicants to fill their swelling ranks. However, in the past several years, agencies have found it increasingly difficult to attract and train a sufficient number of qualified applicants, and “new challenges of the 21st century, including military call-ups, homeland security obligations, and increased population, have combined to make the problem more acute. While many agencies are struggling, others are moving forward with innovative approaches” (Pearsall & Kohlhepp, 2010, p. 128-129). With these challenges comes opportunity, if agencies look in new places and make new partnerships.

With today’s law enforcement agencies severely understaffed, many agencies welcome the influx of returning service members interested in law enforcement employment, and “the prevailing perception is that individuals with military experience make desirable law enforcement employees” (Bureau of Justice Assistance, 2009, p. 17). This is also becoming true with respect to applicant veterans equipped with prosthetic limbs.

There is an emerging trend in law enforcement in which agencies are becoming more open to the idea of hiring police officers with prosthetic lower limbs. In 2014, the Brevard County Florida Sheriff’s Department hired an Iraqi war veteran named Robert Smith with a prosthetic leg for the position of deputy sheriff (Ford, 2014, p. 1). According to Sergeant Daryl Osborne, who is assigned in the Career Development Division of the Brevard County Sheriff’s Department, “Deputy Robert Smith has recently completed his field training program and is working as a solo patrol officer. Robert is coming along well and his supervisors have reported no issues or concerns with his abilities or performance. He has been required to meet all the standards required of a deputy sheriff, and has been able to do so with no problems.” (D. Osborne, personal communication, May 13, 2016). Deputy Smith was required to meet the same physical requirements as every other applicant. Although equipped with a prosthetic device, he met the challenge.

Able-Bodied Veterans

It is undisputed that military veterans are strong candidates for the transition in to law enforcement, but the focus is on so-called “able-bodied” veterans who have completed their service commitments. If police agencies understand that veterans with amputations have the potential to be as able-bodied as those without, recruitment efforts can be expanded to include active duty military hospitals and rehabilitation centers. Through communication and continued partnership with military services, those amputee veterans who have been able to regain most, if not all, physical abilities can be referred to agencies for recruitment testing. All members who are in the process of separating from the military, including those who have suffered disability and are being separated as a result, must go through a Transition Assistance Program, or TAP. The TAP includes career counseling and job transition assistance. (Military Separation Guide, 2016). Through a partnership with law enforcement, the hospital and rehabilitation center personnel will gain a clear understanding on the requirements and make referrals of those who desire a career in law enforcement and pose the greatest chance of success.

Recruiting amputee veterans who are capable of meeting physical

requirements not only provides law enforcement with a previously untapped resource. It will also provide these veterans with a sense of hope for their futures and a feeling that they can still achieve the goals they had before they went off to fight for our nation. This sentiment is well illustrated by words of retired marine William Gadsby, who suffered an above knee leg amputation as result of injuries sustained while fighting in Iraq: "I was living under a dark cloud for a long time; having your limbs taken away takes some of your dignity away" (Burk, 2012, p. 2). Law enforcement can play a key role in restoring the dignity of men and women who have suffered the same experience as William Gadsby. All it takes is looking for applicants somewhere new. In doing so, law enforcement has an opportunity to improve its ranks and provide a much-needed service to people who have given so much for all of us.

Going There

As with many large, historical institutions, American law enforcement is rich in tradition and ingrained in its culture. As such, changes in attitudes and beliefs take time and evolution. What was considered an ideal police candidate fifty years ago is far different from today. Women and minorities have joined the ranks, making agencies more diverse and representative of the communities they serve. It took a change of attitude and a willingness to look in new and unique places for police recruits.

Today, law enforcement again finds itself on the cutting edge of another opportunity to go somewhere new and recruit those who have been previously overlooked. In September 2009, The Bureau of Justice Assistance released a report that listed positions within law enforcement agencies that can be filled by amputee veterans to provide them the opportunity to fulfill a law enforcement career as a future priority (Bureau of Justice Assistance, 2009, p. 48). Experts are unsure of exactly when, if ever, prosthetic technology will reach the stage where someone can be rebuilt to a condition where they are as physically capable as they were before they lost one or more limbs (T. Sugar, personal communication, April 27, 2016). What is clear is that over the next five to seven years, advances will continue, and amputees will be much closer to having the physical abilities they had before their injuries, particularly with lower limb amputations. Many of these amputees will be American military veterans who dream of careers in law enforcement. Law enforcement agencies should look to them to fill our ranks. We should go there.

References

- Bilmes, L. (2007). Soldiers Returning from Iraq and Afghanistan: The Long-term Costs of Providing Veterans Medical Care and Disability Benefits. John F. Kennedy School of Government Faculty Research Working Paper Series. Retrieved August 1, 2015 from <http://ssrn.com/abstract=939657>
- Bureau of Justice Assistance. (2009). Employing Returning Combat Veterans as Law Enforcement Officers. Retrieved April 22, 2016 from <http://www.iacp.org/Employing-Returning-Combat-Veterans-as-Law-Enforcement-Officers>
- Burke, M. (2012). Advanced Prosthetics Pair Limbs with Robotics. Stars and Stripes. Retrieved July 7, 2015 from <http://www.stripes.com/news.advances-in-prosthetics-pair-limbs-with-robotics-1.197530>

- Clark, M. (2014). Military Vets Joining Law Enforcement. Police, the Law Enforcement Magazine. Retrieved July 7, 2015 from <<http://www.policemag.com/channel/careers-training/articles/2014/01/military-vets-joining-law-enforcement.aspx>>
- Eldridge, L. (2013). PTSD and Police: Hiring and Retaining War Veterans in our Ranks. PoliceOne.com News. Retrieved July 7, 2015 from <<http://www.policeone.com/police-jobs-and-careers/articles/6222919-PTSD-and-police-Hiring-and-retaining-war-veterans-in-our-ranks/>>
- Ford, A. (2014). Marine Overcomes Amputation, becomes Deputy. Washington Times. Retrieved July 5, 2015 from <<http://www.washingtontimes.com/news/2014/sep/1/marine-overcomes-amputation-becomes-deputy>>
- Internet Movie Database. (n.d.). Retrieved April 26, 2016 from <http://www.imdb.com/title/tt0071054/>
- Kirsner, S. (2014). Getting Advanced Prosthetics to Those Who Need Them. The Boston Globe. Retrieved July 19, 2015 from <https://www.bostonglobe.com/business/2014/09/13/the-biggest-challenge-for-advanced-prosthetics-may-getting-people-who-need-them/uRnjueXxHGX1c1kDOAxFUL/story.html>
- Military Separation Guide (2016). Vets First. Retrieved May 16, 2016 from <http://www.vetsfirst.org/military-separation-guide>
- Pearsall, A. & Kohlepp, K. (2010). Strategies to Improve Recruitment. The Police Chief. Retrieved August 15, 2015 from http://www.policechiefmagazine.org/magazine/index.com?fuseaction=print_display&article_id=42010
- Peterson, G. (2013). From military to police force: A natural transition? East Bay Times. Retrieved May 13, 2016 from http://www.eastbaytimes.com/news/ci_23886232/from-military-police-force-natural-transition
- Wood, D. (2012). U.S. wounded In Iraq, Afghanistan Includes More Than 1,500 Amputees. The Huffington Post. Retrieved May 5, 2016 from http://www.huffingtonpost.com/2012/11/07/iraq-afghanistan-amputees_n_2089911.html
- Yadav, S & Krishnaiah, R. (2013). Haptic Science And Technology. International Journal of Computer Engineering & Applications. Retrieved May 17, 2016 from <https://arxiv.org/ftp/arxiv/papers/1309/1309.0185.pdf>

Law Enforcement Rolls Out Drones: What Will be the Limitations the Policy Makers and the Public Impose

By: Captain Scott Rudisil, Fullerton Police Department

Law enforcement has been dealing with shrinking budgets, layoffs and reductions in services since the economic downturn in 2008. One area that has had the most growth and advancement in policing, though, is the use of technology tools. These technologies include analytical software, nanotechnology and drones with current and future applications. Although all of the potential advances in technology may be critical to public safety, none has created more controversy than the considered use of unmanned aerial vehicles (UAV's) or drones by the police.



Drone and UAV use by suburban police agencies will rise in the coming years. There will be concerns that will need to be researched and addressed to provide assurances to the communities they serve. Limited use of this technology has been met with minimal resistance from the public and mostly over privacy concerns. With the deployment of drones or UAVs in a relatively small geographic area, research and practical experience will help shape a community's perception of their level of safety as aerial vehicles create the ability of the law enforcement agency to better keep the community safe. The need now is to assess the trade-offs; what might be the community's level of acceptance of drones and UAV's be compared to current policing methods with consideration given to cost savings.

Background

Drone and UAV technology has been developed and utilized by the military for many years as both a surveillance platform and in a combat capacity. In the 1960s and 1970s, United States Air Force engineers worked on unmanned aircraft for surveillance flights. Major improvements in computing and electronic controlling systems in the 1980s and 1990s made modern day drones possible (Sifton, 2012). With the invasions of Afghanistan and Iraq after 9/11, drones rapidly became an essential tool of the U.S. armed forces. The Pentagon armed the Predator and a larger unmanned surveillance plane, the Reaper, with missiles,

Captain Scott Rudisil is a 25-year veteran currently assigned as Support Services Division Commander. Prior assignment include: Patrol, Community Policing, Gang Unit Detective, OCDA Gang Task Force, Crimes Persons Detective, Patrol Sergeant, Communications Manager, Gang Unit Sergeant, Patrol Lieutenant, Lieutenant Traffic Bureau Commander, and Captain- Support Services Division. His education includes: a Bachelor's Degree Criminal Justice CSUF, and a Master's Degree Emergency Management, CSULB.

so that their operators- sitting in office in places like Nevada or New York- could destroy as well as spy on targets thousands of miles away (Horgan, 2015). As technology progresses, drones and UAVs have become smaller and less expensive for local law enforcement to obtain and utilize. Drones and UAV's are terms that are interchangeable, although the civilian population tends to refer to them as drones.

Law enforcement is currently looking at drones that are more expensive than recreational drones flown by hobbyist. Domestic drones currently cost between \$10,000 and \$20,000 for a small system which stays aloft only 15 minutes, to more than \$1 million for a sophisticated fixed-wing drones that can remain aloft for hours (Francescani, 2013). There are many options between these extremes. For instance, the Alameda County Sheriff's Office purchased two QuadRotor QR425s drones for \$48,500 each. Law enforcement prefers these more sophisticated drones because they have better avionics, encrypted electronics, durability of materials such as carbon fiber, imaging and sensor capabilities and autonomous flight controls. Drones differ from traditional model airplanes in that they are able to hover, can easily change direction and altitude, can fly autonomously, and are usually computer-operated while remote-controlled aircraft are managed through radio transmissions (Kowalski, 2015). Drones can be an effective, efficient, reliable, and cost effective tool to use in certain capacities. As we move into the future, policing should consider adding drones to their capacities to deliver better quality safety services in more efficient ways.

Use For Police Operations

Drones and UAVs can be used in a routine patrol function and reduce the number of officers needed, thus are a substantial cost savings. Drones can be flown in shifts similar to helicopters. A helicopter costs \$600 to \$650 an hour to fly, which is substantially more than the cost to fly a drone. Most agencies cannot afford a helicopter and rely on mutual aid to use one in the area. They are not always available due to being primarily used to support the agency they belong to.

A drone can patrol rural areas, often arrives on scene first and provides critical information to responding officer by potentially collecting video evidence of a crime in progress. They can also assist in documenting crime scenes. These capabilities could allow for fewer officers deployed in the field.

Drone technology has dropped in price and the equipment is easier to fly. With the reduction in budgets, many agencies are looking for a more economical way to provide police services. For instance, drones have been used in search and rescue for a lost hiker in the Angelus Forrest in Ventura County, according to Commander Chris Dunn of the Ventura County Sheriff's Office. Dunn said their drone was able to search in areas a helicopter couldn't see, such as under large rocks and thick brush. They eventually located the lost hiker. However, he had already perished.

Alameda County's drones would initially be deployed for search and

rescue, tactical operations and major incidents, according to Sheriff Greg Ahern (O'Brien, 2014). This is a cost effective expansion of the use of helicopters and fixed surveillance cameras. Firefighters are also considering their possible use in scouting wildfires or to find people trapped in areas where helicopters cannot fly (Newcombe, 2013).

Drones for law enforcement have become a serious topic of discussion, and not just in the United States. Every drone replaces a cop on patrol and frees up valuable person-hours. The Tijuana Chief of Police Alejandro Lares said in 2014, "It's like having 20 officers on patrol or more." (Amato, 2014). Of course, the public has also begun to purchase and fly UAV's for recreational purposes. This makes the job of the police both easier and harder.

FAA Regulations

Efforts are underway to make it easier for public safety agencies to fly the unmanned aerial vehicles in regulated airspace. The FAA has a process in place for commercial use of drones by applying for a Certificate of Authorization. It is an authorization with specific conditions outlined including where they can fly, hours of operation and pilot training. In a December 21, 2015, press release, the FAA (which controls all commercial airspace) announced the implementation of a web-based registration system for small unmanned aircraft systems weighing more than .55 pounds and less than 55 pounds if they are flown outdoors and for recreational purposes (Dorr and Duquette, 2015). This is the first step to regulate the drone industry, which is growing exponentially and until now, unregulated. A few well known incidents of recreational drones crashing at the White House, the U.S. Open in New York and the University of Kentucky football stadium illustrate the need for regulations. The Consumer Technology Association estimated that 400,000 drones would be sold during the 2015 holiday season (Cromartie, 2016). More and more recreational drones will be in the skies, requiring law enforcement to find a way to safely navigate their drones in limited airspace.

With recreational and police drones becoming more commonplace, the public will likely be apprehensive about their privacy. Law enforcement will have to clearly mark their drones and illuminate them with distinctive lighting, so the public can readily identify them from the ground during daylight and night time conditions. This will enable the public to see who is flying above and report any privacy concerns when they arise.

Concerns of Law Enforcement Using Drones

As drones become commonplace as police equipment, concerns will arise regarding personal privacy from surveillance and the safe operation of drones by law enforcement. Privacy concerns will need to be addressed via legislators and local policy makers. There will also be safety concerns with the use of multiple drones or UAVs in a small geographical area. The most significant problem will be the community's perception of safety. Drone use means potentially having fewer officers on the beat and a highly visible presence of the aerial vehicles above. No

one has publically said that drones will reduce the number of officers in patrol. However, during an April 2015 panel discussion with law enforcement experts, one panelist believed that this is a distinct possibility in the future.

Another concern from an April 2015 expert panel discussion was the ability for law enforcement to fly drones safely. Aircraft pilots reported 238 sightings in 2014 to more than 650 by August of 2015 according to a recent FAA report. That's just a small fraction of the hundreds of thousands of drones flying in the sky (Greenemeier, 2015). Firefighters in Southern California had to ground their air operations in San Bernardino County in July 2015 because of fears of midair collisions with drones that were being flown by hobbyists to capture video of the wildfire.

Public privacy and public trust of law enforcement are also issues. A Monmouth University Polling Institute revealed that 69 percent of Americans would feel their privacy was threatened if law enforcement began using drones with cameras and recording equipment (Rosenberg, 2013). Another significant concern is that the community would lose their ability to have that personal relationship with their police department if drones replaced patrol officers, according to the expert panel's perspectives.

The Alameda County Sheriff's Office and the Ventura County Sheriff's Office have used drones with no serious public outcry. They have been used for search and rescue missions. According to Commander Chris Dunn of the Ventura County Sheriff's Office, a drone has been used to help in SWAT operations, searches and rescues, surveillance, and hazardous materials calls (Gonzales, 2015). The question for the public and policy makers will be what the use will be and how fast will they become mainstream. If law enforcement uses drones appropriately, safely and within statute and policy limitations, public acceptance of their use will become more widespread and accepted.

Law enforcement must adapt and be responsive to emerging technologies to reduce crime and provide safety in the community. The implementation will be key to the success of using drones for routine patrol.

CA Police Agencies Seeking to Use Drones

An Alameda County Board of Supervisor's Public Protection Committee had a public hearing in February 2013 regarding the possible use of drones by the Alameda County Sheriff's Department. The Sheriff indicated that he planned to use drones for search and rescue, firefighting, bomb detection and crime scene preservation. Opponents said, "We oppose the use of public resources used to surveil its citizens." Many of the 150 people in attendance applauded the comment (Kravets, 2013). Ultimately, the Alameda County Sheriff's Office received a one-year Certificate of Waiver of Authorization (COA) from the FAA in July 2015.

The ACLU had concerns of a drone hovering over someone's backyard with high-powered imaging capabilities. The ACLU has noted that currently drones are not legislated (Salazar & Zak, 2013). The Associated Press reports that in February 2015, the Berkeley City Council considered whether to impose a two-year

moratorium on police use of unmanned aircraft so the city can study the issue and develop a policy. Hobbyists will still be able to fly drones. The concerns were with privacy, indicating that at least four cities have banned their police departments from using the technology. There will continue to be debate as various agencies contemplate their use.

Recommendations to Research, Gain Approval and Implement Drones For Policing Ops

To what extent drone use will prevail is to be determined on three factors. First, the proper and successful implementation by law enforcement. Second, the anticipated cost savings. Third, and most importantly, the community's perception of feeling safe and their willingness to have potentially less interaction with law enforcement on the beat.

Within the year, the FAA must allow government agencies to operate drones weighing 25 pounds or less as long as certain conditions are met (FAA Modernization and Reform Act of 2012-H.R. 658). Agencies must seek and receive a Certificate of Authorization (COA) to deploy drones in the National Airspace System (NAS). The COA authorizes an operator to use defined airspace to include special provisions unique to each operation. FAA believes the safest and most successful jurisdiction-wide deployment of drone technology that supports public safety agencies is accomplished through a two-phase process. Initial COA (Phase 1) is generally restricted to training and evaluation confined to Class G airspace (clear of housing, roads, persons) and is designed to bring pilots to a high level of proficiency. Phase 2 is the operational COA (emergency procedures, SOP, communications) and identifies jurisdictional boundaries, unique operational areas within jurisdiction and their hazards. This is a significant building block in the program that will help ease some of the safety concerns the public will have.

Other items that should be completed to successfully implement the use of drones include:

- Review policies and procedures for each phase of flight operations, which must include FAA specifics.
- Review Safety Risk Analysis Plan (SRAP) that identifies jurisdictional limits, all unique operational areas and their attendant hazards.
- An FAA evaluation of a drone exercise to demonstrate the competency and safety of the drone program. Estimated to be a 12 month process before issuance of Operational COA.
- Hold draft policy meetings with the Public Defenders Office, District Attorney's Office, FAA certified pilots, and the ACLU to address privacy concerns.

Drones are relatively inexpensive compared to using a helicopter that costs between \$600-\$650 per hour to operate. In two panel discussions with community leaders, business owners and several members of the Fullerton Police Department, members stated that they like having direct contact with the police and some have developed strong working partnerships in the community. For

the Fullerton community, that relationship is very important. They did realize for many large agencies those relationships may not exist or are not as strong. The officers involved in the panel discussion agreed that drones are a logical step in using newer technologies, reducing costs and still providing quality public safety to the community.

Buy-in must be obtained from the affected communities, prosecutors, defense attorneys, ACLU and the aviation community. Public meetings and input must be considered as the programs are developed. An incremental implementation with defined missions and applications with assessments and adjustments is necessary. Having the community involved in the policy making and implementation of the plan will help garner public support. Highlighting success stories and making adjustments will reinforce the police-community collaboration.

Locally, in February 2016, the Anaheim Police Department used a quad copter to photograph a crime scene in an investigation of a person who was shot and killed by police (Duranty, 2016). This is an example of a cost effective use of a drone that is acceptable by most in the community.

Conclusion

Law enforcement is constantly trying to streamline policing services while not compromising service. Embracing technology is a likely way to achieve that goal. City administrators and local officials will support drone use under certain assurances of compliance with policy, safety and proper implementation. The capability of the technology at a reasonable cost will pressure police agencies to implement drone use to become more cost effective, efficient and versatile in providing police service.

As law enforcement experiences success deploying drones, the public will accept more uses such as patrolling the skies at major outdoor events, identified high crime areas and eventually routine patrol. This is merely a cost effective expansion of the use of helicopters and fixed surveillance cameras, both of which are fairly commonly used in most communities. Drones would be more versatile and cost effective adding to the appeal of law enforcement and local governments.

A balance of officers on the beat and drones in the sky will be the recipe that works for most communities in the not too distant future. Those who embrace it will likely reap the benefits. Society moves forward with technology and those who don't use it will be left on the ground, and left behind.

References

- Amato, Andrew. (2014, March). Drones in Law Enforcement. Retrieved from <http://dronelife.com/2014/03/17/drones-in-law-enforcement/>
- Cromartie, Tim. "Drones: A Growing Hazard in the Absence of Tighter Regulations" Western City (2016, February)
- Dorr & Duquette. (2015, December). Press Release- Unmanned Aircraft Registration System Takes Flight. Retrieved from http://www.faa.gov/news/press_releases/news_story.cfm?newsid=19874

- Duranty. (2016, February). Update: Anaheim resident identified as 22-year-old man shot, killed by Anaheim police officer. Retrieved from <http://www.ocregister.com/articles/police-703401-park-officer.html>
- Francescani. (2013, March). Domestic drones are already reshaping U.S. crime-fighting. Retrieved from <http://www.reuters.com/article/2013/03/03us-usa-drones-lawenforcement>
- Gonzalez. (2015, September). In absence of legislation, county sheriff's office sets own drone protocol. Retrieved from http://www.toacorn.com/news/2015-09-03/Community/In_absence_of_legislation_county_sheriffs_office_s.html
- Greenemeier. (2015, August). Dogfight against Rogue Drones Begins. Close encounters between aircraft pilots and unlicensed drones in the U.S. have nearly tripled in the past year. Retrieved from <http://blogs.scientificamerican.com/observations/dogfight-against-rogue-drones-begins/>
- Horgan. (2015, February). The Drones Come Home. Unmanned aircraft have proved their prowess against al Qaeda. Now they're poised to take off on the home front. Possible missions: patrolling borders, tracking perps, dusting crops. And maybe watching us all? Retrieved from <http://ngm.nationalgeographic.com/2013/03/unmanned-flight/horgan-text>
- Kowalski. (2015, September). From sports to law enforcement, drones flying into everyday life Retrieved from <http://exclusive.multibriefs.com/content/from-sports-to-law-enforcement-drones-flying->
- Kravets, David (2013, February) California County Inching Toward Drone Deployment? Retrieved from <http://www.wired.com/3013/02/alemeda-drone-deployment>
- Newcombe, Tod. (2013, April). "The Benefits of Drones, Police on Pinterest, and a Successful IT Consolidation". Retrieved from http://governing.com/templates/gov_print_article?id=200613651
- O'Brien, Matt. (2014, December). Alameda County sheriff buys two drones. Retrieved from http://www.mercurynews.com/crime-courts/ci_27059034/alameda-county-sheriff-buys-two-drones.
- "Northern California city considers police ban drone use." (February 25, 2015). Retrieved from http://www.sanluisobispo.com/2015/02/25/3507715_northern-california-city-considers.html?rh=1
- Rosenberg, Ethan. (2013, August). Poll: Americans Against Warrantless Drone Use. Retrieved from <http://www.usnews.com/new/newsgam/articles/2013/08/16/poll-americans-against-warrantless-drone-use>
- Salazar, Denise and Zak, Annie (2013, July). Law-enforcement drones might hover over O. C. Retrieved from <http://www.ocregister.com/common/printer/view.php?db=ocregister&id=517863>
- Sifton, John. (2012, February). A Brief History of Drones-With the invention of drones, we crossed into a new frontier: killing that's risk-free, remote and detached from human cues. Retrieved from: www.thenation.com/

Robots and Cops: Connect the Dots

By: Lieutenant Mark Salazar, Fresno Police Department

As Carlos walks to the front door, he can hear screaming and an argument between a man and a woman. Carlos tells his partner that he is going to make an attempt to call the male out of the home. Behind Carlos are a half-dozen of his peers, dressed in fatigues and armed with long guns. Carlos remembers a class that taught them how to de-escalate violent encounters. The male involved in the disturbance responds to Carlos and begins conversing with him.

They talk for over 30 minutes, and Carlos is able to convince him to give up. The man, who was armed with a knife, exits the home, and submits to Carlos. The man immediately recognizes Carlos looks like him, talks like him, but recognizes Carlos doesn't move as nimble as the other officers. At the station booking area, he asks Carlos why he walks and talks differently. Carlos responds, "I can laugh and sweat like you, but I am not human, I have been trained to handle these types of situations."



Background-Robotics Industry

We often relate to robots to the movies and TV shows we watched as kids. What many do not know is that the robotic industry has grown this past half century from science fiction to near-term reality. Japan has been the leader of robotics for the past 60 years. For example, in 2015, Japan opened the first all-robot hotel. The hotel has featured over a dozen robots performing human-like tasks such as front counter service, maid duties, and dinner staff. The hotel featured robots that had human-like appearances. These humanoids caused patrons of the hotel to feel comfortable and this led to decreased anxiety over robots and their use in the hotel industry (Wong, 2016).

One of the advancements by Japanese scientists has been the drastic improvement in the humanoid-robot sector. Toshiba's "Aiko Chihiro" is now in a large Department store in Tokyo working in customer service. The robot can talk and communicate with sign language. The robot has left mall goers with a friendly impression. The success of Aiko Chihiro has Toshiba examining and improving their current model to a more in-depth social robot by 2020 (Prigg, 2015). Japan often cites "Aiko Chihiro" as their model humanoid (Chihiro, 2015). Hagi-San, of the University of Tokyo, led the robotic engineering design at the "Henna-na Hotel," Japan's first robotic hotel. The hotel has been viewed as an efficient concept in

Lieutenant Mark Salazar is assigned as the Southwest District Commander. Previous assignments included: Homicide and Robbery Commander, Southeast District Commander, Compstat Commander, Internal Affairs, Gang unit, and a team member and supervisor on two tactical teams.

a customer-service driven business (Smith (2015)). A robot attached to a tactical team that is proactive and making community contacts is in the same customer-friendly business of engaging the public. With the success of the Henna-na Hotel, the potential exists for robots in police to efficiently interact with the public.

Presently, robots can interact with the community. For example, in Japan, there are robots that are being tested that can feel others emotions and react to those emotions. Japanese Robotics Expert Hiroshi Ishiguro, of Osaka University, created a humanoid-robot that can communicate with the public (Alba, 2014). These same robots can sweat, cry, and get goose bumps. The testing so far has yielded positive results as the robots have adapted to their environment. This situational awareness has been hailed as critical in robotic development. Police work is about making split-second decisions ranging from counseling a victim of domestic violence to engaging an armed gang member (Murphy, 2015). If robots are created to “feel emotions” and respond to humans empathetically in crisis circumstances, they can be beneficial and useful for the police.

Robots Are Job Creators, Not Job Replacers

Last year, Google poured billions of dollars in the nine robotic companies they now own. They promised to cross over their technological advancements into robotic development. One of the challenges of a law enforcement robot will be to find a partner in the private sector or military who is willing to have a police agency act as a “pilot” program. There are just a handful of United States companies that are progressive in this field and thousands of law enforcement departments countrywide. The agency that partners with a leading robotic group like Google will have an edge in introducing robots to law enforcement tactical teams (Google Puts Money, 2013).

The robotic industry will create more high-end jobs according to many experts. Vint Cerf, one of the early investors of the Internet, believes technological advancements, like robotic development, will create more jobs (Anderson, 2014). This is encouraging, as doubters think robotic development would take away officer’s jobs. According to Detective Brad Stevens, a Central Valley police union official, “If robots took away from the duties of a real officer then I would not be for it.” (B. Stevens, Personal Communication, February 29, 2016). This is key in winning support from police unions who will be initially fighting the idea of a robot introduction into law enforcement. Significant outreach efforts to the unions and governments will be needed for accurate and mutual understanding. A possible outreach effort is to have a Dubai official visit and give an overview of their successes with the police robots they have incorporated into their police force. If these unions know the agency is leveraging technology, robot development, to make officers’ jobs easier or make them safer, they may be more understanding (Smith, 2014).

Law Enforcement Should Use the Military Model of Deploying Robots

For law enforcement to be successful in this arena, it may follow the lead

of the US military. Currently, the United States Army is using robots to downsize their support staff. Army General Robert Cone, head of the Army's Training and Doctrine Command, is using the LS3 Robot for missions. The robot carries supplies for the soldiers (Ackerman, 2014). In Fort Benning, military personnel are working with robots in mock battlefield scenarios and the results have been positive. Many military commanders have praised the robots and the advancements in the industry. The robots are showing few setbacks during exercises. Law enforcement has learned from the military model in the past and this could be another opportunity to do so (Chow, 2013).

The largest major city in the United States with a robot is the Houston Police Department. On August 21, 2014, the HPD rolled out their robot, Officer Defender. The robot was paid for by a grant from State Farm Insurance and was named by a local Boys and Girls Club. The robot interacts with school-aged children about topics like drugs and gangs. The robot has been a hit in the Houston community and has spoken to more than 14,000 kids since its debut (Chief McClelland Introduces, 2014).

Georgia Tech researchers conducted the first study on human-robot trust in an emergency situation. Researchers discovered that group participants trusted the rescue robots when they told them to leave a smoke-filled building. Researchers surmised the robot might have become an authority figure to the experiment group whom trusted the direction given by the robot (Felt, 2016). These findings although limited, offer hope that the community would embrace a police robot.

An exciting possibility with robots in a law enforcement tactical team is connecting with Millennials. Law enforcement is traditionally run by baby boomers. A robot at the side of a law enforcement tactical team can bridge gaps between police leadership and the front line (who are often Millennials). This could lead to increased communication and enhanced job performance (Millennials and Robots, 2015).

Invasion of Privacy and Community Interaction

According to Robotics Expert Rodney Brooks, robots will invade our lives. The robots will mimic our movements, study our language, and imitate us (Brooks, 2003). As robotics work side by side with law enforcement, many will wonder if their privacy will be compromised. It depends on how advanced robots are wired and how far artificial intelligence is developed for law enforcement use. Each community is different. Some communities will forsake some privacy concerns in order to be safe, while some communities will not tolerate an invasion of privacy (Davis, 2013).

Get Started: Bring an Officer Robot to Your Police Department

The Dubai Police Department in the United Arab Emirates plans to unveil a new fleet of robots in 2017 that will patrol malls and crowded streets. These police robots will act as public-information terminals and guards. The robots will

interact with the public and be connected to their dispatch center. Dubai plan to have their robots interact with the public independently by 2021 (Alba, 2015). The leaders of Dubai feel that police robots are the future. They want a robot that can speak multiple languages due to the tourist attraction that exists in Dubai and the robot offers solutions to those challenges. Dubai officials claim they will be the first city to develop a police robot that works just like a human police officer, and it will not be controlled. The robot will have an advanced AI (Shouk, 2015).

How To Do It

Law enforcement agencies contemplating using robots in the future should start developing the IT talent who will be responsible for this emerging issue. Many agencies lack technological talent and taking on robotic development is a significant risk. The law enforcement agency should establish an IT task force that examines police robotics (Anandon, 2015).

The IT task force should identify agencies like Dubai Police Department and Houston Police Department and start an immediate dialogue. The costs could be minimized at first by using other tech advancements like Skype. Ultimately, the Task Force would have to make an on-site visit to fully comprehend the police robots advancements in those agencies. While visiting Houston, the Task Force should contact the sponsor of the robot, State Farm Insurance, and seek their input on how they feel the sponsorship is benefiting them. This will be key as it may be necessary to build their first robot with private dollars.

Next, the task force should communicate with universities in the United States that are leading the way in robotic research. The task force should seek out the Georgia Tech researchers as they begin to research humans and emergency services robots and the trust that exists. This could be accomplished through advanced telecommunication advances and on-site visits.

The third component that the task force should focus on is the Henna-na hotel in Japan. The hotel business is all about customer service and in many ways mirrors law enforcement's attempt to achieve a high-level of trust and service to the people they police. The task force would benefit seeing the "behind-the-scenes" of how this all-robotic hotel functions.

After the team conducts their research, they should find a partner and begin phases of incorporating a police robot into their agency and culture. The task force should then examine creating a community panel that will help build the robot. What do they want to see in it? What skills do they want the robot to possess? This buy-in would allow the agency to determine how the robot will be deployed in the communities they police. This will also give time to explain the process to those entities that fight for individual rights and the local governments that oversee police budgets.

Conclusion

Robots will be a reality for some law enforcement agencies in the future. To what degree they play in policing has yet to be determined.

Could a humanoid-trained robot assigned to a tactical team improve trust when faced with use of force encounters? The data does not exist in a clear and convincing manner to support one way or another at this time. The Georgia Tech research on human and robotic trust is encouraging, but more in-depth studies need to occur. There is enough evidence of data to forecast that in 10 years we can be in a position to have such a robot in law enforcement and be assigned to a tactical team. The limited data that is available suggests that the public would welcome a police robot. The advances in humanoid development by Japan could further strengthen the introduction of police robots in the communities they police.

References

- CNN News. (Robots). Maggie Wong. (January 12, 2016).
- Reuters Television. (Aiko Chihiro). Crispin Balmer. (April 20, 2015).
- Google puts money in robots using the man behind Android. (2013, Dec 4). NY Times. John Markoff.
- Smith, Aaron. (2014 August 6). AI, Robotics, and the future of jobs. Pew Research Center.
- Ackerman, Evan, (2014 August 15). US Army Replacing Thousands of Soldiers With Robots. IEEE.
- Chow, Denise. (2013 October 21). Gun-toting robots may fight alongside soldiers in the future. Live Science.
- Brooks, Rodney. (2003, February). Robots will invade our privacy. TED 2003.
- Davis, Nikola. (2013, October 19). Smart robots, driverless cars work- but they bring ethical issues. The Guardian.
- Alba, Alejandro. (2014, November 20). Japanese professor creates uncanny human-like robots. NY Daily News
- Murphy, Mike. (2015, June 22,). Robots now have emotions. Quartz.
- Smith, Mat. (2015, July 31). Japan's ridiculous robot hotel is actually serious business. Engadget.
- Felt, Rob. (2016, February 29). In Emergencies, should you trust a robot? PHYSORG.
- Millenials and Robots. (2015, June 8). Times of India Editorial.
- Alba, Alejandro. (2015, May 10). United Arab Emirates to introduce patrolling "robocops" in two years. NY Daily News.
- Anandon, Yanya. (2015, April 30). Closing the skills gap in automation. Robotics Online.
- Interview with Detective Brad Stevens on February 29, 2016. 1-559-287-5363. You Tube. August 21, 2014. Chief McClelland introduces Officer Defender robot.
- Prigg, Mark. (2015, April 6). Can I help you? Toshiba puts its humanoid robot to work in Tokyo Department Store. Dailymail.com
- Anderson, Janna. (2014, August 6). AI, Robotics, and the future of jobs. Pew Research Center.
- Shouk, Ali. (2015, June 7). Dubai police reveal their robot enforcer. UAE News.

YOU ARE COMMITTED TO EXCELLENCE

CPOA IS COMMITTED TO YOU

The California Peace Officers' Association has developed progressive leadership in California law enforcement for nearly 100 years. CPOA's membership program strives to develop your leadership skills through training, advocacy and networking. CPOA is...

YOUR SOURCE

for professional development and training

YOUR VOICE

on issues impacting law enforcement

YOUR CHOICE

for connections that make a difference throughout your career

START LEADING TODAY AT CPOA.ORG

California Peace Officers' Association
555 Capitol Mall, Suite 1495
Sacramento, CA 95814