

**POLICE OFFICER COMMUNICATIONS  
THE NEXT GENERATION**

**by**

**Christopher R. Catren  
Redlands Police Department**

**April, 2012**

**COMMAND COLLEGE CLASS 50**

The Command College Futures Professional Article is a study of a particular emerging issue of relevance to law enforcement. Its purpose is not to predict the future; rather, to project a variety of possible scenarios useful for strategic planning in anticipation of the emerging landscape facing policing organizations.

This article was created using the futures forecasting process of Command College and its outcomes. Defining the future differs from analyzing the past, because it has not yet happened. In this article, methodologies have been used to discern useful alternatives to enhance the success of planners and leaders in their response to a range of possible future environments.

Managing the future means influencing it—creating, constraining and adapting to emerging trends and events in a way that optimizes the opportunities and minimizes the threats of relevance to the profession.

The views and conclusions expressed in the professional article are those of the author, and are not necessarily those of the CA Commission on Peace Officer Standards and Training (POST).

© Copyright 2012

California Commission on Peace Officer Standards and Training

## **POLICE OFFICER COMMUNICATIONS**

### **THE NEXT GENERATION**

If you had the chance to dramatically improve an officer's ability to communicate, improve his or her health and safety, and reduce the costs associated with equipping field personnel, would you take it? Given the current demands placed on policing agencies by their communities, the courts, and elected officials, coupled with the constraints of the current economic climate, most police administrators would answer with a resounding, “yes.” Fortunately, technological advances have emerged over the last few years to make these dreams a reality. The technology exists today to create an all-in-one, hands-free, wearable device to deliver contextually based information as well as smart phone functions. The device would allow improved communication, a higher degree of officer safety, and an overall reduction in costs. The cornerstone for the development and deployment of such a device is contextual awareness.

Contextual awareness and its application to policing is perhaps one of the most exciting technological developments in recent years. The use of the term context awareness was introduced by computer scientist and author Bill Schilit in 1994 to describe the idea that computers can both sense and react based on their environment, including linking the environmental information to the user’s location and activity. Today, this includes the user’s habits, biophysical state, location of others and the user's tasks. In the near future, it has incredible potential to transform the situational awareness information available to officers in the field. On the pages that follow, we will look at the technologies that are, or soon will be, available, and also provide a foundation from which police professionals can advocate for the

development of a contextually aware, wearable, communications device that takes full advantage of these emerging technologies.

### **The Next Generation of Police Communications:**

Imagine an officer driving through a neighborhood and having information automatically available regarding the known offenders, Neighborhood Watch block captains, crime series, and wanted persons living in close proximity. Additionally, the officer's biophysical data is constantly monitored by computer systems that would alert dispatchers and other officers in the event of a sudden change in officer's heart rate, adrenaline or degree of physical activity indicating a need for assistance. This information dramatically improves officer safety, and also enhances their ability to effectively tailor a response to crime and disorder issues in their community. One might think this is in the realm of science fiction. In fact, the work is already underway.

The City of Redlands (CA) Police Department is in the process of adopting an element of this technology with a grant received by the National Institute of Justice In 2010. They are developing an iPhone-based crime mapping application to assist their police officers to understanding spatial temporal crime patterns. One of the components of this project is to have a contextually-based application to constantly update crime hotspots occurring in close proximity to their location to determine whether this information will positively impact the officer's ability to observe trends and patterns more quickly (Taniguchi, 2010).

Recent technological advancements make the development of a contextually aware, wearable, communications device possible. One of the most important developments is cloud

computing, which is quickly transforming the manner in which individuals and entities access stored information and applications. A 2010 Pew Internet survey of technology experts revealed that 71% agreed with the assertion, "by 2020, most people won't do their work with software running on a general-purpose PC. Instead, they will work in Internet-based applications such as Google Docs and applications run from smart phones." The value of cloud computing to advancing policing communication platforms is that many mobile devices can be kept up-to-date from a centralized location rather than current methods that rely on physical interaction with individual devices to perform tasks such as operating system updates, software updates and routine maintenance. Additionally, the use of open-source, cloud-based, applications such as Google Docs have the potential to significantly reduce the costs associated with providing similar software to officers on a subscription basis. Finally, in this day of reduced human resources due to the current economy, it has become increasingly important to utilize officers in the most efficient manner possible. In this realm, the use of cloud-based applications and storage services eliminates the need for officers to constantly travel from the field to the station to access the tools they need to perform their jobs. It can also change the way the police communicate with one another.

Startling advances in mobile computing play a significant role in the development of policing's communication device of the future. Policing is a mobile function and requires equipment that can support the user in that capacity. Great strides have been achieved over the past 20 years to mobilize the police function through the addition of mobile data computers, cell phones, and mobile fingerprint identification devices (Roberts, 2011). The potential for vast improvements in the transfer of information via mobile devices is now being realized through

profound advancements in smart phone technology, voice activated software, and wearable computers.

The proliferation of smart phones by the general public is evidenced by the fact that from March to May, 2011, 55% of mobile phone purchases were smart phones, a 34% increase over 2010 (Isaac, 2011). The adoption of smart phones in policing is beginning to take hold as evidenced by their use in cities such as Redlands, California and Lincoln, Nebraska. The City of Redlands Police Department utilized local funding and a National Institute of Justice grant to purchase and deploy iPhones to all field personnel (Taniguchi, 2010). The Lincoln Nebraska Police Department collaborated with the University of Nebraska to develop a location-based service that operates on smart phone platforms that lists addresses of wanted persons, recently issued arrest warrants, known offenders, and crime locations to police officers in an effort to better inform officers in the field (Casady, 2011). Research efforts are underway to determine the value of both projects. These examples demonstrate a belief that smart phone technology has the potential to significantly enhance the amount of information available officers in the field to make more informed policing decisions.

To truly achieve the benefits of an all-in-one, wearable, communications device, the multitudes of data sources available to policing need to be integrated and accessible through a single query method. To improve efficiency, officers should be relieved of the responsibility of accessing potentially dozens of disparate data sources to adequately perform investigative work. Progress on this issue is evidenced by systems such as Coplink, which integrates disparate data sources from multiple agencies and collates them for simplified searching through a web-based interface (Government Technology, 2011). Additional work is needed to provide for the

seamless integration of Department of Motor Vehicles data, parole data, probation data, automated license plate reader data, and many other types of data available to officers today through the implementation of a standards-based communications infrastructure. A smart phone technology powered communications device with access to cloud technology makes such integration possible.

Despite the constantly changing world of technology, one law has remained constant; Moore's law. Moore's Law states that “the number of transistors on a given chip can be doubled every two years,” and it has been proven accurate since he stated it in 1965 (Kanellos, 2003). Technological developments such as tri-gate transistors (Murray, 2011) and the 4G wireless network (Isaac, 2011) are two of the latest examples of the continued progression in processing speed and wireless access to enable the development of a wearable, all-in-one communications device for policing. These developments, coupled with the decreasing costs associated with technology (Roberts, 2011) presents an opportunity for law enforcement to take full advantage of the devices and communication methods already employed by businesses and the general public. As technology continues to improve while the relative costs continue to decrease, police administrators would be remiss not to exploit the advancements in contextual awareness software, cloud computing, smart phone technology and wearable devices.

### **Officer Safety**

The benefits to the policing profession of exploiting the technology and circumstances listed above are multifaceted. The most compelling reason to develop a wearable, contextually aware, hands-free communications device is to improve officer safety. Such a device can be voice activated and worn on an officer's forearm much like the playbooks worn on the forearms

of NFL quarterbacks. As such, officers would be able to keep their hands-free as opposed to the current situation where officers are constantly holding pens, paper, radios and smart phones. Additionally, the contextual awareness software will alert officers to dangerous persons and situations based on their current location.

Biophysical information such as heart rate, adrenaline, and sudden increases in physical activity would be collected seamlessly by the device and transferred to the Communications Center in the event an officer is encountering resistance or other potentially life-threatening circumstances. Working in concert, these advancements have the potential to significantly reduce the incidence of officer injury and death. In 2010, 53,469 police officers were assaulted in the United States and 26.1 percent of those sustained injuries. Additionally, 56 police officers were feloniously killed in the line of duty in 2010 (Federal Bureau of Investigation, 2010). The fear and anxiety preceding an assault causes measurable changes in biophysical characteristics such as increases in heart rate and breathing (Mental Health Foundation, 2012) that, if collected, could be transmitted to others to summon immediate assistance to mitigate the potential for an assault or to minimize the consequences of it.

### **Reduced Costs**

Other benefits associated with the adoption of a wearable communications device include an overall reduction in costs as a result of integrated information systems, and reductions in overall software costs due to the inclusion of cloud-based, open-source software applications for police work. According to research conducted by William D. Eggers (2011), director of public-sector research at Deloitte, “cloud computing offers governments a clear and compelling value proposition: All the technological firepower you need without any of the headaches of ownership

and maintenance” and describes the potential for cost savings as “huge.” The all-in-one device has the potential of replacing mobile data computers, smart phones, and audio and video recording devices. A recent survey of online prices showed the costs associated with equipping a patrol officer with a popular model of a mobile data computer, a smart phone, a hands-free headset, and a digital recorder range from \$3,420 to \$4,750, excluding proprietary software costs. The functionality of all these devices can be combined into one wearable device that eliminates the need to purchase and maintain the aforementioned pieces of equipment potentially saving thousands dollars per officer.

The costs associated with the provision of such device include the costs of the smart phone technology, software developed for this purpose, a wearable sleeve, and a wireless headset. Additionally, further efforts to integrate data sources and provide a single query method for accessing them via the wearable communications device would result in officers having more immediate access to the information needed to successfully resolve cases while keeping them in the field as opposed to the station.

### **The Solution**

The process to turn this idea into reality requires advocacy and partnerships on a grand scale. Although there is no evidence this device is under development, the technologies to make it a reality are literally “sitting on the shelf” and ready to be repurposed for this use. Police unions to Chiefs of Police across the nation need to band together and lobby for funding from private and governmental sources to begin developing, testing, and implement this all-in-one transformational device. Professional associations such as the International Association of Chiefs of Police (IACP) and the Police Officers Research Association of California (PORAC) in concert

with state commissions on Peace Officer Standards and Training (POST) need to focus on the development of this tool and lead the efforts to advocate for its development and funding.

Partnerships with technology industry leaders, research institutes, and regional policing partners are critical to the eventual success of this idea. The partnerships must be based on the premise these devices will be developed as open source applications to ensure their long-term viability and widespread adoption across the country and potentially throughout the world. The partnership between the Defense Advanced Research Projects Agency (DARPA) and Boston Dynamics, for instance, to develop a robotic quadruped dubbed “BigDog,” provides a blueprint for a successful collaboration between governmental funding and private ingenuity (Raibert, 2008). DARPA provided the funding for Boston Dynamics to develop a working prototype of a completely robotic device to traverse various types of terrain for military purposes. A similar approach could be taken, which may mean the National Institute of Justice would fund private developers or public-private partnerships to create a wearable, contextually aware communications device.

The need exists; the technology is here; the time to develop a wearable, voice-activated and contextually aware computing device for policing is now. The imperative to dramatically improve the communication ability of policing professionals, increase officer safety, and significantly reduce the costs associated with equipping police officers is real and can be achieved with technology that exists today. Through unrelenting advocacy and strong partnerships, this dream device can become a policing reality in a relatively short period of time.

## Works Cited

Casady, T. K. (2011, June). How Location-Based Services Can Improve Policing. *The Police Chief*, pp. 70 – 72.

Eggers, W. (2011, January 31). *Cloud Computing in Government Explodes*. Retrieved March 9, 2012, from governing.com: <http://www.governing.com/blogs/bfc/cloud-computing-government-explodes.html>

Federal Bureau of Investigation. (2010). *Uniform Crime Report: Law Enforcement Officers Killed and Assaulted, 2010*. Washington, D.C. : U.S. Department of Justice.

Government Technology. (2011, October 24). *Coplink Data Sharing System Goes Mobile*. Retrieved March 7, 2012, from Govtech.com: [www.govtech.com/public-safety/Coplink-Goes-Mobile.htm](http://www.govtech.com/public-safety/Coplink-Goes-Mobile.htm)

Isaac, M. (2011, June 30). *Wired.com*. Retrieved 11 28, 2011, from Wired.com: <http://www.wired.com/gadgetlab/2011/06/android-iphone-growth/>

Kanellos, M. (2003, February 10). *news.cnet.com*. Retrieved March 7, 2012, from Cnet News: [www.news.cnet.com/2100-1001-984051.html](http://www.news.cnet.com/2100-1001-984051.html)

King, L. (2011, August 5). *Computerworld UK*. Retrieved March 9, 2012, from computerworlduk.com: <http://www.computerworlduk.com/news/public-sector/3295484/police-planning-major-switchover-to-cloud-computing/>

Mental Health Foundation. (2012). *Fear and Anxiety*. Retrieved March 13, 2012, from Mentalhealth.org: <http://www.mentalhealth.org.uk/help-information/mental-health-a-z/F/fear-anxiety/>

Murray, M. (2011, May 4). *Intel's New Tri-Gate Ivy Bridge Transistors: 9 Things You Need to Know*. Retrieved March 13, 2012, from PCMag.com: <http://www.pcmag.com/article2/0,2817,2384909,00.asp>

Raibert, M. e. (2008). *BigDog, the Rough-Terrain Quaduped Robot*. Waltham, PA: Boston Dynamics.

Roberts, D. (2011, January). Technology is playing an expanding role in policing. *The Police Chief*, pp. 72-73.

Schilit, B. A. (1994). Context -aware computing applications. *IEEE Workshop on Mobile Computing Systems and Applications* (pp. 89-101). Santa Cruz, CA: WMCSA '94.

Taniguchi, T. (2010, April 5). Developing an iPhone-based Crime Mapping Application to Assist Law Enforcement Officers with Understanding Spatial and Temporal Crime Patterns. *Response to NIJ solicitation "NIJ FY 10 Information Technologies: Improved Delivery of Information to the Officer at the Scene"* . Washington, D.C., U.S.