

# How Location-Based Services Can Improve Policing

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**R**apid advancements are under way today in the field of mobile computing in policing. The first generation of mobile data terminals has been replaced by successive generations of more capable mobile data computers. Today, mobile data are quickly moving toward handheld wireless devices such as tablet computers and smartphones, many of which are more portable and functional than laptops for police officers in the field.

Mobile applications for identifying pharmaceutical drugs, language translation, blood-alcohol calculators, and many others relevant to police officers are already available, with new applications emerging at a staggering pace. The potential to place these resources in the hands of police officers in the field is vastly increased by the emergence of smartphones and tablets.

A growing number of police officers—and a few departments—are beginning to realize these capabilities and deploy handheld personal mobile technology. The trend will almost certainly gather momentum, and it is likely that the major vendors of police applications such as computeraided dispatch and records management will be recognizing this trend and adapting their offerings to leverage this new reality in mobile computing.



*Images courtesy of the Lincoln, Nebraska, Police Department*

## **Implications for Policing**

While the trend toward the mobile personal device in policing is already well under way, much of policing has yet to realize the potential of something else the current generation of smartphones and tablets makes available: location-based services (LBSs). An LBS is an information service delivered to a mobile device, such as a smartphone or tablet computer, through the wireless data network that uses the ability of the device to provide its current

geographic position. The implications for policing are huge. To understand these implications, consider a common need: locating a restaurant for a good pizza.

Think for a moment about how the task of finding a good pizza in an unfamiliar city has changed. Thirty years ago, a person might have checked phonebook listings and picked up a free road map at the gas station. Fifteen years ago, a person might have selected a restaurant after reading an online review. Ten years ago, a person might have used an online mapping site to print directions or might have used an expensive navigation system to lead the way.

Today, individuals can simply type or speak “pizza” into their mobile devices. In many cases, the keyword or voice search will launch a mobile map application and will populate the map with pushpins representing pizza restaurants in the vicinity. Individuals can click any pin for the business name, a hyperlink to its website, a link to restaurant reviews, and even a street-level photo of the business and its surroundings. Moreover, since the device is global positioning system (GPS)–enabled, the map updates and moves with users as they drive, ride, or walk, and more pushpins pop up as users near additional pizza places.

This pizza search merges wireless data, the Internet, geocoded business data, the underlying mapping application, and the GPS receiver in the smartphone or the tablet. Although many implementations of LBSs use a map as the interface, this is not the case for every location-based application. For example, a weather application that delivers current conditions and forecasts based on the GPS coordinates of the device is an LBS with no map, as is an application that delivers the schedule at nearby movie theaters. LBSs have rapidly become ubiquitous. This is how hundreds of thousands of travelers will find bike shops, Thai food, ATMs, and brewpubs today.

LBSs have tremendous potential in policing. Hundreds of police departments in the United States have already developed automated processes for geocoding crime and incident data in order to feed Internet and intranet mapping applications. These data are typically hosted “in the cloud” on web servers rather than locally on individual personal computers. There is no reason these data cannot be provided as LBSs for the police. The technology is exactly the same as that used on tablets and on smartphones for locating shoe repair shops, wineries, and auto parts stores, among other locations.

### **Case Study: Lincoln, Nebraska, Police Department**

It was this realization that caused the Lincoln, Nebraska, Police Department, in collaboration with the University of Nebraska, to develop its first LBS application. Proactive Police Patrol Information (P3i) is a location-based service that provides police points of interest (POI) to Lincoln police officers. Supported by funding from the National Institute of Justice, the police department and the University of Nebraska’s Public Policy Center and Department of Computer Science and Engineering are studying the impact of this technology on the work of Lincoln police officers.

This application delivers LBSs consisting of the addresses of wanted persons, recently issued arrest warrants, registered sex offenders, parolees, gang members, and the locations of recent crimes to Lincoln police officers. The data appear on officers' wireless devices without any effort on the officers' part aside from starting the application—if it is not already running. The map moves as the officer moves, displaying the POIs in the immediate vicinity based on the coordinates provided by the GPS.

The P3i application has been designed to operate on Apple's iOS, the Google Android operating system, or as a basic web application for any GPS-equipped laptop computer, including the laptops the department presently uses as mobile data computers mounted in its marked patrol fleet. The application is currently deployed on all of these types of devices to an experimental group comprising 75 officers, with 15 each on 5 devices: Android tablets, Android smartphones, Apple iPads, Apple iPhones, and mobile data computers in patrol cars.

Research is under way to study the relative merits of each, the technology uptake by the participating officers, and the ways in which this capability impacts the work of police officers. The research team hypothesizes that officers equipped with this technology will collect more information and intelligence in the field, arrest more wanted persons, and make more contacts with parolees and registered sex offenders. This technology is also expected to reduce miles driven and fuel usage by officers equipped with P3i in comparison to a control group without this application. Qualitative data are also being gathered from surveys, focus groups, and web forms. Following data collection and analysis, the research team expects this technology will be deployed to a larger group of Lincoln police officers and incorporated into the department's operations.

While the current project focuses primarily on people—sex offenders, parolees, and so forth—and delivers information about recent crimes near the user, there are many other types of information that might be delivered to police officers as LBSs. Many data sets could be provided to officers as an LBS, such as premise history information and addresses flagged for known hazards. This technology has obvious applications in fire service and emergency medical services, such as by delivering information on the locations of stored hazardous materials, water mains, hydrants, and medically fragile patients. It has tremendous potential in community corrections for parole, probation, and other community supervision programs. Imagine an application that delivers the home, school, and work addresses of clients to probation officers as they move about the jurisdiction.

### **Relevant to Users, Easy to Adopt**

Location-based services can take existing data and present them in a manner that is especially relevant to the user's current spatial and temporal context. The information is delivered to users where they are located, while they are right there. Very little effort or interaction by the user is needed. The LBS pushes the relevant data to the user, rather than requiring that the user initiate the search and pull the information.

The technology of LBSs could be relatively easy to adopt for many agencies, particularly those that already maintain web services for Internet or intranet mapping applications. These agencies have already accomplished the most difficult aspects of creating a location-based service by developing processes to gather and geocode their data for use in desktop and web mapping software. Web services and open application program interfaces make it easier than ever to deploy these data as an LBS, and bandwidth limitations that may have made applications like P3i impractical a few years ago are much less an issue today as more capable wireless networks proliferate.

Tablet computers and smartphones have changed mobile computing almost overnight. As police officers and departments adapt these new capabilities to their needs, the leap forward will be game changing, just as the move from call box to mobile radio and from mobile radio to portable radio was for our predecessors. The deployment of LBSs for the police is likely to play a significant role in the future of mobile data in policing and may represent a watershed event in how information is delivered to officers in the field. ■

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