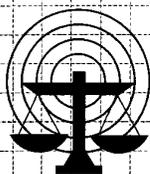


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Law Enforcement Mobile Computing: Armed with Information

By Kelly J. Harris, SEARCH

Numerous law enforcement agencies throughout the country have turned to mobile computing with overwhelming success. Laptops outfitted with wireless communications packages allow officers to access and query information from law enforcement agency databases and, in many cases, from a variety of local, state and federal databases. Laptop computing gives officers the ability to conduct important research without the assistance of a dispatcher, and to process information — a powerful weapon at an officer's fingertips.

How it works

On routine patrol, a police officer is dispatched to a home where domestic violence has been reported. Before getting out of the car, the officer uses a laptop computer outfitted with a wireless communications system to instantly check the police department's database, as well as local, state and federal databases, for information on the residence. The officer finds that there have been numerous police responses to the location and that a gun is registered to a resident — crucial information

the officer needs to approach the scene.

Following an investigation of the scene, the officer files a report — directly from the patrol car. The report is transferred instantaneously to headquarters, reviewed by the officer's supervisor and approved for filing — all accomplished electronically, without paper and without the officer returning to headquarters. The

department's records management system is instantly populated by the officer's report data, which investigators, crime analysts and others can quickly access. Compare this process to the traditional time-consuming task of an officer returning at the end of a shift and handwriting formal reports, which are then scheduled for supervisor review and subsequently sent to data processing, where it

Bureau of Justice Assistance, SEARCH Explore New Technologies

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The *Bulletins* identify, describe and assess new and emerging technologies that have existing or potential application in criminal justice information management. They alert practitioners to the existence of technologies which can benefit their management of information.

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can often take days, if not weeks, for those reports to be entered into the department's computer system and to be made available to investigators, prosecutors and other interested parties.

Background

Laptop computers are a significant advancement from the "dumb" mobile digital terminals that have historically resided in patrol cars. The dumb terminals only allowed dispatch to send bits and pieces of information to the officer when requested.

Since the late 1980s and early 1990s, many law enforcement agencies have been issuing laptop computers to patrol officers and crime investigators. Initially, the

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goals associated with laptop implementation included eliminating pen-and-paper reporting and the redundant and often error-prone data entry of manual reports. These important benefits were realized as officers used laptops in the field to write their reports and then downloaded them at the end of their shift to the department's mainframe computer system.

The reporting software alone sped up the process of report-taking and report availability, improved the accuracy of officer reports by reducing redundant data entry, and enhanced report completeness and quality through well-designed software. (Most software programs for report taking include preset menus with street names, penal codes and descriptions, car makes and models, etc.; mandatory fields that the system will not accept unless entered with data; spell-checking; and automatic copying of pertinent data fields such as name, address, date, time, etc., to each page of a report.)

The next step forward is interactive, wireless communications between the officer on the street, other patrol cars, headquarters and dispatch, and the ability to query a variety of remote databases. Laptops, combined with advanced communications technologies and a good software package, transform officers and investigators on the street into valuable contributors to and users of the vast information resources available from a variety of law enforcement databases. Agencies using it report that

mobile computing gives officers and investigators access to abundant and crucial information that has the power to:

- ultimately improve officer and public safety, by instantly providing information that can make the officer more effective and prepared when responding to an incident;
- allow the officer to personally query agency, local, state and federal law enforcement databases from the patrol car, without having to wait for an available dispatcher or to return to headquarters;
- send electronic mail (email) to other patrol cars, headquarters and/or dispatch simultaneously;
- enhance the quality of the incident report by collecting crucial data at the scene using software that ensures more complete and accurate reports;
- eliminate paper reporting and, therefore, redundant and error-prone data entry;
- allow electronic report filing, thereby increasing the speed at which investigators can access the reports and begin an investigation;
- significantly reduce the number of hours spent preparing and filing reports (returning officers to the streets quickly);
- save money through time saved generating reports and reducing or eliminating data entry, and through reducing dispatcher workloads, paper usage, copying and distribution, and storage space needed;
- give officers and investiga-

tion system integration with other justice agencies, such as the prosecutor, courts and jail, should also be considered at this time. Several law enforcement agencies beginning the laptop implementation process are also upgrading reporting practices and are considering what information to capture and how to pass the information to the prosecutor's office.

Project Support

An agency implementing mobile computing must also consider such operational issues as hiring on-site technical staff to support the laptop project or developing user training programs. It is also crucial that the agency realize that technology is constantly evolving, and that upgrading and replacing technology is an important planning element.

Many agencies face budget limitations that preclude continuous expansion of their technical staff to support those facets of an agency. The key to dealing with this issue, some agencies have found, is to make sure all users are well-trained in the technology. "We look at the laptops like we do the officers' car, weapon and radio — they must know how to use these tools to do their job properly, and the same goes for the computer. They cannot run to the technical staff every time they have a problem," said Cmdr. Steele. "Computer literacy is a major emphasis, and we select one officer from each unit to become the coordinator for that unit's computer education program."

Training, then, is an integral element in system

implementation, and users must be thoroughly trained and continuously updated on the advances in technology. Fortunately, most newly designed programs for law enforcement usage are very user-friendly, relying on Windows-based, point-and-click technologies, that make training faster and easier.

Getting officers and other users involved in the design of the system is also crucial in developing a system that meets officers' needs, as well as makes the learning process a bit easier.

Technology Issues

The following briefly highlights the primary technical issues an agency must consider when implementing a mobile computing system, including the laptop hardware and software. (Wireless communications packages and security, which are also important technical aspects of mobile computing, will be discussed in greater detail in Part 2 of this *Technical Bulletin* series.) Obviously, the technical needs vary by agency.

Laptops. In years past, many law enforcement agencies had difficulty with standard laptop computers unless they were specifically "ruggedized" for heavy usage. Dim screens, breakable parts, sensitivity to heat and cold, and short battery lives frustrated users. Technology has advanced so significantly in the last several years, however, that many departments are now using commercial laptops that have not been heavily ruggedized for fleet usage, and report they are pleased with these computers.

The Washington State Patrol uses standard IBM ThinkPads, the Houston Police Department uses Toshiba, Compac and Zenith laptops, and the Alexandria Police Department is using semi-ruggedized laptops from Fujitsu.

Ruggedized or not, SEARCH Technical Assistance staff (who provide technical assistance and training to criminal justice agencies nationwide on information management technology issues, under a grant from the Bureau of Justice Assistance, U.S. Department of Justice) advise that laptops be configured to accommodate the most current technologies, as well as those mandated by upcoming program initiatives (such as NCIC 2000 and IAFIS). SEARCH recommends the following basic laptop configurations: Pentium laptops with 16 MB of memory, 850 MB hard drives and active matrix screens.

With respect to those agencies considering docking the laptop in a patrol car, selecting a docking station can be one of the more difficult tasks. There is a broad range of manufacturers for the various patrol car docking stations, and a price and features check is often the best a department can do in selecting the appropriate dock.

Cmdr. Leichner warns agencies to select their docks carefully. "This is an area where standards are particularly needed," he said. "Agencies have purchased docking stations in the past that have not met their needs when expanding or implementing

...information management

officer's written notes, often days after the incident.

"Implementing a mobile computing system is the time to be creative," said Cmdr. Steele. "This is the time to realize that you do not have to just replace the old MDTs, but look at the challenge offered by how much more you can do with the laptops — how much more information is available and the versatility of that data."

Therefore, the first, and most important, part of planning for a mobile computing system is developing a strategic plan, adds Cmdr. Steele, who spearheaded his department's effort. "Assessing the future needs of the department and developing a plan for getting there is the most important part of the process."

For instance, if the agency maintains or plans to upgrade the computer-aided dispatch (CAD) and records management systems (RMS), or to implement automated vehicle location systems with global satellite positioning, the mobile computing project should be developed to ultimately integrate with those new systems. Cmdr. Steele says the Alexandria Police Department is looking at a different approach to data processing that focuses on moving information "from the rim to the hub." In other words, he explained, "we are using the officer's data input from the field as the starting point to build a new CAD and RMS that feed off of that information, not the other way around."

In Washington State, the laptop system will be the basis

for an entirely new automated records management system the State Patrol is designing.

Hand-in-hand with assessing the department's future is to consider issues and events occurring at the federal, state and local levels that may impact the mobile computing system design. In particular, specific programs and legislation, such as the FBI's NCIC 2000, the Integrated Automated Fingerprint Identification System (IAFIS) and the National Incident-Based Reporting System (NIBRS) will impact the mobile computing system and its technical requirements. This is an excellent opportunity to incorporate the requirements of these initiatives and their mandates (to the extent they are known) into the new project, rather than retrofitting or redesigning later. Cmdr. Steele notes that the motivation to begin implementing laptops in his agency stemmed directly from the need to meet the future requirements of NCIC 2000, IAFIS and NIBRS.

In Washington State, project personnel made sure the hardware and software they purchased was configured to handle file compression for transferring large image files (such as fingerprints and mugshots, in compliance with NCIC 2000 and IAFIS). "It is our plan," said Cmdr. Leichner, "for troopers to eventually be able to scan fingerprints in the field for identification purposes, and to receive mugshots in the patrol car." The State Patrol also ensured the laptops were barcode-compliant and magnetic reader-compliant, so

that troopers can swipe a driver's license through the reader and receive Department of Motor Vehicle information.

In addition, the State Patrol designed its software to capture the reporting fields required under NIBRS. By adding these fields to new software introduced to the troopers, the implementation of NIBRS was virtually transparent. Future updates to the system, such as adding new reporting requirements, are easily added to the computer program. This is much simpler, of course, than redesigning, copying and redistributing paper forms. Other agencies implementing laptops also agree this is the most logical and suitable time to redesign systems to be compliant with incident-based reporting.

Many law enforcement agencies are taking advantage of other laptop applications that can be developed to assist officers and other department employees in making their jobs more effective and efficient. The Washington State Patrol is currently working on an enhancement project that will allow users to enter, edit, send, receive and format data for interfacing with the computer-aided dispatch and time and activity systems; a trooper contacts database; and field intelligence reporting and computerized license investigation repository databases. Consideration can also be given to the data collection needs of other agency units, such as crime analysis and investigation.

Future or planned informa

tors access to the Internet and other online databases for legal research;

- be an integral component of a fully-integrated computer-aided dispatch, automated vehicle location, geographic information and records management system; and
- free up voice dispatch lines for emergencies.

Operational experiences

The benefits of mobile computing are exceptional and agencies that have implemented the technology are experiencing significant improvements in the business of administering justice, and users are pleased with the systems and results.

The Houston (Texas) Police Department, which has implemented approximately 2,000 laptops in the patrol, investigation and training divisions, notes that one of the most significant benefits the department has realized is that of time reduction. According to a report prepared by the department, "Houston Police Department Laptop Project," field officers who used the laptops for incident reports "reduced the time it took them to get a report on the mainframe from five days to eight hours or less, improving the likelihood of solving crimes and facilitating crime analysis." The report further notes that the elimination of officer field notes and direct data entry into the laptop saved approximately 15 minutes per report. Additionally, "staff review saves 10 minutes per report because the laptop program automatically codes each report. With a

total savings of 40 minutes per report, the department saves an estimated 600-700 work hours each day entering approximately 1,000 reports with the laptop software."¹

The Washington State Patrol (WSP) operates a Mobile Computer Network in five of its counties. Over 300 vehicles are outfitted with IBM ThinkPad computers, and there are plans to eventually outfit over 1,000 vehicles. Using commercial off-the-shelf software and private radio frequencies, state patrol troopers electronically exchange files and link to the State Patrol's information management system, other state agencies and the National Law Enforcement Telecommunications System. Commander Robert Leichner, Intergovernmental Services Bureau, says the troopers using the mobile computers are pleased with the technology. "At first they didn't even want to try it," Cmdr. Leichner says. "Now you can't take it away from them. They think it's exceptional."

Following the implementation of wireless computing, WSP has experienced a significant increase in trooper queries to a variety of databases. Despite the increase in queries, the State Patrol has also experienced a significant reduction in voice traffic (which reserves the airways for emergencies). The increase has been so significant that Cmdr. Leichner says the troopers without laptops believe that they are at a significant disadvantage to troopers computing remotely from the field.

In Alexandria, Virginia, the

mobile computing project has been extremely well-received by officers, and is considered a significant enhancement to community policing. "Our officers call their laptops 'Tactical Computer Systems,'" said Commander Tom Steele of the Alexandria Police Department, where 30 laptops have been installed, with plans for 22 more. "Our units give us the capability to go to a crime scene and take our units out of the car to collect and process information as part of our community policing strategy."

Implementation considerations

The speed, power and access provided to law enforcement agencies by mobile computing technology can profoundly change the way an agency conducts business, and in many cases, implementing a new system is an opportune time to evaluate current business practices and how they can be improved.

With wireless computing, officers have near-instantaneous access to a broader range of information at their will — not just when a busy dispatcher can find time to answer a request. Mobile computing also means that law enforcement officers will be able to work from the field — and not have to return to headquarters for patrol or investigative information. Perhaps most importantly, the incident data are collected and entered into the system at the most crucial time and by the most knowledgeable person: during or immediately after the incident, by the officer on the scene — not a data entry clerk who must translate an

newer technologies." He added that the Washington State Patrol had to replace several docking stations because they did not allow for the department's addition of new technologies, such as a fingerprint scanning station or magnetic stripe readers.

Software. There are many commercial, off-the-shelf software packages that can be implemented, and many law enforcement agencies have found success with them. Other agencies have had very positive experiences designing their own software with in-house staff.

Applications that justice agencies are designing and implementing include not only report-writing software, but also time and activity logs, computer-aided dispatch, field intelligence databases, and officer contacts databases. It is most important at this time to review the agency's current processes and to update and redesign those (if necessary) before developing the software, and not simply to automate existing business

practices that may be inefficient.

Design of software should incorporate "safety" features that reduce error and simplify the related processes as much as possible. For instance, many report-writing software applications include preset menus for penal codes, street names, etc., and automatic default of pertinent fields such as name, address, etc. Many applications check spelling, and most mandate completed forms before they can be transmitted to the department's databases.

At the Houston Police Department, staff developed a reporting program that ensures several levels of accuracy and completeness. The program includes, for example: conditional window fields (i.e., an officer's choice is limited to the models for a selected make of automobile); data validation, including numbers validated via check-digit and vehicle identification number; and automatic age calculations made based on the date of birth entered.

Designing new reporting software also gives agencies the opportunity to incorporate NIBRS reporting requirements and introduce them simultaneously with the new system.

The next issue of the *Technical Bulletin* will explore the controversy over and advantages and disadvantages, as well as the security implications, of public and private radio systems and their use in law enforcement mobile computing.

For more information on mobile computing (including links to other articles and publications, as well as justice agencies implementing mobile computing) and other justice-related technical issues, please visit the SEARCH and BJA Technical Assistance Exchange Forum Web Site at <http://www.taexchange.search.org>.

Endnotes

¹ "Houston Police Department Laptop Project", an unpublished report by the City of Houston Police Department.



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