JUN. 04

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Research for Practice

Law Enforcement Technology—Are Small and Rural Agencies Equipped and Trained?

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Findings and conclusions of the research reported here are those of the researchers and do not reflect the official position or policies of the U.S. Department of Justice.

This research was supported by the National Institute of Justice under grant number 1999–LT–VX–K022. The study was conducted by Eastern Kentucky University's Justice and Safety Center, led by executive director Pamela Collins.

NCJ 204609

ABOUT THIS REPORT

Researchers conducted a national survey of small and rural law enforcement agencies to understand their technology and technology-related training needs and capabilities and to determine to what extent they have adopted new criminal justice-related technologies into their operations. They surveyed 239 agencies with fewer than 20 sworn officers serving populations of 50,000 or less.

What did the researchers find?

Although small and rural agencies use—and are well trained in the use of—a variety of communications-related technologies, they may be underutilizing such technologies as global positioning systems, digital imaging for fingerprints, less-lethal weapons, and other technologies that can help them do their jobs better.

Several factors may contribute to underutilization, most notably, limited resources and commonly held views among small and rural law enforcement personnel that new technologies—other than communications equipment and computers—are less applicable to their work. Also, these agencies may be unaware of the advantages that such technologies offer their departments.

Who should read this study?

Law enforcement officials and planners, technology manufacturers, law enforcement training providers, State and local officials.

Law Enforcement Technology—Are Small and Rural Agencies Equipped and Trained?

This Research for Practice is based on "National Assessment of Technology and Training for Small and Rural Law Enforcement Agencies (NATTS): A Descriptive Analysis," final report to the National Institute of Justice, December 2002, NCJ 198619, available from the National Criminal Justice Reference Service Web site at www.ncjrs.org/pdffiles1/nij/grants/198619.pdf.

Small and rural law enforcement agencies, as a group, are susceptible to falling behind their urban and suburban counterparts in adopting and using computers and other new technologies—technologies that can help reduce crime rates, apprehend criminals, and improve safety for officers, suspects, and the public. They also face the challenge of keeping pace with criminals who use some of the same new technologies in planning and committing their crimes. Although these agencies use communications equipment and personal computers adeptly, they are not making full use of other specialized technologies.

These are the conclusions of a study conducted for the National Institute of Justice by researchers at Eastern Kentucky University's Justice and Safety Center.

Most studies of policing have focused on large agencies, especially those in urban and suburban areas. The Justice and Safety Center's study was one of the first to look nationwide at the extent to which small and rural law enforcement agencies have adopted new technologies, the value they place on these technologies, and how competent and well trained their officers are in using the new technologies.

The study takes on additional significance considering that 90 percent of all law enforcement agencies in the United States have fewer than 50 sworn officers. Indeed, half of all law enforcement agencies have 10 or fewer officers. Nationally, 90 percent of law enforcement agencies serve populations of 25,000 or less. For the purposes of this study, the researchers surveyed small and rural law enforcement agencies with fewer than 20 officers that serve populations of 50,000 people or less.

Despite their size, these small and rural law enforcement agencies face many of the same problems as their large urban and suburban counterparts. Armed robberies, thefts, fraud, rapes, assaults,

murders, and many other violent and nonviolent crimes occur in small towns and rural areas as well as in cities and suburbs. Small and rural agencies have to deal with the same issues of specialization, volume and nature of workload, training, local history and culture, and limited budgets as do large police departments.

Because of their small size and limited financial resources, few small agencies can afford to have officers who specialize in particular types of crimes or are highly trained in using new technologies. Police officers in small towns and rural areas have to be generalists. Still, they need to be aware of technology and its application to crime investigation. Thus, for example, officers do not have to be computer or video specialists, but they do need to know that a suspect's personal computer or home digital camera may contain useful evidence. They also need access to other police departments that do have specialists who can retrieve and analyze that evidence.

Some new technologies are now widely used in American society while others are more specific to police and the military. The former include laptop and personal computers, mobile telephones, portable radios, and video cameras. Slightly more esoteric devices such as global positioning systems (which link computers with earth-orbiting satellites) and geographic information systems are becoming more common. More specialized equipment includes devices that allow police to track stolen cars or disrupt a vehicle's engine, night-vision goggles, stun and TASER® guns, rubber bullets and other less-lethal weapons, and digital imaging fingerprint systems (see "Law Enforcement Tools of the Trade", page 4).

Exhibit 1 lists the technologies included in the survey and their reported frequency of use.

Technology in small agencies

Recognizing what technology can help police do, the critical concerns are whether small and rural agencies are adopting new technologies, how important they perceive these systems or devices to be for their operations, and whether or not they have the ability to use new technologies effectively. To find out, the Justice and Safety Center's researchers sent a survey to 384 small and rural agencies across the United States to learn what

Exhibit 1. How frequently do small agencies use technology?

Technology	Percentage of agencies* that use it		
	Often	Sometimes	Never
Communications—mobile radios	98.7	0.0	1.3
Communications—portable radios	95.3	2.1	2.6
Communications—base station radios	82.5	7.7	9.8
Personal computer (PC/microcomputer)	66.4	11.1	22.6
Communications—cellular phones	59.5	30.8	9.7
Mainframe computer	43.6	9.4	47.0
Video camera (in patrol cars)	33.6	18.1	48.3
Digital imaging—mug shots	31.2	14.1	54.7
Minicomputer	25.8	10.0	64.2
Car-mounted mobile digital/data terminal	15.9	3.1	81.1
Car-mounted mobile digital/data computer	12.9	1.3	85.8
Laptop computer (in field)	11.3	15.2	73.5
Digital imaging—fingerprints	9.6	7.9	82.5
Video camera (fixed-site surveillance)	8.3	30.9	60.9
Video camera (mobile surveillance)	8.3	31.0	60.7
Digital imaging—suspect composites	6.9	30.2	62.9
Vehicle (tire deflation spikes)	3.9	37.4	58.7
Night vision/electro-optic (image intensifiers)	3.5	38.2	58.3
Night vision/electro-optic (infrared—thermal imagers)	1.8	23.7	74.6
Vehicle (stolen-vehicle tracking)	1.3	5.3	93.4
Global positioning systems—mobile surveillance	1.3	7.4	91.3
Night vision/electro-optic (laser rangefinders)	1.3	8.4	90.3
Global positioning systems—vehicle location	0.9	1.8	97.4
Hand-held digital terminal	0.9	1.8	97.4
Less-lethal force—hand-held electrical device/direct contact	0.4	7.0	92.5
Less-lethal force—stun devices	0.4	8.8	90.8
Less-lethal force—choke hold or neck restraint	0.4	15.7	83.9
Less-lethal force—flash/bang grenade	0.4	21.6	78.0
Less-lethal force—three-pole trip	0.0	0.0	100.0
Less-lethal force—tranquilizer darts	0.0	1.3	98.7
Vehicle (electrical/engine disruption)	0.0	1.3	98.7
Less-lethal force—capture net	0.0	2.2	97.8
Less-lethal force—rubber bullets	0.0	8.8	91.2
Less-lethal force—soft projectiles	0.0	14.5	85.5

**N = 239*

Note: Figures may not sum to 100 due to rounding.

Law Enforcement Tools of the Trade

Wired. For modern law enforcement agencies, computers have many uses beyond their traditional administrative, recordkeeping, and report-writing functions. Patrol car-based computers—either laptops that can be moved from place to place or personal computers mounted in the car*—can connect officers in the field with computers at their police station, other police stations around the community, and State and Federal law enforcement agencies. Information obtained via those computer connections can quickly inform officers, for example, that a suspect they have just arrested or a person they have questioned is wanted by other law enforcement agencies and might be armed and dangerous.

Computers can also be used to help police map where certain crimes are occurring, locate crime hot spots, and identify geographic patterns in criminal behavior. Such crime mapping is an important tool that allows police to spot patterns, calculate whether a series of similar crimes were committed by the same person or different individuals, and sometimes even prevent crimes or catch suspects by increasing patrols in hard-hit areas. By connecting their separate computer systems, neighboring small and rural police departments can extend their crime-mapping abilities beyond their own jurisdictions to see regional patterns and assign officers accordingly.

Modem operandi. Computers, especially when combined with other new technologies, can also link officers in the field with national databases. Digital imaging fingerprint systems can scan arrestees' fingers electronically instead of using the traditional ink-and-paper method. The results can be sent electronically to the FBI's Automated Fingerprint Identification System (AFIS), a database that lets police compare a set of newly taken fingerprints with those already in the system.

As with computers, modern communications are vital to today's police work. Portable radios and cellular telephones can help officers in the field better apprise their home station of their position and situation, and they can enable dispatchers to send more police to a crime scene quickly if necessary. Global positioning and geographic information systems also show great promise as useful law enforcement tools. These systems can help small and rural agencies—especially those with sprawling jurisdictions—by enabling officers in the field to pinpoint their precise location. They can help individual officers describe more accurately to dispatchers the exact position of a crime scene or rescue situation, or they can help police locate the car of officers who have failed to radio in on time. They can even help find a stolen police car.

Less lethal. Some technologies, a few of which are not so new, can help save the lives of officers, citizens, and suspects. These include such nonlethal weapon systems as rubber bullets and other "soft" projectiles, capture nets, stun and TASER® guns, and grenades that produce a loud bang and a bright flash to disorient a suspect. These weapons allow police to better control a crowd, defuse a riot, or capture a suspect without seriously injuring or killing anyone.

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*Computers installed in patrol cars are often called "digital/data systems" or "mobile digital/data computers and terminals." The former are usually mounted between the driver and front passenger. Mobile systems are placed in the car's trunk because the passenger compartment is too small to accommodate the computer. With these systems, a smaller terminal linked to the computer in the trunk is mounted in the front seat or on the dashboard.

technologies they are using, which technologies they perceive as important to their work, what technical competency and training needs exist, and what obstacles prevent or limit agency access to new technology. Of the 384 agencies that received surveys in the fall of 2000, 239 (62 percent) responded.

Technologies in use. Not surprisingly, nearly all the small and rural agencies surveyed use computers in their work, but most use them more for administrative support than for specific law enforcement functions. In fact, a majority said they use computers for only three law enforcement functions: managing records such as computerized arrest files and telephone calls for service (86 percent), accessing the Internet (73 percent), and criminal investigations (72 percent). In contrast, only 46 percent reported using computers for dispatch purposes, 41 percent for crime analysis, and less than one-third for crime mapping, in-field communications, and/or resource allocation.

Modern communications systems are more important to small and rural agencies than computers. More than 97 percent of the agencies surveyed said they consider communications to be vital to their work. Ninety-nine percent reported that they often use mobile radios, 95 percent often use portable radios, and 82 percent use two-way radios. Nearly 60 percent often use cellular telephones.

On the other hand, less than one-third of the agencies reported that they maintain an official home page on the Internet, and less than one-fourth of the agencies reported that they had computer crime investigation capabilities.

Perception of value. Beyond use, the researchers wanted to know how important small and rural police agencies consider modern technology to be to their operations. In addition to the high value placed on communications equipment, the police departments surveyed said that personal computers, video cameras in police cars, and mainframe computers are important. Seventy-two percent said that personal computers are "very important," 55 percent said the same for video cameras in patrol cars, and 53 percent for mainframe computers.

In most cases, respondents rated the importance of technologies at the ends of the spectrum—either "not important" or "very important." However, some technologies were rated in the middle ("somewhat important"), including rubber bullets and stun guns, laptop computers, night-vision goggles, surveillance video cameras, and stolen-vehicle tracking systems.

Training needs. Most small and rural police departments gave their officers a low rating for their knowledge of and/or competence in using new technologies. A "no-competence" rating was most often associated with less-lethal weapons, car-mounted digital/data terminals, digital imaging for fingerprints and suspect composites, global positioning systems, mainframe computers, night-vision goggles, vehicle engine disruption devices, and stolen-vehicle tracking devices. It should be noted that the technologies given "no-competence" ratings were those perceived as unimportant and not used by the agencies.

Small and rural agencies rated their officers as "fully competent" in using two-way, portable, and mobile radios and cellular telephones. These are the same technologies that most of the agencies said their officers have access to and see as important to their work. A smaller number reported that their officers are "fully competent" in using personal computers (38 percent) and video cameras (36 percent). As noted above, the new technologies that police become competent in and use are those that agencies have available and view as important.

Regarding training needs, the surveyed agencies gave more varied responses. Most indicated their officers need training in the use of such technologies as global positioning systems, hand-held digital terminals, digital fingerprinting, and less-lethal weapons. They also reported needing training for devices that track stolen vehicles, car-mounted digital/data systems, and equipment that disrupts a vehicle's engine. Again, these are the technologies that most small and rural law enforcement agencies do not use, do not see as important, and do not view their officers as being competent to use.

Fully 82 percent said that their police officers do not need further training in the use of cellular phones or mobile

and portable radios. Most said, however, that they do need "some training" in the use of personal computers.

Cooperation, barriers, and resources. The survey also asked about interagency cooperation, barriers to acquiring technology, and resources for acquiring technology. On the subject of cooperation between police departments, nearly 65 percent of respondents said they have interagency cooperation with other police departments to provide technology assistance. Most often, these agreements are with other local and State law enforcement agencies.

Regarding barriers to obtaining new technologies, more than 83 percent cited financial and budget constraints. Twenty-six percent said the lack of trained personnel and limited manpower impedes their ability to acquire new technology, and nearly 14 percent pointed to a lack of available training. To overcome those barriers, the surveyed law enforcement agencies most often cited taking advantage of State and Federal grants and State training programs (see "Getting the Tools," page 9).

County versus municipal agency technology use

Finally, the study looked at differences among small and rural law enforcement agencies based on whether they represented a county or municipality. Significant differences were found mostly in how county versus municipal police departments use computerized data files. Municipal agencies are more likely than county agencies to use computers for in-field report writing and to maintain computerized files for alarms, traffic accidents, and traffic citations. Conversely, twice as many county agencies use computerized files for warrants as their municipal counterparts. And, although very few county and municipal departments reported using global positioning systems, slightly more municipal agencies use these systems than county agencies.

Technology gap

Study results suggest that rural and small law enforcement agencies nationwide do not use most of the technologies included in the survey. These agencies tend to use, to be competently trained in, and to perceive as important a variety of communications-related technologies and personal computers. They tend, however, not to use, not to be trained in, and to be ambiguous about the need for or importance of more sophisticated technologies. Clearly, these issues will have to be addressed systematically for small and rural law enforcement agencies to become better versed in more sophisticated law enforcement technologies.

Recommended reading

The Justice and Safety Center, Eastern Kentucky University, "National Assessment of Technology and Training for Small and Rural Law Enforcement Agencies (NATTS): A Descriptive Analysis," final report to the National Institute of Justice, December 2002, NCJ 198619, available at www.ncjrs.org/pdffiles1/nij/grants/198619.pdf.

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"Technology: Alaska to the Appalachians," *Techbeat* (Winter 2002), available at www.nlectc.org/techbeat/winter2002/AlaskaWinter02.pdf. Techbeat is published quarterly by the National Institute of Justice's National Law Enforcement and Corrections Technology Center (NLECTC).

NLECTC provides technology information and assistance to State and local law enforcement agencies through five regional centers that specialize in specific areas of technology research and development. See www.nlectc.org or call 1-800-248-2742 for more information.

Getting the Tools

Small and rural law enforcement agencies can get information and assistance in determining how technology can help them and how they can obtain equipment and training. Grants and buying consortia are available to help cash-strapped local law enforcement agencies purchase and install new technologies. The U.S. Department of Defense and other Federal agencies, such as the U.S. Forest Service, as well as police departments across the Nation often make surplus or outdated but still useful equipment available free or at a reduced price. Small and rural agencies often can share expensive technologies with neighboring agencies, thus making their purchase feasible for all; or they can buy less costly alternatives. Free or low-cost training programs can help officers learn how to use computers and other new technologies.

The National Institute of Justice's Science and Technology Web site has a technology funding page* with information on funding availability for technology purchases and on surplus property programs.

*www.ojp.usdoj.gov/nij/sciencetech/techfunding.htm#equipmentfunding

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