One conclusion that emerged from our discussions with the emergency responder community is that protecting the health and safety of law enforcement responders may be the most challenging personal protection task within the community. A major part of the challenge stems from the difficulties in characterizing the hazards that law enforcement responders face. These difficulties are compounded by the fact that law enforcement personnel are typically the first on the scene of an emergency or incident, and therefore have the least amount of advance information about the scene’s potential hazards. In addition, the range of hazards that law enforcement responders face continues to increase, with exposure to infectious diseases and terrorism ranking as the most important concerns.

CHALLENGES OF PROTECTING LAW ENFORCEMENT RESPONDERS IN THE LINE OF DUTY

In our little “burg” we have enough bizarre [situations] . . . . It’s usually the case that we don’t know what we are getting into until we get into it.

—Law enforcement representative

Several factors affecting the use of personal protective technology in law enforcement were raised by law enforcement representatives in their discussions with RAND.

First, patrol officers often are the first to arrive on a scene and are expected to render assistance while maintaining law and order. “We are trained to drive right up to something and fix it,” said one police officer. In many cases, patrol

1The focus in this chapter is on “main-line” law enforcement personnel (e.g., police, sheriffs, state police, transit police). Personal protection for specialty units such as SWAT, bomb, and anti-terrorism squads are addressed in Chapter Six.
officers discover unsuspected health and safety hazards only while in the process of being exposed to those hazards. An example cited by participants is the witnessing of a violent assault or the discovery of a methamphetamine laboratory when responding to a domestic disturbance call. “[Methamphetamine labs] are unlike anything we have dealt with before,” said one official of a mid-size city, voicing a concern that was echoed in several discussions. In talking about this issue, many participants referred to police officers as “blue canaries.” Said one commander, “It’s funny, but it’s probably true.” But, he added, in the post-9/11 environment, “It’s not stuff we can laugh at any more.”

Second, given their need for agility, flexibility, and speed, police officers cannot be burdened with excessive or restrictive gear. Situations in which PPT could impair an officer’s performance include foot pursuits, the use of firearms, and physical altercations. Recent changes in operational doctrines that emphasize a more-proactive, offensive response to threats in the community have put mobility at a premium, several law enforcement representatives observed.

The handier you make it, the more likely you are to use it.

Nobody has been able to design gear for the range of environments that police find themselves in.

—Law enforcement representatives

Third, most law enforcement personnel are on patrol in the field between calls and therefore usually have very limited personal protection equipment that they can grab quickly in the event of an emergency. The trunk of a patrol car has proven to be inadequate for storing PPT (see Chapter Eight for further discussion of this topic). Patrol officers on foot or on bicycle cannot carry much gear with them at all. Yet, they encounter widely diverse environments and scenarios over the course of a work shift. Unlike the fire and medical services, law enforcement agencies typically do not have backup technology resources they can call on: “You can be reasonably assured that [firefighters] have the gear they need,” or they can call in another truck that has the gear, said a police official from a mid-size city.

Fourth, responders’ appearance is a concern, which places another constraint on developing PPT for law enforcement. Because of their frequent face-to-face contact with citizens and the increasing importance of fostering and maintaining strong ties with the communities they protect, patrol officers and other law enforcement personnel should not be burdened with excessive gear, especially gear that can be perceived as being threatening. Undercover agents and anti-terrorism squads need to blend into their surroundings and not become targets of attention.
Fifth, time for training is limited, which creates another impediment to the effective use of PPT in law enforcement. In contrast to the fire service, in which station time can be used for conducting training and refresher courses, patrol duties and case loads leave police officers little time to obtain extensive training in areas such as hazard identification, use of personal protection equipment, and safe practices. Although many agencies noted that several extramural training opportunities are available, particularly in the areas of terrorism and WMD response (much of this effort is coordinated through the State and Local Domestic Preparedness Training and Technical Assistance Program of the Office of Domestic Preparedness), many agencies lack the money for backup personnel to fill in for officers who are pulled off their shifts for training.

Sixth, most personal protective equipment and practices are not developed with the law enforcement mission and operating environment in mind. Compared with the fire service, law enforcement in the United States has fewer guidelines, standards, institutions, and committees addressing its protection needs. “We don’t have a whole lot of regulations,” said one police official. The National Institute of Justice (NIJ) maintains an active program of research on and standardization of technologies for law enforcement, but, aside from research on ballistic vests, little of this effort is directed toward personal protection. Where it is feasible, many agencies observe NIOSH and NFPA guidelines. Yet, implementation of these guidelines might still be haphazard because most law enforcement agencies have not put into place the safety committees, compliance officers, and enforcement practices that are common in the fire service. “There’s a basic lack of oversight on this job,” said one law enforcement representative.

Finally, PPT has not historically ranked as a critical policy, management, or budgeting priority in the law enforcement community. In talking about ongoing efforts to upgrade PPT for a WMD event, a police official in one mid-size city

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2One participant noted that law enforcement personnel who also serve as volunteer firefighters and attend firefighting seminars can be important conduits of the latest information on PPT.
commented, “We are the only public servant first responder [organization] that has never been mandated to have such equipment.” A representative from a small-town police department in a heavily industrialized area noted how his agency was relatively well prepared in terms of communications, hazmat, and incident command. But, in terms of PPT, he said, “We are sadly lacking.” He added, “To put an officer out there with insufficient training and equipment is not right.”

In sum, the low baseline of personal protection preparedness combined with high performance demands on PPT used in law enforcement creates particularly difficult hurdles standing in the way of improving the health and safety of law enforcement responders in the line of duty.

In recognizing the need to improve PPT for law enforcement, the federal government has instituted several programs, coordinated through the Office of Domestic Preparedness, to provide funding for local police departments to acquire equipment, including PPT, and to offer training. Many of the large departments with whom RAND met had taken advantage of this funding. While such programs represent a positive step toward protecting law enforcement responders, they primarily are built around responding to the threat of terrorism and are viewed as nonessential resources for large law enforcement departments with special needs. Discussion participants emphasized that widespread awareness, availability, and use of PPT still does not exist at the local police department level.

HAZARDS AND TECHNOLOGY PRIORITIES FOR LAW ENFORCEMENT RESPONDERS

Participants voiced their greatest concern about three principal threats to the safety and health of law enforcement officers: assaults, automobile accidents, and acts of terrorism. The last concern was raised by multiple emergency responder services and is addressed in Chapter Six. Other concerns that were raised include infectious diseases, nonassault injuries incurred during arrests, and exposure to chemicals involved in illegal drug manufacture. Overall, the community’s perception of the risks from these threats agrees with the available surveillance data, which were presented in Chapter Two.

Protecting Against Assault

The PPT in most widespread use in law enforcement is the ballistic vest. It is designed to protect the wearer primarily from gunshot wounds, but it also provides protection from knife wounds, abrasions, and blunt-impact injuries. Two participants noted that ballistic vests helped reduce injuries from serious auto
accidents, and “probably saved way more lives from blunt-force injuries from a steering wheel than they ever protected from bullets.”

Nevertheless, patrol officers often do not wear vests because they find them too uncomfortable to wear over the duration of an entire shift. Problems with fit that were cited include the vests bunching up at the waist and riding up the chest and neck when seated in a car, excessive warmth, and moisture buildup underneath the vests. “It gets soaking wet all of the time,” said one law enforcement representative from a warm-weather community. “Discomfort is the reason they don’t wear them.” Most departments that RAND visited issue issue vests to all responders but do not require their use for routine duties.3

Senior-level officers consistently mentioned the high cost of purchasing ballistic vests for their departments. A related problem is the lack of any objective means of determining when a vest needs to be replaced. Consequently, vests are usually discarded when the manufacturer’s warranty expires, which is usually five years after purchase.

Research and development to improve ballistic vests, largely supported by NIJ’s Office of Science and Technology, has produced tangible benefits: Several participants noted that the functionality and comfort of ballistic vests has improved significantly since they were first introduced in the mid-1970s. The thickness and weight of the vests have been reduced, but to some extent this has been achieved by reducing the size of the vest, which leaves portions of the wearer’s shoulders and the lower abdomen exposed. With regard to recommended technology improvements, there appears to be a strong consensus supporting development of more-comfortable vests (in terms of weight, flexibility, and breathability) with equal or improved levels of protection. Such improvements would promote greater usage of vests and allow for designs that provide greater bodily coverage.

For officers in high-risk situations, additional assault protection equipment, such as helmets, face shields, and body armor, is available. This equipment is welcome protection in predictably high-risk assignments, such as forced entry and arrest, some types of crowd control, and many SWAT missions. However, participants were in strong agreement that this type of equipment is not appropriate for officers on routine patrol, even though it is on routine patrol when the vast majority of assaults to officers occurs. A problem with this additional as-

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3Ballistic vest usage was said to be in the 50–60 percent range by several participants. One explanation that was given for not making the vests mandatory is to allow families of officers who are shot and killed in the line of duty to be eligible for benefits whether or not the officer was wearing a vest. If the wearing of vests were mandatory, officers who are shot while not wearing a vest would be in violation of department policy and their families may not be eligible for benefits.
sault protection is its threatening appearance and the fact that it conveys the impression that violence is presumed to occur.

Other innovations mentioned in the discussions with law enforcement responders included “throw-on” armored jackets and overcoats that can be donned in high-risk situations (and which can also be used by fire or medical personnel), protective armor that is integrated with the uniform shirt, and armor that is worn as an outer garment with the officer’s identifying information and other features sewn onto it. Participants, however, identified logistical and performance constraints that lessened the usefulness of this gear: Overcoats are not likely to be available for grabbing in a hurry; integrated-armor shirts tend to become burnished and fray too quickly, and external armor may appear threatening to the public. As one police representative put it, “As officers, you’re at risk all of the time. There is no time to get a vest.”

**Preventing Automobile Injuries**

Most police patrol work is done while officers are riding in an automobile. We often heard participants describe the patrol car as “the officer’s office.” Forty percent of all line-of-duty police officer deaths are motor vehicle related (see Chapter Two). About one-third of police line-of-duty fatalities and 16 percent of line-of-duty injuries result from accidents occurring while officers are in their patrol cars. Law enforcement representatives participating in the RAND discussions mentioned three major problems driving these numbers: problems with vehicle interior design; lack of protection during high-speed, rear-end collisions; and the driving behavior of patrol officers.

Vehicle interior design problems center around the location and design of a vehicle’s communication and information management systems. Generally, this equipment is located to the right of the driver, and use of this equipment can cause officers to become distracted, leading to accidents. Participants also believed that this equipment increases the risk of injury in collisions because occupants can be thrown into the equipment during an accident. In addition, the size of the equipment often leaves the officer in the passenger seat with limited space, resulting in ergonomic problems. An emerging improvement, discussion participants noted, is equipment built into the vehicle itself rather than retrofitted into the passenger space. Indeed, one police department showed the RAND team a new set of patrol cars with much of the communication and information management systems integrated into the dashboard. Some participants suggested that law enforcement officers could also benefit from “heads-up” displays, similar to the displays that are used in fighter jets and some luxury automobiles, so that officers could keep their eyes on the road.
Police officers’ patrol duties require them to operate and stop their vehicles in the vicinity of high-speed traffic—on city boulevards as well as on freeways. In such situations, an officer can be seriously injured or killed by a rear-end collision. One participant raised concerns about the design of police cars that contributes to fuel-tank explosions in such incidents. Options that were discussed to address the risk of rear-end collisions included strengthening the frames of police vehicles, adding active protective devices (e.g., airbags) that are specifically designed for such collisions, and improved warning lights on police vehicles. Although a few officers mentioned the concept of designing a police car from the ground up to incorporate enhanced interior and safety features (as opposed to simply modifying a civilian vehicle), none thought it was a practical alternative.

Senior police officers who discussed vehicle accidents appeared to be keenly aware that the driving behaviors of patrol officers—especially the younger members of the force—are a major cause of accidents, injuries, and deaths. Seat belt use has improved significantly in recent years, but participants reported that it is still not universal. Department rules mandating that officers pull over when using computers are not always observed. And participants said they know that officers are prone to drive at excessive speeds. Law enforcement representatives discussed various strategies that their departments have used or are considering to educate officers about the dangers of driving at excessive speeds and enforcing safer behavior behind the wheel. These measures include purchasing vehicles with lower-power engines; installing speed monitors and governors; developing protocols for high-speed pursuits, including when to desist from engaging in a chase; and disciplinary action for noncompliance with department rules. Our discussions with law enforcement representatives left us with the overall impression that many approaches are being discussed and tried in this area, but there is little knowledge about which ones are the most effective at enhancing automobile safety.

Protecting Against Pathogens

Like their colleagues in the emergency medical service, law enforcement personnel noted their concern about certain health hazards they now face in their routine duties: exposures to hepatitis, tuberculosis, and HIV. In addition to accidental exposure, many participants listed assaults, such as spitting, as potential means of exposure to pathogens. Many agencies now issue to individual officers or stock patrol cars with duffel bags or fanny packs containing disposable gloves, gowns, glasses, and masks or respirators for basic splash protection. However, one police representative from a mid-size city stated that not all personnel were trained and received refresher training in how to use the gear in the
equipment bags his department issues, and he estimated that half the force did not even know what was in the kits.

Pathogen exposures through the eyes, nose, and mouth were said to account for the largest portion of workers’ compensation claims in one mid-size city. At the same time, the eyes, nose, and mouth were seen as being difficult to protect in the course of routine operations because patrol officers rarely carry the necessary protective gear with them or do not have the time, or do not take the time, to return to their cars to retrieve that gear. “We’re lucky to throw on latex gloves,” said one officer.

Cops use their hands for everything they do.
—Law enforcement representative

Protection of one’s hands was seen by some participants as the most difficult pathogen protection problem they face because of the need for manual dexterity in executing critical police tasks such as driving, holding a flashlight, apprehending individuals, and using weapons. The need to collect evidence also was repeatedly cited as being critical to police work, but it also makes protecting one’s hands more difficult. “You have to be able to look at evidence and handle it,” asserted one representative. A crime scene investigation can go on for many months, he added, pointing to the 1993 World Trade Center bombing. The anthrax attacks in 2001 also highlighted this problem: U.S. Postal Police needed to gather evidence while protecting themselves from extended exposure (Jackson et al., 2002).

Like ballistic vests, protective gloves (typically made of latex) are in widespread but not universal use in law enforcement. Most law enforcement agencies reported having gloves stocked somewhere in their patrol cars. However, the protective capacity of latex gloves is limited. Police officers worry about needle sticks and other hand injuries when searching pockets or cars for evidence. Leather gloves (sometimes lined or coated to prevent needle-sticks) were seen as adding a level of protection, and they appeal to many officers (partly because of the “macho factor,” said one participant). However, it was noted that an approaching police officer wearing leather or even latex gloves can be perceived by the public as intimidating and may communicate undesirable and unintended messages.