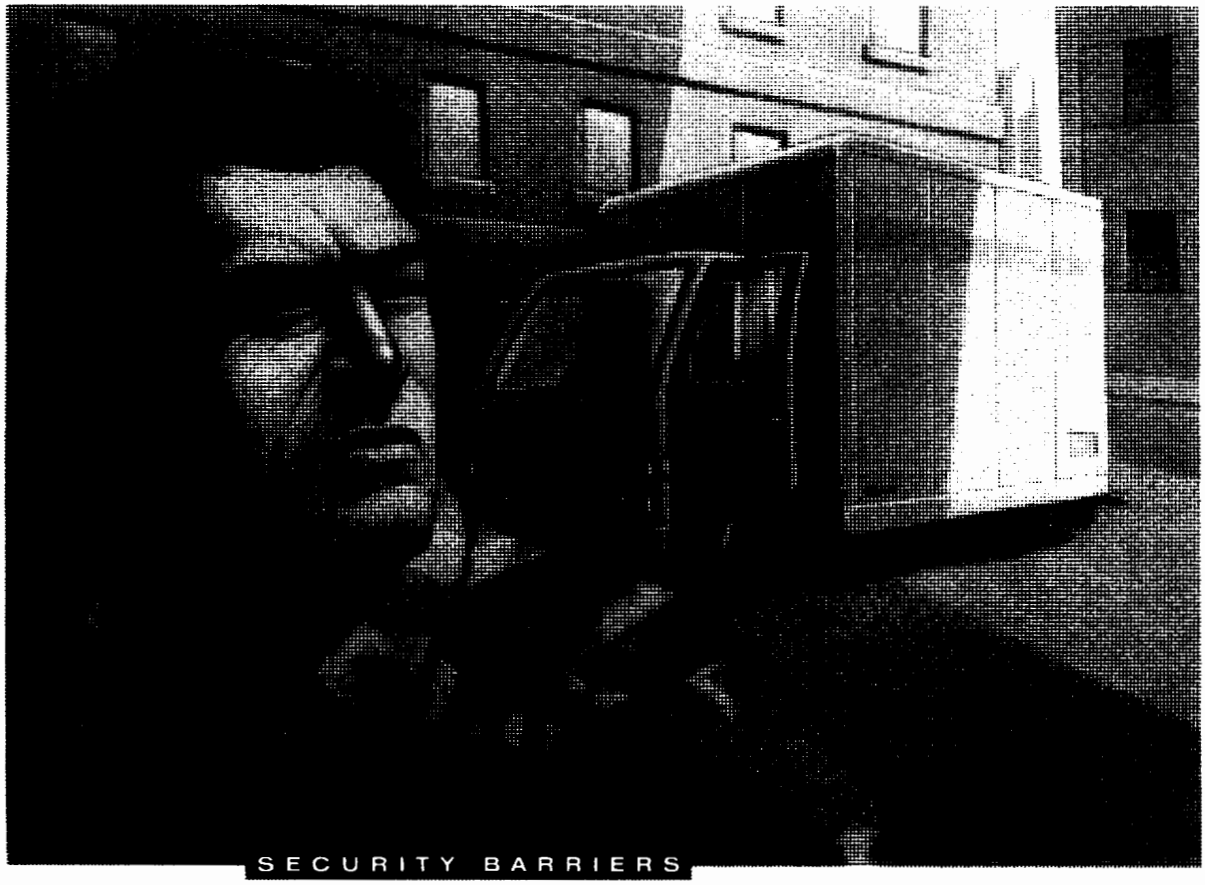

SECURITY BARRIERS

RAISING THE RAMPARTS

By TIM TRUE

WHETHER IT IS FOR A DRIVE-BY SHOOTING or a deadly car bomb, motor vehicles are being used more than ever in criminal attacks. As a result, government agencies and businesses are erecting vehicle barriers around their buildings to control the traffic flow into their facilities while also deterring and, if necessary, stopping vehicles from penetrating the perimeter.

Before purchasing a vehicle barrier, the security manager must understand the threat and the techniques an individual or group would most likely use against the facility. In addition, the security manager should be familiar with the different types of barriers available on the market, including the vehicles they will stop and the image they will portray to the public.

Illustration by
STEVE KROPP

Threat assessment. If a company is considering whether its facility should enhance security with vehicle barriers, the security professional should conduct a site-specific threat assessment of the building.

The process should begin with an analysis of the company's potential exposure because of its physical location or its association with other groups. For example, security personnel should look at the company's neighbors and any tenants who rent space in the facility—each of which could be potential targets from a particular group. The security manager should contact local law enforcement to determine whether any threats have been made against other businesses in the area. In addition, local police can educate the company about local groups that have a history of targeting specific businesses or industries.

Once any specific group has been identified as a potential threat to the company, the security manager should determine what attack methods the group or similar groups may have used in the past. The company should also identify specific vulnerabilities to its building. For example, a company housed in a building located at the end of a long, straight road would be vulnerable to a high-speed vehicle attack. A building that backs up against a dark alley would be vulnerable to a parked car bomb.

When completed, the assessment should help the security manager develop a plan that outlines the type of barriers needed and where those barriers should be located. The threat assessment will also help the security manager estimate the likely size and weight of an attack vehicle and the maximum speed that vehicle could achieve on the streets leading to the building. This information is critical when choosing vehicle barriers.

Ratings. Vehicle barriers are assigned government-certified ratings based on the level of protection they provide a facility. The rating, which is generally given after a barrier undergoes a crash test, will tell the security manager the size and speed of a vehicle the barrier can stop. For example, one barrier might be certified to stop a 15,000-pound truck traveling at fifty miles per hour (mph), while another barrier is certified to stop a 10,000-pound truck traveling at forty mph.

The ratings can be confusing, however, because no single universally recognized rating system is used throughout the barrier industry. Instead, the industry relies on several different rating systems that have been developed over the years by various government agencies. The State Department, for example, has developed one rating system for vehicle barriers while the Nuclear Regulatory Commission has developed another.

Each agency's rating system is based on a barrier's ability to stop a certain size vehicle. For example, one agency tests barriers against 15,000-pound trucks traveling at thirty, forty, and fifty miles per hour. The barrier is considered to have stopped the vehicle if it only allows the truck to penetrate three feet or less beyond the barrier. Another agency tests barriers against 10,000-pound trucks traveling at fifteen and fifty miles per hour. The se-

curity manager should ask to see the vehicle barrier crash certification, which should list the model of the barrier, the weight and speed of the vehicle it stopped, and the federal agency that supervised the test.

Crash tests. Most government rating systems require the barrier to undergo a crash test conducted by an independent, government-certified engineering firm. The barrier's manufacturer is usually responsible for paying for the test, which must be witnessed by a representative of the federal agency rating the barrier.

Some agencies do not always require a crash test, instead using mathematical formulas to calculate a barrier's stopping capability. Although these formulas are fairly accurate, a company cannot know for sure how much force a barrier will withstand unless it has been crash tested.

Design. In addition to determining the most appropriate barrier rating for the threat scenario, the security manager must choose the best barrier design for the facility. Many options exist within two broad categories: passive, immobile barriers, such as bollards, and active barriers that move either manually or automatically.

Passive barriers. Passive barriers offer the greatest variety of styles. The most commonly recognized fixed barriers are decorative perimeter bollards and concrete planters. Effective vehicle barriers can be formed by earth berms or large boulders. Large trees (which are not rated) and specially engineered and anchored park-type benches can also serve as barriers. Special hardened perimeter fencing and fence cabling systems are available to help resist vehicle penetration as well.

Each one of these barriers comes in different sizes to stop different size vehicles traveling at various speeds. The style chosen—whether it is a fence, bollards, or planters—usually has more to do with aesthetics than other criteria. For example, a company headquarters located in a busy downtown building may choose reinforced benches or planters, which offer a more attractive alternative than concrete bollards. A company that wants to display a strong security image may opt instead for the bollards. Fences, which are often seen as unattractive, are appropriate when a company is trying to limit pedestrian access to a facility as well as vehicle access.

In an emergency that requires temporary or immediate installation of barriers on short notice, the security manager can contact local highway contractors and have them erect ordinary concrete highway barriers. These barricades are not rated on their stopping capability because they are not manufactured as a security device. However, they can be effective in an emergency, especially if they are interlocked together and firmly bolted to the ground when installed.

In an extreme emergency, when the company doesn't have barriers, it can use heavy vehicles such as trucks, buses, bulldozers, and forklifts to block critical areas. Heavy vehicles, although not rated, can stop a 15,000-pound truck at 50 mph—providing strong security in a pinch.

Active barriers. Active barriers are used at entrances and include gates, barrier arms, and pop-up type systems. Pop-up systems include bollards, rotating wedges, spikes, and other devices that are set underground and, when activated, spring up to block a vehicle. Pop-up barrier styles can address secu-

rity while meeting aesthetic considerations because they can be set out of sight when not in use.

More sophisticated systems involve two sets of barriers that secure a vehicle in a sally port. These systems are used for high-security operations, such as at a U.S. embassy. In this type of configuration, one barrier is on the outside of the perimeter and the other is on the inside. A vehicle passes through the outer gate, which closes and locks. The vehicle, now sandwiched between the two barriers, is searched by security. When the vehicle has been cleared, the second gate opens, allowing the vehicle to move into the facility parking lot.

When choosing gates, pop-up devices, and barrier arms, the security manager should also consider the speed of the active barrier. High-security gates and barrier arms move slowly and can delay traffic during morning and afternoon rush hours. For example, a barrier arm designed to stop large vehicles at high speeds takes about ten seconds to rise and drop. Heavy-duty sliding gates take about twelve seconds to move twelve feet. By contrast, pop-up devices take only one to three seconds to either rise from or drop into the ground.

Most barriers are available as either an automatic moving system or manually operated. Automatic systems are power-activated by access control cards, vehicle tags, remote pendants, programmable timers, and other devices. Manual systems require a security officer to either open the barrier by hand or use another device such as a manual lever.

With automatic systems, the security manager should place the operator or power unit in close proximity to the barrier device. If it is a gate system, the power unit will have to be mounted integral with the gate. In a barrier arm installation, the power unit is either integral with the device or mounted remotely.

Most pop-up barriers have remote power units. These power units should be located within twenty-five feet of the barrier device to help avoid the requirement for a more specialized connection. Remote power units should be placed above ground on a concrete pad. Outside mounting of the power unit requires the addition of an environmental enclosure to protect the unit from weather and vandalism. In addition, when installing the controls, the security manager should ensure that the person operating the barrier functions will have a clear and unobstructed view of the barriers and the traffic lane.

Accessories. The security manager should also consider using safety accessories to control the traffic flow through an active barrier and to protect pedestrians. Safety options include traffic signals, informational signs, special roadway painting schemes, reflective paint, tape stripping, barrier mounted warning lights, barrier auxiliary lighting, and speed bumps. In addition, a vehicle safety loop sensor can be used to monitor traffic flow and prevent an active barrier from moving while a vehicle is passing through the barrier zone. This prevents a pop-up barrier, for example, from emerging from its underground post while a car is driving over the barrier. Photoelectric and microwave sensors are similar devices; both can be used to protect pedestrians as well as vehicles. These accessories are only options; they do not automatically come with active barriers.

In addition to safety options, environmental equipment should also be used. For example, heaters should be added to keep barriers functioning properly in cold weather.

When purchasing barrier systems, the security manager should try to purchase all of the equipment from one source to help ensure that the components selected work together and have been chosen based on compatibility. The security professional should require product specifications and technical drawings.

As with any purchase, it is important to look for suppliers who have a good reputation and can offer product warranty and service.

Installation. Before making a final product decision, the security director along with a qualified contractor or potential supplier should analyze the installation location. This decision must involve consideration of many factors such as how deep the company can excavate, how high the water table is, what is needed for adequate drainage, and other site specific details. This is particularly important for pop-up barriers, which will be set underground and could have problems if water does not drain away from the device properly.

Most manufacturers today set up their equipment to be somewhat modular so that little field assembly is required and the task of installation can be handled by most general contractors. Some manufacturers may be willing to assist in the installation of the equipment where needed. Additionally, many security equipment dealers have installation and service capabilities.

Use. After installing and testing the equipment, the security manager should tell all employees why the barriers were installed and how they are to be used. Barriers will often require a change in security policies and procedures since they affect vehicular traffic. New procedures should be distributed in writing so that there is never any confusion.

The proper operating sequence for the greatest security benefit and safest operation for active barriers is to leave the barriers in the blocking position. Only after a vehicle and its occupants have been approved should the security barrier be opened to allow passage. After the vehicle clears the device, the barrier should be raised again to guard against unauthorized intruders.

Training. Training of operating personnel is strongly recommended. In addition to general training of these employees, at least two key people should be trained in all aspects of the system so that if something irregular or unusual occurs, the company has personnel that can help. For instance, the company may have a major power outage and might require that the barriers be operated manually during this situation.

With new systems, the company should require the installation group to provide the basic operational training. If the company requires expanded system training, the facility security manager should contact the product manufacturer for assistance.

As building and perimeter security is given higher priority at corporate facilities, more security managers may face the barrier selection issue. Through proper planning, the company can achieve the level of security that is right for its site. ■

Tim True is president of True Barrier Systems, Dulles, Virginia. He is a member of ASIS.