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Fall 2019

NAVIGATING
**SECURITY
TECHNOLOGY**

**& CYBER
SECURITY**
FOR VENUES

DEFENDING THE PERIMETER

FROM VEHICLE RAMMING ATTACKS

By Randy Atlas



Site analysis is a starting point in security defense planning. It considers the perimeter and grounds of the facility, including walls, plantings, fences, berms, ditches, lighting, and natural topographic separations.

The next security level is the perimeter or exterior of the building. The building shell and its openings represent a crucial line of defense against intrusion and forced entry. The area being protected should be thought of as having four sides as well as a top and bottom. The principal points of entry to be considered are the windows, doors, skylights, storm sewers, roof, floor, and fire escapes. Doors are by nature among the weakest security links of a building because they inherently provide poor resistance to penetration. Attention must be paid to the door frame, latches, locks, hinges, panic hardware, the surrounding wall, and the door leaf.

Window considerations for secure design include the type of glazing material, the window frame, the window hardware, and the size of the opening. The building shell itself is a security consideration for the simple reason that the type of construction will determine the level of security. Most stud walls and metal deck roof assemblies can be easily and rapidly compromised with common hand tools. Unreinforced concrete block walls can be broken quickly with a sledgehammer or by impact of a motor vehicle.

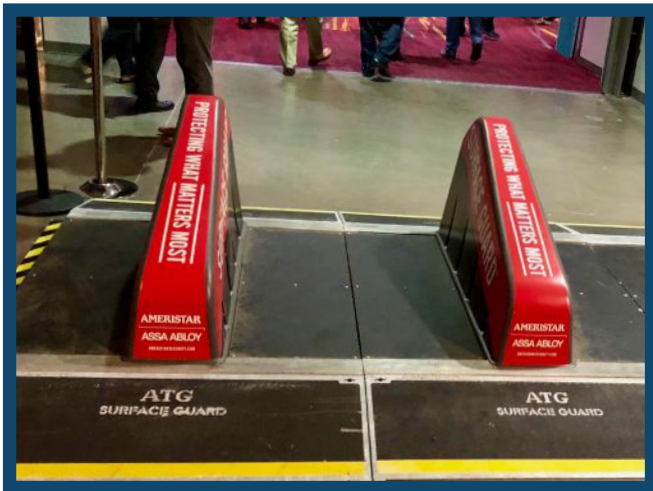
Vehicle ramming attacks are now a major consideration for public venues, both as accidents or on purpose crashes, to run over pedestrians or possibly deliver explosives to the building facade. From 2014 through October 2018 there were 23 terrorist vehicle ramming attacks, resulting in 204 deaths and 861 injuries.

When it comes to urban development and planning, communities are managing competing goals. On one hand, the public square is having a renaissance. Research confirms that pedestrian-friendly streets and walkable neighborhoods make for healthy, attractive cities. Vibrant streetscapes engage people to walk, play, eat, and shop, which lead to many benefits. Walking promotes individual health and is good for the environment, community engagement fosters social health, and street-level activity is a lift to local business and economy.

Yet, as this vital shift is happening, news reports too-often carry news of terrorist attacks. City and site planners must balance keeping people safe without sacrificing the welcoming spaces that encourage people to gather. In most communities, a limited budget is another consideration.

ANTI-TERRORIST PERIMETER SECURITY

For a long time, vehicular terrorism in public spaces was about the delivery of explosives. Research in the United States



has focused on ways to secure areas against these attacks without making people feel like they are living in a bunker. Fences and walls may prevent vehicles coming into close quarters, but they also close off the street and give the sense of living in a militarized zone. Instead, the solution has been to install barriers that allow pedestrian traffic while stopping vehicles.

Recent years have seen a rise in vehicle attacks, not involving an explosive. Before 2001, when cars struck pedestrians it was usually because of an accident or impaired driving. Deliberate crashes were rare and linked to mental illness, road rage, or targeted murder. The world has seen an increasing trend towards the use of pedestrian targeting in terrorism, albeit still rare. In reaction to this new threat, communities are considering how to build security on open streetscapes. Perimeter security is no longer just a concern for buildings and venues.

FINDING A BALANCE

No city wants to turn itself into a fortress for protection. No one wants to destroy, through security measures, the vibrant communities they are working so hard to protect and nurture. Yet, a sense of safety is important to the enjoyment of public space.

In response, designers, planners, engineers and architects have come up with creative solutions to provide safety while welcoming people into walkable neighborhoods. These security measures must respect street level views and vistas, provide disability access, secure gathering spaces, and blend in with local architectural styles to minimize interruption to city life.

The challenge is to implement these measures in a cost-effective way. After all, security planning is only one part of an overall planning budget, and funds are still needed to encourage investment and development in other ways.

SECURITY IN DESIGN DETAILS

After 9/11 the National Capital Planning Commission released a comprehensive document discussing security in urban and site design. The paper considers the balance between security and user-friendliness. To satisfy both needs,

the analysis examines a variety of site furnishings that can be hardened to provide barriers against vehicles without being obstructive to users or destructive to the landscape. Common public amenities like seating, drinking fountains, bike parking, planters, walls, and decorative fences can be hardened to provide a perimeter. Traffic guiding elements like streetlights, signposts, and bollards are also be unobtrusive security elements. Boulders and trees, so at home in many settings, can provide both protection and safety.

This NCPC paper suggests that a mixture of barriers is usually the best choice for bringing security to an area. Monotonous repetition of a single element for hundreds of feet is poor design that can make the security features embedded more obvious and less welcoming. A repeating element is made visually interesting with interspersions: for example, a line of bollards can be mixed with lamp standards, fences, trash receptacles, seating, and signage, in similar or complementing styles, to create cohesive visual interest while doubling as a security perimeter.

Changing the types of barriers can also mean changing the mix of security levels, depending on where on a site the barrier lies. Even if a tree or signpost can be driven over, it is an obstacle that drivers avoid. A car that drives over such obstacles is slowed and is clearly behaving erratically.

BOLLARDS IN A SECURE PERIMETER

As common traffic guidance posts in a streetscape, bollards are often a cost-effective and unobtrusive addition to security perimeter plans. Small, low profile, they are spaced widely enough to allow wheelchairs, scooters, and cyclists, yet close enough to stop cars. Bollards or bollard covers come in a variety of styles to match the architecture and design of almost any streetscape, including complementing other features like benches and lamp standards. Bollards placed in front of new tree plantings can unobtrusively “harden” the tree into a security feature.

As visual guides, low-impact decorative bollards guide expected behavior. Even a low impact bollard can prove a deterrent that moves someone along. The hesitation as to whether a bollard is impact hardy or not may be all that is necessary

to push a driver with ill intent away from a gathering space. Even if not, low-impact metal bollards are still an obstacle that will make a noise and cause damage, when hit. As directive barriers, there is a psychological aspect to their presence. They create an expectation of behavior and any sort of deviation outside. However, for stopping power, there are two major forms of security bollards available.

ANTI-TERRORIST BOLLARDS

Anti-terrorist bollards, also known as crash-rated or anti-ram bollards, are currently a popular topic in the news. They are sometimes confused with security bollards that are also designed to protect property and people against cars. In 2003 the Department of Defense released an updated definition of K-Ratings. These had always been a system evaluating the stopping power of furnishings such as planters, fences, gates, and bollards, but the updates were designed especially for the prevention of bombs being delivered by cars into buildings. As such, the re-released ratings promised an object could stop the bed of a midsize truck from traveling more than 150 feet after impacting at various speeds. These K-ratings have been replaced by a comprehensive ASTM crash rating system, which evaluate different sizes of cars and different levels of incursion past the barrier.

Crash-rated barriers, in conjunction with other security measures, are now required around government buildings. They are recommended around any high-target stationary sites that might draw a car-bomb or another vehicle attack. Crash-rated (anti-terrorist) bollards are often quite expensive. A set of three simple, permanent anti-terrorist bollards can cost upwards of \$50K. A retractable, hydraulic system can be much more expensive, costing hundreds of thousands of dollars for an installation, and millions of dollars for an entire site. Although these anti-terrorist bollards are extraordinarily important for targeted areas, they may be impractical for some installations, or best used as close-perimeter components in others.

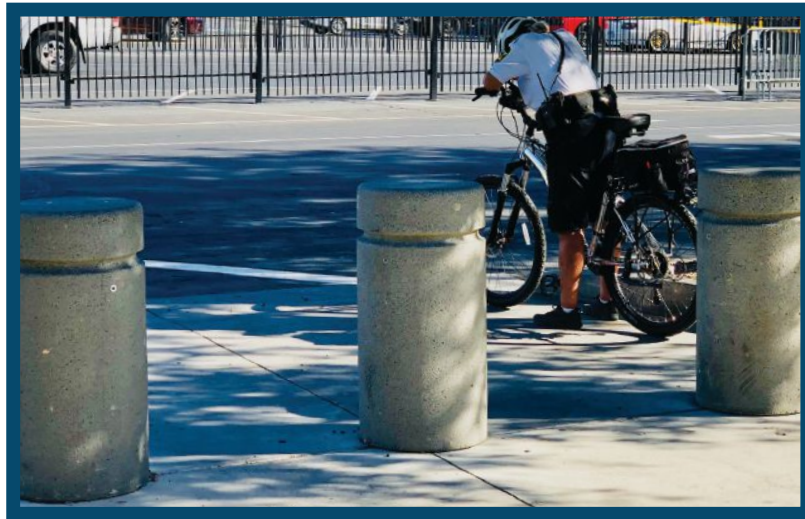
SECURITY BOLLARDS FOR HIGH-TRAFFIC AREAS

Cities and buildings may have large stretches of busy sidewalk or green space to protect, which quickly makes crash-rated bollards much too expensive. Fortunately, standard security bollards continue to be a good alternative to protect people

and property against vehicles. A cluster of protective bollards is an effective way to prevent a car or truck from careening into public spaces.

A terrorist's goal is to cause as much damage as possible in an attack. Although security bollards are not rated precisely, they remain powerful obstacles. In most cases they will forcefully stop a small to mid-sized vehicle, even if more of the chassis makes it through the line than would happen with crash-rated bollards. Their precise stopping power is not as well known, but the cost to install is an order of magnitude cheaper, making them cost effective for longer stretches where protection is needed. As a less expensive but active deterrent, security bollards are functional in protecting areas where large groups of people gather. They're common enough in our landscape to be unobtrusive: it is not until you start looking for bollards that you realize they're everywhere, protecting storefronts and utility meters, guiding cars in parking lots and beside drive through windows, and providing security along traffic and bike lanes. They can be made

to be a beautiful landscape enhancement when desired, available in many architectural styles. Around high traffic areas, bollards don't need to be anti-ram to be effective.



A CULTURE OF CIVILITY

When planning community spaces, it is important to protect people without allowing a culture of fear to strip away the vitality that encourages engagement. One way to do

this is to ensure that the values of the community are included in security planning. When possible, providing security through welcoming amenities—such as seating, greenery, bike racks, or water fountains—allows planners to approach design issues in a holistic way. These furnishings can be expensive, so the urban designer must also look to other options. Another common feature in the urban landscape is signage, informing the public of expected behavior in an area. Bollards, the little unobtrusive posts that can blend into their environment, communicate messages, and deter offenses. Less directive than signs, they're still effective at guiding people and traffic. Protective bollards are an excellent addition to urban planning because they do double duty in a cost-effective manner, encouraging civil behavior while defending those who are out in their community, creating societies we can all enjoy. **FM**

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