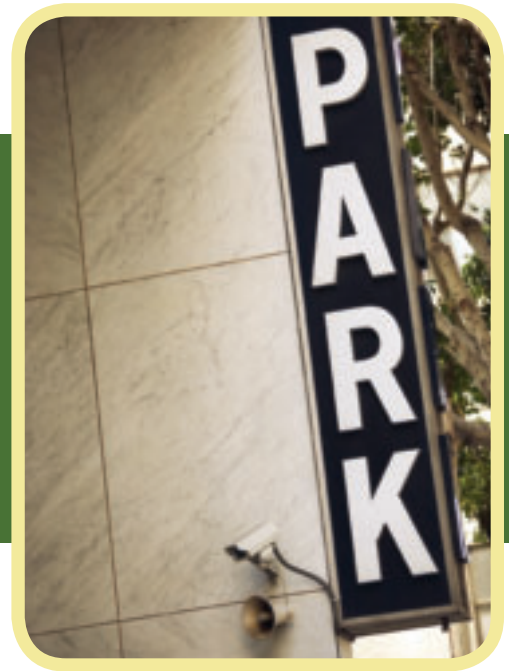


Fundamentals of Security –

Focus on Mixed-Use in a Changing Industry

By Mark N. Santos, P.E., and James L. Johnson, P.E.



Traditional stand-alone garages are evolving and changing. As structured parking begins to serve as a catalyst for redevelopment and revitalization, the trend towards mixed-use structures will continue. The integration of mixed-use elements complicates the design process, and has significant impact on the way we think of parking and security.

Garages in mixed-use development are becoming active, walkable, people places. Whenever people gather, dine, and shop, active communities develop, increasing pedestrian traffic. Community places where people gather are inherently safer, more secure and pleasant. The role of parking has shifted from storage for cars to a “gateway” to a destination. These gateways should be lasting, positive first impressions, encouraging patrons to return again and again.

The importance of safety and security of parking and mixed-use structures cannot be underestimated. In the rush to meet deadlines and design attractive facades, a steady focus on security should be maintained throughout design and construction.

During the design and construction of a parking garage, one of the most important details that are often put on the back burner is security. With so many design specifics needing careful consideration, including size, materials, number of spaces, ramping systems, and even architectural appearance, the issue of security can become a secondary matter. Mixed-use structures incorporate further challenges, but the fundamentals of good garage design remain the same.

Parking garages do have the potential to be extremely vulnerable places. This is due not only to the high concentration of valuable property inside, but also to the fact that garages create situations in which people are often alone. As a result, it is essential to equip parking garages with the best security possible.

The two basic types of security implemented in parking garages can be classified as active and passive measures.

Active Security Measures

Active security entails systems and accessories added to the garage once constructed. For example, closed-circuit television monitoring (CCTV), gates, signage, and security staff are some of the most popular active security measures taken to ensure the safety of parking garage patrons.

CCTV cameras are possibly the most effective active security measure. In the past these systems have traditionally consisted of bulky, out-in-the-open cameras feeding grainy, black-and-white images to television monitors. The images displayed were usually quite difficult to make out. These were effective for their time, but a lack of technology created inherent limitations for the systems.

Today high definition cameras and monitors provide the ability to observe activity clearly throughout a facility. Cameras are much smaller, making it more difficult to tell where they are, and they can be placed in a wide range of areas including exit/entrance lanes, lobbies and stair towers. These are able to capture

images with much higher resolution, giving those observing the activities greater awareness of what is going on, as well as the ability to stop potential problems. Cameras are also useful for providing records of all activity in the facility, including damage to the structure or other cars, or tampering with equipment.

The most important consideration in the installation of CCTV systems is operational in nature. Facility managers must decide how the facility will be monitored. If CCTV cameras are evident in a garage, they must be operational and actively monitored round the clock. The facility manager is responsible for the regular maintenance and inspection of the cameras, system, and monitoring process.

The optimal time to make the decision to install CCTV systems, as well as other electrical systems to be, is during the design phase. At this stage, the design team will plan for conduit and other required elements in the design of the facility. If CCTV is not considered until after construction, it could result in expensive retrofit solutions.

Another method of security that may be included in a garage is the use of intercoms and panic buttons. Patrons should be able to summon help if needed. In the face of car trouble, problems locating a vehicle, a medical emergency, or an unsafe situation, intercoms and panic buttons allow for quick responses. These systems should be obvious and placed prominently throughout the facility so that they are visible and easy to access.

Uniformed security guards and regular patrols inside parking garages can also be extremely effective at ensuring safety. They deter potential threats, and can serve people directly when confronted with challenging situations like a medical emergency or access to the facility by non-patrons. The knowledge that a parking facility has security officers on hand will give patrons a feeling of comfort and peace of mind, and they will be more likely to park in a facility where they feel secure.

The installation of gates has proven to be a successful active security measure. Gates control access to the facility, limiting entry to those who are authorized and legitimate patrons. Machines and/or attendants

stationed at entrance and exit points ensure that patrons can enter with a ticket or valid method of payment. When the same people park in a garage on a regular basis, which is often the case at universities, multi-family residences, or corporate buildings, key card systems are often used to allow entrance.

Finally, although it may seem like a minor security measure, signage is an often overlooked, yet extremely effective measure to make a parking garage safe. Effective signage is useful in helping people get in, around, and out of the garage, while giving explanations of any security systems throughout the facility. For example, signs can notify customers of where certain devices, such as intercoms, are located throughout the facility. In addition, effective signage can also explain how to use such devices, and how to get assistance if needed.

Passive Security Measures

Passive security measures are those implemented into the actual design of the garage to increase safety. There are a number of factors in passive security design, including specific features to stair towers and elevators, as well as the actual wall, lighting, and entry/exit placement within the garage. The passive security elements in a parking garage are critical; unlike active security elements, once the garage is constructed, it is extremely difficult, and many times impossible, to change or improve them. Therefore, it is important to consider every area and feature of the structure, from the stairwells to the doors, down to the minute details.

The most important factors to consider when implementing passive security features into a parking garage are visibility and openness. It is essential that parking patrons feel comfortable, safe and secure in a facility. One way to create an open and visible environment is to minimize the placement of interior walls to include only those that are absolutely necessary. Depending on the layout and desired wayfinding channels of the structure, cutting down on the presence of interior walls will give those who park there maximum visibility, and eliminate dark areas and hiding places.

There will be times when minimizing the placement of walls in a garage is illogical or impossible. In these cases, a compromise can be achieved by providing

openings in both the interior and exterior walls. This will make sure the necessary walls are present, yet it will still provide the openness and visibility.

The entrance and exit points to the garage, and where they are integrated in the design, are also very important. To maintain the security of the garage, and limit access to those with valid reasons to enter, the design can limit the number of openings and access points on the ground level. Not only will this limit access into the garage, but it also limits the ability for an unauthorized user to exit. Controlling access to the garage through the use of physical barriers, gates, guards, and signage, is possibly the most effective single method for providing security.

From a design perspective, the internal areas that should get the most attention are the stair and elevator areas.

Placing stair towers in close proximity to the pedestrian's destination makes for efficient travel routes, and minimizes the distance required to exit, not only in the face of an unsafe situation, but also in the event of an emergency. Further, providing openings in stair tower doors makes surrounding areas more visible, and allows each patron a clearer view of their environment.

Special emphasis should also be placed on the design of elevators and lobbies. The use of glass-backed elevators has proven effective in increasing security by allowing natural light to penetrate these areas and create a welcoming atmosphere. These provide a sense of security due to the openness and visibility that enable patrons to see inside the elevator from the outside, and vice versa.

Another area in a parking garage that can create a problem is the area beneath the ground level of stairs. These areas are often open, and can be used as trash receptacles and hiding places. However, this issue can be easily and inexpensively eliminated by filling in or sealing off the areas behind the stairways.

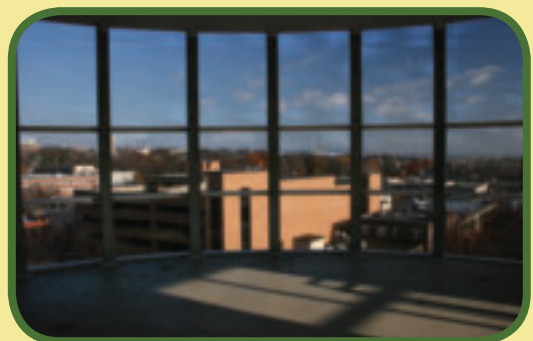
In addition to natural light and openness, appropriate lighting creates a welcoming feeling and increased security. Illuminating the areas in which people walk and drive reduces the risk of injury from other vehicles and eliminates shadows and dark areas. Lighting levels vary not only by time of day, but also by the area illuminated. Applying recommended



Alfred I. duPont Hospital for Children parking garage, Wilmington.



Two Christina Crescent parking garage, Wilmington.



Beaver Avenue parking garage, State College, Pennsylvania.


lighting levels adjusted to these factors will increase safety and security in the garage.

Another way to increase security within a garage is to provide a pedestrian-friendly setting. Keeping elevators and lobbies free of debris, as well as

painting walls and doors, creates a clean and inviting area. The importance of regular maintenance and cleaning cannot be underestimated, and creates a garage that patrons will want to use. Helpful and well-trained staff can be an invaluable resource in the operation and maintenance of the facility, as well as the garage's security.

Overall, the most important things to consider when employing passive security measures are to make a facility as open as possible, to maximize visibility, and to design a garage that is easy to navigate. An effective functional design, partnered with appropriate signage, creates an efficient facility and minimizes confusion by first time users and conflicts with pedestrians. Further, it is important to draw natural light into the garage, as this is the most effective method of illumination.

Security in parking garages is a topic of growing importance as the demand for structured parking increases. As garage designs become more complex, evolving into integrated mixed-use developments, transit facilities, and hospital and university campuses,

there will be immense pressure to ensure that those using the garage feel secure. Well-designed passive security, coupled with effective, monitored active security systems will create a secure facility as well as a safe and pleasant atmosphere for patrons and employees. 

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