

Design considerations for compartmentalization

How to use cross-corridor doors to prevent the spread of smoke, flames—and active assailants.

Emergency preparedness begins well before occupants step foot inside a building—before hardware is installed and fire alarms are tested. It starts with the building design. From planning paths for free egress to following all fire safety codes, architects are essential to how prepared a facility is in the event of an emergency or lockdown.

More than twenty years ago, cross-corridor doors were top of mind during the design phase as they were commonly required to prevent the spread of fire and smoke. While current codes have reduced the need for these in new construction, architects shouldn't write off the value of compartmentalization just yet—especially in educational facilities.

Why to consider compartmentalization: Real-world influence

Dividing a building into sections that can easily be closed off during an emergency can delay or prevent an assailant from moving freely throughout the facility. Manager of codes and resources for Allegion, Lori Greene, has seen K-12 school projects incorporate this into their floorplans, though it's not as common as she would like. Compartmentalization is one of her top recommendations for physical security. She's written about how it can limit an attacker's mobility and potentially save lives.

Following the mass shooting at Marjory Stoneman Douglas High School in Parkland, Fla., the state legislature tasked a group with identifying and addressing issues that occurred during the event to improve school safety and security. As part of that, [a video animation](#) was created to show the timeline of events. Among the weaknesses identified from the findings was the ability of the shooter to move freely throughout the building using the stairs and corridors.

“When a shooter is in the building, he or she should not be able to travel freely,” said Greene. “In the Parkland video, it's obvious that he had free access to the entire building.

If the stair doors were lockable on the stair side, or if there were cross-corridor doors, it could have limited his movement.”

Greene expressed similar thoughts [after researching the shooting at Columbine High School](#), which occurred nearly two decades before the Parkland shooting.

“Of the many things I learned about that day, one thing that struck me was that the assailants had access to so many areas of the school—the cafeteria, the library, the stairways, corridors and classrooms,” she said. “The ability for them to move freely throughout the school almost certainly affected the number of casualties.”

When designing educational facilities, considerations for physical security often begin at the perimeter with main entrances, secondary entrances and other openings intended only for egress. From there, it's crucial to plan for security at classrooms and large assembly spaces like cafeterias and gymnasiums. Cross-corridor doors for compartmentalization should be considered to add an additional layer of security. When strategically incorporated into the building's design, these doors can limit the movement of assailants from one area of the building to another, slowing the attacker while students and faculty escape through a different egress path.

Incorporating cross-corridor doors

According to Greene, she usually recommends cross-corridor doors that are mechanically locked on the access side and held open electrically. The least complicated way to equip these doors is to specify panic hardware that is locked on the pull side, or access side, with wall-mounted electromagnetic holders. The doors are held open most of the time but can be released with the push of a button that cuts power to the magnetic holders. These buttons are often controlled by the main office. Depending on the system, this could also be done automatically when the alarm sounds to indicate a security breach. Since the

access side of the hardware is already locked, the doors are automatically secure as soon as they are closed. When budget permits, the panic hardware may be equipped with electrified lever trim which locks when the system is activated.

Another option is to use special-purpose doors, often called [Won-Doors](#). These are power-operated and slide out of the pockets in the corridor walls to separate the sections of the building. Of course, these can be used to provide fire protection, but they're also a great way to design security into the building as they will close automatically when signaled from the main office in the event of an emergency lockdown.

"Limiting access is key," explained Greene. "So if it's possible, lock-off large areas, wings of the building and assembly spaces that could prevent the shooter from reaching more people. Locking stair doors so they still allow free egress but limit access from one floor to another is also a good idea. It's important to note that you're not trying to trap the shooter; the doors still have to allow egress. But this design will limit access and deter the assailant from moving quickly from space to space."

While the most common place for compartmentalization is in K-12 facilities, architects and specifiers should consider including compartmentalization in other projects where it could positively impact security. For example, higher education campuses can implement similar use of cross-corridor doors and even tie the doors into their access control system.

Security is important in every building type, and more and more facilities are increasing their focus on emergency planning. Architects and building designers can take notes from K-12 best practices. Think about the purpose of the facility and how compartmentalization could impact security.

Don't limit your association of cross-corridor doors to fire codes. It won't make sense for every project, but compartmentalization can play an important role in emergency preparedness.

When specifying for compartmentalization, it's critical to reference the latest codes before specifying cross-corridor solutions. Allegion has a team of more than 150 specification writers located around the world who would be happy to assist on your next project. [Contact an Allegion specification consultant](#), or check out the [iDigHardware blog](#) for information and updates on door hardware codes.

Considerations when using cross-corridor doors to compartmentalize for security:

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- The school must have a means of immediately notifying building occupants that a security breach is taking place
- In most cases, the doors must allow free egress from the push-side and can only be locked on the pull-side
- Impact-resistant glazing should be used in doors and sidelights adjacent to the door hardware to delay access to the inside lever or touchpad through broken glass
- For some schools, magnetic holders with an increased holding force may be needed in order to reduce the frequency of students closing cross-corridor doors
- Planned egress routes should lead out of the building through outer doors, preferably directing occupants away from lobbies and other congested areas
- Most stair doors that are locked on the stair side must be able to be unlocked remotely during a fire alarm, so it's important to coordinate this requirement with the security plan
- Periodic drills should address the use of cross-corridor doors and the planned egress routes
- Keys or access-control credentials should be readily available to allow emergency access to secured areas

About Allegion

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