



# Schools Behind Bars?

Designing safe and secure environments for schools and colleges doesn't mean they need to look like detention facilities

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**C**reating safe schools is the responsibility of the entire community where a school or school system resides. Yet, the day-to-day operation is primarily the responsibility of the teachers, administrators and security or law enforcement officers at the school. But, before the first student walks the halls, an architect creates the design of the school and what will be the subsequent relationships between people and their buildings. The success or failure of that school is predisposed to the quality of design and the limitations of budget.

The basic crime prevention through environmental design (CPTED) premise is that through the effective use and design and management of the built environment, there can be a reduction in the opportunity and fear of crime, and result in the improvement in the quality of life. If we can build effective spaces using CPTED in the next generation of schools, we will substan-

tially reduce the opportunity and fear of crime in them.

There is a connection between the design and management of schools and the relationship to crime.

Schools must address the conflicting goals of being an accessible facility to its students and faculty, yet be secured and controlled environments. The design of elementary schools through college campuses needs to address the functional integration of CPTED and security features to control access onto the site and in the buildings, reduce vandalism, document activity on the property, control movement in areas of the building that are restricted and provide communication between faculty and administration and emergency assistance.

### Safe and Secure School Design Principles

Beyond specific designs that may vary from school to school, there are

some general principles for success in security. They are defined here as Safe and Secure School Design Principles, which are:

- Effectiveness of security design modifications and security programs;
- Affordability of security programs and features;
- Acceptability of security technology and practices;
- Definition of assets that are worthy of being protected;
- Definition of threats of what is vulnerable to attack and loss; and
- Characterization of the environment and balancing the needs to the threats.

Safe and Secure School Principles involve five key areas, and each area should include security layering planning practices:

- **Site Design** includes features of: landscaping, exterior pedestrian routes, vehicular routes and parking, and recreational areas.

- **Building design** features: building organization, exterior covered corridors, points of entry, enclosed exterior spaces, ancillary buildings, walls, windows, doors, roofs and lighting.

- **Interior spaces** include features of: lobby and reception areas; corridors; toilets and bathrooms; stairs and stairwells; cafeterias; auditoriums; gyms; libraries and media centers; classrooms; locker rooms; labs; shops; music and computer rooms; and administrative areas.

- **Systems and equipment** will include features such as: alarms and surveillance systems; fire control; HVAC (Heating Ventilation and Air-conditioning equipment); vending machines; water fountains; elevators; and telephone and information systems.

- **Community Context:** Schools need to be functionally integrated into the community. Impacts of schools to surrounding neighborhoods include traffic, parking, pedestrian flows, crime and disorder.

### **Specific design strategies**

**Observation from classrooms:** Parking and circulation areas should be placed in view of the classrooms. High volume of students in classes means more chance for casual observation.

**Observation of vehicular traffic:** Adequate observation of vehicular traffic is as important as observation of pedestrians. Administrative spaces should have clear lines of sight to entry roads and parking lots. Anyone entering a school area should never go undetected, and any vulnerable entry should be secured.

**Observation of recreation areas:** The school recreation resources serve a needed function for the students during school hours when activities are supervised; however, many schools do not have their ball fields fenced, the basketball courts screened and equipment protected. After hours, the school's recreational spaces and equipment become invitations for neighborhood kids to use without supervision. While this might seem desirable, the premises liability of the school is wide open if someone is hurt or assaulted.

**Surveillance points:** Providing surveillance points can increase safety. Providing views to potential problem

areas from publicly used spaces, such as a common-use stairwell, ensures that many people will be observing at any given time. Designers must be sure that the surveillance advantage goes to legitimate users of the space, not the possible perpetrators. If cameras are to be used, they would be used typically to monitor parking lots, main entrances, playground areas, courtyards, load-

ing docks and special equipment areas such as computers labs.

Landscaping and plantings should be carefully placed and considered so that they do not pose maintenance problems for upkeep and trimming, and provide blind spots for hiding, placing of contraband or ambush.

**Exterior circulation:** Exterior circulation paths are as important as

interior paths. Paths should be large enough to accommodate large numbers of students, yet comply with the American's With Disabilities Act of 1990. Students should be prevented from using exterior paths as informal gathering places. Bicycle racks should be placed in a high-visibility area.

Covered circulation ways must be designed with care. Blind spots and entrapment points must be minimized. Potential "door in the face" incidents must be eliminated. Covered corridors should be designed so access to the upper floors of a structure is not possible.

**Signage and notice:** Signage should announce intended and prohibited uses. Signage should be clear, reasonably sized and placed in a way that is easily viewed. Signage must also be mounted correctly, not just taped on.

**Accessibility:** Main entry into the school is required to be handicapped-accessible. Ramps with proper slopes and handrails are required. Non-slip materials should be used. All travel ways must be wide enough to permit wheelchairs without disrupting pedestrian traffic. ADA standards must be followed for all access control and security systems equipment. Proper ramps and handrails must be used. Any safety hazards must be marked off.

**Main entry security:** Many techniques and devices can be used to increase security. Although they are costly, weapon detectors can be integrated within an entryway. Access to other areas from main entryways should be carefully planned and not obscured. Main entryways should be obvious. Entryways can be very dangerous if not designed with CPTED in mind. Potential for getting confused and lost should be limited. Too many entryways can create confusion and often provide ambush points.

Treatment of secondary entries is as important as primary entries. ADA, signage and hardware requirements must also be met at all secondary entrances. It is important not to create entrapment points at secondary entries.

**Recessed entries:** Blind spots should be avoided whenever possible.



The wide-open space of the main entryway to this school is under both natural and mechanical (CCTV) surveillance.



Above: School violence in the 1990s prompted designers to implement tight access control. Right: Placing bike racks in plain view can eliminate some campus crime.



When the configuration of a building demands a blind spot, corners can be tapered with 45 degrees to allow the eye to see around a corner to avoid an ambush situation. Bathrooms are required to have recessed entries or blocked line of sight of the toilet areas, however, having an opening that allows sound and smell (of smoke) to be transmitted to the hallway deters many illegal or inappropriate behaviors.

**Courtyards and gathering places:** Formal gathering places should be well-defined. There should be no doubt where people are intended to gather while within the school grounds. Observation, lighting, accessibility, and safety are all design and management considerations. The basic hardware and furnishings of construction are merely the stage props for young people to engage in extreme sports. Skateboard, rollerblades, razor scooters and dirt bikes use curbs, planters, railings, stairs and more as

their stage to practice. But with minor architectural design innovations, the builder can remove the opportunity and ease to engage in such activities.

**Interior circulation:** Certain functions and spaces require access control by definition, such as the library. However, the same strategies are being used now in some schools for screening of persons coming into the main entrance comparable to courthouses and airports. If screening is required by function or need, special consideration is needed for cueing, staffing, equipment and requirements of package and person screening.

**Walls and Windows:** The characteristics of a wall directly influence the potential for crime. Walls should not be placed in a way that will provide hiding areas. Landscaping along walls should reduce hiding areas, not produce them. Walls located in high-vandalism areas should be constructed of durable material resistant

to graffiti and vandalism. Using plant material on the wall can deny the artist a good surface. This strategy is referred to as a living wall. The architectural choices for finishes of the school must reduce the potential for acts of vandalism.

If exterior windows of the school face a road, bullet-resistant glass may need to be considered. Though it is expensive, properly framed glass will resist burglary, wind damage and the threats of drive-by shootings. Another alternative might be polycarbonate and security-laminated glass for high-risk areas, though these glazing materials are costly compared to regular insulated tempered glass.

When the buildings themselves become the exterior perimeter, as compared to a fence around the property, then openings between the buildings must be connected and secured. Careful selection of fencing to reduce climbing and cutting is critical.

Interior walls of schools can use a finished concrete masonry block that is fired or glazed on one side, or painted with graffiti- and scratch-resistant epoxy paint.

**Screen walls:** Screens provide physical access barriers to windows and walls, and provide privacy where



Screening devices on school grounds are commonly found in libraries and retail stores.

needed. Make sure the barriers do not negatively effect ventilation. Decorative materials should be used for aesthetic value, but the walls must be designed in a way that makes climbing impossible.

**Building exterior shape:** The form that the school buildings take should be designed to create open spaces, yet eliminate blind corners and increase natural surveillance by students and staff. Adequate exterior lighting and the correct type of building materi-

## General School Design Guidelines

The following suggestions are some design and management tips for a safer school:

- Conduct a security needs assessment for each school with a uniform survey instrument.
- Consider the views of students, faculty, administrators, school resource officers and neighbors and community groups into school crime prevention planning and design decision making.
  - Have a district-wide crisis response plan, and establish practices annually.
  - Integrate the school security systems, and have them remotely monitored.
  - Natural and mechanical access control is a must.
  - Selective use of CCTV. CCTV can attract nuisance behavior, so low-profile cameras are preferred. Time-lapse digital recording is essential for evidence of any criminal mischief.
  - Eliminate design features that provide access to roofs or upper levels.
  - Develop a Safe Corridor Program so that students can safely walk to and from school without being solicited for drug or gang activity.
    - Communicate your security policy to faculty and students, and have them acknowledge their understanding of the ground rules — for example, no propping open the exit doors.
    - Have lighting on grounds from dusk to dawn. Use motion sensors on exterior areas and common-use areas after hours to notify staff and police of inappropriate use.
    - Operate schools after hours as adult education facilities to expand hours of use. However, care should be used in the design of school facilities that co-locate community recreational facilities, such that proper access control prevents school grounds from trespass and damage coincident to after-hour adjacent uses.
      - Have self-engaging locking mechanisms on all windows.
      - Provide landscape buffers to reduce access to vulnerable graffiti walls.
      - Provide piano hinges on vulnerable external doors to reduce access for vandalism.
      - Rooftop air conditioning units require access, and any pull down ladders should be secured and locked, or placed inside of a building to restrict access.
      - Be careful of placement of utility boxes along side of building walls that could provide climbing access to the roofs or balconies.
        - If basketball courts are exposed, provide an external water fountain to reduce need to climb over fences to get water.
        - If basketball, volleyball, or tennis courts are attracting nuisance behavior after hours, remove the nets and hoops and end of day to stop any opportunity for use. Consider relocating the courts and lights in areas where there can be natural surveillance and supervision of responsible adults or capable guardians.
          - Be sensitive to placements of internal space protection devices near air conditioning vents or exhaust grills, as the vibrations of the compressor kicking on can trigger false alarms.
          - Doors and frames must be institutional grade to withstand heavy use and abuse. Faceplates should be used over locks to prevent jimmying.
          - Reconsider the use of student lockers. The trend is for no lockers and to encourage the use of clear or transparent backpacks. Athletic lockers would only be used during the class and overnight storage prohibited.
            - School boundaries and exercise areas should be fenced with vandal-resistant picket type fencing.
            - All fire exits should be exit only with no handles for reentry. Doors should be alarmed and have door position switches to notify staff if the door is opened.
            - Limit the number of buildings to as few as possible, preferably one, to restrict access to outsiders and illegitimate users.
            - Minimize the entrances to as few as possible, preferably one for student and faculty, use to restrict access to legitimate building users.
            - Allow for a security person to be positioned at a single entrance onto the school campus to challenge each vehicle for identification of all occupants, if needed. Buses and school employees would have their own separate and controlled entrance.
              - Minimize the number of driveways or parking lots that students use to walk across to gain entry to the school.
              - Allow for the ability to lock off the rest of the campus from the gym during after-hours activities.
              - Provide a conduit for present and future communication and security systems in the classrooms and common areas.



al choices will reduce the opportunity for vandalism.

**Windows design:**

Groupings of smaller windows function as a large window but increase security, while still providing ventilation and natural lighting. The smaller size makes it difficult to crawl through or remove property. Clerestory windows, which are windows constructed high on a building wall to admit natural daylight, provide multiple functions with high security benefits. The goal for the school architect in designing some classrooms and spaces is to provide natural light, natural ventilation, and shield occupant privacy, yet does not permit easy entry.

Glass block combined with clerestory windows will minimize wall penetrations and provide good security and natural lighting. Exterior windows on classroom buildings, labs or libraries must be secure from outside intrusion.

**Door security:** Any door is a critical point of access. Lighting, signage, hardware and observation are all key elements. Doors should be checked to ensure their security. Management should be held accountable for maintenance and inspection. If doors are not designed for security in the architectural stage, the retrofitting of walls, doorframes and conduits is expensive and ugly.

Special access areas require careful attention to detail. Roof access needs to be secure, but also in an area that permits quick and effortless access for maintenance staff. Other access areas such as electrical or mechanical rooms need to be placed so they are not in danger of being compromised.

Signage on doors is important to let people know whether the doors are exit-only or an entrance.



Far Left: Clear signage should state the groundrules of the facility. Left: Plantings and overgrown bushes can create dangerous hiding places. Did you spot the man behind the bush? Bottom: Interior courtyards allow for open supervision, but also semi-private areas for students to congregate.



duress alarms, and CCTV systems. Periphery observation and security checkpoints should have a clear and secure line of communication to main administrative areas. It is important to secure and regularly check expensive or high-end equipment, such as computers. Besides security emergencies, there will be medical emergencies in schools. A comprehensive communications system is essential in schools and universities to account for emergency situations. Some schools have incorporated monitoring and locator systems, others have used intercoms and man-down alarms in the phone systems, and panic buttons in administrative offices.

**Management:** It is the designer's responsibility to ensure that an area can be properly and sensibly managed. Once an efficient design is constructed, it is up to management to maintain a secure atmosphere. **STD**

CCTV can be placed strategically at entrances, exits, hallways, stairwells and exterior doors. Cameras should operate continuously and videotapes analyzed and archived. There is an over-reliance on technology: Many of the kids committing school crime are trying to have their moment of fame captured on video. CCTV gives the kids their chance to be famous, which is what they want; thus, cameras should be low-profile or hidden from view. Broadcasting which areas are under surveillance will not have the desired effect of reduced criminal behavior, but could actually increase the number of incidents with kids showing off for the camera.

**Duress alarms:** Duress alarms provide security in isolated areas. They should be located in areas such as restrooms and locker rooms. Duress alarm systems should be integrated with other security systems. Several types of devices can be used to improve security: Electronic sensors can detect anything ranging from weapons to stolen library books; and security mirrors can be used in areas containing blind spots.

**Communication systems:** Communication systems must be integrated within the design of the facility and with other systems such as fire and



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