# DESIGNING SAFE SCHOOLS A Human Centered Approach to Safety and Security in the 21st Century

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#### BIO

Nandita Mishra is a Senior Associate of TMP Architecture and is focused in the project management, design and planning of K-12 educational facilities. She currently holds leadership roles for major school improvement projects with Port Huron Area School District, Walled Lake Consolidated Schools and South Redford School District.

Mishra has a solid background as a teacher and lecturer, previously serving as an adjunct faculty member at The Art Institute of Michigan in Troy, Eastern Michigan University and Central Michigan University, where she taught various design courses. She has a strong technical background and understands how a solid infrastructure in a school is vital to its success. Overall security in a school is critical to a successful, healthy learning environment, as fearfulness diminishes student performance. Multiple studies have concluded that individual student achievement is influenced by the safety characteristics of the school facility. Upgrading existing facilities to create layers of deterrents is an important starting point in securing the building.

However, as designers, we must be conscientious about balancing security features in a building while supporting 21st century learning environments. While safety and security is a necessary driver of design choices for architects and designers, we cannot forget that students, and their ability to learn, are the center of every school and therefore their educational needs should be at the forefront. Our focus and goals must be on creating safe spaces that support problem solving, communication, collaboration, critical thinking, and creativity.

Drawing from the principles and strategies discussed in "Crime Prevention Through Environmental Design" (CPTED) and the 2012 Department of Homeland Security "Primer on Buildings and Infrastructure Protection Series to Design Safe School Projects," architects can incorporate a more humane approach to designing security. These two documents emphasize multidisciplinary design strategies in deterring people with malicious intent.

#### **CPTED PRINCIPLES**

When looking to the CPTED principles, we have to consider the strategies in a macro and a micro sense. The macro entails securing the site and the micro involves securing the building in place. When successfully implemented together, these ideologies

create layers of deterrents which can help establish security and deter a potential threat. CPTED builds on four design guidelines natural surveillance, natural access control, territorial reinforcement, and maintenance.

#### NATURAL SURVEILLANCE

Natural surveillance, to see and be seen, is essentially the overall goal for designers and administrators alike. This strategy looks at the macro which emphasizes location and orientation of the building on the site, while paying special attention to adjacencies around the site. Looking at the overall master plan of the site and determining visibility of the access points to and out of the site is crucial. Maintaining visibility of the exterior perimeter is central to maintaining the first layer of security.



Securing the Perimeter Evanston/Stokie School District 65 Lincoln Elementary School TMP Architecture, Inc. Photographer: Chris Lark Photography

As we explore the concept of transparency and visibility in the design of active and invigorating learning environments, we need to include transparency around the perimeter of the building to maximize visibility of the site. Although maximizing glazing around the perimeter of the building for visibility may create vulnerabilities in the design, we can overcome this by adding bullet resistant glass, strengthening window framing, or possibly adding bullet resistant window film around the perimeter, but each of these comes with added construction expense that must be considered and budgeted for. The goal is to maintain lines of sight so that an intruder can be spotted quickly.

#### NATURAL ACCESS CONTROL

Natural access control is the second strategy with an emphasis on preventing people from going into unobservable areas on the site. Security is enhanced by controlling and guiding people on the site through the placement of walkways, fences, lighting, signage, and landscape. This principle helps deter access to an intruder. Some examples are locating bollard lights strategically to direct people to the main entrance or community entrance, positioning retractable bollards at locations around the perimeter to control vehicular access, designing sidewalks to guide residents and students along the roadway and provide a safe pedestrian area, and guiding people and vehicles in such a way that you control the access points to your building and site. All of these design strategies direct the flow of people and vehicles to enter through observable areas.

Furthermore, natural access control can be achieved by reducing the points of access into the building, adding access control and video intercom systems, providing secure access through a protected and controlled entry way / vestibule into the school, and adding emergency responder signage at exterior doors for way finding.



Secure Entry Vestibule - Guests must enter office before access to school building is granted. Spring Lake Public Schools, Jeffers Elementary School TMP Architecture, Inc. Photographer: Chris Lark Photography

#### TERRITORIAL REINFORCEMENT

Territorial reinforcement, the third strategy, can be incorporated by using landscaping and signage to convey a sense of ownership of the property. Improvements such as decorative light fixtures, decorative sidewalk pavers, and other design treatments on the exterior support a sense of place around the site and perimeter of the building.

Using the modern learning concept of creating invigorating, agile learning spaces in order to help students build a sense of place and respect for their surroundings is another way of implementing this strategy. Research supports the notion that if a student has a sense of proprietorship, they then show more respect for the environment in which they function. This reinforces the changes we are seeing in education and educational facilities today.



Agile Collaborative Learning Space Novi Community School District, Parkview Elementary School TMP Architecture, Inc. Photographer: Chris Lark Photography

As we evaluate strategies to incorporate territorial reinforcement in design, it is important to incorporate inconspicuous security that creates a more human centered environment. Some examples to achieve this include providing all student occupied spaces the ability to lock the room from inside, building lockdown features, applying ballistic fabrics behind drywall, installing hidden security cameras to monitor access points, and having an emergency plan in place for all students, teachers, and administrators in the building.

One of the most common training programs to deal with threats is the A.L.I.C.E. program, which is a method of handling aggressive intruder or active shooter events based on the principles of Alert, Lockdown, Inform, Counter, and Evacuate. Several of TMP staff members recently attended A.L.I.C.E. training to update our knowledge of what is being taught and practiced in schools. This program ensures that every individual is informed and prepared to deal with security threats and ultimately adds another layer of protection to staff and students.

#### MAINTENANCE

Maintenance is the final strategy that can have a positive effect on security. When an individual is placed in a rundown and dismal environment that has not been kept up properly, the individual will have a different psychological reaction than when in a well-kept, clean environment. To address facility maintenance, designers incorporate sustainable and durable elements to prevent wear and tear and utilize local and easy to maintain materials. Additional examples include maintaining open, clutter free stairwells, clean unobstructed windows, limited access to hidden areas, properly locked doors, accessible emergency exits, and grounds maintained with low hedges and unblocked views can help in securing the perimeter and minimizing the risk of a potential threat.

#### PRIMER PRINCIPLES

The "Primer on Buildings and Infrastructure Protection Series to Design Safe School Projects" also supports using human centered design guidelines to minimize risk in the case of a threat. The study focuses on prioritizing site/ campus design and layout to deter potential threats, using the four CPTED principles discussed earlier as a guideline, and provides additional examples on how to achieve safe and secure facilities.



Figure 2-26: Typical entry point control layout Source: US Air Force, Installation Entry Control Facilities Design Guide (Primer on Buildings and Infrastructure Protection Series to Design Safe School Projects)

Natural Surveillance can be managed by minimizing the risk to the school building by setting the building back on the site, by adjusting orientation or physical positioning on the site, by installing concrete planters to control visibility and access of unauthorized pedestrians and bicycles, and by designing entry roads to the building and site that do not provide direct or straight line access.

Natural Access Control is achieved by securing the perimeter and installing barriers to prevent unauthorized vehicles and pedestrians from entering the site and implementing access control points at which vehicles and pedestrians can be screened if necessary.

Territorial Reinforcement, focusing on increased attractiveness, is considered by complementing the building design with the landscape and natural earth forms and distancing vehicular traffic zones from the school building. Maintenance includes strategic placement and locations of dumpsters on the site, maintaining the site perimeter, and using bollards as a vehicular barrier.

### **SUMMARY**

Together these strategies generate psychological and physical deterrents to ensure safety without compromising the learning environment, aesthetics, or a sense of place for the users. While addressing these concepts, it is vital to keep in mind that the design elements must reflect the needs of our students. All of these strategies are relatively unobtrusive changes that will allow students to feel safer in their learning environments without being overwhelmed by security features.

There are many opportunities to significantly enhance school safety, security, climate, and culture, thus reducing the opportunity for a potential risk through thoughtful plan and design. The key approach is to be proactive and adopt procedures and practices to maintain and enhance security measures. Additionally, districts can add that further layer of security by training staff and students in the appropriate response to a threat. Empowering students and staff with the knowledge of correct responses; coupled with designing 'safe' buildings will ultimately lead to an environment where students feel safe and secure in their school building and are then able to focus on learning.

"Our focus and goals must be on creating safe spaces that support problem solving, communication, collaboration, critical thinking, and creativity."



Proper site layout can enhance natural surveillance Conceptual Site Plan, New High School TMP Architecture, Inc.

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## **ABOUT TMP**

TMP Architecture was founded in 1959 with the goal of designing the finest buildings for education. For 59 years we have focused our practice on educational clients. Our vision statement "Life. Long. Learning." encompasses the passion, creativity, strength, and commitment we bring to each client. TMP's offices in Bloomfield Hills and Portage, MI have grown to serve the broad spectrum of needs for institutions across the country.

Through the years, as a natural outgrowth of our work for education clients, TMP has developed national recognized expertise in the design of libraries, recreation/sports centers, and performing/fine arts facilities. These challenging building types, in addition to our K-12 and college facilities, have been the primary focus of our practice. Over 500 national, regional, and state level awards for design excellence attest to our ability regarding innovative design within budget and schedule.

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