Redesigning Secure School Entry Thresholds to Create Inclusive and Welcoming Environments

Alexandra I. Yarovaya
Portland State University
Redesigning Secure School Entry Thresholds to Create Inclusive and Welcoming Environments

By
Alex Yarovaya

An undergraduate thesis submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in University Honors and Architecture

Thesis Advisor
Todd Ferry

Portland State University
2024
Redesigning Secure School Entry Thresholds to Create Inclusive and Welcoming Environments
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Terminology</td>
<td>3</td>
</tr>
<tr>
<td>Project Outline</td>
<td>5</td>
</tr>
<tr>
<td>Existing Threshold Design Practices</td>
<td>6</td>
</tr>
<tr>
<td>Case Studies: Real-World Application of Design Strategies</td>
<td>11</td>
</tr>
<tr>
<td>Entry Threshold Design Strategies</td>
<td>28</td>
</tr>
<tr>
<td>- Natural Surveillance</td>
<td>30</td>
</tr>
<tr>
<td>- Landscaping &amp; Biophilic Strategies</td>
<td>32</td>
</tr>
<tr>
<td>- Accessibility and Universal Design</td>
<td>35</td>
</tr>
<tr>
<td>- Art and Design Interventions</td>
<td>36</td>
</tr>
<tr>
<td>Application to Three Key Focus Areas: Pathway, Canopy, and Vestibule</td>
<td>37</td>
</tr>
<tr>
<td>- Threshold 1: Pathways</td>
<td>37</td>
</tr>
<tr>
<td>- Threshold 2: Canopy</td>
<td>39</td>
</tr>
<tr>
<td>- Threshold 3: Vestibule</td>
<td>40</td>
</tr>
<tr>
<td>Diagrams of Gaffney Lane and Gardiner</td>
<td>45</td>
</tr>
<tr>
<td>- Gaffney Lane Elementary School</td>
<td>45</td>
</tr>
<tr>
<td>- Gardiner Middle School</td>
<td>54</td>
</tr>
<tr>
<td>Conclusion</td>
<td>59</td>
</tr>
<tr>
<td>Bibliography</td>
<td>60</td>
</tr>
</tbody>
</table>
Introduction

Schools are known to have been one of the largest assets to communities, providing folks with integral resources and accessible spaces that can foster a variety of activities. They have supplied communities with the spaces needed to learn, facilitate events and large gatherings, host before and after-school programs such as breakfast for children, and even act as a trusted resource to congregate for emergencies. Over the last decade, however, our perspective of schools has undergone significant changes. Schools have eagerly been undergoing the process of “hardening” by implementing safety and violence prevention tactics with Crime Prevention Through Environmental Design (CPTED) as a response to the staggering increase of gun violence incidents and safety & security issues today. Schools have been scrambling to accommodate this change in reality by retrofitting with security systems, implementing high security measures such as metal detectors, fortified entries, student ID cards, and patrolling officers; not only this, but many schools had even historically implemented student profiling strategies as a tactic as well. Such quick-response security implementations can have short-sighted pitfalls through security system planning inconsistencies and unwelcoming barricade-like design responses, failing to support “a long-term, holistic approach” to safety and security in schools.

But “we cannot convert our schools into prisons and treat our students like prisoners”, architects today are diligently iterating on concepts for contemporary safety and security methods, measuring their long-term appropriateness against expeditious reactions. For example, an expeditious security reaction occurred three days after a tragic school shooting in Robb Elementary School in Uvalde, Texas. The state’s Senator, Ted Cruz, promptly proposed to harden Texas schools by reducing the number of doors in them. He states, “We may have to look at the design of our

1 Schneider, T., Walker, H. M., & Sprague, J. R. (Jeffrey R. (2000)). “Safe school design: a handbook for educational leaders applying the principles of crime prevention through environmental design” (1st ed.). ERIC Clearinghouse on Educational Management.
schools moving forward and retrofitting schools that are already built. And what I mean by that is there are too many entrances and too many exits… One of the things that everyone agreed is don’t have all of these unlocked back doors, have one door into and out of the school and have that one door [with] armed police officers at that door,”.⁴ The concepts of contemporary safety design for schools are dominantly informed from the need to prevent further school shootings.

But how appropriate is it for students to be met with armed police officers at the school entry? How appropriate is it to have a set of eyes that profiles students every day from the door? There is existing research on the importance of designing for a positive physical ecology, as it is a leading “powerful factor in contributing to… safety, security, and effectiveness. The design and use of school space has a huge but often unrecognized impact on the behavior of students as well as staff”.⁵ The contextual factors of place are “extremely influential in accounting for behavioral outcomes”;⁶ though physical security is incredibly important to have in schools, the trauma-informed design can quickly short sight its long-term psychological effects. Ohio State University conducted a study specifically on these effects, finding that higher levels of fear were experienced by the students and staff in schools that implemented high-tech security measures at interactive building points that were always visible or implied.⁷ ⁸

As a side effect of promptly enacted CPTED philosophies, schools have become less accessible, welcoming, and approachable for communities, parents, and students – triggering the decline of schools being leveraged as a large community resource. The unintended consequences of security measures has led to a burgeoning movement for contemporary school designs, of which architects are reevaluating and redesigning thresholds that prioritize both safety and a sense of

---

⁵ Schneider, T., Walker, H. M., & Sprague, J. R. (Jeffrey R. (2000)). “Safe school design: a handbook for educational leaders applying the principles of crime prevention through environmental design” (1st ed.). ERIC Clearinghouse on Educational Management.
⁶ Ibid.
belonging. The main entrances of schools, specifically, play the most crucial role in defining and setting the tone for a sense of welcoming and belonging. By recognizing the effects of security implementations, it is important to revisit, reassess, and reiterate on the designs of the secure entry threshold procession. With this in mind, it triggers the idea of the question: how can schools better utilize entry point thresholds to set up expectations of an inclusive and welcoming environment, while balancing the needs for contemporary safety protocols?

**TERMINOLOGY**

Before delving into the research and addressing this question, it is important to acquaint oneself within the context of contemporary school designs; more specifically, within the terminology and existing practices. To begin, CPTED (Crime Prevention Through Environmental Design) investments in schools are focused on both exterior and interior thresholds. In this project, thresholds will be defined as “spatial conditions that create openings in boundaries allowing for movement and transition in space”, with boundaries being what “define spaces by separating a smaller space out of a larger spatial structure” and / or place. Thresholds are used to invite occupants to move through space, and are designed to create a perceptible change in experience, function, or environments as one moves from one area to another. Because they encompass a multitude of qualities and characteristics, for the purpose of this thesis, they will be condensed into the concepts of ‘hard’ and ‘soft’ transitional thresholds.

‘Hard’ thresholds are defined by the physical architectural features and elements that define distinct, noticeable, and clear boundaries which break spaces apart. They are used to create spatial differences in function, privacy, and atmosphere by using definitive structural and architectural features such as walls, partitions, doorways, and elevational changes. Hard thresholds are therefore used to create the physical architectural security by providing controlled access between different areas of a building. As they are often more distinct and larger in scale than soft thresholds, they can

---


also be used as orientation points to the building, allowing the architecture to translate its interior program to the exterior, aiding visitors in navigation to the main entry point at a school.

‘Soft’ thresholds offer a more subtle and gradual transition between spaces, signaling gentle cues to create movement and a sense of continuity between spaces. They are often used to enhance the experiential quality of spaces, which foster a coherent spatial narrative that engages the building with the occupant. Occupants are able to better connect with and experience these changes in space as the designs often consider human scale and proportion, which ensures that the transitions feel comfortable and intuitive for people to move through. These changes in space are done through non-abrupt designs elements such as materials and textures, colors, and lighting, which engage psychological comfort and the senses such as sight, touch, and smell.

In this project, hard and soft thresholds will be used in combination with one another as they inform each other to articulate different transitional experiences, which are vital to the process of making folks feel welcome to the school building. It will focus on balancing the qualities of these threshold types, as well as how they can be combined with further architectural detailing that has symbolic significance to the context of schools, facilitating belonging and place-making.

Place-making is a term characterized by strengthening the identity, emotions, and sense of belonging people have with a place through design. Place is a dimension, location, and physical setting that is characterized by people, meaning that people are the heart of a place. Place gains meaning and identity through how people interact with, move through, and experience it; therefore, place-making in communities has been a practice reckoned to do good and benefit communities. However, it is important to recognize that place-making strategies are not universal or a “one-size-fits-all” situation across different places. There is a very fine line in which good architectural intentions can inadvertently crossover into insensitivity and exclusivity concerning the present context of a location. Designing at the broadest lens can quickly overlook attending to the specific and unique characteristics that make a community so distinct; places can have different values, spatial practices, assets, resources, and needs, of which aren’t always physically demonstrated or
visually apparent. Schools have the great opportunity for facilitating place-making for students, staff, parents, and communities, especially because the environment of a school can significantly impact student well-being, behavior, mental health, productivity, and performance.\(^{11}\) To foster emotional connectivity, inclusivity, belonging, and safety, this thesis will use careful design considerations through landscape, architectural, and interior design to explore ways schools can implement place-making at the three main entry point thresholds of schools: pathways, canopy, and vestibule.

**PROJECT OUTLINE**

In this thesis, I will begin studying the existing contemporary architectural, landscape, and interior design thinking and theory around both ‘welcoming’ and ‘trauma-informed’ school entry threshold designs in three key focus areas: pathways, canopy, and vestibule. After addressing the contemporary design tactics and interventions, research on real-world applications of these design practices will be conducted through a series of six case studies. The case studies and threshold design research will then work together to inform a compiled list of design strategies and guidelines, which will then further be applied to a self-lead iterative exploration and study diagramming of the designs of the three main school entry thresholds (pathways, canopy, and vestibule) at two K-12 schools located in Oregon City, Oregon built by BRIC Architecture, Inc.: Gaffney Lane Elementary School and Gardiner Middle School. In my diagrammatic explorations, I will: first, analyze the trauma-informed zones in the entry thresholds of the schools; second, I will analyze the security-informed designs’ potential effects on the feeling of ‘welcoming’; lastly, I will overlay these zones with the application of my own ‘soft’ and ‘hard’ threshold design concepts to balance the needs and issues of safety protocols to set up the expectations of the school being an inclusive and welcoming environment.

---

EXISTING THRESHOLD DESIGN PRACTICES

The contemporary endeavors for exterior entry threshold designs in schools need to go beyond what is written in building code; as Daniel Lamoreaux and Michael Sulkowski say, “innovative and inspiring school designs are generally the exception rather than the rule”. Architects need to turn to using ‘best practices’, which are context-specific design approaches and methodologies in the field that are widely recognized and accepted as effective. One example of best practices are the ‘soft’ security design approaches taken by urban designers at the landscape and city-scale, where there is indirect implementation of security through the designs of streets. In a city-wide project proposal in Florence, Italy, Italian architect Stefano Boeri aimed to protect the public spaces in the city from consistent terror attacks without the military-style barriers. Boeri emphasizes that “the safety of these places is urgent and appropriate, but we cannot allow safety to transform thousands of squares and public spaces in Europe to become sites of barriers and concrete blocks, as if they were military checkpoints.” Hard, anti-terror, barricade-like designs can be easily designed as they function without the need for aesthetics; however, leaving the harsh, unsightly designed barricades to the public will serve as direct, constant reminders to the public of their unsafety in the city. Jay Brotman, managing partner of architecture firm Svigals + Partners that rebuilt Sandy Hook Elementary School in Connecticut (reference page 24), adds on to this idea, stating that “buildings and public spaces must be designed for many goals, and the most important are to encourage compassion, prosperity, collaboration and joy”. Instead of using explicit safety tactics such as concrete barriers and walls, cities and developing areas have begun using trees, large planters, and berms to facilitate temporal flow, which Brotman states “are equally effective in preventing attacks by vehicles”; “Nature, art and accessibility are just as important as security features.”

14 Yalcinkaya, Gunseli. “New Sandy Hook school is designed to “prevent unwanted intrusions of any kind”.” Dezeen, October 26, 2017.
15 Ibid.
16 Ibid.
The urban design scale of indirect security methods can be directly transferred into architectural school projects. In the Sandy Hook Elementary School project (reference page 24), for example, Brotman suggested the use of indirect safe landscaping tactics such as bioswales, trees, planters, and gentle hill-like berms that not only act as indirect security, but also as “drainage systems to remove silt and pollution out of surface water runoff”.

Indirect tactics not only reduce the psychological impact of physical and visible security measures, but also serve as a dual-purpose design strategy. From even the broadest lens of indirect security practices, numerous amounts of methods and considerations are applicable when designing secure thresholds in contemporary architectural designs for K-12 schools that can simultaneously encourage functionality and the sense of welcoming. As designing thresholds with safety and security in mind is undeniably crucial for schools, there also needs to be a balance in its overt explicitness and directness to visitors. Features found in thresholds such as security cameras, the often stale secure vestibules, metal detectors, key card readers, and buzzers certainly contribute to a secure environment and control movement across the site; however, being greeted by these prominently placed features upon entry can evoke discomfort and reinforce concerns about school safety, creating an uneasy atmosphere for users.

To create a welcoming entry presence with indirect security measures, multiple problems work against it. Randy Fielding, an internationally recognized architect in school design, states that these problems are: “one, a tendency to create grandiose, institutional entries rather than human-centered spaces, and two, the need for a strategy to address violent threats”.

By designing entry thresholds to be grandiose in scale and to address violence through direct CPTED philosophies, context-specificity and human-scale can easily get undermined. This means that the design layers of each threshold need to address both context and the human experience from the human scale to be successful at creating a comfortable, welcoming, and inclusive environment. Fielding discusses this further, saying that through his experience of designing, “people don’t tend to congregate in the center of large open spaces—instead, they hug the edges, and look for the small amenities that

17 Yalcinkaya, Gunseli. “New Sandy Hook school is designed to “prevent unwanted intrusions of any kind”.” Dezeen, October 26, 2017.
support human comfort”.\textsuperscript{19} Elements designed with intentionality to invite folks for interactions, such as canopies to protect from the elements, places to pause and sit for a moment, transparent views that showcase building activity, “and a view to an administrative office are all key elements that create a welcoming entry”.\textsuperscript{20}

To demonstrate ‘best practice’ ideology, Fielding has created a sketch diagram that quickly illustrates the ideas of a human-scaled entry threshold design that indirectly uses security measures, natural surveillance, and courtyard design to create a more “indirect” security and welcoming experience. It is important to note that, though this diagram does demonstrate transparency and natural surveillance by intentional design tactics, it does not consider the other necessary layers of security such as the double-layered vestibule, or stress the importance of the design behind the exterior pathways, courtyard, or covered entry (referred to as ‘canopy’ in this thesis).

Fielding delves deeper into the idea with a guest author, Nathan Strenge, in the article “6 Elements of Thriving Learners”, providing examples of projects that integrated this design philosophy and what design elements were incorporated into each. For example, they refer to the

\textsuperscript{19} Ibid.

Figure 1: “Welcoming Entry” by Fielding, diagramming the natural surveillance safety tactics applicable to the “front of house” in schools.
(https://www.gettingsmart.com/2021/12/16/welcoming-entry-and-layered-access/)
St. Martin de Porres High School in Cleveland, Ohio, a school intentionally designed to nurture safety and wellness. They describe that this was achieved because “many of the physical security measures go unnoticed by the untrained eye, including mechanisms to layer access inside and outside the building… good design in this domain creates spaces that foster movement, well-being, and social connections without sacrificing physical safety”.21 Design features that center the human rather than “institutional uniformity” such as: the ability for folks be autonomous and choose how to engage with the place and with each other; mitigating glare to give a sense of inclusion and belonging to folks with visual impairments; the treatment of wall surfaces and colorful graphics to aid wayfinding shows care for the human experience; and the consideration of atmosphere and comfort play a vital role in creating a sense of welcoming and belonging.22 The authors discuss further that by balancing designs for well-being in conjunction with the sense of physical and mental health safety, “a key aspect of [people’s] foundational needs is met. They are in a mental and physical state that prepares them for deeper learning, critical thinking, and enriching relationships”.23

It is clear that safety and security in schools are heavily layered, “multifaceted and complex”.24 The Partner Alliance for Safer Schools (PASS) goes beyond CPTED philosophies, describing the layers of best design practices to follow and the different types of security components that aid architectural designers in balanced secure school designs.25 These components aim to balance direct and indirect security measures through: “Policies and Procedures; People (roles and training); Architectural; Communication; Access Control; Video Surveillance; Detection and Alarms”.26 Using the principle of “multiple layers of security to improve safer school design”, recommendations are established for each component layer that “address a broad range of threats, providing components that deter, detect or delay and respond to adversarial behaviors”.27 On the

22 Ibid.
23 Ibid.
25 Ibid.
26 Ibid.
security management side of school threshold design, successful integrations come from a holistic design process that involves assembling a team of stakeholders, district workers and infrastructure professionals (architects) to work together to successfully identify, measure, and reduce threats to safety in schools. This foundation to a security management system will later inform the architectural design choices made when designing a secure school threshold to be inclusive and welcoming.

Balancing the design of school main entry thresholds with the need for well-being and physical security is a difficult, yet vital, action to take. The three main entry thresholds of schools in this thesis (pathways, canopy, and vestibule) have existing architectural design practices being done to address safety and security in both direct and indirect ways that need balancing. To further study the design strategies and principles that help integrate belonging and physical and mental health into security designs, this thesis employs multiple comprehensive case studies of existing schools that do just so. By doing a comprehensive analysis of these three main entry thresholds in conjunction with contemporary architectural case studies, key design practices that designers used will be identified, synthesized, and summarized to serve as a design strategy guideline for the diagrammatic re-evaluation portion of the thesis.

Figure 2: PASS Security Teamwork diagram, demonstrating the many team “players” and stakeholders involved in ensuring safety and security of schools. (PASS Safety and Security Guidelines: 6th Edition)
CASE STUDIES: REAL-WORLD APPLICATION OF DESIGN STRATEGIES

Case Study A: Academy of the Sacred Heart | New Orleans, Louisiana

The two-campus ‘Academy of the Sacred Heart’ is one of the oldest schools in New Orleans, educating from the youngest of learners all the way through high school. As the Academy’s Mater campus needed to be redesigned to adapt to the needs of children and contemporary safety protocols, the architects “redesigned and rebranded the entrance to improve security, offer greater curb appeal, and connect the [Mater campus’s] Nims Center to a forecourt”. The Academy’s campus site is historically significant to the community, reflecting both a distinct architectural style and relationship with the courtyard. Brand reinforcement was therefore the main driving concept of the redesign of the Mater campus’s ‘Nims Center’, utilizing careful design considerations for the building and its upgraded entry thresholds. The vestibule design engages a concept of “layering” to re-brand and reconnect the vestibule with the Academy’s culture and values: “community engagement, faith formation, operations, stewardship, and worship”. In each layer of the design, the campus’s culture and values were reflected through integration of the existing visual cues on the site such as architectural details, materials, and graphics. By doing so, the identity of the campus was kept meanwhile balancing the needs of contemporary security measures.

The community celebrates its values and holds its identity within the dual campus courtyard, of which holds “a bronze statue of Saint Rose Philippine Duchesne of the Sacred Heart sitting stoically in the courtyard”. The spatial design of the courtyard allows folks to sing, dance, learn, discover, and pray at the statue, as “lighting and seating encourage moments of solace and engagement around the figure”. The vestibule entry threshold is located adjacent to the courtyard, creating a visibility layer that visually connects people inside of the vestibule back to the courtyard, strengthening identity and connection of who the community is.

29 Ibid.
30 Ibid.
31 Ibid.
Figure 3: Layers of the Academy of the Sacred Heart’s Entry Threshold
Figure 4: Vestibule entry threshold reflecting campus architectural details and identity. (“Academy of the Sacred Heart”. Multistudio. https://www.multi.studio/project/academy-of-the-sacred-heart-mater-campus-renovations/.)

Figure 5: Courtyard and bronze statue of Saint Rose Philippine Duchesne of the Sacred Heart. (“Academy of the Sacred Heart”. Multistudio. https://www.multi.studio/project/academy-of-the-sacred-heart-mater-campus-renovations/.)
Case Study B: Lake Stevens Elementary and Early Learning Center | Lake Stevens, Washington

The Lake Stevens Elementary and Early Learning Center in Lake Stevens, Washington was designed by NAC Architecture in collaboration with the Lake Stevens School District, whose mission is to provide early learning opportunities for disadvantaged and lower income students. The site’s campus consists of an early learning center and an elementary school, which will then in future plans have an adjacent middle school. The vision of the site’s campus is derived from the concept of water flowing from a watershed to a stream and then to a lake, which is reflected back into the design and building program as a consistent flow of progressive education where the learning starts at “pre-k and [continues] to a future middle school…Stevens Creek’s students begin in the Early Learning Center, growing academically, socially, emotionally, and physically as they flow to the Elementary School, and eventually to the Middle School”. With the heart of the design being to have a connection back with the nature that surrounds the site, the exterior thresholds such as the parking lot, court yard, and entry spaces were designed to both mimic the natural non-linear movement of nature and have landscaping with native plants and trees “as part of a successional plan to reforest the site”.

The pathways leading to and between the school’s entry thresholds were designed by Fora Landscape Architects, who are based locally around the site. Locality was a key aspect in the success of creating a sense of inclusion and belonging on the site, as the architects were knowledgeable in native species and the importance of environmental context. The design of the exterior pathways that flowed through the thresholds mimicked and represented the natural meandering of people through nature and through education; an award showcase of the project further states: “As students develop and flow through their educational path, nature-inspired imagery also grows in scale and complexity along with them to inspire further curiosity about our natural environment”.

With what could have been a simple and flat typical walkway between entry thresholds, the ‘soft’ pathway design manipulated standards with materiality to create an energetic and biophilia-inspired wayfinding system. Meandering curving edges bring softness to the design and allow for a human connection and feeling of inclusion between the human, designer, and infrastructure, enhancing the sense of welcoming and belonging. The ‘Early Learning Center’ campus is where the “flow of
Figure 7: (Pathway to the right) Soft exterior threshold condition that uses material manipulation to visually integrate the ‘flow of knowledge’ into the design. This creates an energetic and welcoming wayfinding system for the young students at the school, giving them a sense of belonging. (Fora Landscape Architects. https://fora.land/projects/stevens-creek-elementary-and-early-learning-center/.)

Figure 8: Meandering ‘flow of knowledge’ pathway design flowing irregularly through the sidewalk panels. Warmth is introduced to the design through wooden paneling that showcases the knots, connecting the school back to nature. (Fora Landscape Architects. https://fora.land/projects/stevens-creek-elementary-and-early-learning-center/.)
knowledge” begins. The front entry of the center is a great example of a secure threshold that is a welcoming and inclusive environment. By looking to proxemics and human scale in mind for spatial design, the architects designed the vestibule to be experienced uniquely by the parent and child with doors scaled to their height. The experience that an atypical design of a child-scaled door demonstrates inclusivity and welcoming to the users of the space. Not only does this spark excitement and joy for a child to look forward to, but it also allows for a typically sterile threshold interaction that is deeper and memorable. The small door allows for children to have a sense of agency over the space, and, when growing up over time, will reflect back to this threshold experience as a stamp in a timeline in their flow of knowledge.

Figure 9: The Early Learning Center’s double door vestibule. Taking human scale into consideration of the sizing of the doors, the architects were able to create a special interaction at the vestibule threshold. This gives a sense of welcoming and belonging to the younger students, promoting excitement at the front door. (Fora Landscape Architects. https://fora.land/projects/stevens-creek-elementary-and-early-learning-center/.)
Case Study C: North Kansas City Schools Early Education Center | Gladstone, Missouri

DLR Group took upon a redesign and retrofit project, converting a vacated retail strip mall into the North Kansas City Schools Early Education Center in Gladstone, Missouri. A conversion of a stale retail space into a vibrant school meant that designers needed to create a "colorful, welcoming, and child-friendly environment" from the forefront of the building. For the community to feel a sense of belonging at the place, the exterior entry threshold needed to bring reflection and representation of the Gladstone community, as well as help familiarize folks with wayfinding designs that were welcoming and human-scaled. The architects used wayfinding strategies both interiorally and exteriorally such as colors, graphics, animals, and objects on the walls to bring a simple and recognizable identity that resonates with children, meanwhile providing a cohesive identity to the space. At the entry, a playful feeling is encouraged with a graphic “hi!” at the vestibule doors. Whimsical circle cut outs in the canopy spark curiosity and familiar shapes to children that gives them a sense of belonging. The outdoor playground is also located right at the front of the entry due to retrofit design restrictions and implications; though playgrounds at the main entry are not the best practice of safety for children, it ultimately helps the building feel more approachable and creates a sense of connection between the school, parents, and children.

The round curved edges of the pathways and ample width in the front courtyard creates a soft entry approach that also allows accessibility for all bodies. Small courtyard landscape integrations using planter beds and natural stone seating benches creates a subconscious safety barrier that is consciously taken as another amenity that is inviting to use for folks. The building entry overall is designed to invite, reflect, and represent both the adult and young community through design, giving kids a sense of welcoming and belonging and allowing parents to have a sense of calm and place for their child.

Figure 10: The Early Education Center’s front entry courtyard and pathway space with an inviting “hi!” slogan. (DLR Group. https://www.dlrgroup.com/work/north-kansas-city-schools-early-education-center/.)

Figure 11: Aerial view of the front entry, demonstrating a curving pathway, light materiality, and playground. (DLR Group. https://www.dlrgroup.com/work/north-kansas-city-schools-early-education-center/.)
Case Study D: Michelle Obama School | Richmond, California

The Michelle Obama School in Richmond, California was designed by Multistudio and built over the site of a previous school. The design of the school was made to “address a shortage of open spaces, community amenities, and resources for students and families in the neighborhood”.

As the main driver of the project is community, the integration of large community spaces, agency and flexibility, and indoor-outdoor connections supports a welcoming and inclusive environment. The main entry of the school integrated landscaping strategies, biophilic elements, community engagement, and natural surveillance to create a “welcoming bioswale entry plaza [that] provides a safe pickup and drop-off location and defines the most public and community-oriented zone of the school, with the community room and multipurpose room directly adjacent to it”.

The incorporation of resilient landscapes and visible stormwater filtration systems allow the main entry to facilitate community stewardship and invite folks to gather.

As the site is mostly hardscaped, the courtyard and pathway arrangement uses soft curving edges with non-stark edges to help soften the design. The canopy of the school is receded, which inadvertently gestures to the courtyard as being the center space of welcoming, circulation, and gathering. The use of color within the design is what strongly separates this project from sterile institutional entries, facilitating curiosity and a sense of energy. As color can be a “powerful communication tool and can be used to signal action, influence mood, and influence physiological reactions”, Kendra Cherry and David Kelly help summarize some psychological studies done on color theory. Cherry describes that yellow symbolizes hope and joy, to which Kelly states that it promotes mental activity, “happiness and optimism in the observer... [and] helps foster strong analytical thinking”. However, it is important to recognize that, even though color can promote feel-good emotions, it can also heighten awareness to points where it increases irritablity, agitation, and aggression, so, it must be used in moderation.

40 Ibid.
Figure 12: Front entry and gathering courtyard. (https://www.overaa.com/projects/michelle-obama-elementary-school/.)

Figure 13: Front entry and gathering courtyard. (Multistudio. https://www.multi.studio/project/michelle-obama-school/.)
Case Study E: Sartori Elementary School | Renton, Washington

Designed by Integrus Architecture and FORA Landscape Architects, the Sartori Elementary School in Renton, Washington is another example of a welcoming and safe approach to school entry design. Though it does not use some of the biophilic elements such as curving pathways or a main gathering center as the Michelle Obama School, Sartori Elementary does use its courtyard as a buffer zone between the main entry and the main road. This provides safety and security for the school in a non-hardening way, as it incorporates a large safe space from the road, a large branding bench, and plants for a more inviting and natural feeling. Additionally, the school uses a more considerate approach to use of color: “It was designed to not only educate students, but also serve the community…” The design and color palette for the school—orange, turquoise blue, and green—pays homage to local Native American tribes, including the Duwamish, who settled in the area as far back as the last ice age.”

Figure 14: Public Entry Plaza. (Fora. https://fora.land/projects/sartori-elementary/.)

Figure 15: Public entry plaza working as a buffer zone between the main entry and the main road. (https://www.bpcmag.com/case-studies/matt-feldmeyer-renton-school-district/)

Figure 16: Public entry plaza working as a buffer zone between the main entry and the main road. (https://formacc.com/portfolio/sartori-elementary-school-replacement/)
Case Study F: Sandy Hook Elementary School | Newtown, Connecticut

After the devastating Sandy Hook Elementary School shooting in December of 2012, the old school, which was “a simple, flat-roofed, brick square constructed in 1956” was demolished with the plan to erect a “new building on the same property”. Architecture firm Svigals + Partners have been chosen to rebuild the Sandy Hook Elementary. Jay Brotman, partner of the firm, states in a Dezeen Magazine interview that “building prosperous, compassionate communities cannot happen with a bunker mentality”. Brotman starts to discuss the exterior threshold design of the school, stating that the “softer” thresholds approaches they introduced brought a sense of security to schools just as “hardened” thresholds approaches do.

Svigal + Partners have written about the process of design and community involvement in the project, where “the wholehearted participation of the community brought to life their vision of what was needed: a process of revitalization for all of Newtown and the creation of a plan with welcoming arms, embracing all the future students of Sandy Hook”. The collectivized integration of community and designers was vital to the new design of the school as community integration was initiated to ease expectations and anxieties. Though security became a deeply integral concern for parents, children, and community members, the firm says that “the town realized that the design would only succeed if the educational mission remained the primary goal. In this way, all design decisions around security were also serving this essential mission”. By developing the core of the architecture to deeply involve the wider community, designers at Svigals + Partners were able to design thresholds that were meaningful to the community, creating a sense of belonging.

The facade of the school is “unconventional”; the very long-spanning, undulating facade cladded with vertical planks of contrasting stained wood gives it the look of being decidedly anti-
The design of the pathway and courtyard entry threshold also creates a sense of belonging and place-making for the community, as it drives its main motif of a “footbridge” from the town of Sandy Hook’s “series of footbridges across the Pootatuck River.” The motif behind the design directly resonates with the townspeople, giving them a sense of belonging and a familiar welcoming as the consideration of their identity was reflected in the design. Found in this design is a rain garden, with “a rippling array of plantings designed to absorb the stormwater runoff from the school’s roof… to enter the school you have to cross one of three footbridges, a device that also ensures that everyone is forced to approach the building along one of three well-watched pathways—typical of the inconspicuous ways that security concerns are factored into the building’s design”. Not only does the landscape design facilitate a feeling of welcome and inclusion, but the open-design concept allows for clear sight lines, which are a major part of contemporary safety protocols.

Figure 17: Entry canopy and vestibule. Patterns in the pathway design, a curving tree “canopy”, and biophelic inspiration brings curvature and curiosity to the main entry. (https://slate.com/business/2019/08/school-shootings-design-architecture-sandy-hook-columbine.html)

47 Ibid.
48 Ibid.
Figure 18: Undulating entry facade design and footbridges across stormwater planters.

Figure 19: Undulating entry facade design and footbridges across stormwater planters.
(https://www.architecturalrecord.com/articles/11839-a-new-chapter-for-the-sandy-hook-school.)
Collaborating with the community was essential to creating the landscaping design, deeply connecting it with the environment and the more cheerful histories at the site. As the original building had a grassy courtyard opening at its center, a family of ducks took a living in it – which the community loved deeply. As a result, the community had a devotion to incorporating a courtyard into the building again. The firm listened, involving the community in on the design process by having a design workshop day where the firm brought in shapes that would represent certain landscaping features, prompting folks to design their own courtyards realistically. This is an incredible example of allowing a community to demonstrate their way of belonging through design, and for us architects to professionally make come to fruition in community-serving architecture.

It is also very important to touch on how the elementary school design used “thoughtful touches” in their threshold designs that took into consideration proxemics, anthropometrics, human scale, and welcoming. Even though this thesis primarily focuses on exterior entry thresholds and the vestibule, the new Sandy Hook Elementary School has interior design ideology and philosophy that can be directly applied to exterior threshold design conditions. As the main audience of the school is children, in the corridors, “colorful rectangles of linoleum mark the entrance to each classroom, like welcome mats. In the lobby, there’s a sculpture on the ceiling composed of slowly moving metal ‘leaves.’ And best of all, there are ‘treehouses.’ At the end of each of the second-floor corridors is a snug room with a curvy bench where kids can work on projects in small groups or just look out the windows into the surrounding woods”.49 The role of this school was to become part of the community in a non-invigorating, non-traumatic way, connecting back with nature and the woods, and tying the community back together within the design, ultimately bringing the sense of inclusivity and belonging meanwhile balancing safety protocols in an “invisible” way.

ENTRY THRESHOLD DESIGN STRATEGIES

After analyzing the architectural case studies, several key design strategies that the architectural designers used were identified. For the scope of this thesis project, it was necessary to narrow them down to the most important design strategies that are applicable to the three main entry threshold points of schools: exterior pathways, canopy, and vestibule. To provide further context and credibility to the four derived design strategies, a synthesis of supporting external research will be applied. By doing so, this will ensure that the diagrammatic re-evaluation section of the thesis can refer back to these strategies as a credible “design strategy guideline”.

When it comes to entry design strategies that are both welcoming and secure, designers need to think about natural surveillance, landscape and hardscape strategies, accessibility and universal design, art and design interventions for welcoming and belonging, and human scale. A well designed school entry demonstrates care for the human and the human experience through these design strategies, which work in tandem to create a holistic perception of inclusivity, ownership, belonging, and welcoming, overall contributing to the feeling of safety and security. When it comes to the integration of ‘welcoming’ with physical ‘safety’ and risk-prevention, taking ‘indirect security measures’ should be set as the foundation of the design.

To begin, safety and security are similar concepts; but, they have their own distinct measures. Safety has measures that promote well-being and look at creating conditions and environments that protect and prevent people from harm. Security, on the other hand, has measures that come from a safeguarding aspect, looking at implementing technology that deliberately deters and detects threats and provides security. Between the two, safety measures are more often human-scaled, relatable, informal, and “biological”, meanwhile security measures are more often hardened, risk-influenced, formal, and “technical”. Security measures directly impact the feeling of safety for folks, but that also comes with the direct impact on other feel-good factors such as welcoming, inclusion, and belonging. By cross pollinating the two concepts and their measures, environments that are both secure and welcoming can be achieved.
The Crime Prevention Through Environmental Design (CPTED) guidelines seek to blend the two concepts, but have more of a focus on achieving security through architectural design. To address the security measures of risk response and risk management, CPTED takes on risk as “a deviation from the expected. It can be positive, negative or both, and can address, create or result in opportunities and threats. Risk is usually expressed in terms of risk sources, potential events, their consequences, and their likelihood”.

When it comes to CPTED’s philosophies, it suggests risk to be managed through four principles: natural surveillance and keeping ‘eyes on the street’; natural access control by using physical elements to keep folks out of places; territorial reinforcement where clear and direct territories discourage potential intruders; and maintenance, where the selection of materials impact durability and long-term sustainability. These principles can all be broken down into CPTED’s 8 distinct design strategies, such as: “1. allow for clear sight lines, 2. provide adequate lighting, 3. minimize concealed and isolated routes, 4. avoid entrapment, 5. reduce isolation, 6. promote land use mix, 7. use of activity generators, 8. create a sense of ownership”, which all work together to help inform the design strategies for this thesis that are derived from the case study research.

But how do these security guidelines impact and evoke feelings at the end-user experience in the entry thresholds of schools? It is important to understand how folks at the experiential level respond to security measures, especially in the ways of which they evoke safety. Physical safety (which can be thought of as the quantitative measure) is undoubtedly brought in from security measures, but also emotional safety (which can be thought of as the qualitative measure) is brought in from inclusive and welcoming environments. For example, the policies and practices instilled by the school administrators themselves that have “harsh or unfair exclusionary discipline practices and frequent disparities in the use of exclusionary discipline practices for children of color, LGBTQ students, and children with disabilities can contribute to students feeling unwelcome, unsafe, and

---

52 Ibid.
unsupported”. The same applies for architecture; though the building shape and construction is informed by security, the interior and exterior design details, just like the practices of administration, practice and instill the feeling of safety and belonging in folks. With this in mind, the following design strategies will reflect and cross-pollinate security measures with safety measures to help redesign secure school entry thresholds to create inclusive and welcoming environments.

**Strategy 1: Natural Surveillance**

As far as surveillance of the school premises goes, entry thresholds can be designed to maximize ‘natural’ surveillance, which is an indirect security tactic that allows staff to maximize supervision of who is entering without the need for direct and harsh security equipment such as cameras. Achieving this at the scale of entry thresholds in buildings is practiced at both the interior and exterior conditions. For interior conditions, this typically involves using a strategic placement of windows and glass where opaque, hard thresholds would be. Glass is an indirect boundary and barrier “between the inside and the outside world”, and should be used in place of opaque walls that are problematic to security and act as barriers to sight lines and visual connectivity. For example, CPTED guidelines state that architectural designs with “recessed doorways [that] can result in corners that are hidden from casual surveillance. Sharp ‘blind’ corners create the same problem”, and so do blank walls that offer no supervision or situational awareness of indoor and outdoor conditions.

To avoid the physical sense of separation for folks, windows are implemented to create that transparency to allow for “open” and visual connectivity.

However, a full glass wall isn’t just a simple answer to the problem; for example, when visitors enter a fully transparent vestibule, they can feel quite uncomfortable and unsettled instead of safe and welcome to the school. There needs to be a balance in privacy through further detailing, such as softer threshold design tactics like fritted glass designs or graphic design vinlys that have

---

small perforations or aren’t completely opaque. These types of best practices are project and context specific, meaning that they need to be strategically planned and implemented onto the windows from the human experience scale. Transparency and sight lines into other spaces still need to be maintained through the graphic designs, but should ultimately make the visitor feel comfortable and less exposed. As a whole, natural surveillance features can be integrated into the architecture foundationally so that it is indirect and seems as just a part of the building, discreetly minimizing visual impact while still controlling entry to secure areas.

Sight lines are very important to both supervision and visitor experience. At the visitor scale, CPTED describes that “the inability to see what is ahead along a route due to sharp corners, walls, earth berms, fences, bushes or pillars can be serious impediments to the feeling of being safe… Large columns, tall fences, over grown shrubbery and other barriers blocking sight lines adjacent to pedestrian paths could shield an attacker” and ultimately create a barrier through fear that makes approachability to enter a school difficult.56 On the other hand, well designed considerations such as plantings like “low hedges or planters, small trees” and short flower beds “allow users to see and be seen and usually discourage crime and vandalism”.57 Unintended “screens, barriers or hiding places could be created” as landscape matures; therefore, “planting in a landscape must take into consideration the growth, final height and habit of the plants”.58 Allowing folks to see and be seen is important to mitigate the fear of isolation, especially “if people judge that signs of distress or yelling will not be seen or heard”.59

Not only does natural surveillance from the building prevent the fear of isolation, but so does a well-used space. Surveillance by administrators and security personnel is not always going to be present, and not every space in need of surveillance will have windows. If neither is present, formal security monitoring through hardwares would be necessary but not optimal; luckily, natural surveillance can still take place at these exterior scales through the programming of gathering opportunities. This means that “planning or programming activities [in spaces] for a greater intensity

57 Ibid.
58 Ibid.
59 Ibid.
and variety” of congregation types, such as bicycle storage, seating options, and design that makes folks want to utilize a space will make it more likely that someone else will be around that space if something were to occur. Although this type of activity can be applied at any part of a building or place for increased “eyes” in a space, it is important to use it in moderation and maintain appropriate social densities. Daniel Lamoreaux and Michael Sulkowski found that “excessive crowding can create a sense of insecurity and aggression… higher social densities… tends to produce negative affective states such as reduced motivation and aggression… sustained exposure to noise is associated with higher psychological distress… and exposure to adjacent traffic noise is related to poorer auditory discrimination, lower reading ability levels, and higher blood pressure levels in students”. As psychological distress negatively affects the feeling of welcoming and safety, it is crucial to design thresholds with strategies that inform “appropriate social densities, [have] effective acoustic isolation, and noise-reducing installations”.

**Strategy 2: Landscaping & Biophilic Strategies**

Safety and security can be implemented at school entry thresholds without the sacrifice of aesthetics and a welcoming atmosphere by integrating both landscaping and hardscaping strategies. As seen in both Sandy Hook and Sartori Elementary School, strategically using landscaping elements such as stormwater-managing berms, water-moving features, mid-rise planters, scented plants, trees, and hedges can create soft buffer zones and indirect barriers that guide pedestrian flows and discourage unauthorized activities, all without the need for imposing a fortress-like appearance. Incorporating these natural elements at secure school thresholds softens the visual impact and directness of necessary security measures and creates a welcoming atmosphere. Not only does landscaping aid informal and indirect security at schools, but it also helps ease stress levels. Nature is well known for its positive effects on stress; “Places without nearby nature—that is, places that provide few opportunities to recover from mental fatigue—are more likely to be associated

---

62 Ibid.
with higher levels of incivilities, aggression, and violence.”⁶³ Though there is a common image of green spaces being insecure in the dark as “it may facilitate crime by providing a hiding place for perpetrators of crime and may conceal criminal activity”, Maas et al. found contrary results from US studies suggesting that “exposure to some types of natural environments may actually enhance feelings of social safety in a neighbourhood, because green space can reduce feelings of anger, frustration, and aggression, as well as increase surveillance”.⁶⁴

Landscaping design, most often than not, is inspired by biophilia, “humankind’s innate biological connection with nature”.⁶⁵ Biophilic design patterns are directly inspired by nature, mimicking nature’s visual patterns and sensory experiences which, when integrated in design, “can reduce stress, improve cognitive function and creativity, improve our well-being and expedite healing”.⁶⁶ In “14 Patterns of Biophilic Design: Improving Health & Well-Being in the Built Environment”, William Browning, Catherine Ryan, and Joseph Clancy describe how elements of nature can be incorporated into design through a list of patterns found in biophilic design. These elements are: visual connections with nature through plants; non-visual connections with nature through stimuli such as auditory or scent that references nature; “non-rhythmic sensory stimuli”, which is connections with nature through the unpredicted nature of nature; thermal considerations such as “surface temperatures that mimic natural environments”; the presence of water; dynamic & diffused light conditions that are naturally occurring; and the connection with natural processes such as seasonal changes.⁶⁷

These design elements, which mimic the experience of nature through stimuli, can work together to inform the types of indirect security landscaping chosen to shape the experience for visitors. When it comes to biophilia manifesting within the built environment, however, “objects, materials, colors, shapes, sequences and patterns found in nature manifest as artwork,

⁶⁶ Ibid.
⁶⁷ Ibid.
ornamentation, furniture, décor, and textiles… mimicry of shells and leaves, furniture with organic shapes, and natural materials that have been processed or extensively altered… each provide an indirect connection with nature... [and meanwhile] they are real, they are only analogous of the items in their ‘natural’ state”. Though natural materials such as wood grains, bamboo, dried grasses, and leather “may be extracted from nature, they are only analogous of the items in their ‘natural’ state”, meaning that most of the materials designers use are altered extensively through processing. As the human eye can tell the difference between something that is in its most natural, rough state and something that is synthetic or processed, it would be ideal to utilize cladding and finishing materials that intentionally accept the natural ways of the materials and their “flaws”, such as wood planks with knots and irregularities. This more realistic mimicking of nature can be applied to the design of entry thresholds to connect visitors to nature more holistically, which in theory, increases the sense of safety by mitigating stress levels and the impacts of security measures. Natural materials can therefore become the predominant shaper of the entry experience for folks, minimizing the stressful impacts upon facing security measures and overall upbringing a positive environment.

Pathways can also take inspiration from biophilia by mimicking biomorphic forms, contours, and the immersive experiences that are found being in nature. They can be designed to break away from the average linear designs and begin to meander through the site as one would in a forest or a park. Biophilic designs at their most ideal state can go as far as copying the mysterious, unknown, and risky behavior of nature; however, designers need to avoid “risks” in biophilic school designs, as it negatively impacts the feeling of safety. Folks should be able to see know what is ahead, so balancing out the pathway’s curvilinear behavior should be done just enough to allow curiosity of what is ahead to be sparked. As pathway designs are very much so context-specific and context-informed, site constrictions could present limitations to these endeavors, or even prevent the ability to design them in this way at all. Even in these moments, design of the pathway edges and materiality selections can be combined, customized, manipulated, and ‘softened’, just like the “path

69 Ibid.
70 Ibid.
of knowledge” pathway found in Lake Stevens Early Learning Center. Using material such as wood, for instance, with “minimal processing, [can] reflect the local ecology or geology and create a distinct sense of place”, further setting a building into its environmental context in a way that fosters a better connection between itself and its community.71 As always, pathways can even be further enriched through careful integration of plants and materials that engage the senses of sight, touch, and smell.

**Strategy 3: Accessibility and Universal Design**

Designing secure school entry thresholds to be accessible to individuals of all ages, abilities, and mobility levels is a primary driver in creating a welcoming and inclusive environment for all. It creates that sense of safety and welcoming by enabling the human experience to be similar for all visitors, demonstrating to folks that care for universal design was a key consideration in the project. Not only this, but by integrating ADA design past what is required in building code right at the “front of house” at schools, folks with disabilities feel more welcome and reassured to approach and enter the school. Utilizing universal design strategies beyond requirements in code is a great best practice for designers; mobility strategies such as doorways and pathways wider than minimums and tactile pavement “doormats” for visually impaired individuals are just some examples of best design practices. Establishing a universal experience for all individuals to encounter upon entering a school should serve as the fundamental principle behind designing entry thresholds. The need for ramps, for example, should be minimized, as the foundation of the exterior design should be to integrate equal accessibility at all points to allow for an equitable human experience for all, bringing a sense of inclusivity and belonging for those with disabilities. For example, Sartori Elementary School’s wide public entry plaza allows for an equitable experience for all individuals entering the school because the main entry is designed to be flush with the grade of the plaza, which is also further flush with the perimetering sidewalk. This kind of design allows for a universal entry experience for all types of bodies. North Kansas City Schools Early Education Center is another example of good entry pathway design, as the courtyard has a very wide ADA accessible curb, allowing for a larger range of

motion as well as mitigating the need for people with disabilities to take a separate route to enter the school. Ultimately, universal design creates an environment for folks that makes them feel that their experience was valued.

Effective navigation for all bodies to experience creates belonging and welcoming at secure school entry thresholds. Wayfinding along these pathways should be incorporated as a universal design strategy, achieved through signage (informational and orientational, directional, regulatory), color-coding, landmarks, and spatial cues. Color contrast checking is extremely important in universal signage design; not only does it work for everyone to help them better navigate the site, but it also allows those with visual impairments to be able to read text and signage objects as legibly as possible. Pedestrian walkways and access routes open to the main entry public space should also be adequately lit for both visibility purposes and security so that “a person with normal vision is able to identify a face from a distance of about 10 metres. Inset spaces, signs, entrances and exits should be adequately lit. On the other hand, lighting of different wattage, colour temperature and rendition may also be used to make certain public areas ‘less hospitable’ to gathering for long periods”.72

**Strategy 4: Art and Design Interventions**

Incorporating artistic interventions into security features make them less direct and more visually appealing, engaging curiosity and demonstrating intentional care in school design. Not only that, but artistic interventions have the opportunity to engage the community within their design. Engaging with the surrounding community in the design process of school thresholds creates another layer of belonging as they can reflect the stories, values, and needs of the local population. A “sense of ownership, or territoriality, is often considered a vital factor in making a place safer”.73 Art is incredibly capable of creating a sense of safety and belonging at schools, as it allows students, staff, and visitors to relate with the building and feel reflected within the design. Artistic interventions could include community murals painted by a local artist, sculptures that are representative of the community, or interactive installations that allow for the community to have temporary engagements such as artwork displays.

73 Ibid.
APPLICATION TO THREE KEY FOCUS AREAS: PATHWAY, CANOPY, AND VESTIBULE

The case studies and threshold design practice research will work together to inform an aspirational, self-lead exploration and study diagramming of the of the three main school entry threshold designs (exterior pathways, canopy, and vestibule) of two schools located in Oregon City, Oregon built by BRIC Architecture, Inc.: Gaffney Lane Elementary School and Gardiner Middle School. To begin the process, the “existing threshold design strategies” and practices will guide a research on pathways, canopies, and vestibules further to strengthen and compile their own guidelines. Next, in my diagrammatic explorations, I will: firstly, analyze the trauma-informed zones in the entry thresholds of the two schools; secondly, I will analyze the safety-informed design’s potential effects on the feeling of “welcoming”; lastly, I will overlay these trauma zones with the application of my own ‘soft’ and ‘hard’ threshold design concepts informed by the design strategies to balance the needs and issues of safety protocols and set up expectations of an inclusive and welcoming environment.

Threshold 1: Pathways

*Design Strategies: Natural Surveillance, Landscaping & Biophilia, and Universal Design*

To determine the best design strategies for pathways, I will refer to Partner Alliance for Safer Schools (PASS), as PASS uses CPTED philosophies and iterates upon them with their own best practices. Integrating vision and natural surveillance, they describe that exterior lights should be properly positioned and installed at “strategic points on the property perimeter and illuminate the area evenly during periods of darkness”, with lighting to both “enhance video surveillance visualization” and provide light for visitors that enter or leave the site.\(^{72}\) To achieve the best monitoring and navigation throughout the site at night time, “consistent foot candle levels across the area” should be integrated.\(^{73}\) Lights should also be designed to take into account vegetation, as

---


overgrown shrubs and plants can cause a blockage of light over time.

PASS also describes that the landscape vegetation around pathways should keep clear sight lines, maximizing visibility and sight line depths from the office and interior. They describe that “trees, shrubs and other growth should be cut back to minimize interference with lines of sight throughout the property. Annual inspection should be scheduled to maintain clear sight lines and limit places where individuals could hide for criminal purposes”.74 The landscape should be designed with plants that considers the growth and final heights of plants; low-lying and less dense vegetation types such as earth berms, fences, bushes, low hedges, small trees, and short flower beds should be planted to ensure proper ability of security management through natural surveillance.

Landscaping activity tactics on pathways and courtyards should also be considered in ways to create buffer zones that control and deter vehicle access in a non-fortress like way with objects “such as decorative rocks, shrubs and planters to help keep vehicles off unauthorized areas of property” instead of systems like bollards, which are a less natural and more direct type of security system.75 These landscaping elements can act as multi-use objects as well. Activities can be programmed along the pathways such as “indirect barrier” planters that also act as bench seats, creating an active edge that is inviting to folks through interactive seating options that allow them to utilize the space. Not only does this create an indirect barrier security system, but it also allows for more natural surveillance as folks will tend to congregate more to these activity nodes. These activity nodes should be considered in balance with main egress and movement zones, placed in zones with more appropriate social densities to lower psychological distress.

To lower stress levels and create a better sense of safety, welcoming, and calmness, biophilia should be incorporated into pathway designs. Pathways can take inspiration from biophilia by mimicking biomorphic forms, contours, and the immersive experiences that are found being in nature. They can be designed to break away from the average linear designs and begin to meander through the site as one would in a forest or a park. Biophilic designs at their most ideal state can go as far as copying the mysterious, unknown, and risky behavior of nature; however, designers need to

75 Ibid.
avoid “risks” in biophilic school designs, as it negatively impacts the feeling of safety. Folks should be able to see know what is ahead, so balancing out the pathway’s curvilinear behavior should be done just enough to allow curiosity of what is ahead to be sparked. As pathway designs are very much so context-specific and context-informed, site constrictions could present limitations to these endeavors, or even prevent the ability to design them in this way at all. Even in these moments, design of the pathway edges and materiality selections can be combined, customized, manipulated, and ‘softened’, just like the “path of knowledge” pathway found in Lake Stevens Early Learning Center (pages 15 and 16).

Lastly, pathways and curbs should be designed to be universally accessible to individuals of all ages, abilities, and mobility levels. Effective navigation for all bodies to experience creates belonging and welcoming at secure school entry thresholds. Best practices such as wide ADA accessible curbs, or overall a curb-less design (paired with landscaping barrier tactics) allows for a larger range of motion as well as mitigates the need for people with disabilities to take a separate route to enter the school. Wayfinding along these pathways should be incorporated as a universal design strategy, achieved through signage (informational and orientational, directional, regulatory), color-coding, landmarks, and spatial cues.

Threshold 2: Canopy

*Design Strategies: Natural Surveillance, Biophilic Strategies, Art and Design Interventions*

Canopies at school entry thresholds use design strategies that are known to enhance the safety and security of a place, as well as create a sense of welcoming and belonging. Canopies are integrated to schools not only to provide durable shade and protection from the natural elements, but can also be used to translate the architecture to the visitor. They can gesture and highlight the main entry point of the school, making wayfinding easier for those who are new to visiting the school. Canopies have an incredible opportunity to be welcoming to visitors with the way they are designed, and can incorporate artistic, biophilic, and indirect security system elements within their designs.
For example, the canopy can help with indirect security systems as designers are able to install adequate lighting that illuminates the front entry and the pathways to create a sense of both safety and welcome. Lighting allows for natural surveillance and security systems to work during the evening time, maintaining visibility at the entry and deterring threats. Canopies can also integrate security systems like buzzers and card readers directly into their columns or construction elements to create a more discrete security experience.

Canopy designs can also draw from biophilic design principles and materials. By incorporating natural and less-processed materials, mimicking patterns and textures, or even symbolically representing natural elements like trees and tree canopies (refer to Figure 17, demonstrating Sandy Hook Elementary School’s tree-like canopy), the canopy can evoke a connection to the local ecology and enhance the sense of place for the community. Natural materials are not the only option for creating a good-feeling environment; artistic interventions such as murals and representative colors work together to “place-make” and give an identity to the school, ultimately softening the visual directness of security features. By involving the community in the process of designing what the canopy looks like, they can be visually reflected within the threshold and feel belonging at the school.

Threshold 3: Vestibule

Design Strategies: Natural Surveillance, Biophilic Strategies, Accessibility and Universal Design, Art and Design Interventions

The “vestibule” was initially integrated as an energy saving point of view into buildings residing within colder climates as a space to “protect the interior climate of the building from the exterior climate”. The vestibule’s set of double doors essentially provide a buffer zone between the two different climate conditions from inside and outside the building to prevent heat loss and maintain the interior air temperatures within buildings. When it comes to describing the function of a ‘vestibule’ in schools, PASS (Partner Alliance for Safer Schools) best describes that secure

vestibules are just a “locked” version of a climate controlling vestibule and work to perform other functions such as “limiting the direct access of a number of people into the building at a given time, while providing a secure space to verify the visitor is permitted to be in the school”.77 PASS highlights a fundamental flaw in the concept of “security”, arguing that they are “semi-secure vestibules’ due to the fact that a visitor can bypass the intended entry sequence and gain access to the building by piggybacking or tailgating… grabbing a door while someone is leaving, or taking the opportunity to enter when someone inside the building opens the interior door for them”.78 Instead of referring to this set of double doors as a “secure vestibule”, it is important to describe it as its utmost function: it is a “secure visitor entrance”, “secure visitor entry center,” and most plainly put, a “vestibule”.79

Because secure vestibules are most often utilized as the main entrance space in contemporary schools, PASS describes that the discrepancy in security through the bypass ability ultimately hinders total security to a school. Security solutions that work around a vestibule designed this way have formed PASS’s ideal concepts that shape the process of entry. As visitors are on the outside of the vestibule, indirect communication between them and the office through key cards, buzzers, video

---

78 Ibid.
79 Ibid.
doorbell system and cameras, “intercom or phone system prior to gaining access to any portion of the building” should be utilized.80 This allows the office to stay physically safe while processing the verification of whether or not a person should enter the school. Only when verified should a visitor be “allowed to enter the secure space inside the building, where the verification process can continue. Visual identification of the visitor’s face is important at the main check-in point to the school, as well as at the space beyond the vestibule such as exterior pathways for more monitoring opportunities from the office.81 Video surveillance is used for site surveillance, assessment, and forensics, and is used to provide “deterrence, detection and, in more advanced implementations, enhanced response to a variety of daily challenges experienced at schools”.82 However, using such visual identification processes can be very disturbing to the privacy and welcoming feeling of individuals, as cameras mounted to clearly identify a non-intrusive visitor’s face can evoke unnecessary unsettling feelings or feelings of profiling.

Because indirect security interventions such as cameras and intercoms are an additional system added to supplement the security of architecture itself, they can easily become the main part of what the visitors of the school see and experience first; not being able to talk to someone face to face can evoke a feeling of alienation and becomes unsettling to visitors. To help mitigate these effects of indirect security measures, security features must either be designed to be integrated and hidden within the architectural design of the building itself, or additionally, have architectural “solutions” that mitigate the need for the blatantly indirect security protection. PASS introduces different architectural vestibule design options that bring a layer of security meanwhile protecting the feeling of safety and welcoming security to vestibules.

Figure 21 demonstrates a much larger main entrance vestibule that both recesses into the building, physically separating the visitor entry from the main entry point into their own secure vestibule. The recessed wall of the main entry vestibule gesturally juts out the secure visitor

81 Ibid.
entrance, signaling a visual cue to the visitors to use the secure visitor entrance instead. This way, staff can have both access control through hardware implemented into the doors, as well as a protected direct communication with visitors through a glazing system before letting them in.\textsuperscript{83} Ultimately, staff following proper policies and accountability in visitor management are what allow the vestibule architectural intervention to be most secure. The highest security model is highly architecturally programmed rather than hardware programmed, allowing for multiple layers that allow a visitor to have a series of experiences in the process of entry and has more opportunities of interior design interventions that create comfort and ease the disturbance of direct security hardware.


Figure 21: Vestibule bypass solution diagram.

Figure 22: Highest vestibule security model.
Design Strategies for Vestibules

It is important to recognize that the first hard transition in the school entry procession is the secure vestibule. The vestibule is the first and most direct experience of a ‘hard’ threshold for a visitor entering a school, meaning that physical security is directly faced at the forefront of the physical threshold experience. When it comes to designing the components of the vestibule, such as glazing, doors, and walls, security implementations need to be taken into utmost consideration.\textsuperscript{84} For example, glazing considerations in the vestibule should be ballistic glazing, force protection glazing, or a “less costly option is to install ‘protection’ or ‘security films’ over existing windows… typically a polymer-based component that is applied to the existing glazing”.\textsuperscript{85} PASS further describes that “security film serves to deter or delay the ability of an attacker to breach a doorway using a firearm or other tool/weapon, in addition to limiting injuries from glass shards resulting from a blast, fire, accident, natural disaster or severe weather event”.\textsuperscript{86}

However, as no design solutions will fully, 100\% prevent an assailant from entering the building, PASS’s indirect security principles of “Deter, Detect, Delay, and Defend” should be implemented into architectural design choices to help continue deterring threats from “even considering an attempt at gaining access to the building by force”.\textsuperscript{87} As we now know that strict adherence to ‘hard’ safety tactics makes school entries less inviting and approachable, the vestibule can be designed in such a way that is both secure and inviting.

To begin right at the door, utilizing universal design strategies beyond requirements in code is a great practice for designers to incorporate into vestibule design. Universal mobility strategies such as doorways wider than code minimums, material color selections, and tactile pavement into the entry of the vestibule demonstrates best design practice. The vestibule shall also use natural surveillance tactics through the strategic placement of windows and glass in place of...
opaque, ‘hard’ thresholds could be to bring the office staff sight lines and visual connectivity to the outside. When the visitors are invited in, entering a fully transparent and bleak vestibule can evoke uncomfortable feelings as all they feel is they are being watched through the windows instead of safe and welcome to the school. The glass needs to have a balance in privacy through further design strategies such as artistic interventions; fritted glass designs or colorful environmental graphic design vinyls with perforations that aren’t completely opaque will initiate attention and visual curiosity towards art, easing the attention towards security systems off. It is important to note that, though users will feel less laser-focused on with more privacy, transparency and sight lines through the graphic designs and into another space still need to be maintained for natural surveillance.

The materiality and artistic interventions inside the vestibule work together to create a sense of welcoming and belonging. Through art, there is opportunity to engage and include the community in the interior design to create a sense of being a part of the school design. This could also include community murals painted by a local artist, creating another layer of cultural reflection and belonging. Reference to biophilia and biophilic ideology (found in Design Strategy 2) through both visual and non-visual connections with nature also aids in creating a sense of calm and safety within a security-systemmed place. Visual connections to nature can be made through natural and non-over processed material choices (wood grains, bamboo, dried grasses, and leather), sequencing and patterns in nature in ornamentation, artwork, muraling, and textiles. Non-visual biophilic cues can come from the aroma of the wood type chosen, dynamic and diffused light conditions that mimic daylight and make it feel less institutional or cold, and even music.

**DIAGRAMS OF GAFFNEY LANE AND GARDINER**

**School A | Gaffney Lane**

*Background:*

Gaffney Lane Elementary School in Gaffney Lane, Oregon City underwent a ‘Safety &
Security’ renovation by BRIC. This comprehensive transformation project aimed at enhancing and improving the existing infrastructure of the building to be more secure and also welcoming to students and the community. The renovation addressed the pathway, canopy, and vestibule design. When it comes to the access to the entry through vehicles, there is not a smooth drop off or pick up process. The pace and flow for pedestrians, however, allows the entry procession to feel welcoming. The redesigned pathway enables for community and parental gathering so that they can take a moment with their children during arrival and departure, creating a sense of care and belonging at the school. The new canopy that was designed does an exceptional job at highlighting the entry, gesturing out to the pathways with a natural wood material on the underside that brings a visual warmth to the entry. The once singular double-doors have been redesigned into a vestibule with a view to a “welcome wall” to allow for visitors to be greeted upon entry by the school. A light amount of environmental and biophilic graphic vinyls were applied to the glass, and you can see into the office from the vestibule, of which displays a welcoming message in multiple languages. These enhancements work together to contribute to creating a safe and welcoming environment for folks.

*Diagrammatic Exploration*

Without budgetary constraints, a proposal of ambitious enhancements to the design will be made, aiming for overall ideal improvements to the safety and security of the school entry thresholds. After a careful analysis of the pathway, canopy, and vestibule of Gaffney Lane, some best practice design strategies can be applied. Upon entering the school at the pathway, the visitor is met with a crosswalk that lands on a short, code-minimum ADA slope that allows individuals with disabilities to pass the curb. As the ADA slope is successfully placed in a location that allows for all folks to experience the entry procession at the same points, the slope is all too short in width. Such tight entry design can be uncomfortable during larger volumes of students arriving. In comparison to the running length of the courtyard’s curb, the width of the slope could be much longer, allowing the entry design of the school to be more inviting, telling the story of the school being “welcome for everyone”. The courtyard’s path seams are typical, lined with linear path seams that run
perpendicularly to the main entry, guiding the eye towards the canopy and vestibule doors. However, an extra layer of curiosity and story-telling could be introduced through a meandering, biophilic-inspired pathway, just as in Lake Stevens Early Learning Center’s “path of knowledge” (page 16).

As the visitor walks on the pathway, the soft rounded edges of the landscape create a soft threshold at the feet, gently guiding and gesturing visitors around the pathway and towards the canopy. The blue, wood-finished canopy gestures out towards the pathway and vehicular traffic lanes, calling out the school’s name to aid wayfinding: “GAFFNEY LANE ELEMENTARY”.

The wood materiality of the canopy brings warmth to the canopy, creating a sense of happiness, welcoming, and care to visitors. Getting closer to the vestibule doors, one notices the community artwork displayed on the walls adjacent to the vestibule, showcasing community at the forefront of the building entry. To enter the school vestibule, a security system buzzer is indirectly integrated within the canopy’s column, creating a discrete security implementation so that visitors do not feel like they can approach the school. Though that may make it difficult for newcomers to identify how to access the building, the entry procession does a great job at being approachable meanwhile masking security systems.

However, as all is well, there are a few flaws to the entry design that could have made safety and security even better. Firstly, densely-leafed, large-sprawling, overgrown shrubs have been planted at the landscape. Some shrubs were even planted right against the main office windows, creating a potential hiding place and security hazard as natural surveillance cannot be practiced. Large shrubbery that creates view obstructions can make students feel unsafe at the school, especially at night, as they cannot see what is around them to the other side. Secondly, there is an opaque wall to the left corner of the vestibule, blocking the range width of natural surveillance and also creating an additional hiding place for a perpetrator. As a result, I propose the following tweaks to the pathway and vestibule thresholds: replace the dense shrubs to a vegetation typology that is slow-growing, thinner, and less leaf-dense, and replace the opaque wall with glass. The plants shall be native to Oregon and preferably more common to Oregon City, evoking a sense of connection to place and belonging. The plants shall be soft-leaved and also produce either an aroma that evokes the natural
senses, or provide an opportunity for stormwater management. On the latter, the opaque wall shall be replaced with strong glass that is decorated with vinyl graphic design. The vestibule interior shall also be furnished with a welcoming graphic design on the wall, with opportunities of interactable temporary artwork displays that allow the community to have a sense of ownership over the place.

Figures 23 & 24: Gaffney Lane Elementary exterior entry thresholds. (https://www.homes.com/school/oregon-city-or/gaffney-lane-elementary-school/ylm6b26k1d47d/)
Diagram C: Canopy and Exterior of Vestibule

Diagram D: Canopy and Exterior of Vestibule
Diagram E: Vestibule

Balanced Transparency as Windows Overlook Main Hallway for Visitor Comfort Without Feeling Direct Eyes from Office Space

Currently, school vestibules function as security checkpoints. Yet, when a space is simply about controlling and directing movement, students may direct the space's true function, urbanism. Hence, they simply use them. Hence, school vestibules should mirror contemporary library modules, which use vestibules to both regulate temperatures and also serve as spaces for communities to personalize, gather, and listen to announcements. This model can make a secure school vestibule welcoming and much more inviting.

Diagram F: Vestibule

Balance Window Transparency with Graphic Art

Balancing the windows for natural surveillance into the vestibule with graphic art that represents the community or the school's agenda or theme (science & tech, early learning, connecting with local studios, etc.) allows visitors to feel welcomed as it softens the directness of the office staff's eye on the visitor.

Create an Interactive Wall That Constructs a Holistic Visiting Experience to the Space

This allows for more visibility into the vestibule and prevents a hiding spot.

Replace Opaque Wall with Windows

Make the Vestibule a Useful, Functional Space.
Diagram G: Vestibule

Balanced transparency as windows overlook main hallway for visitor comfort without feeling direct eyes from office space.

Diagram H: Vestibule

Small Tackboard Panels:
Small tackboard panels allow for the community to regularly update the students and visitors with announcements, resources, and events taking place in the community.

Large Tackboard Panels:
Large tackboard panels allow for community, students, and staff choices to represent themselves at the entry point. Large wall art can be displayed to represent the school's and community's identity. These large panels also allow for seasonal/temporary artwork to be displayed and interchanged over the years.

Shelving and Tables:
Providing shelving and tables to place a variety of other pinnable and non-pinable resources for students to access at the forefront of the school.

There should be something useful on this wall...
The new Gardiner Middle School in Oregon City was designed and built completely new by BRIC. This project aimed at representing Oregon City School District’s commitment to reimagining the middle school experience, centering the designs of the spaces around the core theme of: “By Students, For Students,” which creates an environment that evokes the sense of ownership, belonging, and student autonomy. BRIC took the initiative of using “student input about their anxieties in the school environment”, responding with safe indoor and outdoor spaces, critically informing the entry threshold design.88 The interior volume of the school was designed as a “more open environment that prioritizes lines of sight and passive supervision to remove or reduce anxiety-inducing situations from common environments”, which directly translated to the outdoor entry design through the design strategy of natural surveillance.89 The entry threshold of the school has clear innovative designs for the pathway, canopy, and vestibule thresholds. The pace and flow for pedestrians in the courtyard allows the entry procession to feel welcoming. It enables for community, parental, and student gathering for events, creating a sense of care for community space and belonging at the school. The natural surveillance of the school is abundant from the main office and through the vestibule, integrating a “Welcome Center” adjacent to the vestibule. These design considerations work together to contribute to creating a safe and welcoming environment for folks.

Diagrammatic Exploration

Without budgetary constraints, a proposal of ambitious enhancements to the design will be made, aiming for overall ideal improvements to the safety and security of the school entry thresholds. After a careful analysis of the pathway, canopy, and vestibule of Gardiner Middle School, some best practice design strategies can be applied. Upon entering the school at the pathway, the visitor is met with a crosswalk that lands on a fantastic, wide, curb-running length ADA entry

89 Ibid.
that allows for individuals with disabilities to experience the entry procession at the same place as everybody else. However, as a security response to such a wide courtyard, an abundance of bollards had to be placed along the strip, creating a tight entry design which can be uncomfortable during larger volumes of students arriving through. This curb design half tells the story of the school being “welcome for everyone”, as the bollards are direct vertical objects that folks must be aware of. The courtyard’s path seams are typical, lined with linear path seams that run perpendicularly to the main entry, guiding the eye towards the canopy and vestibule doors. However, an extra layer of curiosity and story-telling could be introduced through a meandering, biophilic-inspired pathway, just as in Lake Stevens Early Learning Center’s “path of knowledge” (page 16).

As the visitor walks on the pathway, the soft rounded edges of the bermed landscape as well as seated planters create a soft threshold at the feet, gently guiding and gesturing visitors around the pathway and towards the canopy. The seated planter allows for folks to congregate, and also act as an “indirect” security barrier that can stop vehicles from entering the courtyard. Getting into the vestibule doors, one notices another set of bollards, with some being multi-purpose with a card reader security system integrated into the post. This security tactic, though provides safety, can make one wonder what had happened at schools to require the installation of bollards at the entry, creating an uncomfortable feeling when entering the school. The vestibule is abundantly designed with glass and is grand in size, evoking a feeling of open space and agency. The secure vestibule feels more airy, daylit filled, and spacious. The bench and environmental graphics in the vestibule create a sense of welcome and belonging to the space.

As a result, I propose the following tweaks to the pathway and canopy thresholds: replace the bollards to a landscape and vegetation typology, and make the canopy highlight the entry more better to make it more inviting. that is slow-growing, thinner, and less leaf-dense, and replace the opaque wall with glass. The plants shall be native to Oregon and preferably more common to Oregon City, evoking a sense of connection to place and belonging. The plants shall be soft-leaved and also produce either an aroma that evokes the natural senses, or provide an opportunity for stormwater management. On the latter, the opaque wall shall be replaced with strong glass that is
decorated with vinyl graphic design. The vestibule interior shall also be furnished with a welcoming graphic design on the wall, with opportunities of inter-actable temporary artwork displays that allow the community to have a sense of ownership over the place.

Figure 24: Gardiner Middle School front entry. (BRIC Architecture Inc.)
Diagram I: Pathway, Canopy, and Exterior Vestibule Space

Diagram J: Pathway, Canopy, and Exterior Vestibule Space
CONCLUSION

Of all architectural typologies, schools are one of the most reflectant of a shifting paradigm in approaches to education and security designs, as well as one of the most to have evolved through response iterations to safety concerns. The growing recognition of the unintended consequences of “hardened” security approaches has called for architects and designers to design for a more balanced and holistic approach to school safety and security design, one that prioritizes inclusivity and long-term effectiveness over short-term fixes.

There is a fundamental importance in creating a welcoming, safe, and secure environment at schools as they are a great community asset. As Project for Public Spaces states, “All of these people, all of these places, help us to re-affirm the value of public life in the face of such overwhelming violence. The need to gather, to share stories, to celebrate, protest and grieve in a common place is a basic, human, and universal [need]. We must continue to allow - and encourage - the diversity, culture”.90 David Wood, president of the Radnor Township Education Association, adds to this idea around school safety strategies, stating that “The most effective school safety strategies are less visible or even invisible when compared to trendy, quick-fix fads… We do not need to reinvent the wheel. We simply need to implement and sustain the best practices consistently and in a balanced, comprehensive approach over time”.91 As schools are “a time of intense social growth and preoccupation, where one can lose sight of the broader environment around us”,92 creating a sense of belonging from the moment of entry is crucial. While we navigate the complexities of safeguarding our schools, it’s imperative to remember that the essence of education lies in nurturing environments that encourage learning, collaboration, connecting, belonging, and gathering. Rather than instilling fortress-like designs or the direct, bland security tactics that can instill fear and isolation, we as architects have a responsibility to push these ideas deeper to craft a better human experience. We must instill the best of practices; while security interventions provide us a framework, it’s up to us to craft the narrative and experience, pushing beyond their conventional designs.


