

# Design for Safe, Healthy Learning

Presentation to the Select Committee on School Safety  
Infrastructure and Security Subcommittee

August 17, 2018



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# Who do we represent?

Founded in 1914, AIA Virginia is the voice of the architecture profession in the Commonwealth, dedicated to serving its members, advancing their value, and improving the quality of the built environment

As of July 31, 2018, the organization represents **2,362** professionals



# What do architects do?

Architects are privileged to be tasked by the Commonwealth with the responsibility to safeguard the **health, safety, and welfare** of the public as they design the structures in which we live, work, and play.



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# What are we here to talk about?

- Project process
- Historical trends in school design
- Current trends in school design
- New construction vs. renovation
- What are other States doing?



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# Who are we?



**Bill Brown, AIA**

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**Rob Winstead, AIA**

Principal - VMDO Architects  
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# Project Process

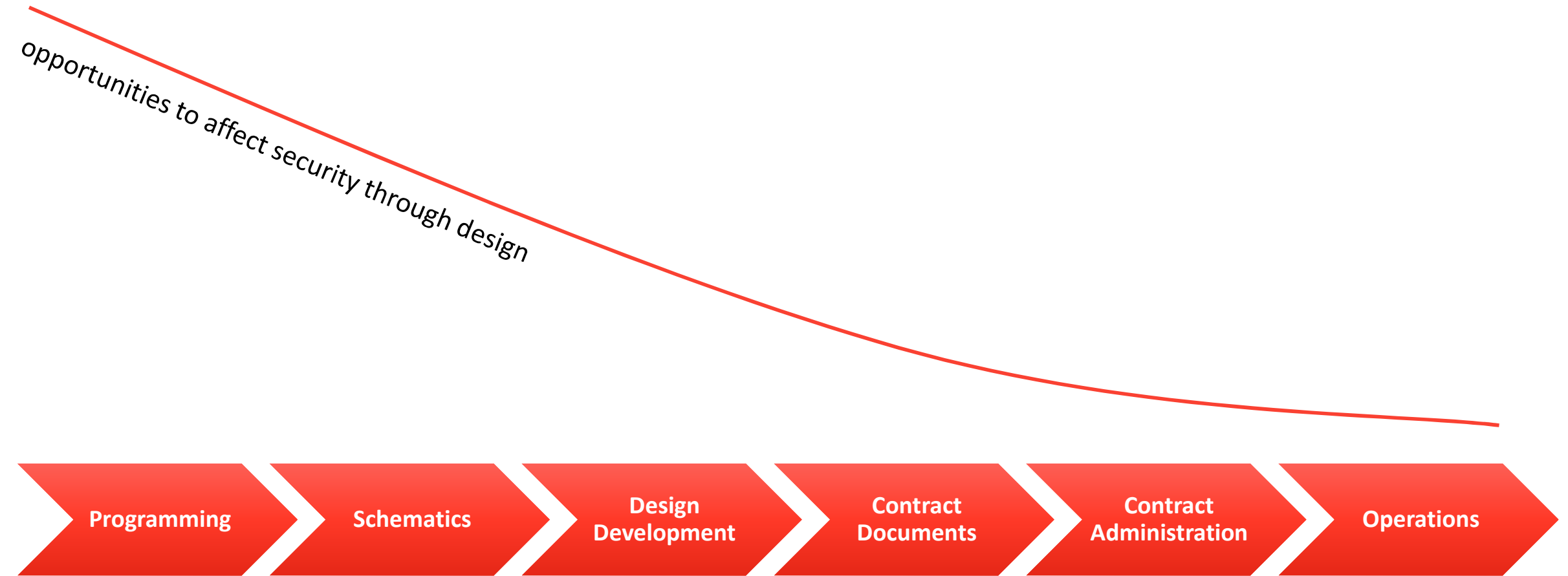
# School Design Process in Virginia

- Locally funded Capital Improvement Projects (CIP)
- VDOE Guidelines for School Facilities (last updated in 2013)
- Local jurisdiction's educational specifications and security protocols
- Qualifications-based selection of A/E through RFP and interview process
- Typically a traditional Design-Bid-Build delivery
- Publicly advertised, low-bid selection of constructor



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# School Design Process



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# Programming

- Engage a broad group of stakeholders
- Establish Owner Design Requirements and Project Vision
- Develop Educational Specifications
- Identify Campus Security Protocols

Program of Requirements

Series	Space	Program Req	SF Req. Per Area	TOTAL S.F.	Number of Teaching Stations
<b>CLASSROOMS - ACADEMIC ZONE</b>					
100.0	<b>Standard Classrooms</b>				
100.1	Core Academic Classrooms	27	800	21,600	27
100.2	Extended Learning Areas	18	120	2,160	
100.3	Supply Room	3	100	300	
100.4	Grade Level Storage	9	133	1,197	
101.0	<b>Special Education Resource Rooms (3 Regional)</b>				
101.1	Special Education Resource Rooms	5	800	4,000	5
101.2	BLS Office	1	120	120	
101.3	CLS Sensory, BLS Reflection, Assessment	3	100	300	
101.4	Speech and Lang. Therapy Suite	1	250	250	
101.5	OT/PT Room	2	250	500	
101.6	Behavioral Interventionist	1	200	200	
102.0	<b>ESOL (English for Speakers of Other Languages) Classrooms</b>				
102.1	ESOL Classroom	4	800	3,200	4
103.0	<b>Science Classrooms</b>				
103.1	General Science Classrooms	9	1,200	10,800	9
103.2	Preparation / Project / Storage	9	175	1,575	
103.3	Chemical Storage Room	1	100	100	
104.0	<b>World Languages Classrooms</b>				
104.1	World Languages Classrooms	4	800	3,200	4
104.2	World Languages Storage Room	1	150	150	
105.0	<b>Visual Arts Classrooms</b>				
105.1	Visual Arts Classrooms	3	1,200	3,600	3
105.2	Preparation / Storage	3	250	750	
105.3	Kiln Room	1	120	120	
	<b>Flexible Learning Classrooms</b>	5	800	4,000	5
106.0	<b>Music Classrooms</b>				
106.1	Instrumental Classroom	2	1,800	3,600	2
106.2	Instrument Storage/Library	2	800	1,600	
106.3	Vocal / Choral Classroom (One unit Shares Stage w/ Dance)	2	1,500	1,500	2
106.4	Vocal / Choral Storage / Library	2	400	800	
106.5	Music Team Office	1	250	250	
106.6	Music Laboratory	1	1,000	1,000	1
106.7	Practice Room	3	100	300	
107.0	<b>Health Science Classroom / Laboratory</b>				
107.1	Health Science Classroom / Laboratory	1	1,800	1,800	1
107.2	Material Storage	1	400	400	
107.3	Magnet Office	1	150	150	
108.0	<b>Technology Laboratory</b>				
108.1	Technology Laboratory	1	900	900	1
108.2	Fabrication Room	1	400	400	
108.3	Material Storage	1	100	100	
109.0	<b>Literacy Enrichment</b>				
109.1	Literacy Enrichment/Remedial Reading	1	550	550	
110.0	<b>Physical Education</b>				
110.1	Gymnasium	1	6,800	6,800	2
110.2	Activity Classroom	2	1,500	3,000	2
110.3	Health / Wellness Classroom	1	800	800	1
110.4	Locker Rooms / Showers / Toilets	2	1,100	2,200	
110.5	Alternate Changing Room	2	150	300	
110.6	PE-Large Equipment Storage	1	500	500	
110.7	PE-Outdoor Equipment Storage	1	500	500	
110.8	PE-Instructor Office	2	100	200	
110.8.1	PE Instr. Shower/Toilet/Locker	2	100	200	
110.8.2	PE Instr. Storage	1	200	200	
	<b>Subtotal for Classrooms</b>			<b>86,172</b>	



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# Schematic Design

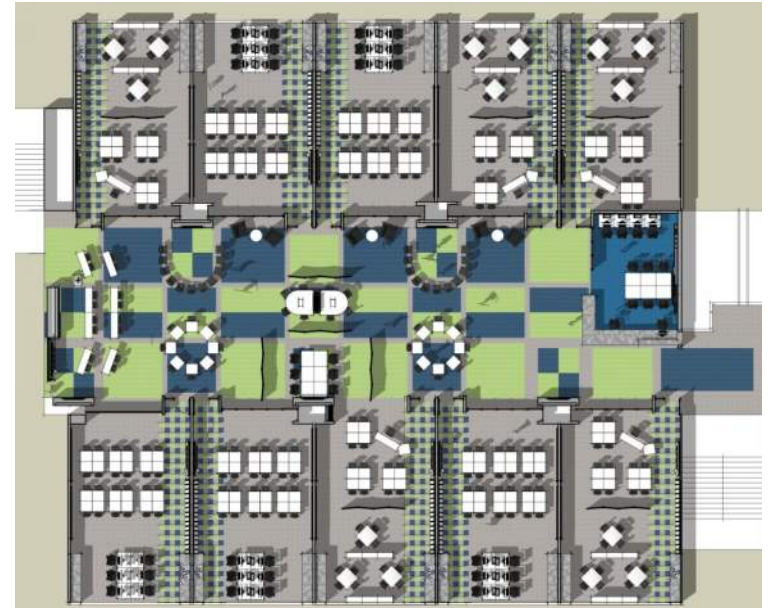
- Site layout influences the circulation flow and lines of sight to create a safe environment
- Building organization, adjacencies and secure separations establish behavioral outcomes intended (i.e. public vs. academic space)
- Prioritization of needs is balanced with cost estimates



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# Design Development

- Room and furniture layouts are developed to reflect desired character of learning environments
- Code analysis for Life Safety is documented
- Security system components are identified and incorporated into the design in a thoughtful manner

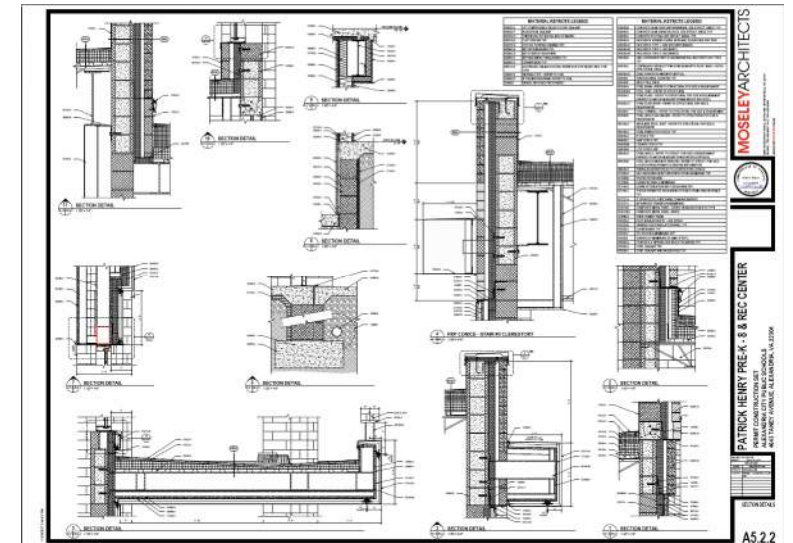
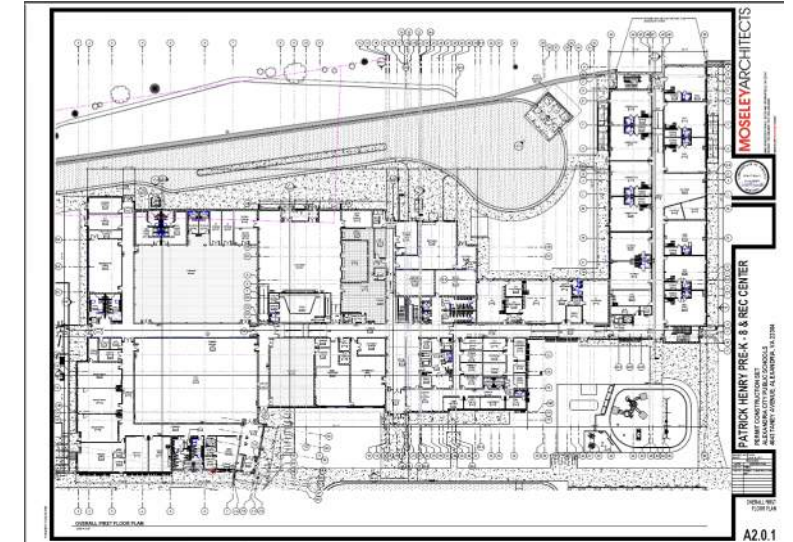


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# Contract Documents

- Documents are submitted to the Jurisdiction Having Authority (JHA) for permit issuance
- Documents are developed to bid and construct the project
- Specification manual describes the component requirements



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# Contract Administration

- Monitor construction activities for general compliance with contract documents and assist contractor with requests for information and clarifications
- Assist owner in turnover of systems and finished spaces
- Assist owner in project closeout



# Post Occupancy

- Survey the occupants and interview staff
- Determine if building and site are operating as envisioned and designed
- Make recommendations for adjustments to enhance building performance

John M Langston High School  
Continuation and Langston-Brown  
Community Center  
Post-Occupancy Evaluation Survey  
Number of responses = 20

	Strongly Disagree	Disagree	Neither Agree not Disagree	Agree	Strongly Agree	Number of responses to Specific Question	Quality Score
<b>Spaces and Spatial Relationships</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>		
1 The different shared spaces (Gymnasium, Media Center, Art, Music, etc.) are conveniently located and easily accessible.			2	6	10	18	80
2 Circulation through the building is clear. There is little to no directional confusion and no bottlenecks.			2	7	9	18	79
3 Classroom layouts work well and there are no changes required. Casework elements are both thoughtful and useful.		3	3	6	4	16	59
4 The building does not impose any constraints on activities.			3	10	5	18	74
5 The new layout provides new opportunities for various activities.		1	2	8	6	17	70
6 There are no noise problems in any of the spaces due to the design or construction.	2	6	1	4	5	18	58
7 Interior and exterior spaces work well together. (i.e.: Does the front office have a good overview of the front entry? When children leave the building, is there room for them to circulate safely outside?)		3	3	7	5	18	68
8 Exterior spaces work well. (i.e.: Does the parent car drop off work well? Are there any circulation conflicts between kids/cars/school buses? Can students get to and from the play areas easily?)		1		12	4	17	70
9 Please comment on any other aspects of the building that you feel are important.						0	0



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# Historical trends in school design









# Historical trends in school design

## First Generation Crime Prevention Through Environmental Design (CPTED)

### **Territorial Reinforcement**

Includes symbolic barriers (i.e. signage, subtle changes in floor textures, etc.) and real barriers (fences and other physical design barriers)

### **Access Control**

Use of real or perceived barriers and other features to orient and guide people and vehicles along appropriate paths and to restrict inappropriate access

### **Legitimate Activity Support**

Uses design and signage to encourage acceptable behavior in the usage of public space and places “unsafe” activities in “safe” locations

### **Natural Surveillance**

Design and placement of features and people to facilitate observations and maximize visibility.

### **Image/Space Management**

Repair, replacement and general upkeep of a building or area.

### **Target Hardening**

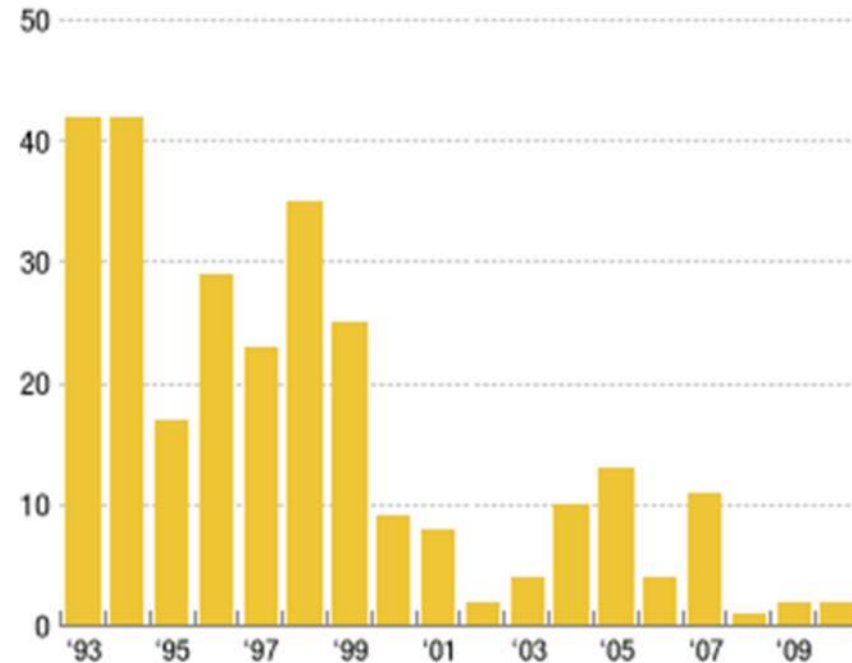
Increases the effort and risk of offending and reduces the rewards associated, often through physical barriers such as fences, gates, security doors and locks.





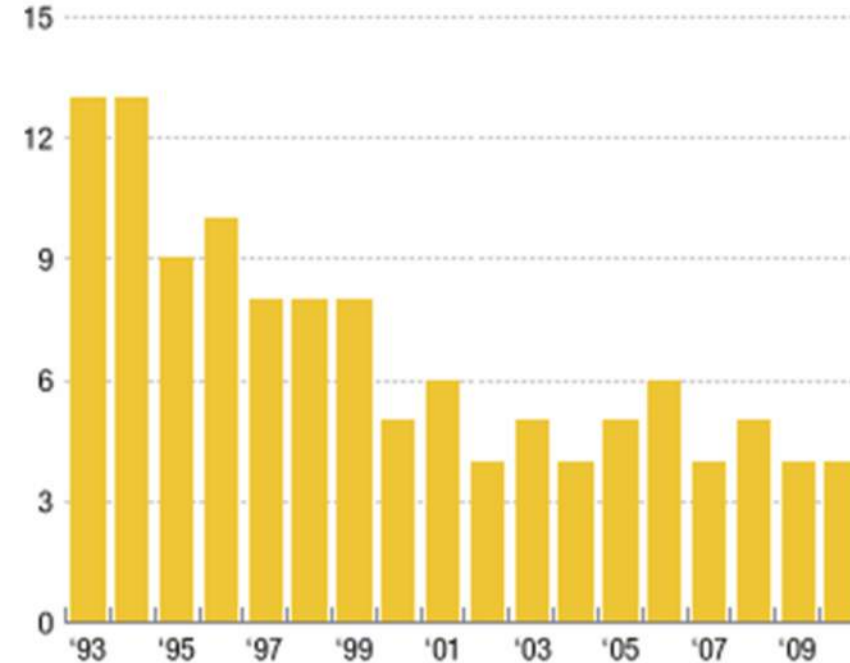


# What does the research tell us?



**Homicides in Schools per 1000 Students**

Source: National School Safety Center



**Serious Violent Crimes per 1000 Students**

Source: National Center for Education Statistics



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# What does the research tell us?

A 2004 Study of School Shootings in the U.S. revealed:

- That **95%** were students of the victimized schools
- That **71%** of perpetrators felt persecuted, bullied, or injured by others prior to the attack
- In **81%** of the cases studied, at least one other person knew about the attack before it took place



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# Current trends in school design

# Current trends in school design

## Second Generation Crime Prevention Through Environmental Design (CPTED)

### Social Cohesion

Focuses on nurturing mutual respect and appreciation of the similarities and differences between people and groups within the community

### Community Connectivity

Strengthening a sense of place through partnerships, shared programs, and activities, thus encouraging self-policing

### Community Culture

Created through activities that serve to cement and strengthen the community such as cultural events, festivals, clubs, and commemorations of significant local events and people

### Threshold Capacity

Idea that can disintegrate when the system becomes overwhelmed (i.e. overcrowding)

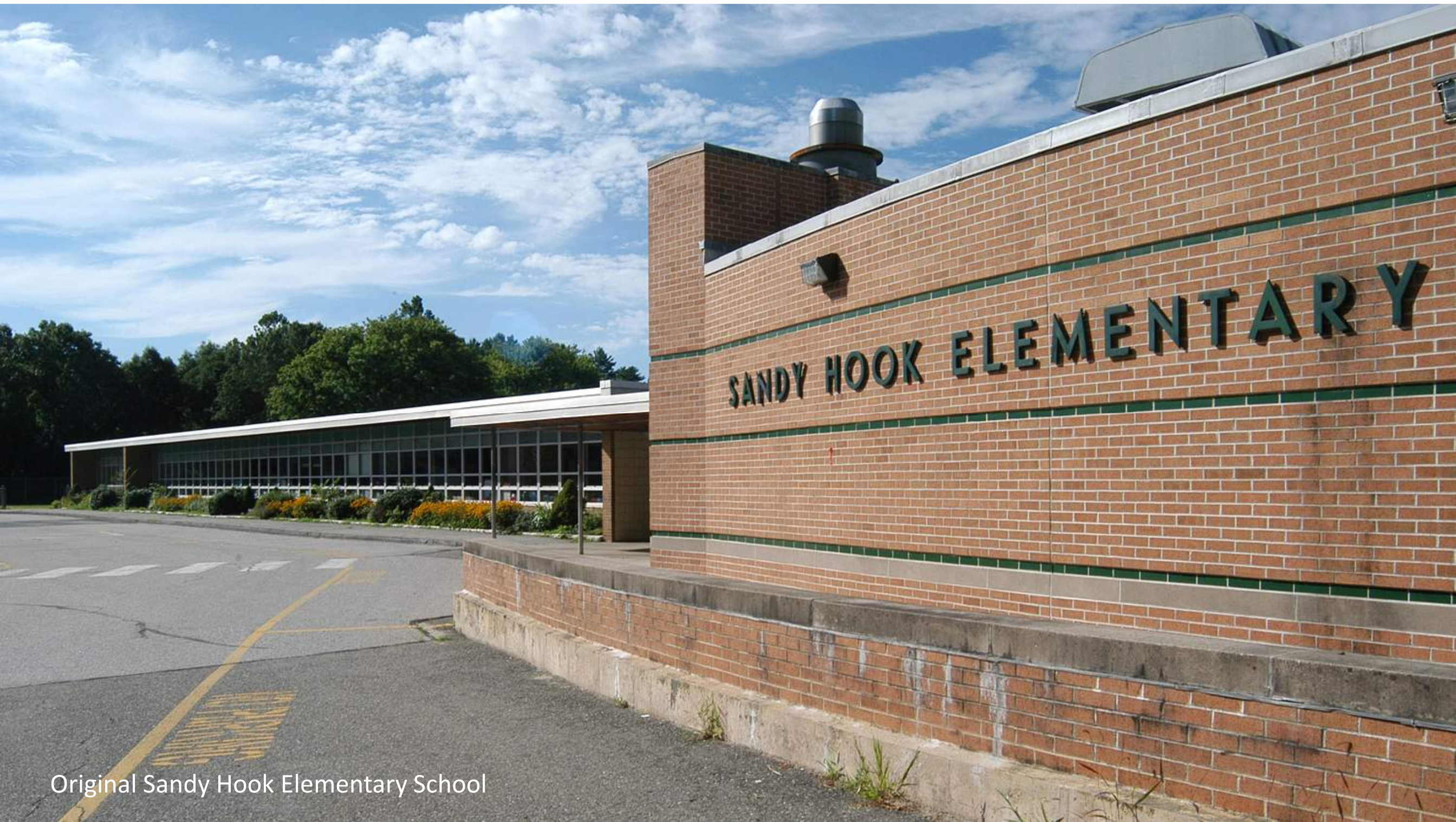


WOUNDED  
-NATALIE HAMMOND, 40 TEACHER  
-ONE UNNAMED ADULT

SUBJECT  
- 44-38861-10474 ANZA CUMMANS

SANDY HOOK  
NEVER FORGET





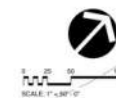
Original Sandy Hook Elementary School





SANDY HOOK SCHOOL

# Site Plan



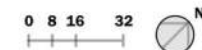
MAY 14, 2014

Richter & Cegan



SANDY HOOK SCHOOL

# First Floor Plan



MAY 14, 2014





Svigals + Partners



Svigals + Partners





Svigals + Partners







# Current Design Trends of Schools

## VIRGINIA STUDENT THREAT ASSESSMENT GUIDELINES

- Created by Dr. Dewey Cornell at UVA
- Out of 2,883 student threats, 99% were resolved without violence
- The remaining 1% resulted in no serious injuries

# Current Design Trends of Schools

## 2016 SCHOOL SAFETY INSPECTION CHECKLIST FOR VIRGINIA PUBLIC SCHOOLS

- Created by Virginia Department of Criminal Justice Services – Virginia Center for School and Campus Safety in consultation with the Virginia Department of Education.
- Standardized walk-through inspection checklist to be used as part of overall school safety audit.
- Identify vulnerabilities and offer a foundation upon which to build a safer learning environment.

# **New construction vs. renovation**

# Key issues for renovation of existing buildings

- Funding availability?
- Prioritization of needs
  - Targeted problem
  - Specific security enhancements
  - Systemic Building and Systems Renovation as Capital Improvement



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# Key issues for renovation of existing buildings

- Site assessment
  - Visibility and line of sight
  - Clear delineation of school boundary
  - Site lighting
  - Wayfinding and signage
- Building assessment
  - Single point of secured main entry
  - Access control and hardware upgrades
  - Location of administration adjacent to entry
  - Visibility and lines of sight / “see and be seen”



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# FAIRFAX HIGH SCHOOL

A photograph of the exterior of Fairfax High School. The building features a prominent entrance with a series of large, square concrete columns supporting a flat roof. Above the entrance, the words "FAIRFAX HIGH SCHOOL" are displayed in large, raised, metallic letters. The building's facade is composed of light-colored panels with vertical grooves. In the foreground, there is a paved walkway and a grassy area with some low-lying shrubs. A person is walking through the entrance area. The sky is clear and blue.

School prior to renovation





FAIRFAX  
HIGH SCHOOL  
3501









MOSELEY Architects

# Simple cost-effective strategies for schools

- Clearly define the school site
- Manage and observe approaches to the school
- Maintain a single, secure point of entry
- Increase transparency and provide clear lines of sight
- Identify “hide-in-place” zones
- Install roller shades (dark on the inside, white on the outside)
- Improve technology (locks, cameras, lighting, communications, etc.)
- Provide training for staff and first responders
- Provide anti-violence and mental health programs



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**What are other states doing?**



# What are other States doing?

## ALASKA H.R. 7 - Special Request

**Summary:** Final version (5/1/2018): This resolution states that the House of Representatives supports the increased access to school safety measures, including school safety infrastructure, public safety officers, emergency planning, and other security measures designed to protect students and staff at school and allow students to focus on learning.

**Status:** Amended; passed House 5/1/2018.

# What are other States doing?

## DELAWARE H.B. 49 - Special Request

**Summary:** Final version (3/20/2018): This measure requires all new school construction and schools undergoing major renovations to incorporate the following safety features:

- (1) a secured vestibule to be used as the primary entrance to screen visitors;
- (2) installation of ballistic resistant glass or other ballistic resistant materials in all areas used to screen visitors;
- (3) installation of a panic button or intruder alert system
- (4) classroom doors that can be locked on the outside with a key or magnetic card locking system.

Further, the measure provides that the Office of Management and Budget Facilities Management Section shall coordinate a review of construction plans with the Department of Homeland Security to verify compliance with this measure and evaluate the security and safety of new schools and schools planning major renovations.

**Status:** Signed by Governor John Carney (D) 6/14/2018.



# What are other States doing?

## FLORIDA S.B. 7026 - Special Request

**Summary:** Final version (3/7/2018): This measure creates the Office of Safe Schools, which shall review and provide recommendations on the security risk assessments. The department may contract with security personnel, consulting engineers, architects, or other safety and security experts the department deems necessary for safety and security consultant services. (page 64)

The measure also requires that a district school board must allow the law enforcement agency or agencies that are designated as first responders to the district's campus and school's campuses to tour such campuses once every 3 years. Any changes related to school safety and emergency issues recommended by a law enforcement agency based on a campus tour must be documented by the district school board. (page 77)

**Status:** Signed by Governor Rick Scott (R) 3/9/2018.

# Key take-aways

# Key take-aways

- Fear is NOT conducive to learning
- Thoughtful design is critical to school security (physical and psychological)
- One way in, many ways out
- Passive and active observation
- Community and culture are key
- Funding is critical (systems, training, staff, and programs)



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“Not only are rates of school violence going steadily down, but it's clear that schools are the safest place for a student to be.”

Stephen Brock, Cal State University Sacramento

**Thank you.**