



THE AMERICAN INSTITUTE  
OF ARCHITECTS

Committee on Architecture for Education

# K-12 Educational Design for Safety and Security

# Learning Objectives

1. Identify elements related to site Design that affect the security of K-12 facilities
2. Be able to explain how the entrance and circulation of K-12 schools affects the safety of the building
3. Be able to explain how transparency makes facilities safer.
4. Identify three topics to consider when addressing the safety of an existing facility.

# Agenda

1. K-12 School Site Design
2. K-12 School Entrance and Circulation
3. Transparency in K-12 Schools and the role that it plays in security
4. K-12 Existing buildings and Active Security Systems
5. Questions and Answers

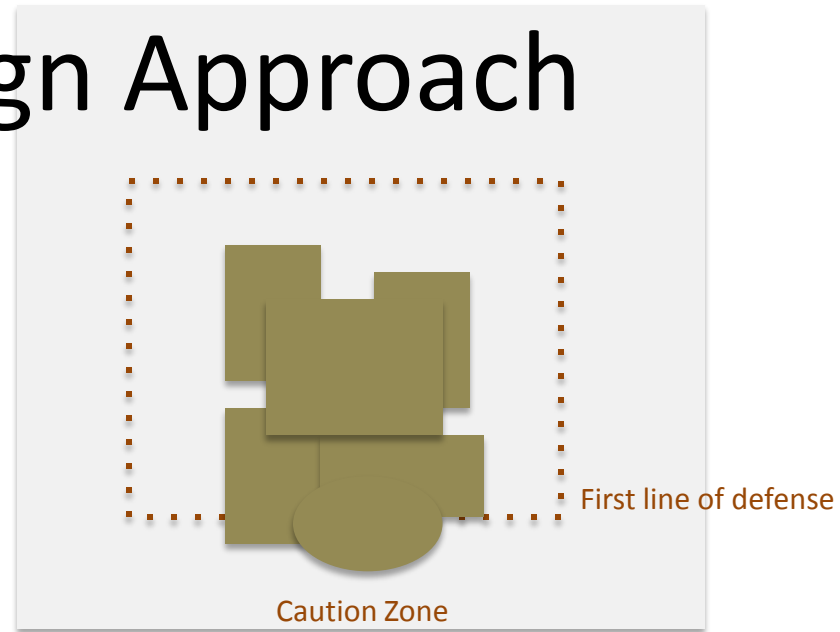
# K-12 School Site Design

Paul D. Winslow, FAIA



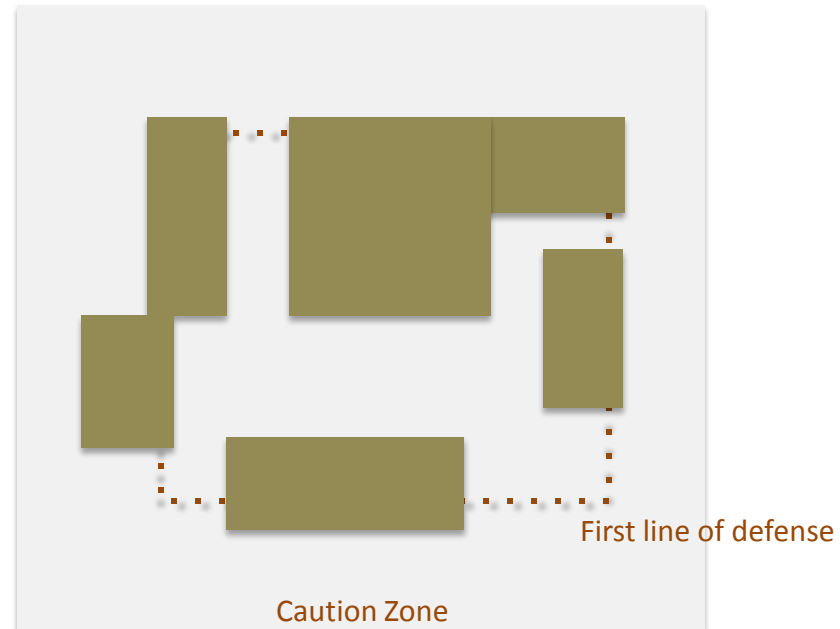
# School Site Design Approach

- Campus Style
  - Single building



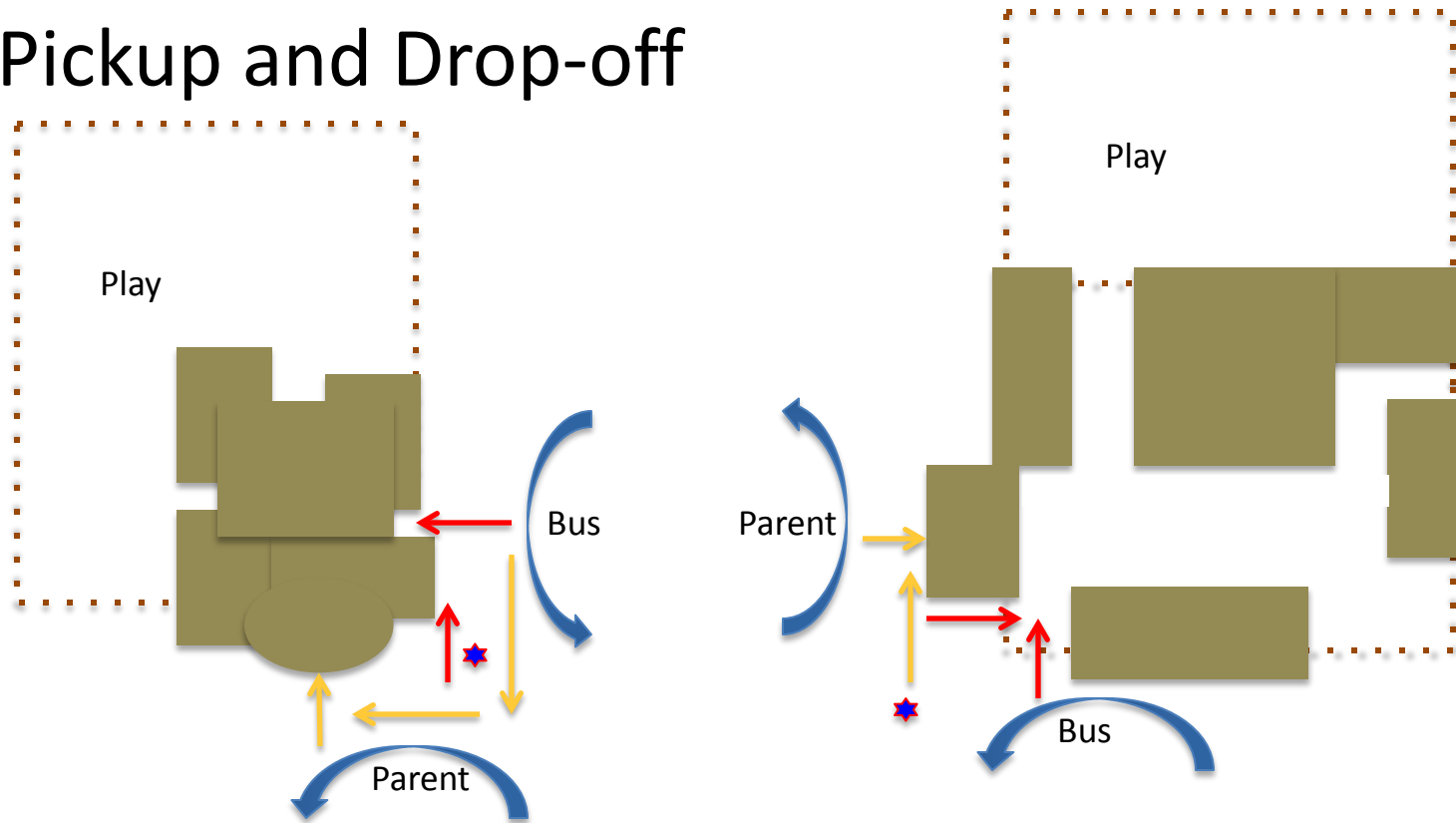
- Multi-building Campus

Different security approach to each



# School Site Design Approach

- Pickup and Drop-off

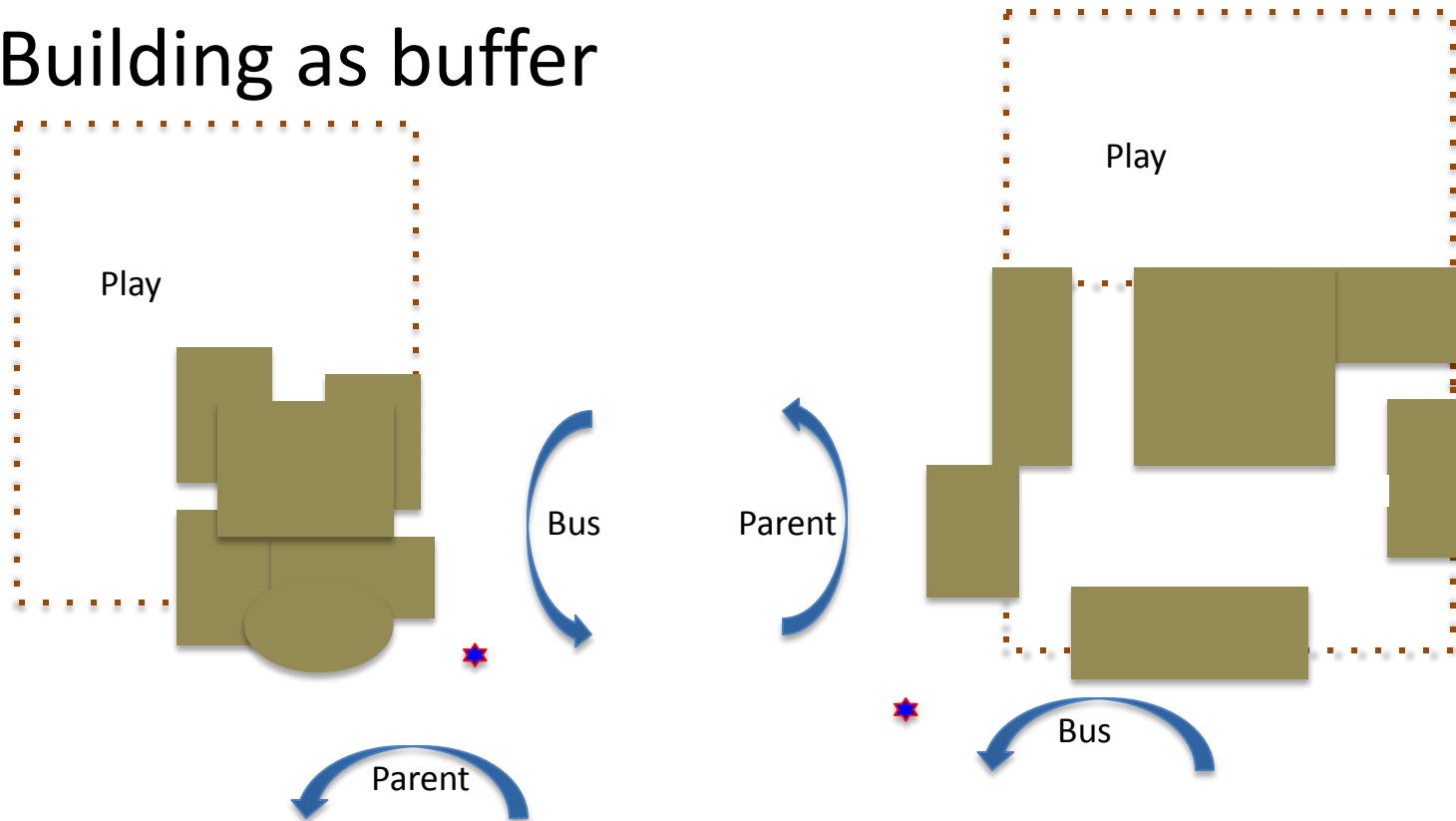


★ Supervision  
Points  
Security

→ Before the bell  
→ After the bell

# School Site Design Approach

- Building as buffer

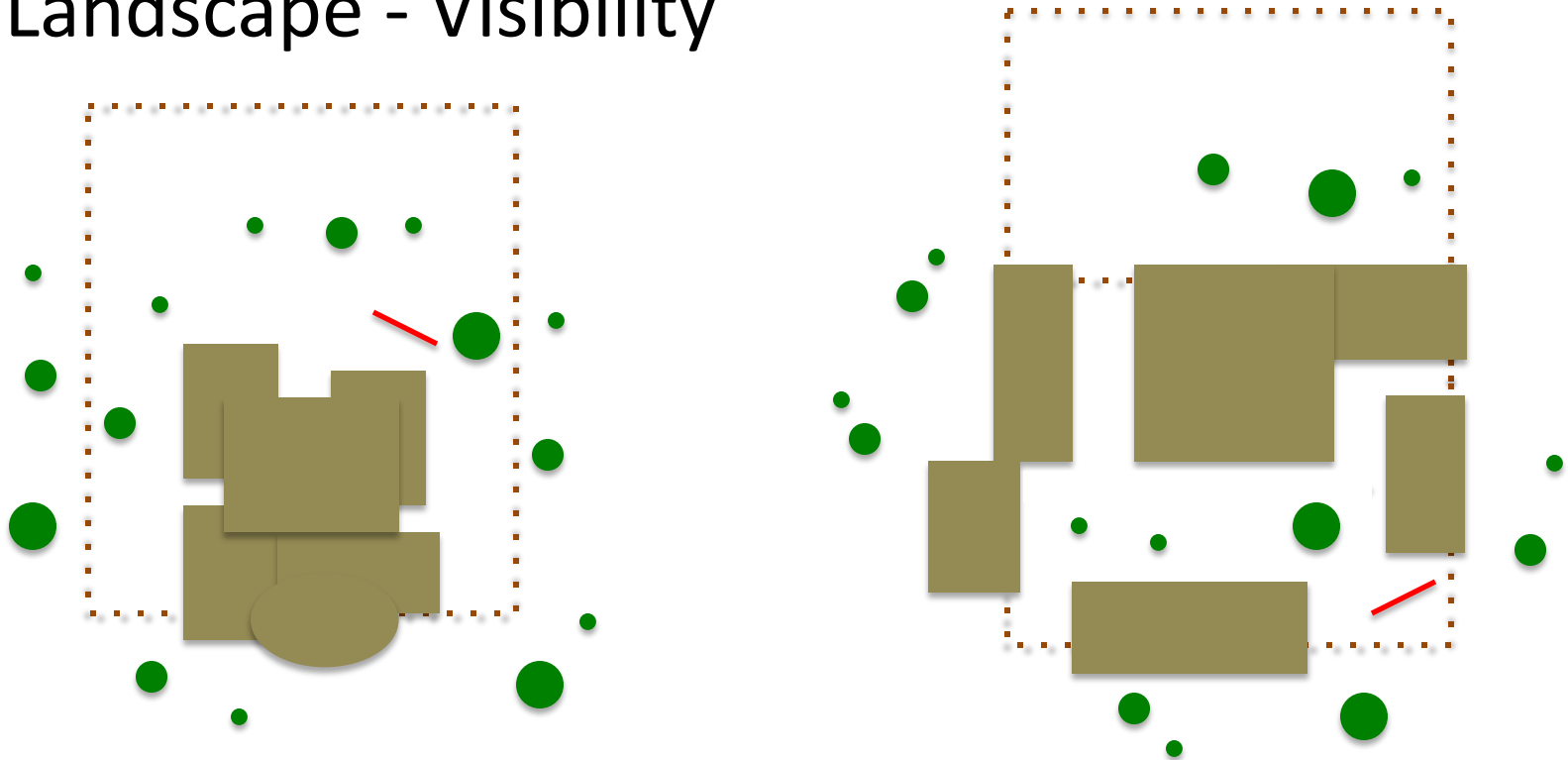


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# School Site Design Approach

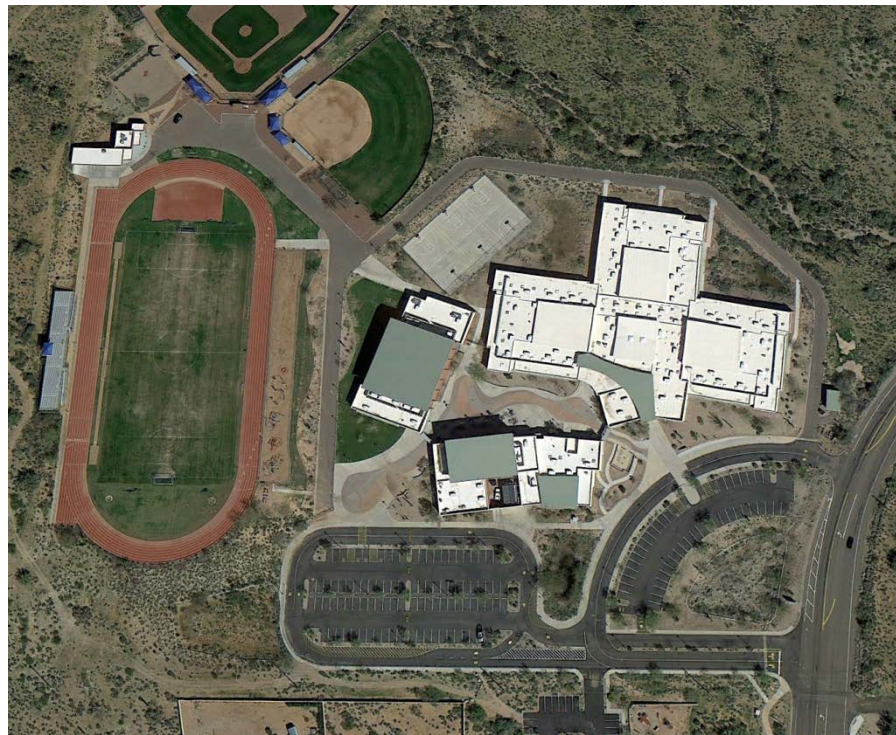
- Landscape - Visibility



- Trees, not shrubs
- Away from the building
- Avoid blind spots

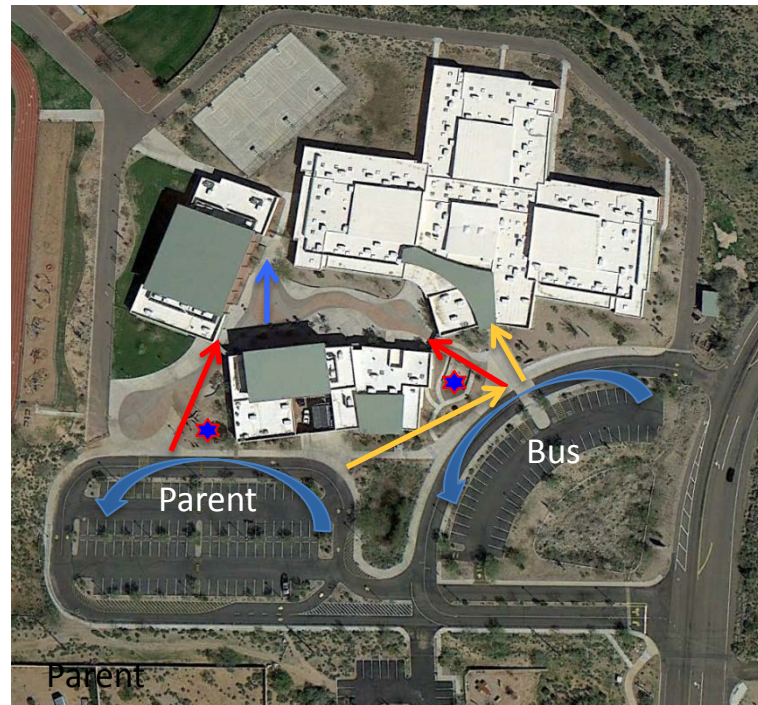
# School Site Design Approach

- Example: Fountain Hills Middle School



# School Site Design Approach

- Example: Fountain Hills Middle School



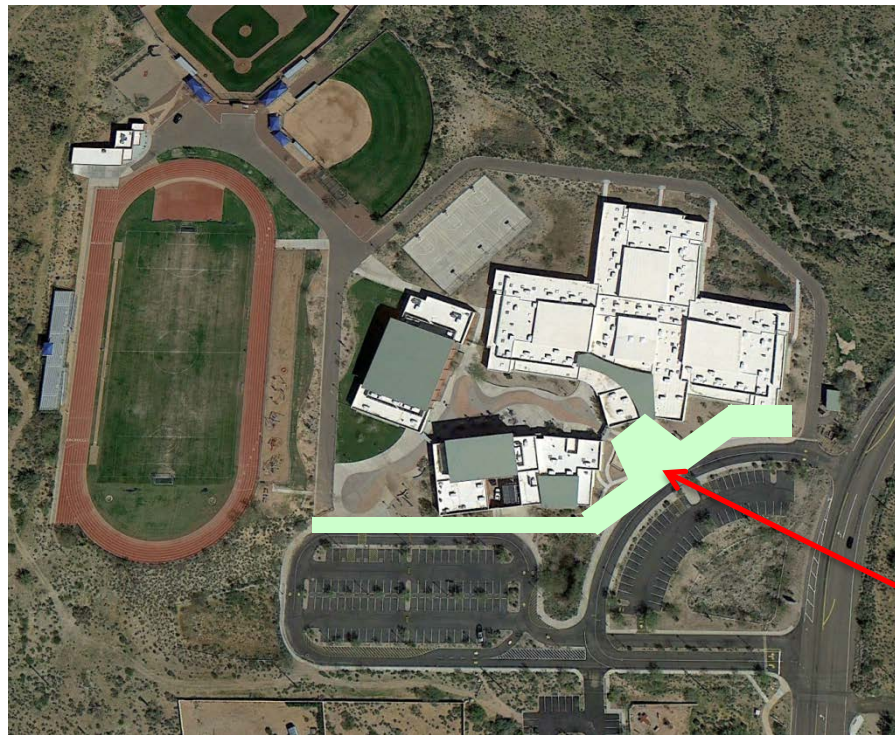
- Supervision Point
- Before School
- During School
- Secondary escape route

- Pickup and Drop-off Before and after school



# School Site Design Approach

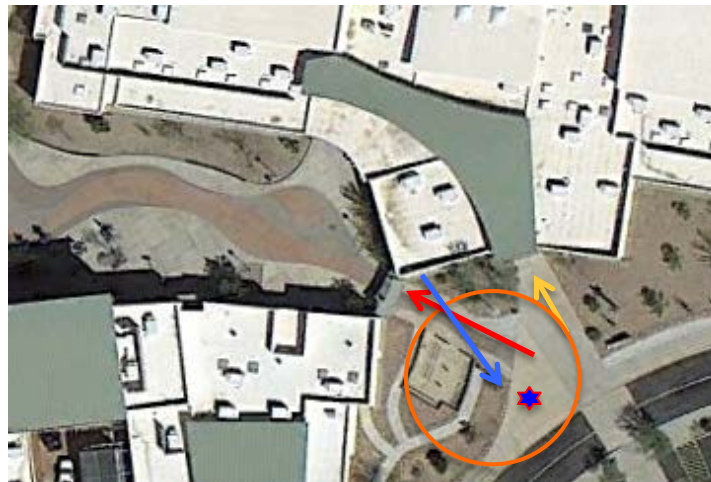
- Example: Fountain Hills Middle School



Buffer from parking

# School Site Design Approach

- Example: Fountain Hills Middle School



★ Supervision Point



Before School



During School



Buffer area



View from Office

- Pickup and Drop-off  
Before and after school



# School Site Design Approach

- Example: Fountain Hills Middle School



Main Entry During School

Roll-Down Screen Gate –  
Open Before and After  
School

Bus drop-off

- Pickup and drop-off entry  
before and after school

# School Site Design Approach

- Example: Fountain Hills Middle School



Roll-Down Screen Gate

- Bus pickup and drop-off entry before and after school

# School Site Design Approach

- Example: Fountain Hills Middle School



Cafeteria before school program

Roll-Down Screen Gate

Gym before school program

- Parent pickup and drop-off entry before and after school

# K-12 School Entrance and Circulation Design

Susan Baker, AIA







Concentric rings of protection

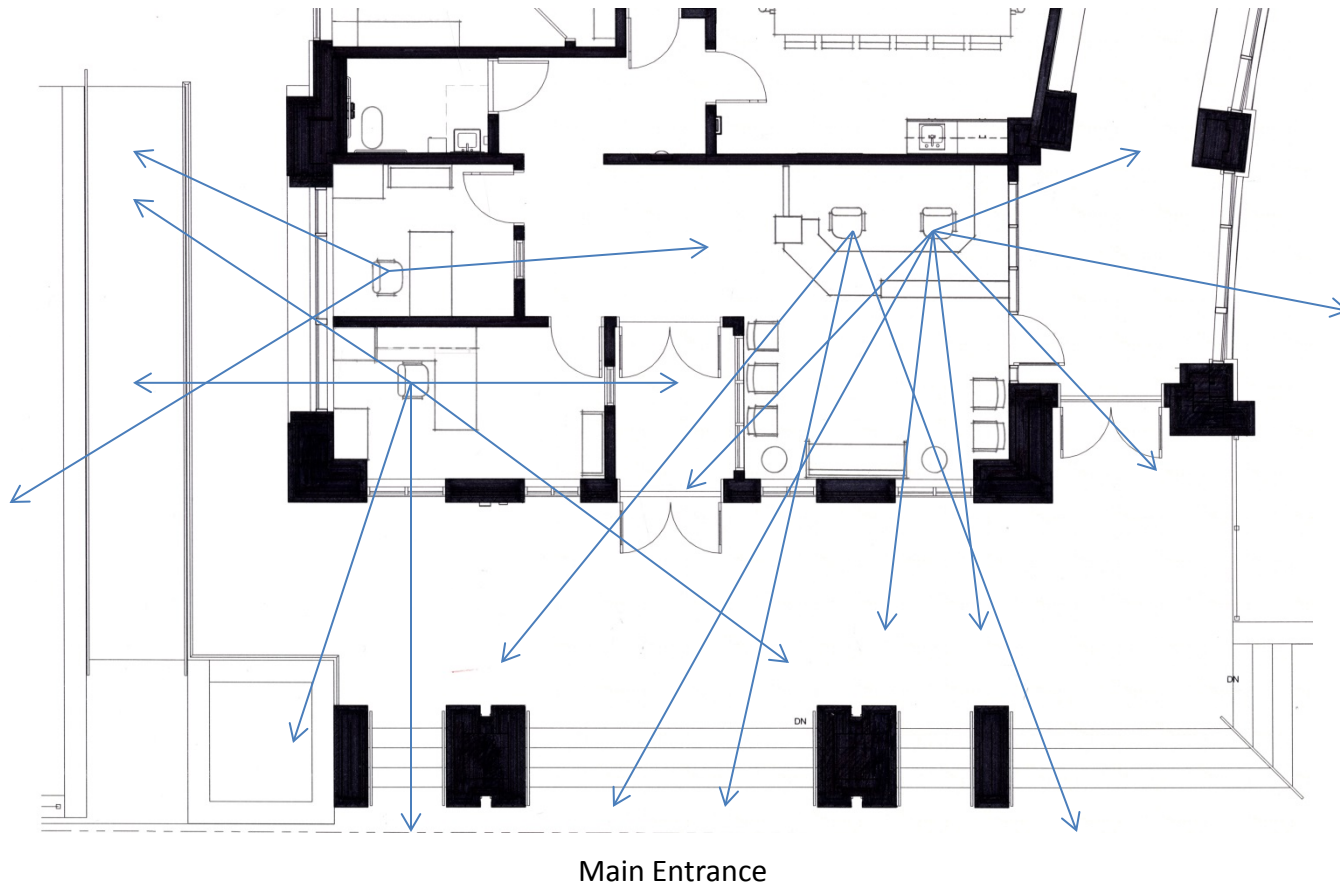


Protect exterior entrances



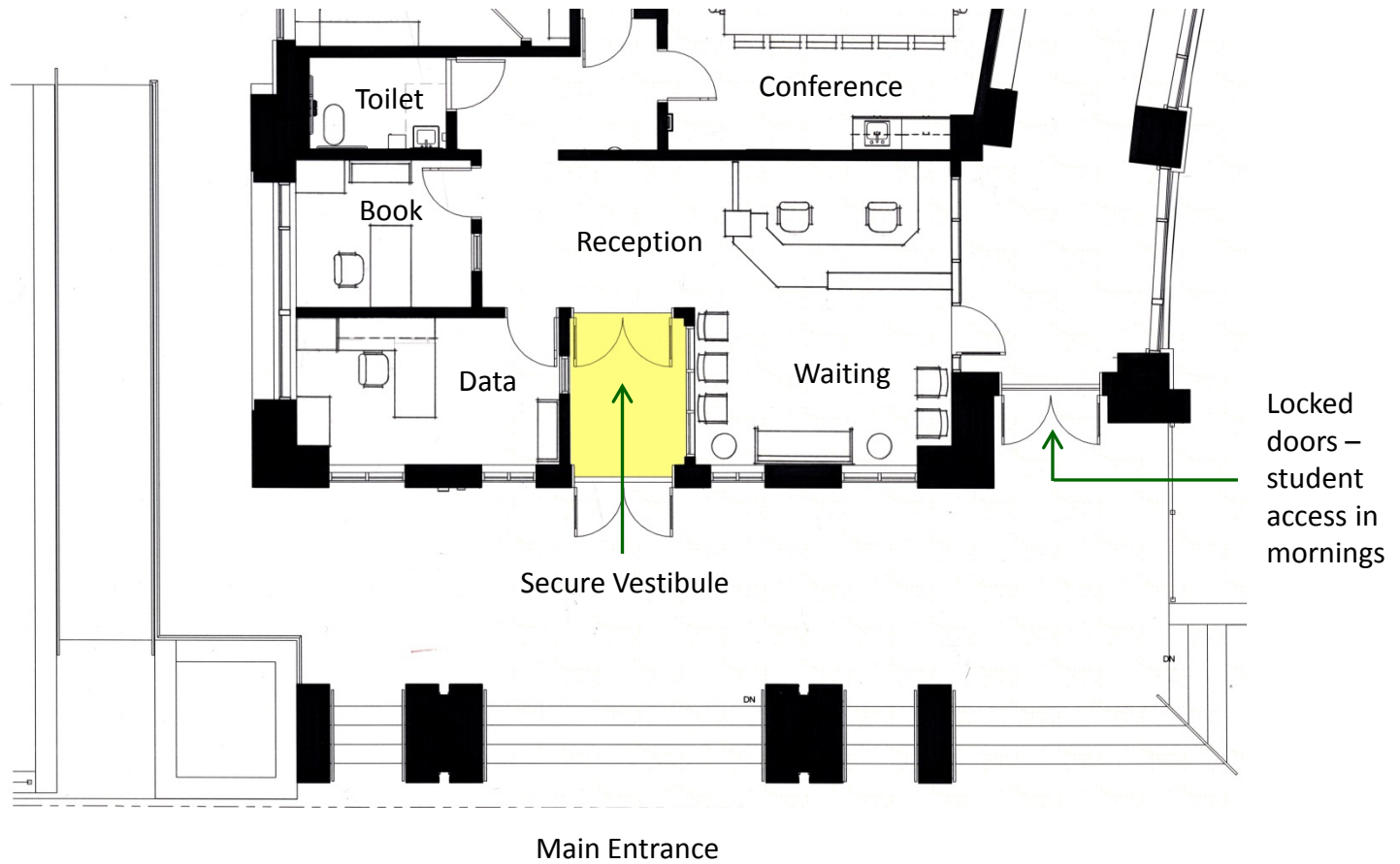


Easily identifiable main entrance

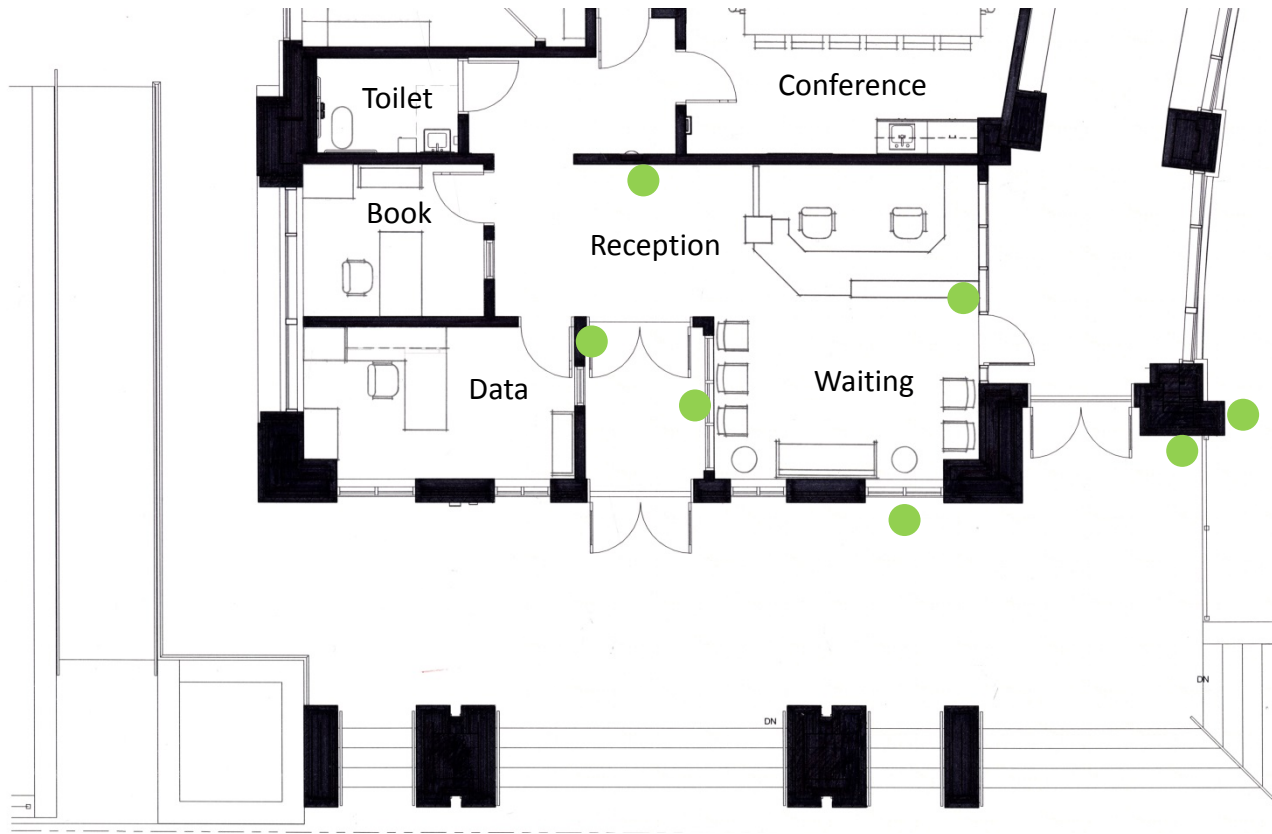


Lines of sight

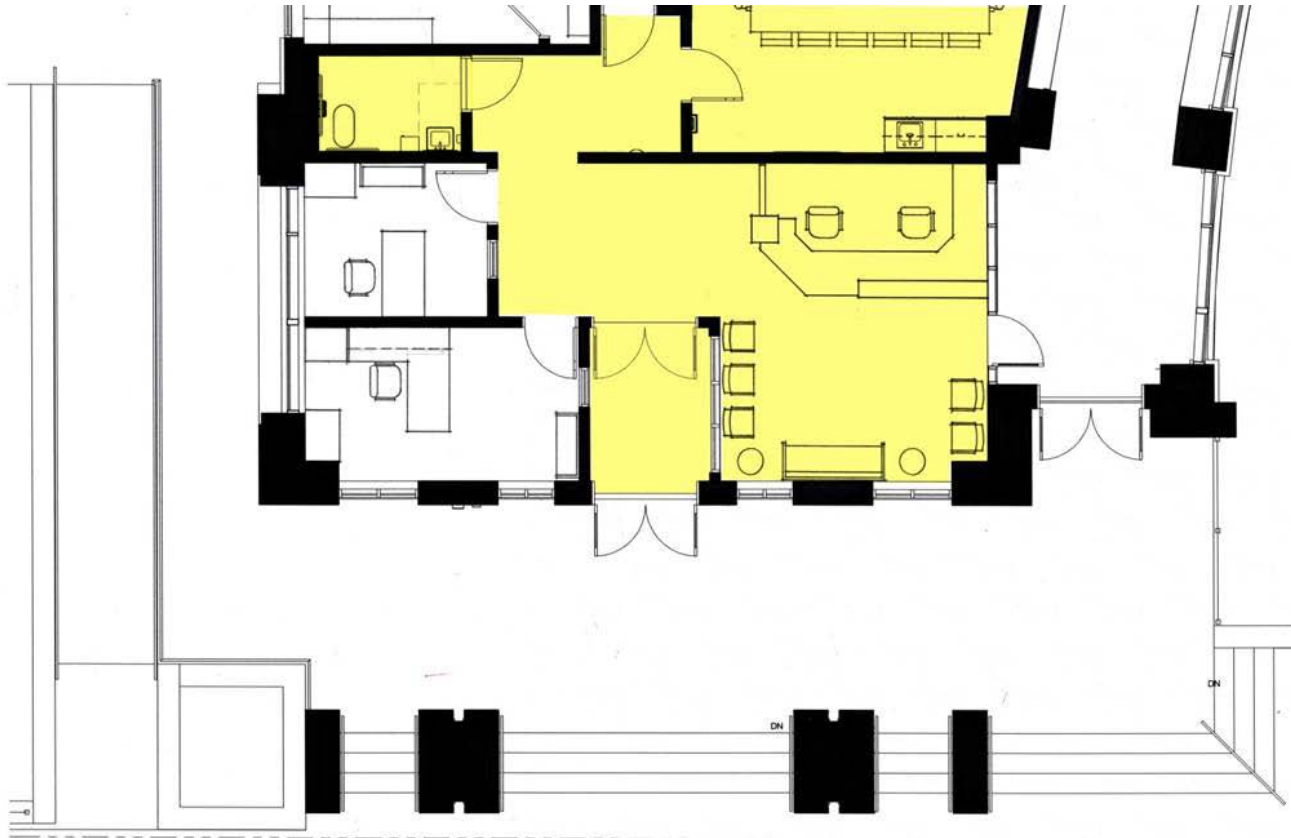




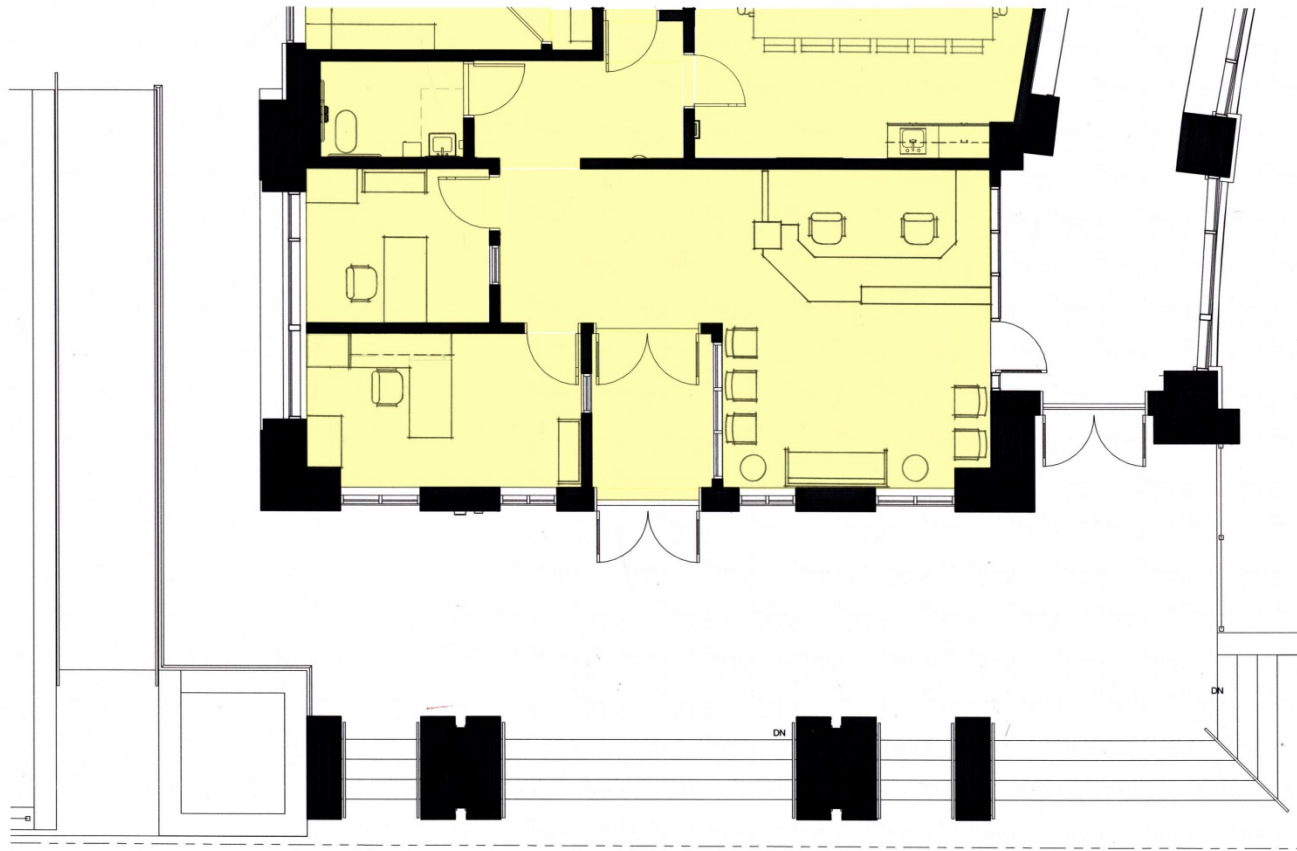
## Secure entry vestibule



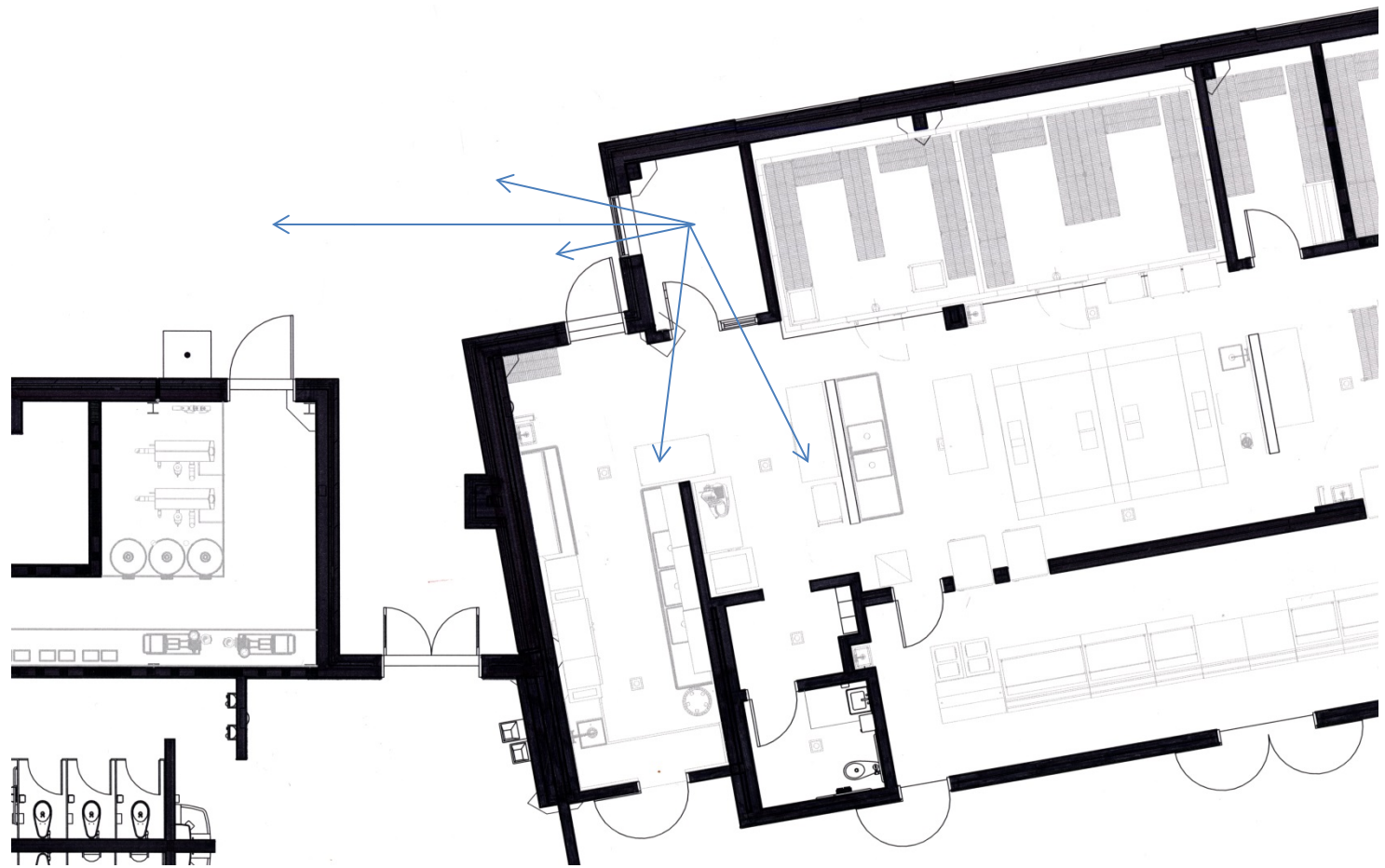
## Pan-Tilt-Zoom Cameras



Visitors' Center



# Administration



Loading area lines of sight



Loading area PTZ cameras





# Lighting



Natural surveillance with good sightlines





# Community Use



# Transparency in K-12 Design

Scott M. Rose, LEED AP







## Transparency as Balance

Reactions to violent crimes in schools are trending toward less visibility with hardened, opaque walls. This is wrong. To maintain an environment of learning, a balance of open and captured space is critical . . . and safer.

# C.P.T.E.D.

## “SEE and BE SEEN”

Natural surveillance occurs by designing the placement of physical features, activities and people in such a way as to maximize visibility and foster positive social interaction among legitimate users of private and public space.

## 21<sup>st</sup> Century Learning

Learning spaces must motivate learners, promote learning as an activity, and support collaboration. While formal practice or rigor is essential, 21<sup>st</sup> century learning spaces must also create a personalized and inclusive environment, and be flexible to the changing landscape.

# Educational Goals

Daylighting  
Visible Learning  
Collaboration  
Flexibility





# Daylighting



**Diffused**  
**Varied View Patterns**  
**Borrowed Light**



# Visible Learning

Learning spaces  
as interactive as  
professional work  
spaces



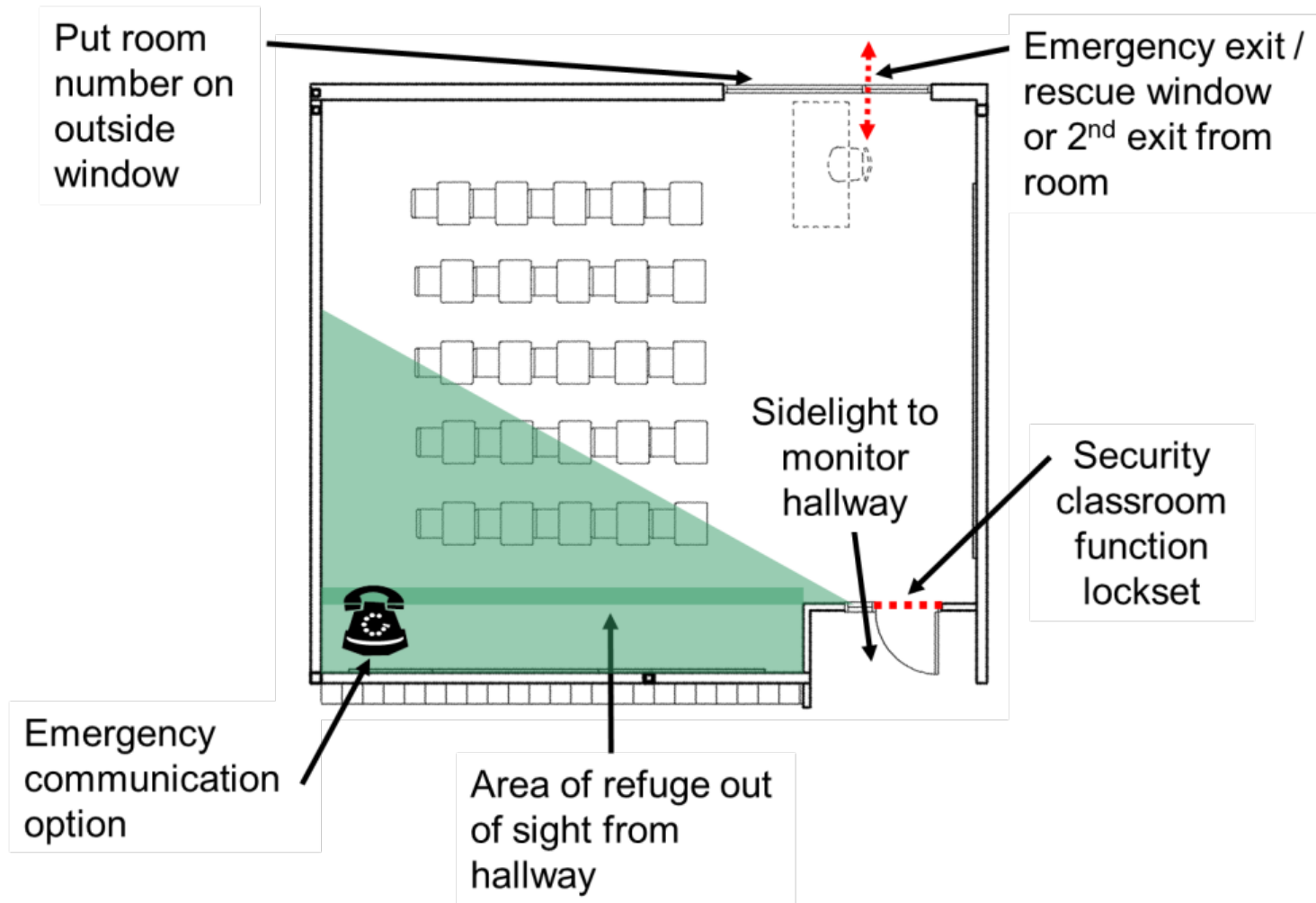


# Visible Learning

## Outdoor Connections



# The “Safer” Traditional Classroom



# Collaboration

Adaptable Furnishings  
Near Cores  
Clear Lines of Sight





# Collaboration

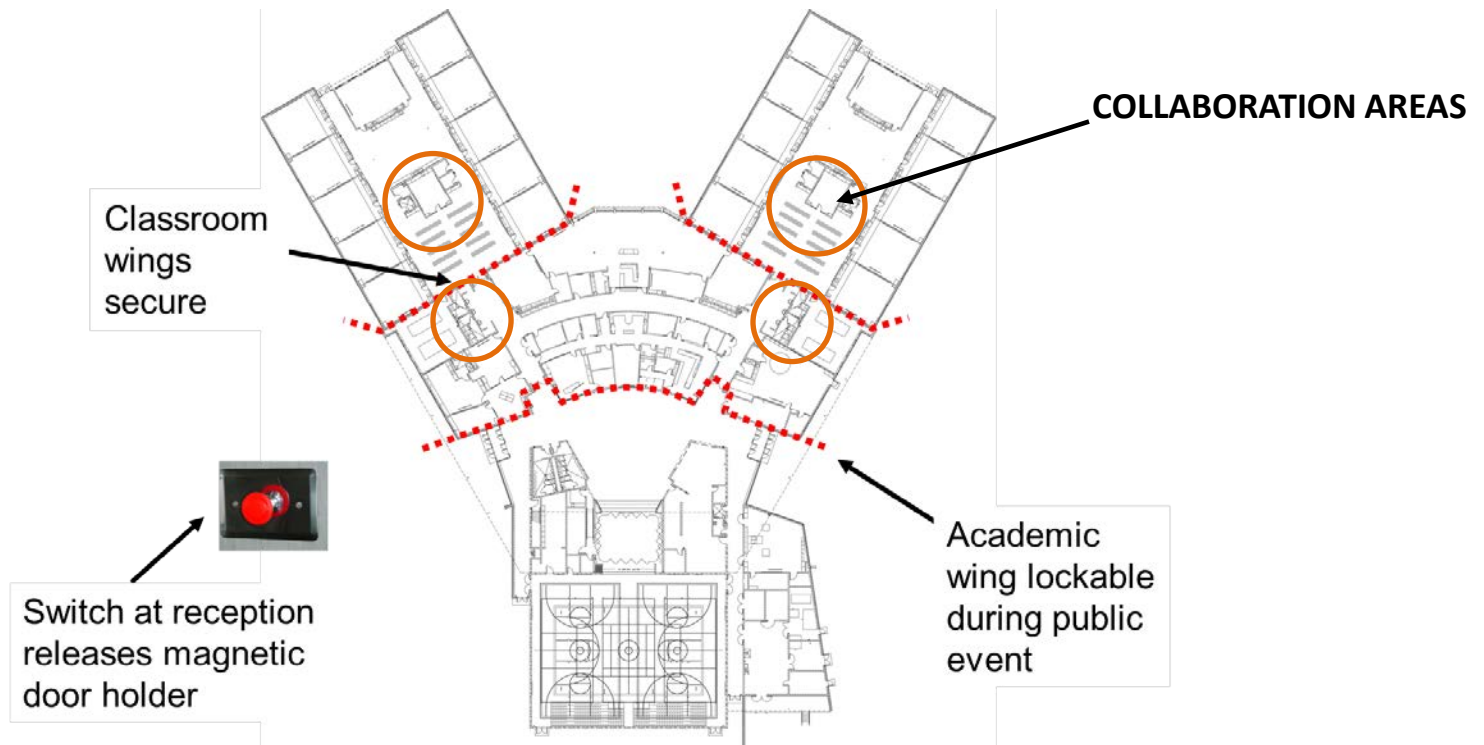
Adaptable Furnishings  
Near Cores  
Clear Lines of Sight





# Collaboration

Pull out areas maintained with cross-corridor doors to shut down pods and buy time for refuge



# Flexibility

Open environments with audible privacy (think tank) and easily closed off (sliding doors) with adjacent areas of refuge. Avoid “all or nothing” transparency



# Flexibility



# Assessing Existing Facilities





# Assessing Existing Facilities

- What is the site assessment?
- When should it be performed?
- Who should perform it?



# Assessing Existing Facilities

- Selecting the right team
  - School Staff – Administrators, Receptionists, Janitorial Staff, Nurse, Counselors, Teachers, Special Needs Instructors;
  - Campus Police or School Resource Officers;
  - Athletics and Fine Arts Directors;
  - Technology, Transportation and Maintenance Directors;
  - Finance Director;
  - Local Emergency Responders and Neighbors;
  - Others as deemed necessary



# Assessing Existing Facilities

- Man-made Threats and Natural Hazard Identification:
  - Man-made threats: Man-made threats are anything that could adversely affect the safety and security of the assets or function of a campus or facility.
  - Natural hazards: A natural hazard is any real or potential condition that can cause degradation, injury, illness, loss of equipment or property damage.



# Assessing Existing Facilities

- Examples of Man-made Threats:
  - Fire
  - Active shooters
  - Criminal threats or actions
  - Gang violence
  - Bomb threats
  - Domestic violence and abuse
  - Cyber attacks
  - Suicide





# Assessing Existing Facilities

- Examples of Natural Hazards:
  - Severe weather & lightning strikes
  - Tornados
  - Hurricanes
  - Floods
  - Earthquakes
  - Wildfires
  - Ice Storms and blizzards
  - Tsunami
  - Volcano



# Assessing Existing Facilities

- Examples of Biological Hazards:
  - Infectious diseases, such as pandemic influenza, extensively drug-resistant tuberculosis, staphylococcus aureus, and meningitis
  - Contaminated food outbreaks, including salmonella, botulism, and e. coli
  - Toxic materials present in school laboratories



# Assessing Existing Facilities

- Examples of Technological Hazards:
  - Explosions or accidental release of toxins from industrial plants
  - Accidental release of hazardous materials from within the school, such as gas leaks or laboratory spills
  - Hazardous materials releases from major highways or railroads
  - Radiological releases from nuclear power stations
  - Dam failure or water failure
  - Power failure



# Assessing Existing Facilities

- Visit the site during the day and at night
- Review floor plans and aerial site plans
- Camera





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# Planning for Security Systems



# Planning for Security Systems

- Examples of Security Systems
  - Surveillance
  - Access Control
  - Intrusion
  - Metal Detectors
  - Door Intercom Systems
  - Building Intercom Systems – Mass Communication
  - Two way radio



# Planning for Security Systems

- Team Structure
  - Technology Director
  - Security Director
  - Transportation Director
  - Facilities Director
  - Superintendent
  - Local or campus law enforcement
  - Campus administrators
  - Custodial





# Planning for Security Systems

- Team Structure
  - Technology Director
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  - Custodial



# Planning for Security Systems

- Consider the system impact on technology infrastructure
  - Cabling infrastructure
  - Network electronics
  - Where will the surveillance storage be kept
  - Backups
  - Access rights
  - Phone and intercom system interoperability



# Planning for Security Systems

- Consider the system impact on the facility and the staff
  - Access control systems and door hardware
  - Surveillance and facility lighting
  - The trained staff
  - Creating a culture of awareness