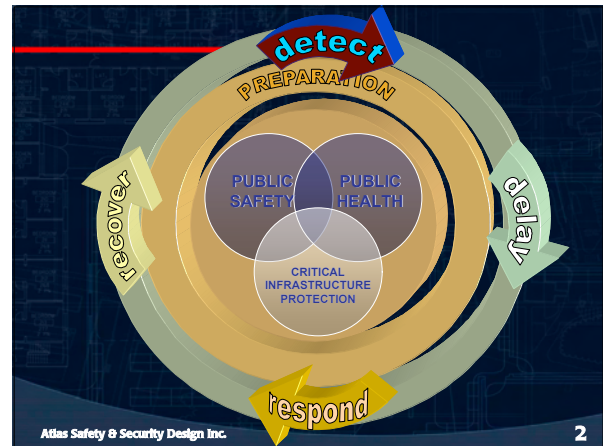


Designing for Security Safe School & Campus Design

by
Randall I. Atlas Ph.D. , AIA, ,CPP
Atlas Safety & Security Design Inc.
Miami, Florida

Atlas Safety & Security Design Inc.

1



Atlas Safety & Security Design Inc.

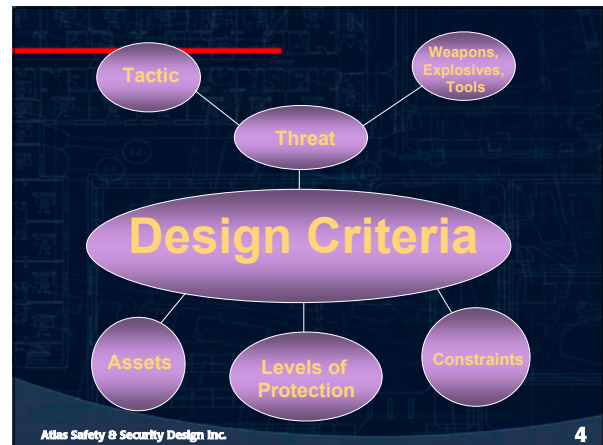
2

Risk, threats, vulnerability analysis

- Identify assets
- Determine criticality
- Determine threats
- Determine modes of attack
- Determine vulnerability
- Determine protection required
- Threat and vulnerability analysis will determine the weaknesses and potential for attacks
- The result is the functional security design criteria

Atlas Safety & Security Design Inc.

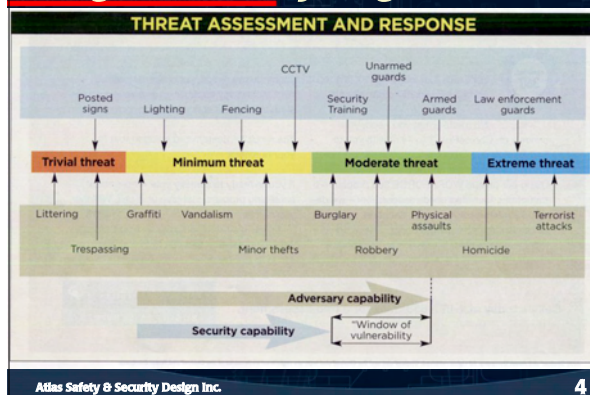
3



Atlas Safety & Security Design Inc.

4

Integrated Security Program



Atlas Safety & Security Design Inc.

4

Identify Assets: What is to be protected

- People
- Information
- Property



Atlas Safety & Security Design Inc.

5

How critical is the asset to be protected?

- What is the mission statement of the facility?
- What and whom are the probable targets?
- How easy can the assets be replaced?



Atlas Safety & Security Design Inc.

6

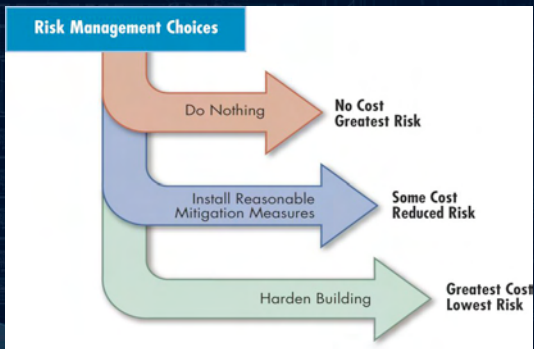
Determine Modes of Attack

- Is the threat from within?
- Or, is the threat from outside?
- How will the perpetrator gain access to the property?
- Is the attack likely or imminent?
- What tools or weapons will they use?
- Bombs? Guns? CBR?
- Who has the answers you seek?
- Does anyone want to hear the truth when you do find the answers?

Atlas Safety & Security Design Inc.

7

DHS All Hazards Approach



Atlas Safety & Security Design Inc.

8

What are the vulnerabilities?

- A vulnerability risk assessment is an in-depth analysis of building functions, systems, operations, and site characteristics to identify building weaknesses, and lack of redundancy, and determine the corrective actions that can be designed or implemented to reduce the vulnerabilities.

Atlas Safety & Security Design Inc.

9



Atlas Safety & Security Design Inc.

11



12



13

Definition of Threat: Street Crime

- What are the challenges to our safety?



Atlas Safety & Security Design Inc.

14



15

Definition of Threat: Workplace Violence

Factory worker kills 5, self in plant shooting

By David J. Phillips
A 40-year-old factory worker shot and killed five other workers and himself in a shooting rampage at a plant in Michigan on Tuesday.

Fired worker kills 6 at Chicago job site

By David J. Phillips
A 40-year-old former worker shot and killed six other workers and himself in a shooting rampage at a job site in Chicago on Tuesday.

Engineer is found guilty of slaying seven coworkers

By David J. Phillips
A 40-year-old engineer was found guilty of slaying seven coworkers and himself in a shooting rampage at a job site in Chicago on Tuesday.

16



17

Definition of Threat: Terrorism

SCHOOL VIOLENCE

MiamiHerald.com | THE MIAMI HERALD

MONDAY, DECEMBER 4, 2006 | 3A

Study finds slight increase in school killings

By a government study reported that at least 21 children were killed at school-related events between July 2004 and June 2005 — up from 19 killings the previous year.

BY LARA JAKES JORDAN
Associated Press

WASHINGTON — At least 21 people were killed at school during the 2004-05 academic year, a slight increase from the year before, the government reported Sunday.

The study by the Bureau of Justice Statistics does not include data from fatal shootings in Wisconsin, Colorado

and Pennsylvania this fall. In Pennsylvania, five Amish girls were killed in a one-room schoolhouse by a milk truck driver who then shot himself.

Overall, fewer students reported being the victims of violent crime at school or school-sponsored events in 2004-2005, the study by the Justice Department agency show. In addition, school-age children remain far more likely to be assaulted, raped and robbed off school grounds. The study looked at violent crime against students over several periods of time.

The 21 killings at school-related events, between July

2004 and June 2005, targeted victims between age 5 and 18, said Katrina Baum, co-author of the 2006 Indicators of School Crime and Safety. Over the previous year, 19 people were killed.

It was not clear whether all the victims were students. Still, the data indicate that students were about 50 times more likely in the 2003-04 school year to be killed away from school than at school.

Overall school violence has shown a declining trend, although it has increased lately.

The study notes that four of every 1,000 students in 2004

reported being the victim of violent crimes — compared with six of every 1,000 in 2003. Researchers polled students between 12 and 18 for that part of the survey, co-written by the Education Department's National Center for Education Statistics.

Younger students were found to be more likely crime victims — including those injured by bullies, the report showed. Last year, 29 percent of students polled said they had been bullied.

Also in 2005, 24 percent of students questioned said that gangs were at their schools — up 3 percent from 2003.

Atlas Safety & Security Design Inc.

18



Our schools are becoming fortresses



Atlas Safety & Security Design Inc.

20



Atlas Safety & Security Design Inc.

15

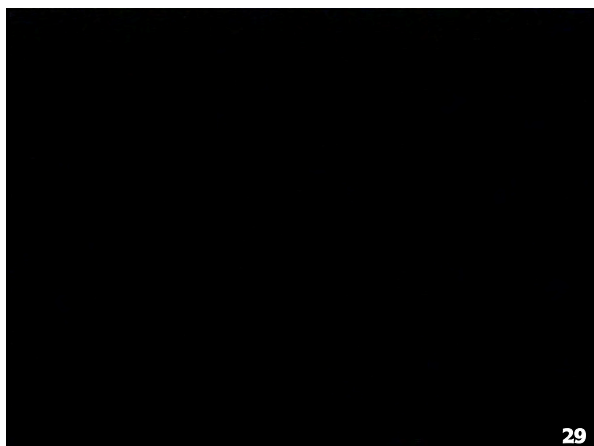


Understanding the threat

- 4/20/99 15 teens killed at Columbine Co. High
- 3/5/01 2 teens killed, 13 wounded at Santana High, Ca.
- 4/19/02 12 teachers, 2 students, school administrator, and police officer killed, 10 wounded in Erfurt, Germany high school
- 4/14/03 1 student shot and killed, 8 wounded by fellow students wielding a AK-47 in at John McDonogh High School in New Orleans
- 4/24/03 school principal shot and killed by eighth grader who later commits suicide at Red Lion, Pa. Area Junior High
- 9/1/04 342 people killed in terrorist takeover of high school in Russia
- 9/30/04 High school student in Buenos Aires kills 4 wounds 5
- 3/24/05 High School student kills 7 at Red Lake, MN High School
- 9/13/06 Man open fire at Dawsons College, 18 died dozens wounded
- 9/26/06 Adult male held six students hostage killed one and himself
- 9/29/06 A 15 year old student kills school principal
- 10/3/06 10 young girls shot, 5 killed in 1 room Amish School, PA.

Atlas Safety & Security Design Inc.

28



Once unleashed - the threat of legal action makes things happen

Atlas Safety & Security Design Inc.

30



Premises Liability Issues

- Victims of crime and accidents are seeking compensation from owners and managers of the properties on which crime takes place with increasing frequency.
- These cases, commonly known as premises liability cases are based on allegations made by the victim that the property owner failed to provide adequate security or safety and thus contributed to the occurrence of the incident.

Atlas Safety & Security Design Inc.

32

Today's school and campus challenges:

- Trespassing
- Vandalism
- Theft and Robbery
- Assault

Atlas Safety & Security Design Inc.

33

Examples of potential problems:

- Campus borders are often poorly defined
- Informal gathering areas are out of sight
- Building layout produces isolated spots
- Bus loading areas often in conflict with cars
- Student parking lots often on outermost areas
- Periphery parking creates with neighborhood
- Parking areas often obscured by plantings
- Locker areas often create conflict and confusion
- The overuse of corridors creating blind spots
- Rest rooms located away from supervision

Atlas Safety & Security Design Inc.

34

Highest risk areas

- Bathrooms from acts of vandalism, assault
- Corridors, minimizing congestion
- Entry and exit doors and avoiding propped doors and piggybacking
- Locker areas and the concealment of weapons, bombs, drugs, personnel items.
- Central control rooms and the location of all of the systems.

Atlas Safety & Security Design Inc.

35

Specific areas of concern:

- Parking lots
- Bicycle parking
- Building lobby space
- Elevators
- Stair systems
- Vending Areas
- Building restrooms
- High risk classrooms

Atlas Safety & Security Design Inc.

36

Specific areas of concern:

- Computer labs
- AV Storage areas
- Retail spaces
- Cash handling areas
- Precious metal areas
- Chemical storage
- Music rooms and equipment
- Laundry rooms
- Study rooms
- Rathskellars and bars

Atlas Safety & Security Design Inc.

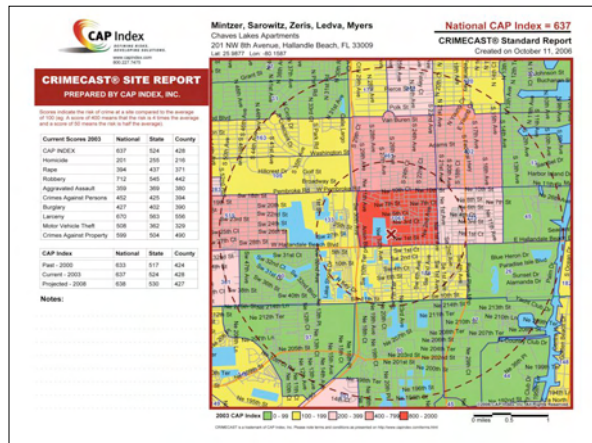
37

Factors for choosing campus

- Public safety directors are faced with numerous issues surrounding the campus regarding safety, security and student retention to the campus.
- The Clery Act mandates that all crime must be reported and disclosed publicly, similar to UCR and enforced by Dept. of Education

Atlas Safety & Security Design Inc.

38



- Campus officials strive to maintain a safe and secure campus environment, while at the same time maintaining a pleasant aesthetic look to the campus that so many colleges and universities are known for.
- Proactive measures are taken to aid in the prevention of crime and CPTED is a viable approach.

Atlas Safety & Security Design Inc.

40

- By incorporating the design elements of CPTED into a student housing, student activity areas, classroom buildings, or parking lots; the design would be able to reduce crime significantly, as well as maintain the aesthetic look that college campuses strive for.

Atlas Safety & Security Design Inc.

41

Making Schools/Universities Safer

CPTED is a powerful concept that may be used to improve the productive use of space.

- Architectural features and structural enhancements and spatial definition can deter, detect, and delay potential violent offenders from entering school campuses and buildings and reduce the opportunity and fear of stranger to stranger crime.

Atlas Safety & Security Design Inc.

42

CPTED Approaches



ORGANIZED
(people)

MECHANICAL
(technology)

NATURAL
(design)

Atlas Safety & Security Design Inc.

43

CPTED strategies

- 1) Natural surveillance
- 2) Natural access control
- 3) Territoriality and boundary definition
- 4) Maintenance and Management
- 5) Legitimate activity support
- 6) Displacement
- 7) Avoid conflicts of users and uses

Atlas Safety & Security Design Inc.

44

CPTED Elements

- Visibility-surveillance, lighting
- Ownership - territoriality
- Land-use activity generators
- Readability
- Mobility paths
- Movement predictors
- Entrapment areas
- Maintenance
- Target hardening/ fortressing

Atlas Safety & Security Design Inc.

45

CPTED

- CPTED is preferable to traditional security approaches because they are intended to fulfill the purpose of providing security while also increasing the level of comfort and functionality of the space.
- CPTED guidelines should be used during the programming and schematic design phases.

Atlas Safety & Security Design Inc.

46

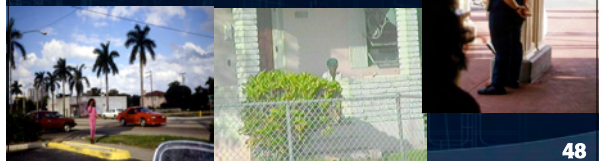
- Time to make the CPTED input is when these directive can affect site planning, use of space, positioning of major building components, and the shapes of buildings, and circulation patterns.

Atlas Safety & Security Design Inc.

47

Who are the users?

- Cast of characters of our buildings
- Normal users: legitimate purpose
- Abnormal users: illegitimate
- Observers: capable guardians
- What are the uses?



48

Who are the illegitimate users?



When are security measures needed?

- There may be circumstances where the nature of the building activities or occupants warrant additional protection measures.
- Some of the situations that commonly require security considerations are:

Atlas Safety & Security Design Inc.

51

When are security measures needed?

- Where select agents or chemical biological materials are maintained.
- Where required by insurance carriers
- Where required by regulatory agencies governing the activity
- Where best practices typical for this type of building is higher

Atlas Safety & Security Design Inc.

52

When are security measures needed?

- Where extensive after hours operations are expected, especially involving students.
- Where large amounts of cash or other valuables are maintained.
- Where clinical operations or patient treatments are to be conducted.
- Where disciplinary counseling or confrontations are expected.
- Where animal care or research facilities

Atlas Safety & Security Design Inc.

53

Common Use or Shared Use Spaces

- There may be a number of areas that are shared or common spaces used by many departments, copy centers, break rooms, conference facilities.
- Shared and common spaces should be positioned to use a common entry so that the need to enter another's assigned space is reduced.

Atlas Safety & Security Design Inc.

54

After hours operation

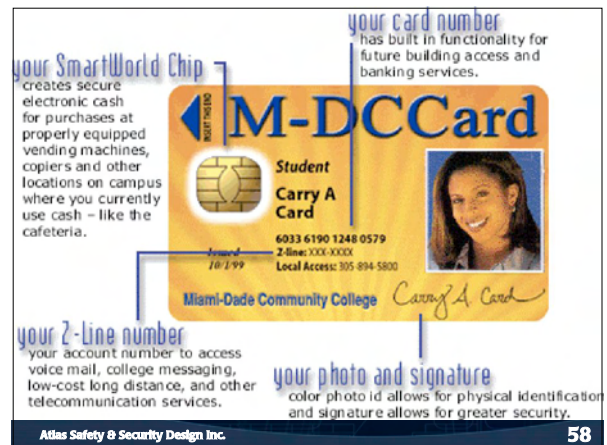
- The design should permit different areas to operate independently yet secured.
- Electronic locking allows for entire sections to be closed or isolated. 24 hour labs could be located on the perimeter of the building where operations could be independent of the other parts of the building.

CPTED strategies for school security

- Perimeter control
- Buildings sited to form a campus perimeter
- Building penetrations and openings
- Distinguishing building exits from entrances
- Fencing and barriers
- Roof configurations
- Sightlines to maximize perimeter surveillance
- Multiple perimeters for various functions.

Safe and unsafe activities

- Place unsafe activities (restrooms, ATM's) in or near safe locations (lobbies, reception desks) to bring along the natural surveillance and increase the perception of safety for normal users as well as offenders.
- Safe activities serve as magnets for legitimate users who exhibit territorial challenge behavior.



CPTED design elements for security

- Circulation patterns throughout the school
- Hallways
- Administrative areas
- Common areas
- Lockers and locker rooms
- Classroom security
- Bathrooms

Security measures should address

- Exterior lighting
- Entrances and access points
- HVAC systems
- Fire protection
- Elevators
- Emergency control center and communications
- Video surveillance and access control

Break

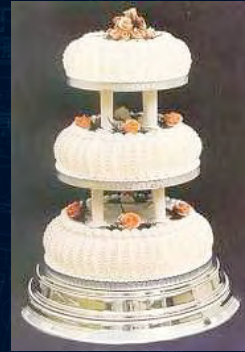


Atlas Safety & Security Design Inc.

61

Safe School Design: Layering

- Site
- Building
- Interior
- Systems



Atlas Safety & Security Design Inc.

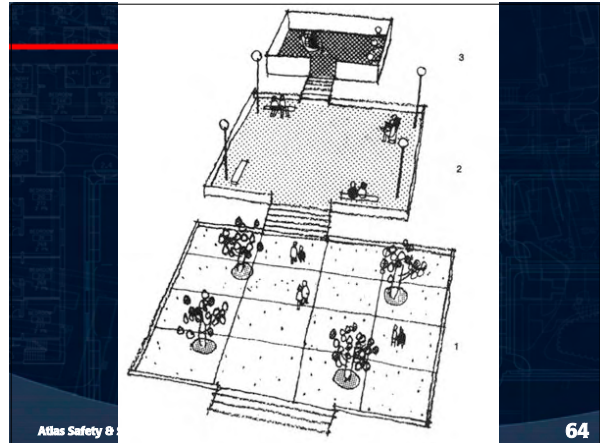
62

Safe School Design: Site

- Boundaries
- Establish territoriality
- Public spaces
- Semi-public
- Semi- Private
- Private

Atlas Safety & Security Design Inc.

63



Atlas Safety & Security Design Inc.

64

Site Boundaries

A school's relationship to its surroundings are communicated through the edge connections.

- Landscaping denotes school boundaries
- Accessibility can be controlled through edge condition
- Areas of clearly defined use are established and naturally observed

Atlas Safety & Security Design Inc.

65

Territorial Reinforcement

- Territorial definition is the first major element in crime prevention.
- It is necessary to convey to others that the space they are currently in is private. Defining a campus from public space can be most difficult.
- Do we want the campuses to blend in or stand out in the neighborhood.

Atlas Safety & Security Design Inc.

66

Territorial definition

- Accomplished by
 - Landscaping
 - Paving
 - Fencing and gating
 - Lighting
 - Road placement and type
 - Access control
 - Signage

Atlas Safety & Security Design Inc.

67

Compatible Building Placement

- Placement of buildings in the surrounding community
- Legitimate activity support
- Blue light call boxes
- Natural access control
- By carefully placing activity areas that are well traveled can change an area that is susceptible to crime.

Atlas Safety & Security Design Inc.

68

Blue lights

- When placing blue light or emergency call boxes be sure to take into account where most activity will be and where they can also be used as deterrents.
- Is the system integrated for quick location identification and response?



Atlas Safety & Security Design Inc.

69

Perimeter entry points

- The location and position of perimeter entry points are important to the issue of natural surveillance and natural access control.
- Highly visible entry points promote their own use by legitimate users of the building and easily watched by security and public safety staff.

Atlas Safety & Security Design Inc.

70



- Entry points that are concealed or remote should not be used or have restricted access and controlled using architectural and or electronic mechanisms to reduce or eliminate these doors from use except during and emergency.

Atlas Safety & Security Design Inc.

72

Safe School Design: Site

- Boundaries
 - Establish territoriality
 - Control where people enter

Atlas Safety & Security Design Inc.

73



74

Safe School Design: Site

- Boundaries
 - Establish territoriality
 - Control where people enter
 - Control where cars enter

Atlas Safety & Security Design Inc.

75



Landscaping Barriers

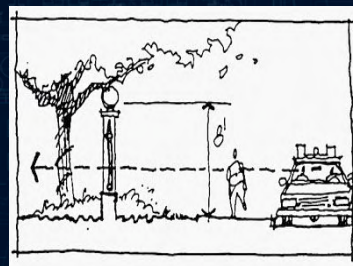
Gates and fences restrict unwanted entrance and access

- Use gates and fences that permit observation to surrounding areas.
- Appropriate landscaping planting can improve the aesthetics of these barriers
- Be sure that solution does not turn into problem by providing potential hiding areas with barriers

Atlas Safety & Security Design Inc.

77

Good natural surveillance



Atlas Safety & Security Design Inc.

78



79



80



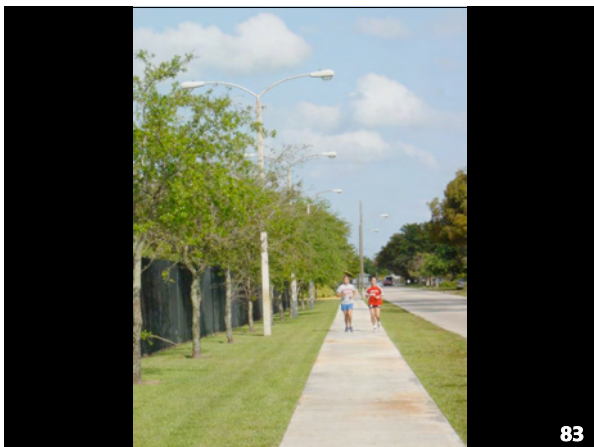
81

Fencing and barriers

- Use symbolic and real barriers to prevent unauthorized access and as means to define and demarcate limits of exterior space.
- Fencing should be used to direct persons to appropriate walkways or building entry points that are under the supervision of capable guardians and surveillance.

Atlas Safety & Security Design Inc.

82



83

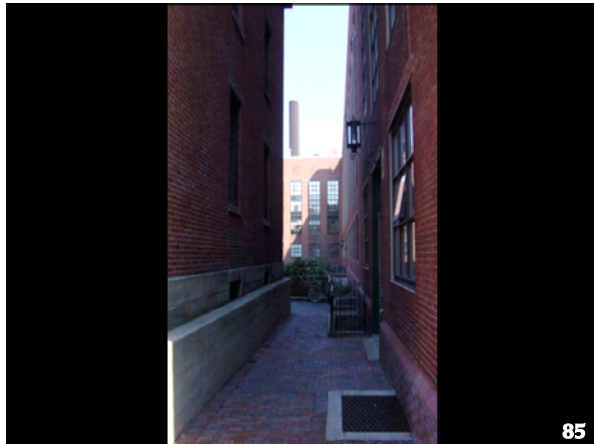
Site Planning

What is the architectural impact?

- Is the landscaping conducive to crime or does it discourage it?
- Are the vehicular and pedestrian pathways safe and secure?
- Is security provided for service areas?
- How efficient is the lighting?

Atlas Safety & Security Design Inc.

84



85

Landscaping

- CPTED concepts integrated into the landscape architecture and plantings regarding the selection of plant materials, their placement, density and height.
- Landscaping should minimize areas concealing cover for a potential attacker.
- Maximize observation of areas
- No conflict with lighting

Atlas Safety & Security Design Inc.

86

Wayfinding and signage

- Wayfinding is a critical design and operational element for interior and exterior design.
- Is it clear where the front door is?
- This is especially important if the building has multiple occupant types, has diverse uses such as offices, classrooms, labs.
- Visual cues are part of symbolic architectural features and directional signage.

Atlas Safety & Security Design Inc.

87



88



89



90



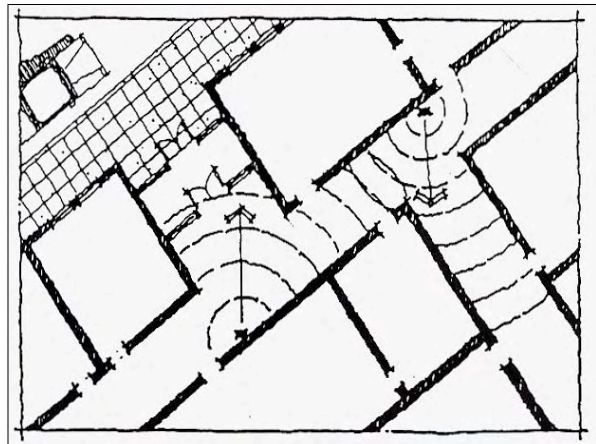
91



92



94



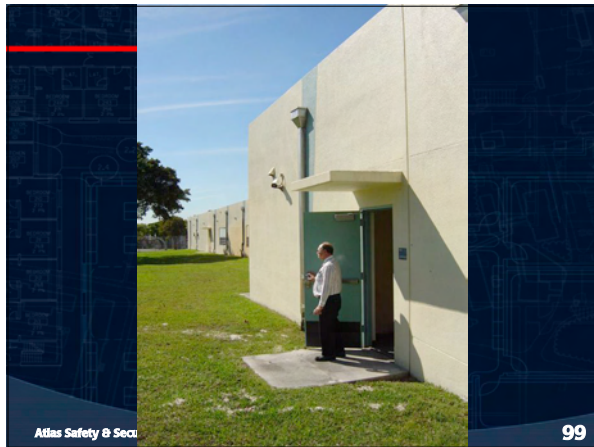
96



97



98



Atlas Safety & Security Design Inc.

99

Safe School Design: Systems

- Mechanical and HVAC
 - Prevent sabotage
 - Placement is critical

Atlas Safety & Security Design Inc.

100

Issues To Consider

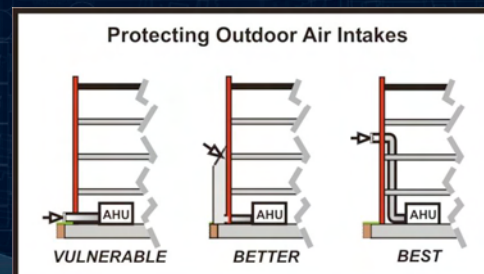
- What is the threat?
- Toxic Industrial Chemicals, particulate, gaseous, chemical, biological?
- How clean does the air need to be and what is the associated cost?
- What is the current system capacity?
- Is there filter bypass and how significant is air infiltration into the building envelope?
- Will improved indoor air quality offset upgrade costs?
- Is system maintenance addressed?

Atlas Safety & Security Design Inc.

101

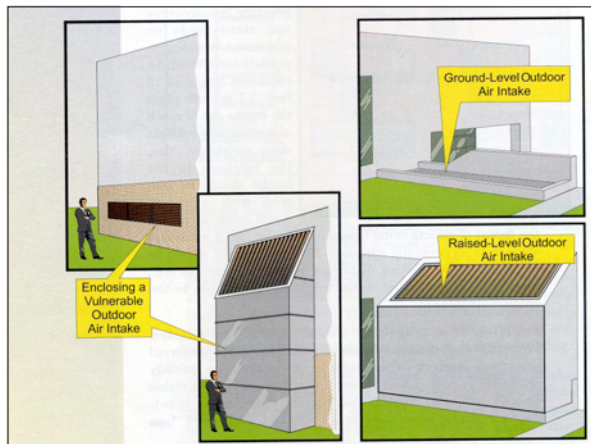
Physical Security

- Prevent Easy Unobstructed Access to Outdoor Air (OA) Intakes.

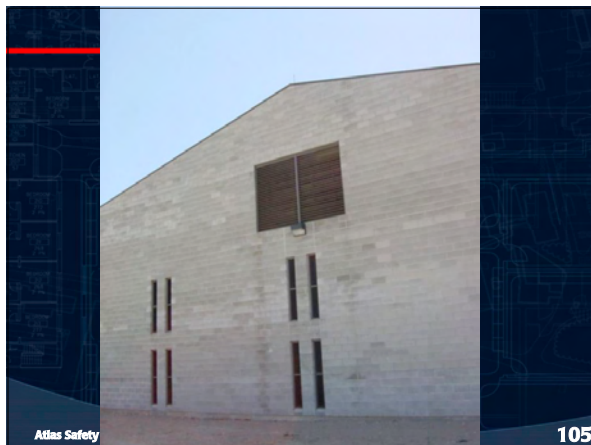


Atlas Safety & Security Design Inc.

102

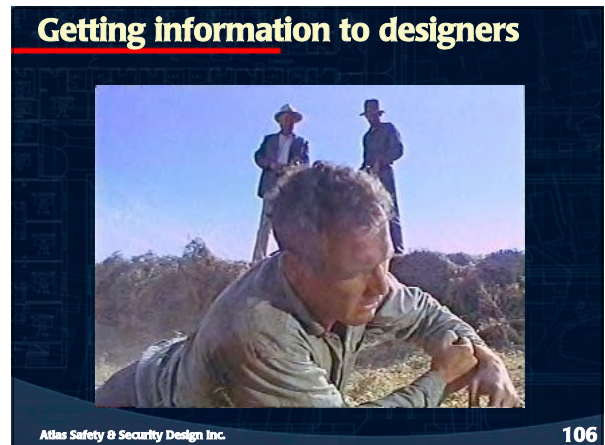


104



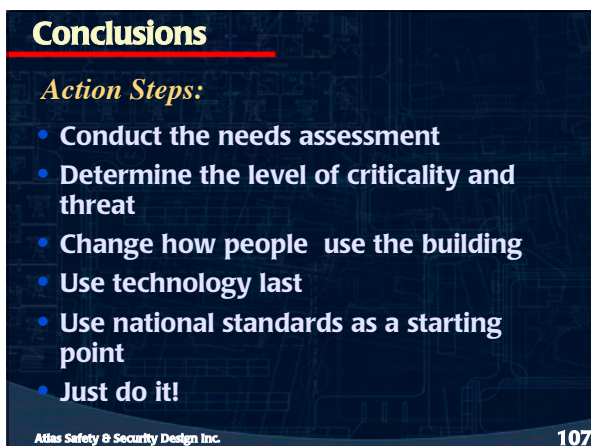
Atlas Safety

105



Atlas Safety & Security Design Inc.

106



Atlas Safety & Security Design Inc.

107



108



Resources

- For more info contact Dr. Randall Atlas at:
800-749-6029 email: ratlas@ix.netcom.com
- Web: <http://www.cpted-security.com>
- Safe School Guidelines at Fl. Center for Community Design: <http://www.fccdr.usf.edu/>
- International Association of Campus Law Enforcement Administrators: <http://www.iaclea.org>
- National Association of School Resource Officers: <http://www.nasro.org>
- Dept. of Education emergency planning web resource: <http://www.ed.gov/emergencyplan/>

Atlas Safety & Security Design Inc.

110

Adjourn



111