# CPTED and Situational Crime Prevention

## Crime Prevention Through Environmental Design (CPTED) Best Practices in Physical Security

Foundations of Physical Security
CPTED 101

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# CPTED Defined

- CPTED is an acronym for **Crime Prevention Through Environmental Design** (CPTED).
- CPTED is the design or re-design of an environment to reduce crime opportunity and fear of crime through natural, mechanical, and procedural means.
- CPTED is best applied with a multi-disciplinary approach that engages planners, designers, architects, landscapers, law enforcement, and residents in working teams.





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# Basic CPTED

- Natural Surveillance
- Access Control
- Territoriality





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# Current CPTED components

- Surveillance
- Access Control
- Territorial Reinforcement
- Image and Maintenance
- Locational Setting and Place Considerations





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# Newman's Defensible Space Principles – evolved into CPTED…

- Facilitates TERRITORIALITY
- Facilitates SURVEILLANCE
- Reduces STIGMA
- Considers SAFE PLACEMENT
- Responsive to RESIDENT NEEDS
- Avoids concentration of DISADVANTAGED





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# Why Consider CPTED?

- Role of physical environment in crime and fear of crime
- Nature of physical environment --
  - Can attract offenders
  - Make crime easy
  - Impede arrests
  - Can increase fear of crime





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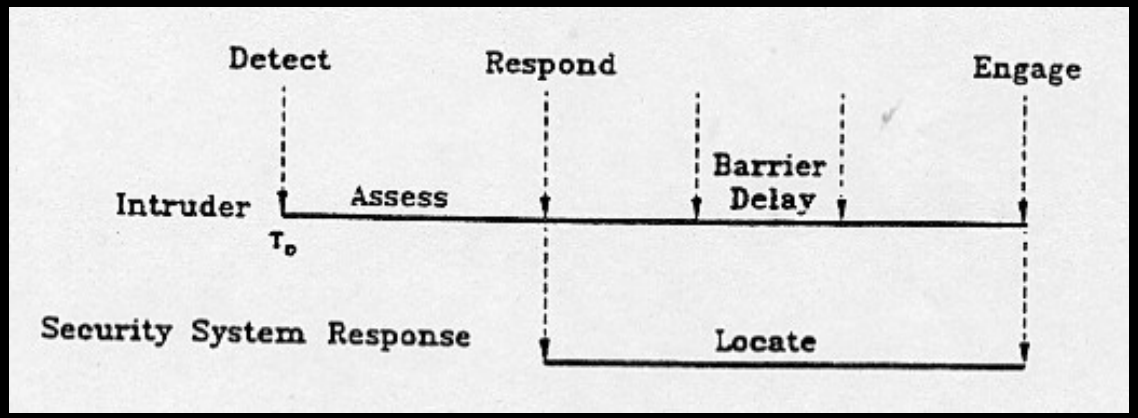
# Perimeter Security Objectives

1. Deter
2. Detect
3. Delay
4. Assess
5. Respond

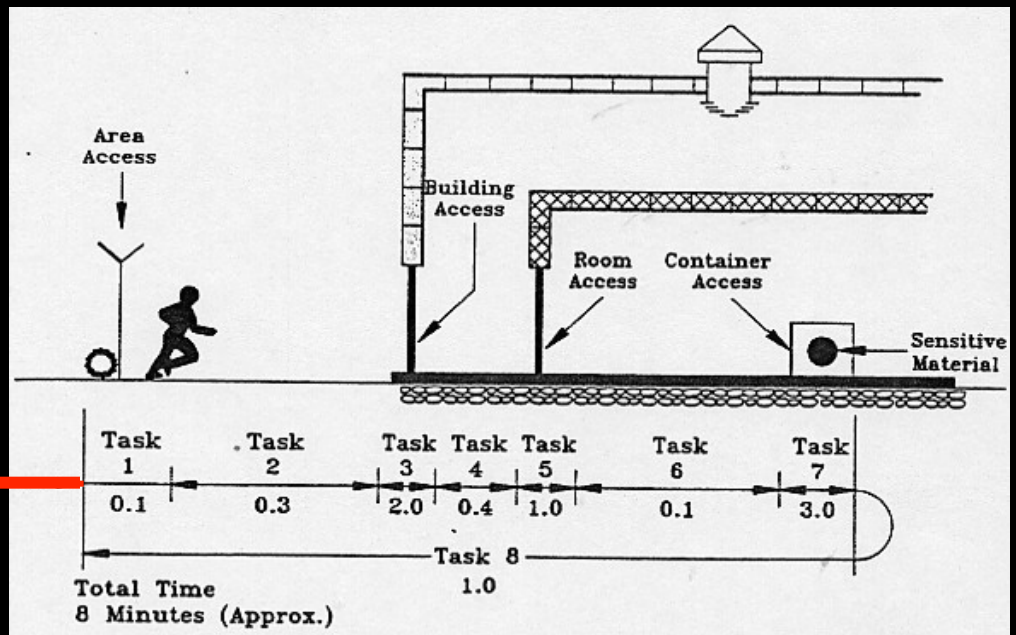



Source: MIL-HDBK-1013/1 (1993), Figure 5

# Intruder Timeline

- This illustration shows a example of an industrial type facility using conventional barriers. This scenario shows the relative time to ingress and egress location with the stolen material.
- Guards will not be available to interrupt the intruder unless systems correctly detect and the guards have time to respond.
- If intruder does not intend to leave scene, response time is halved.

$T_a$




| Time Estimate | | |
|---|---|---|
| Task | Mean Time (min) | Task Description |
| 1 | 0.1 | Climb over fence |
| 2 | 0.3 | Run 250 feet (76m) |
| 3 | 2.0 | Force door |
| 4 | 0.4 | Walk 150 feet (46m) |
| 5 | 1.0 | Force lock |
| 6 | 0.1 | Walk to container |
| 7 | 3.0 | Open container |
| 8 | 1.0 | Gather material and escape |
| 9 | 7.9 | Total (approx. 8 min) |

Source: MIL-HDBK-1013/1 (1993), Figure 7





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# CPTED Evolution

partial listing

21st Century Security and CPTED

Situational crime prevention studies

Tim Crowe (2000) Crime Prevention Through Environmental Design; 2nd Edition

SPARTA / HUD, CPTED and Situational Crime Prevention (1995, 1997, 1999)

Newman, (1996) Creating Defensible Space

The Delft Checklists (1994), Netherlands

Various NIJ Studies (1990s)

NCPI & Tim Crowe (1991) Crime Prevention Through Environmental Design

Various Home Office CPTED Studies (1980s)

Cornish & Clarke, (1986) Rational Choice Theory

Alice Coleman, (1985) Utopia on Trial

Paul and Patricia Brantingham, (1981) Environmental Criminology

William Brill, (1980) Comprehensive Security Program / HUD

Ronald V. Clarke, (1980) Situational Crime Prevention

Patricia Mayhew, (1979) Defensible Space

Westinghouse CPTED studies (1970s-80s)

Felson & Cohen, (1979) Routine Activities Theory

Barry Webb and Barry Poyner, (1978) Beyond Defensible Space

Oscar Newman (1975) Design Guidelines for Creating Defensible Space

**Oscar Newman (1972),** Defensible Space: Crime Prevention Through Urban Design

C. Ray Jeffrey (1971, 1977), Crime Prevention Through Environmental Design

Jane Jacobs (1961), The Death and Life of Great American Cities





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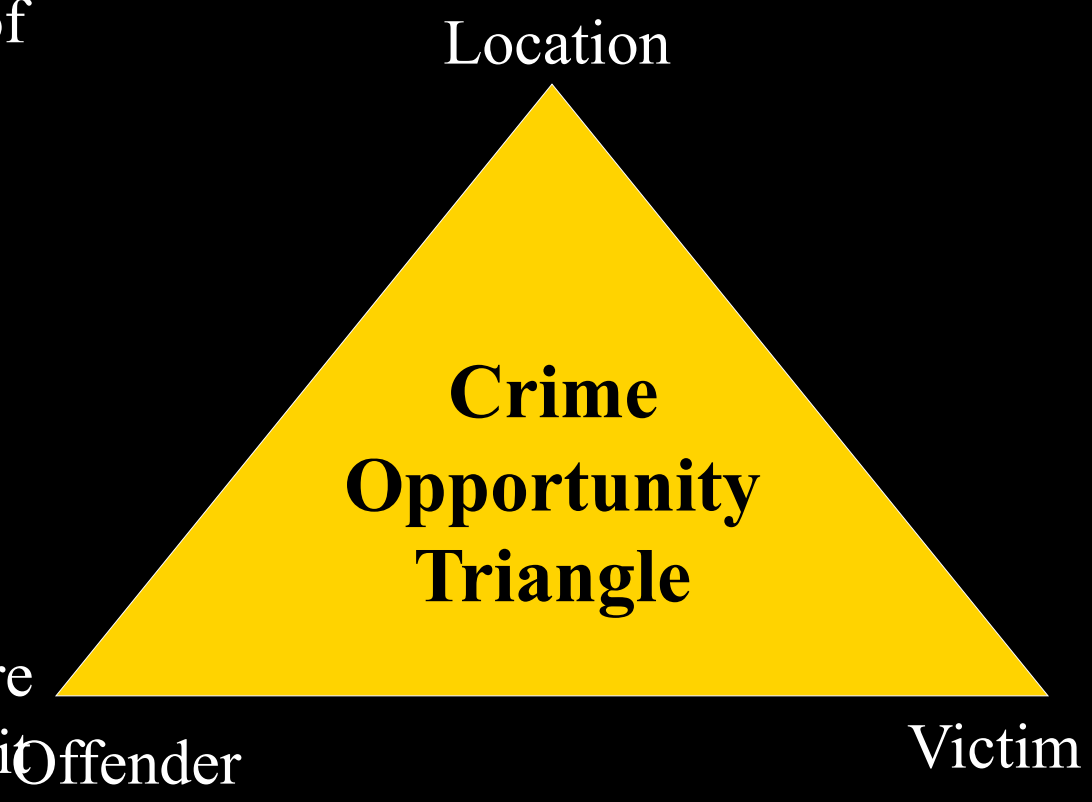
# Crime Opportunity Triangle

Crime opportunity occurs at the nexus of offender, victims, at specific locations.

Criminal offenders with motive, means, and intention to commit crime, provided situational crime opportunity, are most likely to commit crimes.



# Environmental Criminology

- "Individual criminal events must be understood as confluences of offenders, victims or criminal targets, and laws in a specific settings at particular times and places."

Brantingham and Brantingham, Environmental Criminology (1981)

# Targeting Offenders

- Targeting offenders is a specific deterrence (targeting individual offenders) and general deterrence (groups of individual offenders) strategy.
- 10% of offenders commit 60% of the crimes





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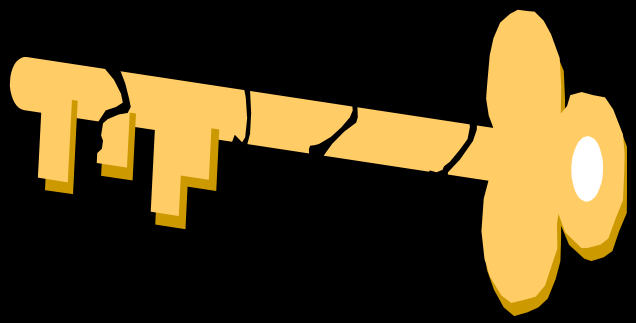
# Preventing Victimization

- Targeting victims is a tactic used to educate potential or profiled future victims on ways to avoid being a victim.

# Targeting Criminal Targets

- Targeting criminal targets means keying on specific crime targets making them less accessible, more secure, reducing their exposure, availability, or prevalence within a given area.

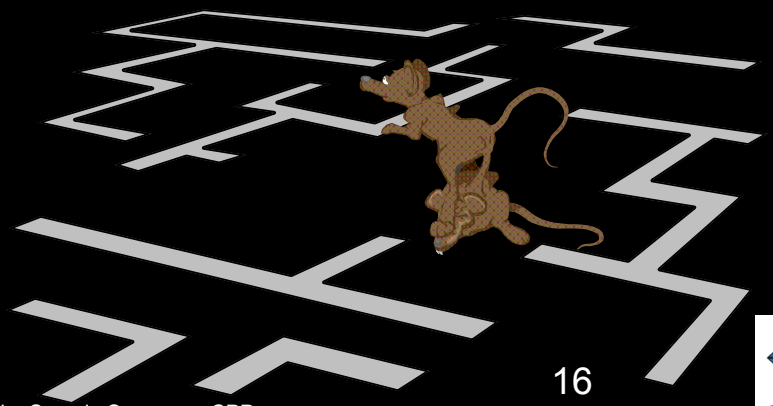


# Improving Laws

- Without good laws, enforcement, and adjudication managers are vulnerable to increased crime opportunity on their sites

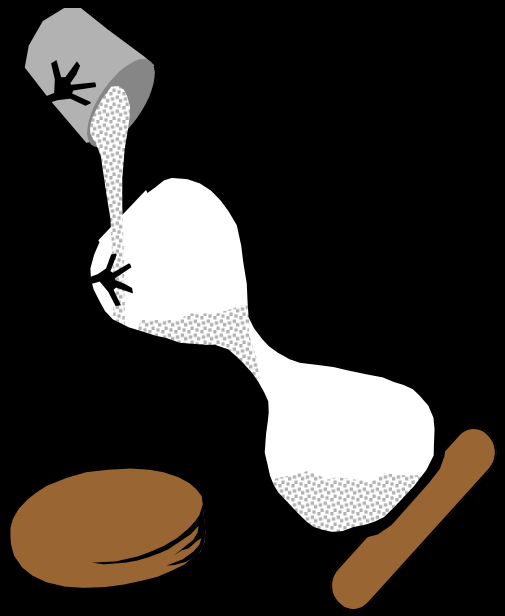
# Exploiting Settings

- Understanding crime settings are key to solving their occurrence. The setting of crime may be described as a stage play with actors, co-actors, key-grips, stage hands, sound technicians, ushers (flaggers), tellers, security, and props.



# Targeting Key Times of Crime Operations

- Crime is not a steady-state. Crimes occur in patterns consistent with human behavior. It is important to target the frequency, times, hours, days, weeks, months and seasons of criminal events.



# Targeting Key Places of Crime Operation

- Not all places are suitable for crime. 50% of crimes are committed at 10% of places. Identifying crime place seeking behaviors can lead to positive remedies to reducing crime opportunities at places.

# Routine Activity and Crime Opportunity Theory

- Crimes occurs most often where . . .
  - Absence of a capable guardian
  - Suitable crime targets
  - Likely offenders
  - Absence of intimate handlers





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# Situational Crime Prevention

- Increase the effort needed to commit crime
- Increase the risks associated with crime
- Reduce the rewards of crime
- Reduce provocations
- Removing excuses for non-performance





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# Situational Crime Prevention 25 Techniques

TWENTY FIVE TECHNIQUES OF SITUATIONAL PREVENTION

| Increase the Effort | Increase the Risks | Reduce the Rewards | Reduce Provocations | Remove Excuses |
|---|---|---|---|---|
| 1. **Target harden**<br>▪ Steering column locks and immobilisers<br>▪ Anti-robbery screens<br>▪ Tamper-proof packaging | 6. Extend guardianship<br>▪ Take routine precautions: go out in group at night, leave signs of occupancy, carry phone<br>▪ "Cocoon" neighborhood watch | 11. Conceal targets<br>▪ Off-street parking<br>▪ Gender-neutral phone directories<br>▪ Unmarked bullion trucks | 16. Reduce frustrations and stress<br>▪ Efficient queues and polite service<br>▪ Expanded seating<br>▪ Soothing music/muted lights | 21. Set rules<br>▪ Rental agreements<br>▪ Harassment codes<br>▪ Hotel registration |
| 2. Control access to facilities<br>▪ Entry phones<br>▪ Electronic card access<br>▪ Baggage screening | 7. Assist natural surveillance<br>▪ Improved street lighting<br>▪ Defensible space design<br>▪ Support whistleblowers | 12. Remove targets<br>▪ Removable car radio<br>▪ Women's refuges<br>▪ Pre-paid cards for pay phones | 17. Avoid disputes<br>▪ Separate enclosures for rival soccer fans<br>▪ Reduce crowding in pubs<br>▪ Fixed cab fares | 22. Post instructions<br>▪ "No Parking"<br>▪ "Private Property"<br>▪ "Extinguish camp fires" |
| 3. Screen exits<br>▪ Ticket needed for exit<br>▪ Export documents<br>▪ Electronic merchandise tags | 8. Reduce anonymity<br>▪ Taxi driver IDs<br>▪ "How's my driving?" decals<br>▪ School uniforms | 13. Identify property<br>▪ Property marking<br>▪ Vehicle licensing and parts marking<br>▪ Cattle branding | 18. Reduce emotional arousal<br>▪ Controls on violent pornography<br>▪ Enforce good behavior on soccer field<br>▪ Prohibit racial slurs | 23. Alert conscience<br>▪ Roadside speed display boards<br>▪ Signatures for customs declarations<br>▪ "Shoplifting is stealing" |
| 4. Deflect offenders<br>▪ Street closures<br>▪ Separate bathrooms for women<br>▪ Disperse pubs | 9. Utilize place managers<br>▪ CCTV for double-deck buses<br>▪ Two clerks for convenience stores<br>▪ Reward vigilance | 14. Disrupt markets<br>▪ Monitor pawn shops<br>▪ Controls on classified ads.<br>▪ License street vendors | 19. Neutralize peer pressure<br>▪ "Idiots drink and drive"<br>▪ "It's OK to say No"<br>▪ Disperse troublemakers at school | 24. Assist compliance<br>▪ Easy library checkout<br>▪ Public lavatories<br>▪ Litter bins |
| 5. Control tools/ weapons<br>▪ "Smart" guns<br>▪ Disabling stolen cell phones<br>▪ Restrict spray paint sales to juveniles | 10. Strengthen formal surveillance<br>▪ Red light cameras<br>▪ Burglar alarms<br>▪ Security guards | 15. Deny benefits<br>▪ Ink merchandise tags<br>▪ Graffiti cleaning<br>▪ Speed humps | 20. Discourage imitation<br>▪ Rapid repair of vandalism<br>▪ V-chips in TVs<br>▪ Censor details of modus operandi | 25. Control drugs and alcohol<br>▪ Breathalyzers in pubs<br>▪ Server intervention<br>▪ Alcohol-free events |

http://www.popcenter.org/25techniques/





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# Surveillance and Visibility

- Natural (passive) surveillance
- Informal surveillance
- Formal surveillance
- Mechanical surveillance
- Visibility and Field of View

# Territoriality and Defensible Space

- Perceptions of place management and place definition
  - Residents and Leaseholders
  - Legal Guardians and Place Managers
  - Space delineation (public, semi-public, semi-private, private)
  - Size, location, zoning, and use

# Target Hardening

- Strengthening barriers and boundaries
- Depth of defense and degrees of security Symbolic barriers
- Physical barriers
- Electronic barriers

# Access Control and Escape Routes

- Access to transportation and through-routes
- Access to open boundaries or barrier-free borders
- Vacant uncontrolled land
- Removing “hard corners” to reduce natural hiding places

# Image, Aesthetics, and Activity Support

- Focus on “Broken Windows”, litter, garbage, abandoned property
- Rapidly secure vacant units and unoccupied buildings to deny space for unmonitored activities
- Use curb appeal and grooming to reinforce perceptions of place management and territoriality
- Reinforce territoriality through increased controlled presence at target locations (e.g., substation, maintenance, etc.)





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# 1. Natural Surveillance

- CPTED focuses on the placement of physical features, activities, and people in such way as to maximize visibility. This includes the lighting of public spaces and walkways at night.

# 2. Natural Access Control

- CPTED features the physical guidance of people coming and going from a space by the judicial placement of entrances, exits, fencing, landscaping, and lighting.

# 3. Territorial Reinforcement

- CPTED encourages the use of physical attributes that express ownership, such as fences, pavement treatment, art, signage, and landscaping.

# 4. Image and Maintenance

- CPTED allows for the continued use of a space for its intended purpose and serves as an additional expression of ownership. CPTED is concerned with image, reputation, and stigma. CPTED is concerned with vigilant management practices that reduce crime opportunity and sustain territoriality, access control, and surveillance.

# 5. Locational and Place Considerations

- Crimes occur at specific locations and places. CPTED is concerned with the environmental settings of crime and how crime is influenced by the proximity and juxtaposition of safe and unsafe activities. Modern CPTED must consider environmental criminological issues that impact crime opportunity at specific places.





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# The Three Ds of CPTED

- The Three-D approach provides a simple guide for determining the appropriateness of space design and usage. It is based on the following 3 Ds:
  - **Definition**
  - **Design**
  - **Designation**





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# Space Definition

- How is the space defined?
- Is it clear who owns and manages it?
- Where are its natural borders?
- Are there social or cultural definitions that effect how the space is used?
- Are there symbolic signs?
- Is there a conflict or confusion between the designated purpose and definition?





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# Space Design

- Is there "depth of defense" separating the four types of spaces (public, semi-public, semi-private, and private)?
- How well does the physical design support the intended function?
- How well does the physical design support the definition of the desired or accepted behaviors?
- Does the physical design conflict with the productive use of space?

# Space Designation (P-SP-SP-P)

- Private space
- Semi-private space
- Semi-public space
- Public space

Illustration adapted from Poyner and Webb, (1991) Crime Free Housing





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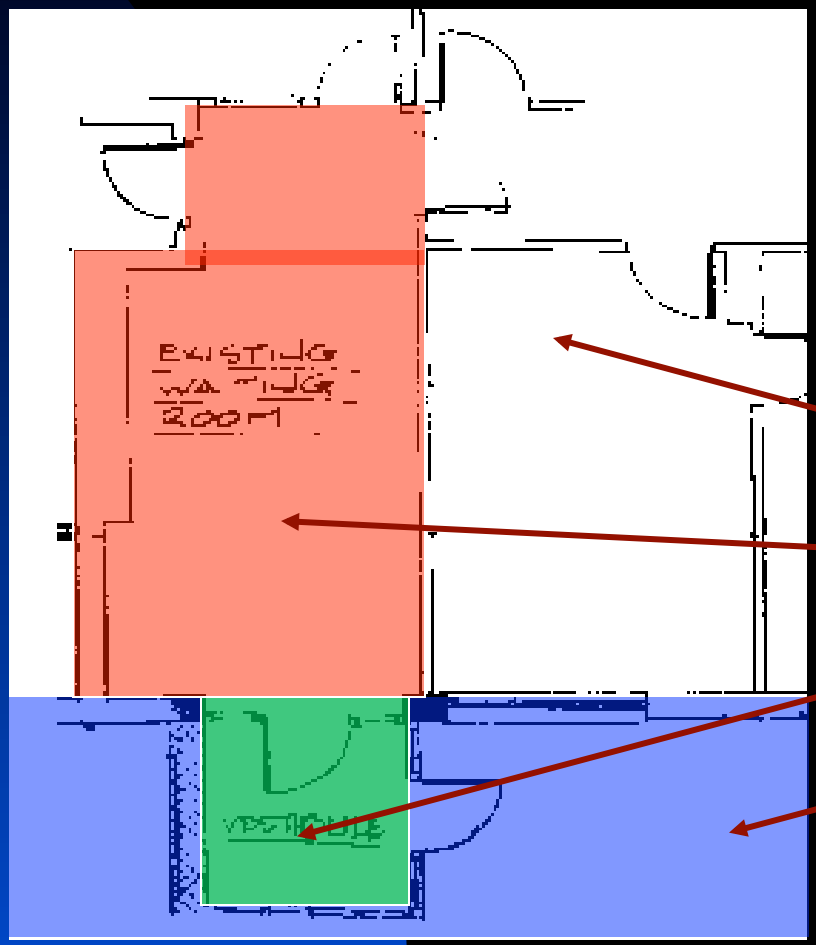
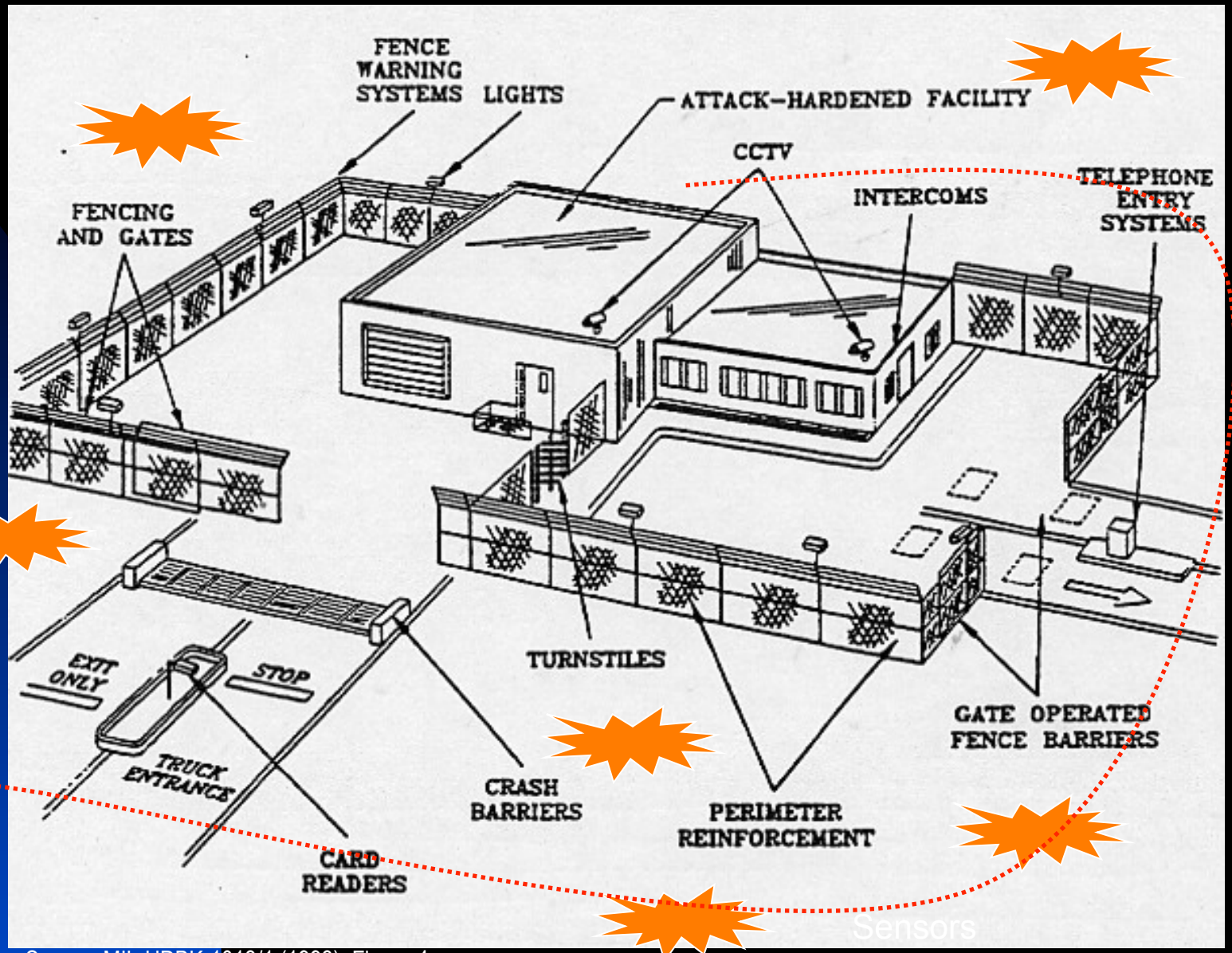
# Space Designation (P-SP-SP-P)




- Private space
- Semi-private space
- Semi-public space
- Public space

# Perimeter Security Through Integrated Security Systems




Source: MIL-HDBK-1013/1 (1993), Figure 4

What are the CPTED elements in this layout?





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# Simple Strategies

- http://transweb.sjsu.edu/mtiportal/research/publications/documents/04-05/MTI_04-03_Secure_Transi_Systems.htm

**TABLE 18: CPTED STRATEGIES FOR SYSTEM COMPONENTS**

| CPTED Strategy | System Component | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Platforms | Entrances & Exits | Gates | Elevators | Escalators | Restrooms | Pathways | Parking Lots | Trash Cans | Vending Machines | Vehicles |
| Lighting | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| Visibility (clear lines of sight) | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| Use of Glass & Natural Light | | ✓ | | ✓ | | | | | | | |
| Keep Clear of Obstacles | ✓ | | | | | | ✓ | | | | |
| No Hidden Corners/Dead Areas | ✓ | ✓ | | | | | | | | | |
| Limit Access Paths/Points | ✓ | ✓ | | | | | ✓ | ✓ | | | |
| Electronic Access Control | | ✓ | ✓ | | | | | | | | |
| Security Cameras | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Emergency Telephones | | | | ✓ | | | ✓ | ✓ | | | |
| Emergency Alarms | | | | | | | | | | ✓ | ✓ |
| Monitoring by Staff/Security | | | ✓ | | ✓ | ✓ | | ✓ | | | |
| Curved Entrance Wall without Doors | | | | | | ✓ | | | | | |
| Explosive Resistant | | | | | | | | | ✓ | | |
| See-through Containers | | | | | | | | | ✓ | | |
| Location* | | | ✓ | | | | | | ✓ | ✓ | |
| Minimal/Low Landscaping | | | | | | | ✓ | ✓ | | | |
| Fencing | | | | | | | | ✓ | | | |
| Public Information Signage | | | ✓ | | | | | | | | ✓ |
| Large Windows | | | | | | | | | | | ✓ |
| Secure Parking | | | | | | | | | | | ✓ |
| Vandal- and Graffiti-Proof | | | | | | | | | | | ✓ |

* Configure location of gates to be able to close off sections of station. Locate vending machines





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# Office Park Scenario #1 – Apply CPTED Measures

Image: http://www.liebrecht-wood.com

Use CPTED principles to define space to reduce crime and risk loss event opportunity





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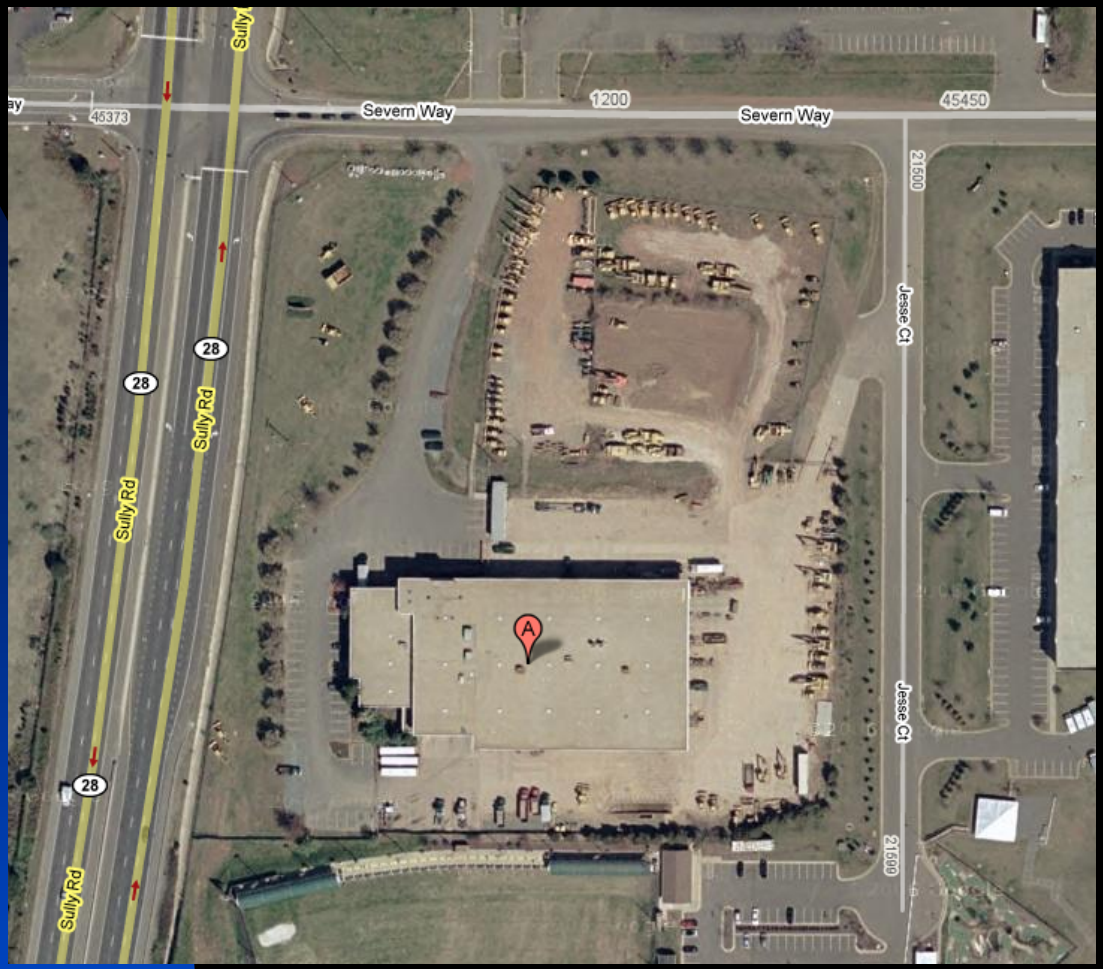
# Flex Space Scenario #2 – Apply CPTED Measures




Use CPTED principles to define space to reduce crime and risk loss event opportunity

# Port Scenario #3 – Small Vessel Marina Apply CPTED Measures

Harbor Hill Marina

Use CPTED principles to define space to reduce crime and risk loss event opportunity





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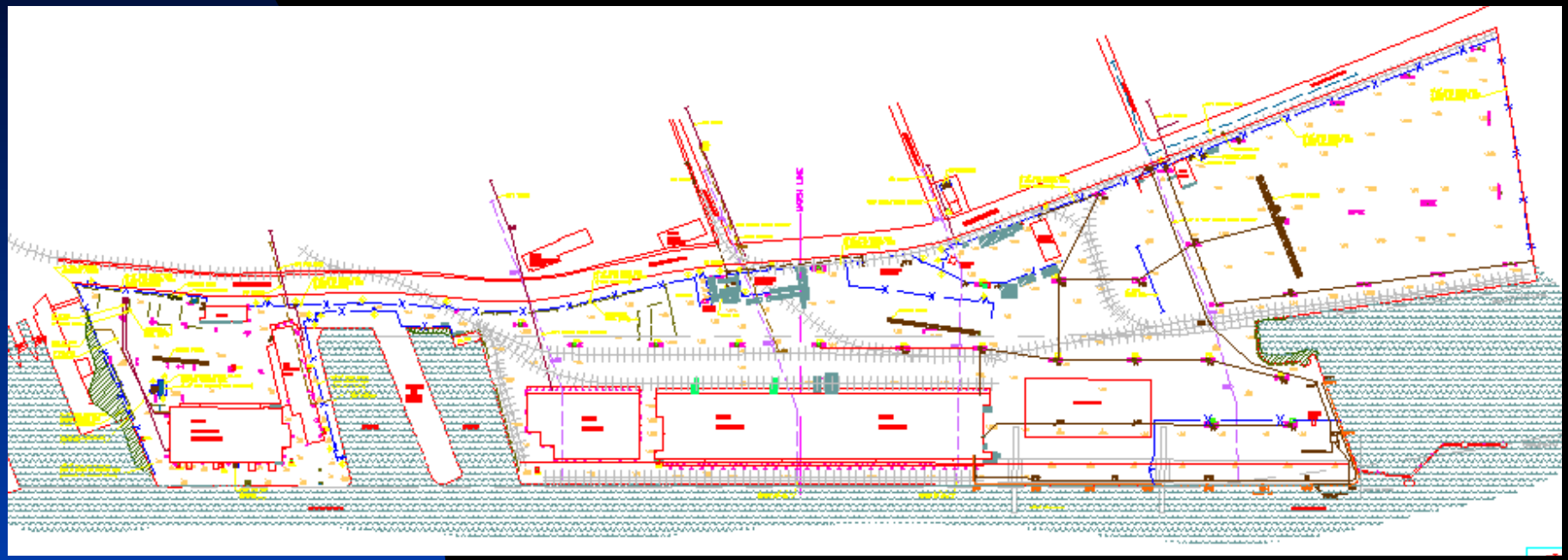
# Scenario #4–Shipyard with Distributed Machines Apply CPTED Principles



Use CPTED principles to define space to reduce crime and risk loss event opportunity





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# Stadium Scenario #5 – Apply CPTED Measures


FAU Stadium

Use CPTED principles to define space to reduce crime and risk loss event opportunity





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# Primary components of perimeter protection

- Forward Detection
  - Sensors
  - Activity Support
- Perimeter Grounds Security
  - Perimeter activity monitoring and event detection
  - Architectural Landscaping
  - Parking and pathways
  - Closed-circuit television monitoring
  - Security lighting
  - Fencing and physical barriers
  - Network Security (IT infrastructure)
  - Enforcement
- Entry security
  - Receiving and shipping
  - Entrances and exits
  - Access control

*Illustration courtesy of Vision Fire & Security*

The Future: Integrated Systems with Remote Video Surveillance and Intelligent Monitoring





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# Needed Scientific Testing and Standardization of CPTED

- Before CPTED can become an accepted Science, an objective methodology and framework for analysis and evaluation must be developed (e.g., theory, instruments, measurable features, tools, etc.).
- Standardizing CPTED will enable "ordinary people" to perform extraordinary things (SOPs, Protocols, specifications, etc.).
- CPTED prescriptions must use of appropriate and sustainable strategies. Scientific methods should target measurable, verifiable, and reproducible interventions and related outcomes.





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# What is Science as it applies to CPTED?

- A common misperception of science is that it defines "truth". Science is not truth, but rather it is a way of testing thought through conjecture and refutation. It is a process by which experimentation is used to answer questions. This process of experimentation is called the scientific method and involves:
  - **Observation**
  - **Hypothesis**
  - **Testing**
  - **Reproducibility**

Adapted from Anthony Carpi, http://andrew.ac1.jjay.cuny.edu/~science/faculty/carpi/home.htm





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# Standards

Sample Physical Security Standards

Protection of Assets Manual
[FAA Order 1600.54B, The FAA Automated Information Systems Security Handbook]
[DOD 5200.28-STD, DOD Trusted Computer System Evaluation Criteria]
[NCSC-TG-001, A Guide to Understanding Audit in Trusted Systems, 1988]
[FM19-30, Physical Security Handbook]
[FAA 1600.6C, Physical Security Management Program ]
[FAA 1600.46, Physical Security Review of New Facilities, Office Space or Operating Areas]
[FAA 1600.54B, Automated Information Systems Security Handbook]; IESNA Security Lighting Standard;
[OMB Circular A-130, Security of Federal Automated Information Systems, Appendix III]
[DOD 5200.28M, ADP Security Manual, 1973]
[FAA Order 1600.54B, The FAA Automated Information Systems security Handbook, 1987]
[FAA NAS OSI Security Requirements Analysis, April 1994] ; AR 190-16 Physical Security
[FAA-STD-045, US Department of Transportation, FAA Standard (NAS) Open System Interconnection Security Architecture, Draft]
[DOTH 1350-250, Information Systems Security Guide]
[OMB Circular A-130, Security of Federal Automated Information systems, Appendix III] .
[FAA-STD-045, NAS OSI Security Standard]
[DOTH 1350-250, Information Systems Security Guide
[FIPS PUB-102, Information Systems Security Guide]
Etc.Etc.Etc. . . .

- Seek out and be current on security standards.
- CPTED Standards should be guided by current practice, standards, and theory. Continual scanning is required to keep current with the latest specifications.
- Security standards are created and maintained by multiple sources that include: standards setting bodies (ISO), governments, NGOs, trade associations, and industry leaders (Protection of Assets Manual), etc.





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# Codes

- National Building Code (BOCA)
- Uniform Building Code (UBC)
- Fire Codes
- Electrical Code
- NFPA standards
- Americans with Disabilities Act (ADA)
- GSA anti-terrorism security standards
- Underwriters Laboratory Certifications
- Local Zoning Codes
- Other codes (ASTM, ANSI, etc.)

# Sikyur Crime Opportunity Risk Likelihood Coefficient Matrix

| | Crime Coefficient* | Target Area #1 | Target Area #2 | Target Area #3 |
|---|---|---|---|---|
| Government Building: Court house | .011 | | | |
| Public Park: Ball fields and pond | .016 | | | |
| Public School; middle school, 3500 students | .027 | | | |
| Multi-Family Housing; 500 units | .029 | | | |
| Laundry Mat; 40 machines | .036 | | | |
| Convenience Store | .034 | | | |
| Vacant Dwellings: per dwelling, etc. | .021 | | | |
| Subtotal Crime Opportunity Score | | | | |

* Illustration data only; actual data to be drawn from local criminalistics.





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# Typical CPTED Data Collection Assessment Tools

- Interviews
- Focus Groups
- Overviews
- Drug and crime situation assessment
- Surveys
- Demographic data
- Vandalism and property damage data
- Program site visits
- Land use data
- Walk-through and ride-along with police
- Historical data gatherings
- Internal and external public safety and security efficacy data
- Review former evaluations, if any
- Uncover property utilization data
- Street ethnographic (discrete surveillance) methods
- Other research methods





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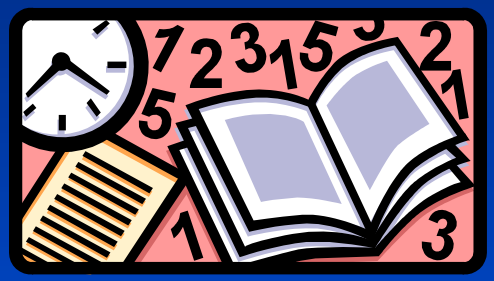
# CPTED Assessment Report Outline

- Executive Summary
- Research Methods
- Applicable Codes and Standards
- Threats and Vulnerabilities
- Findings
- Recommendations
- Strategic Plan
- Budget Plan
- Evaluation Plan
- Supporting charts, graphs, and data



# Next Steps

- Keep current on place-specific CPTED methodology and framework for analysis and evaluation must be developed (e.g., theory, instruments, measurable features, tools, etc.).
- Standardize your security procedures to enable "ordinary people" to perform extraordinary things (SOPs, Protocols, specifications, etc.).
- Focus on implementing measures that can be scientifically validated and choose methods to measure, verify, and reproduce interventions and related outcomes.
- Share findings so that the we can all benefit from your experience and learning.
- Establish written standards that are reviewed and recommended by IADB.





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# For more information on CPTED contact:

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