Crime Prevention Through Environmental Design

CPTED

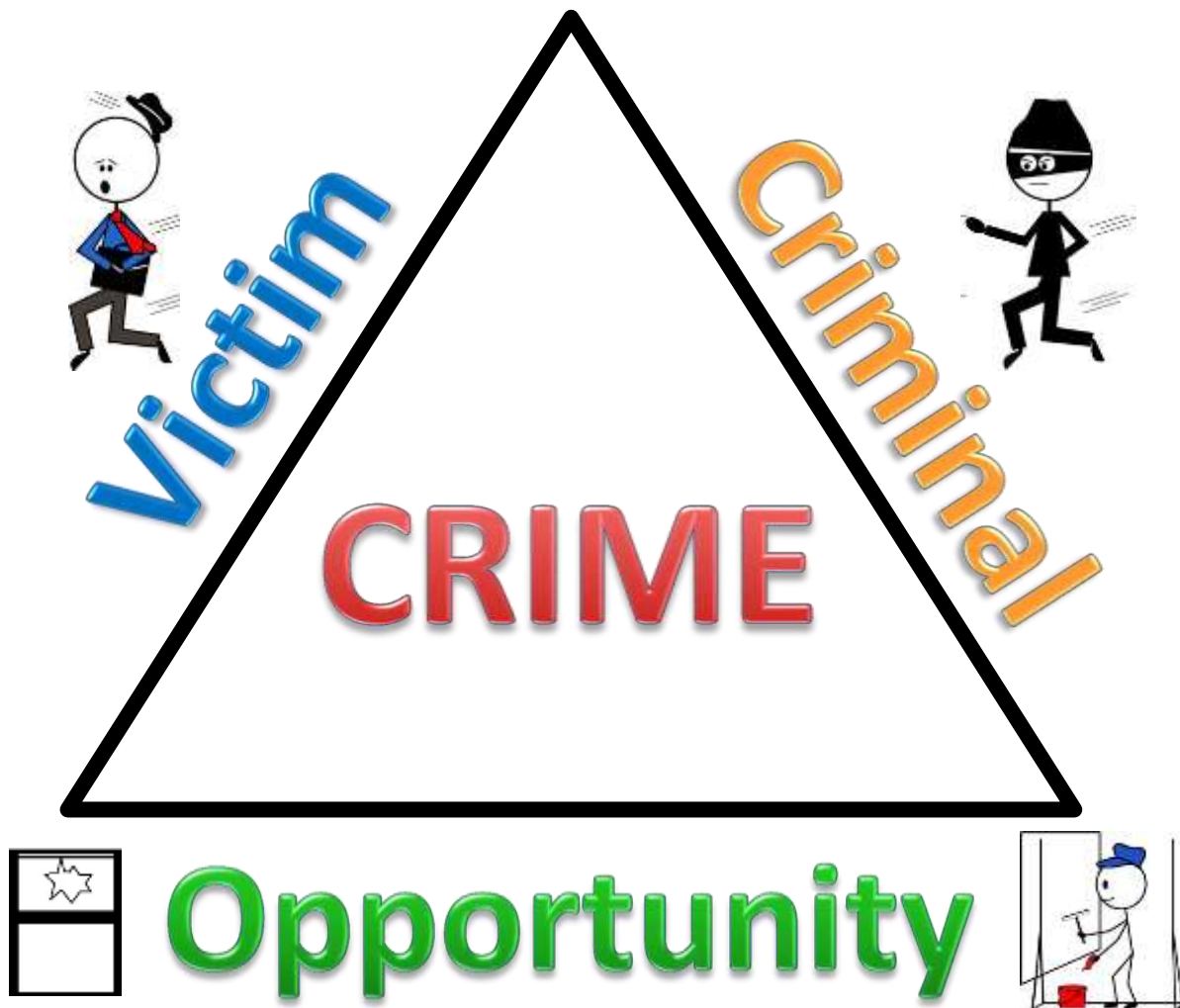- OPPORTUNITY TO REDUCE CRIME
- REDUCE CITIZENS' FEAR OF CRIME
- ENCOURAGE SOCIAL INTERACTION
- ADDRESS QUALITY OF LIFE CONCERNS

Contents

Purpose

The goal of the CPTED requirements in the city of Las Vegas CPTED Program is to reduce *opportunities* for crimes that are inherent in the design of structures, landscape, and/or in the design of the community/neighborhood.

Disclaimer: CPTED principles and strategies are suggested for the purpose of reducing criminal activity on your property. It does not in any way predict or prevent all crime risks.

Introduction

The theory and guidelines of Crime Prevention Through Environmental Design (CPTED), pronounced 'sep-ted', were first created in the 1960s; and like everything else, it evolved into what it is today. CPTED is a well-established and well-researched field of crime prevention utilized internationally. It has proven methods that increase the responsible, positive use of property while decreasing the likelihood of criminal behavior.

'"Crime Prevention Through Environmental Design" (CPTED) is a pro-active crime prevention philosophy based on the theory that proper design and effective use of the built environment can lead to a reduction in crime and the fear of crime, as well as an improvement in the quality of life for the community, and that it aims to reduce or even remove the opportunity for crime to occur in an environment and promote positive interaction with the space by legitimate users;'

The responsibility for reducing crime and the fear of crime should be shared between the police, local governments, local businesses, the voluntary sector, and the local community. This training document is provided on CPTED principles to everyone involved in the urban planning process to ensure that all participants are aware of their roles and responsibilities in relation to preventing crime and reducing feelings of insecurity within the community.'

At its core, CPTED addresses 'target hardening'. Sometimes a citizen cannot remove a target. However, you can harden the target. Target hardening involves the use of locks, electronic devices, or other hardware that will **detect, deny, delay and deter** the criminal away from the intended target.

- **Detect** – By utilizing good security techniques, you can cause the offender to make noise, which will increase the risk of detection, which may persuade them from not committing the crime.
- **Deny** – By engraving valuables, using security electronic equipment (GPS enabled devices), increased surveillance, or by moving other valuables out of view.
- **Delay** – Many time crimes are committed because of an easy opportunity. By using good crime prevention techniques, you can increase the time and effort needed to commit the crime.
- **Deter** – By utilizing the previous three techniques, the citizen may prevent a crime by deterring the crime from the property to an easier target elsewhere.

The Five Principles of CPTED

1. Natural Surveillance

5. Maintenance

2. Natural Access Control

COMMUNITY

4. Activity Support

3. Territorial Reinforcement

It cannot be overemphasized that ALL of these principles applied equally will lend to the objectives of enhanced livability and greater natural safety of the community.
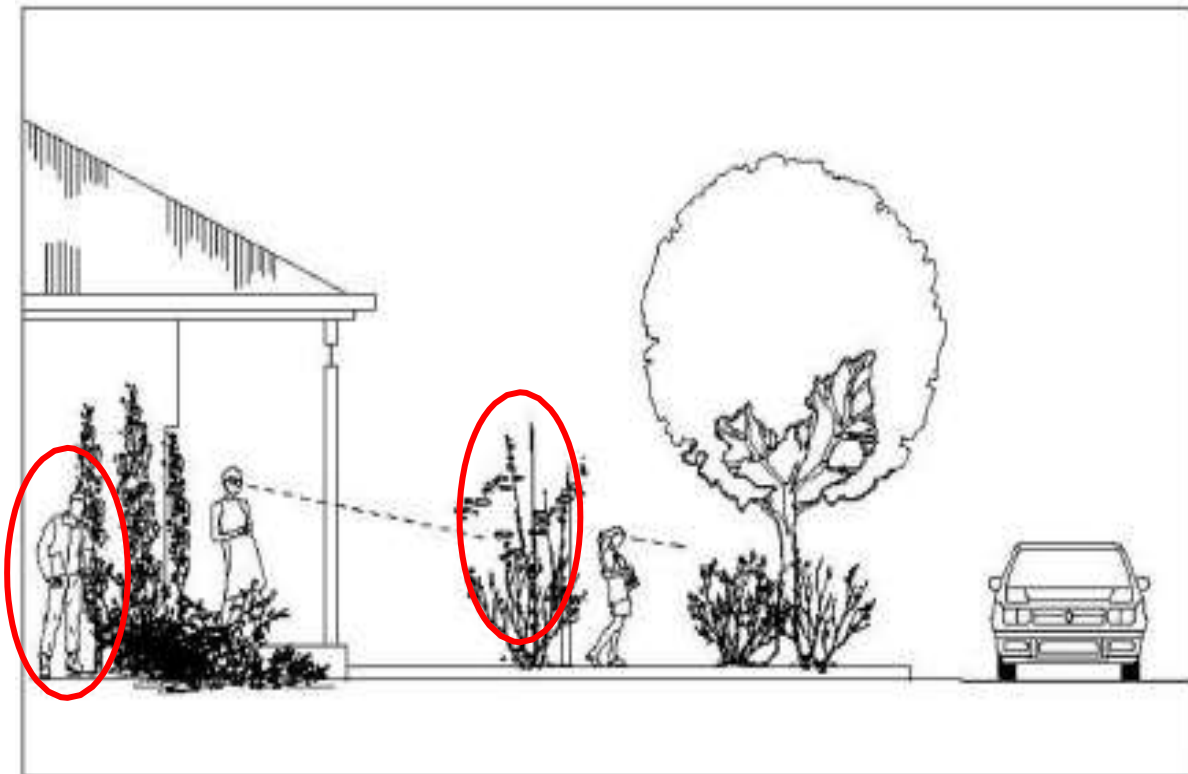
Natural Surveillance:

Natural Surveillance is the placement of physical features, activities and people in such a way as to maximize visibility of the community. *"To see and be seen."*

• Involves design and maintenance elements that ensure full opportunity for residents to engage in their normal behavior and activities to observe the space around them.

• Creates an opportunity for the owner/management team to minimize the opportunity for concealment or secrecy by a person intending to commit a criminal act.

• Increases visibility with landscaping in conjunction with proper lighting.

• Increases the chance of apprehension; therefore, reducing an opportunity for the criminal element

• This is achieved by:
  – appropriate and uniformed lighting
  – low or see-through fencing / shrubs
  – removal / redesign of areas that offer concealment
    ◦ blind corners
    ◦ shrubs / trees
    ◦ walls
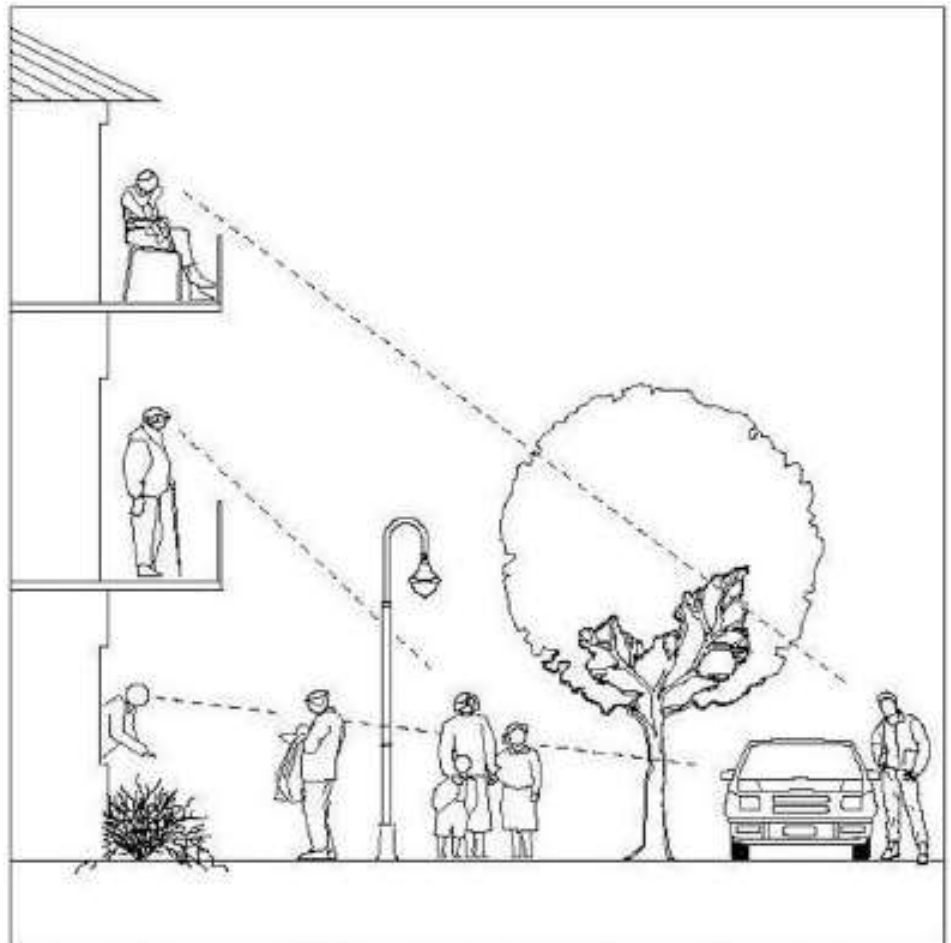
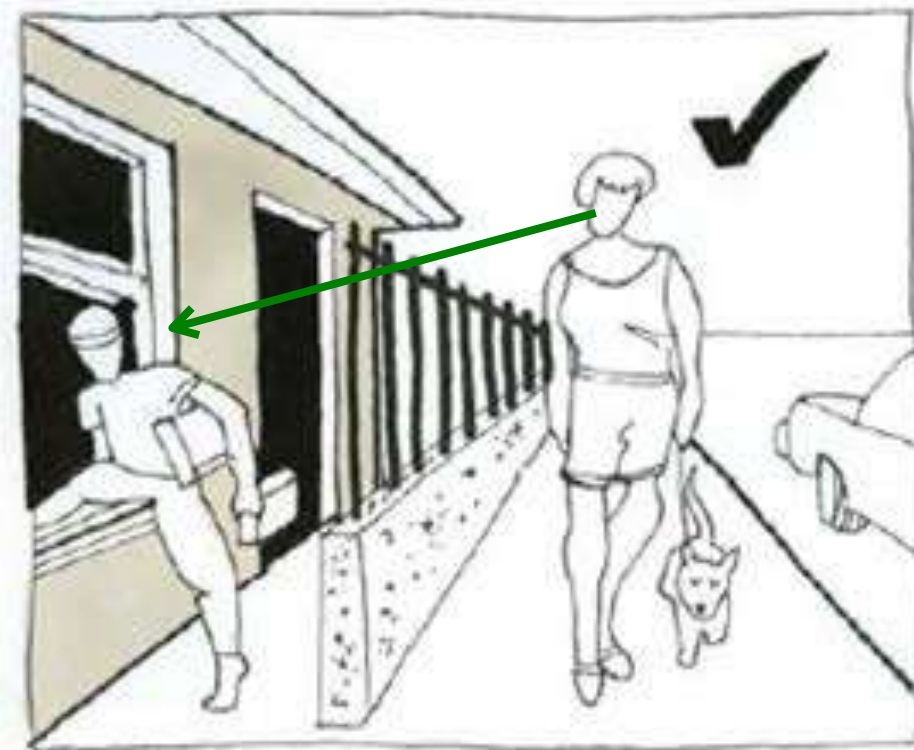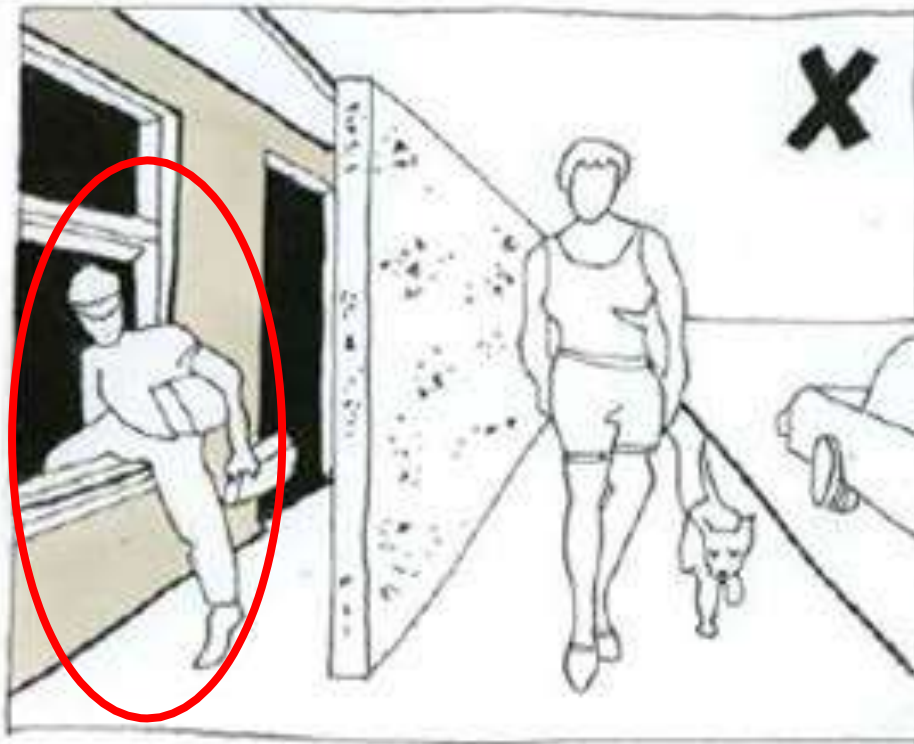# Examples of Natural Surveillance: "Eyes on Ground"

The criminal is hidden by tall foliage. Street view is obscured by tall foliage.
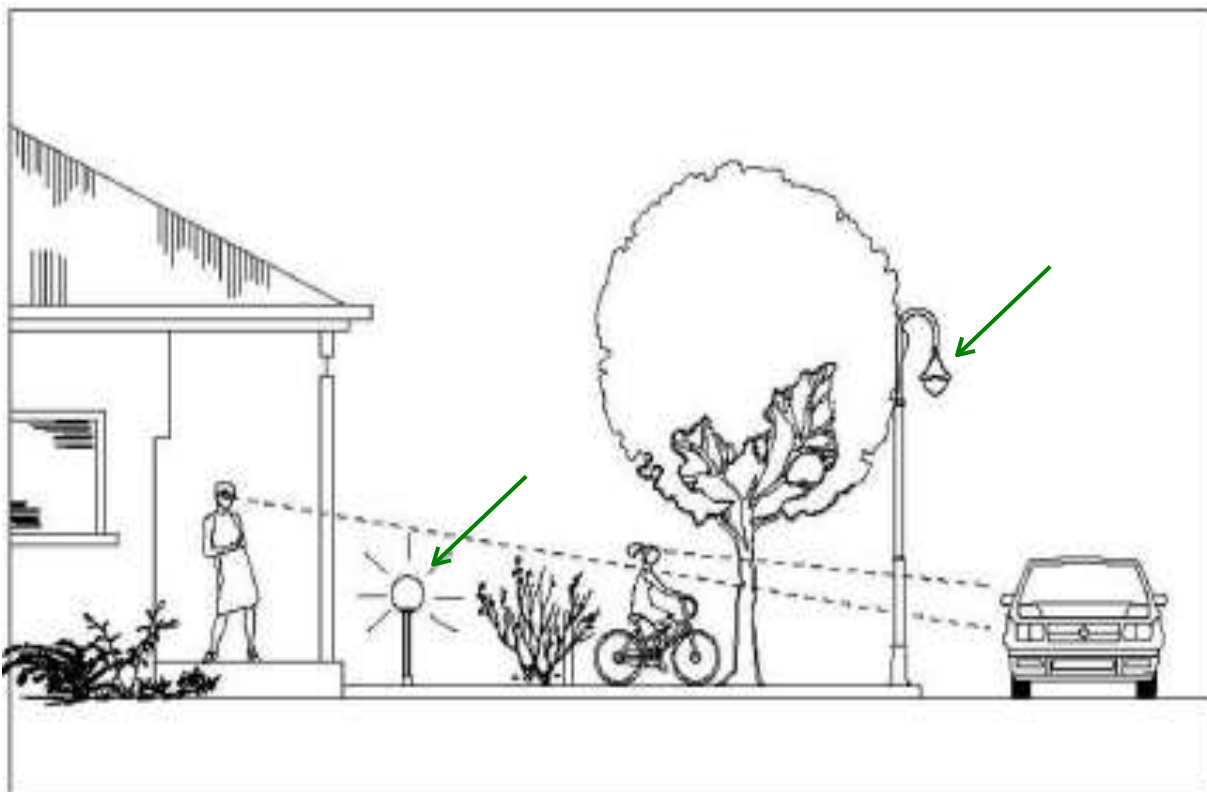
Clear line of sight from the porch and on to the street. Area is illuminated with proper heights and no obstructions.

Examples of Natural Surveillance: "Eyes on Ground"

Solid wall prevents visibility, but the see-through fence promotes Natural Surveillance.

Examples of Natural Surveillance: *"Eyes on Ground"*

Unable to see through the property: Blind spots behind the fence offering concealment to the criminal element.

Clear view through the property: Blind spots and concealment opportunities eliminated.

Examples of Natural Surveillance: *"Eyes on Ground"*

Overgrown vegetation prevents the ability to see in or out of the home and offers concealment for the criminal element.
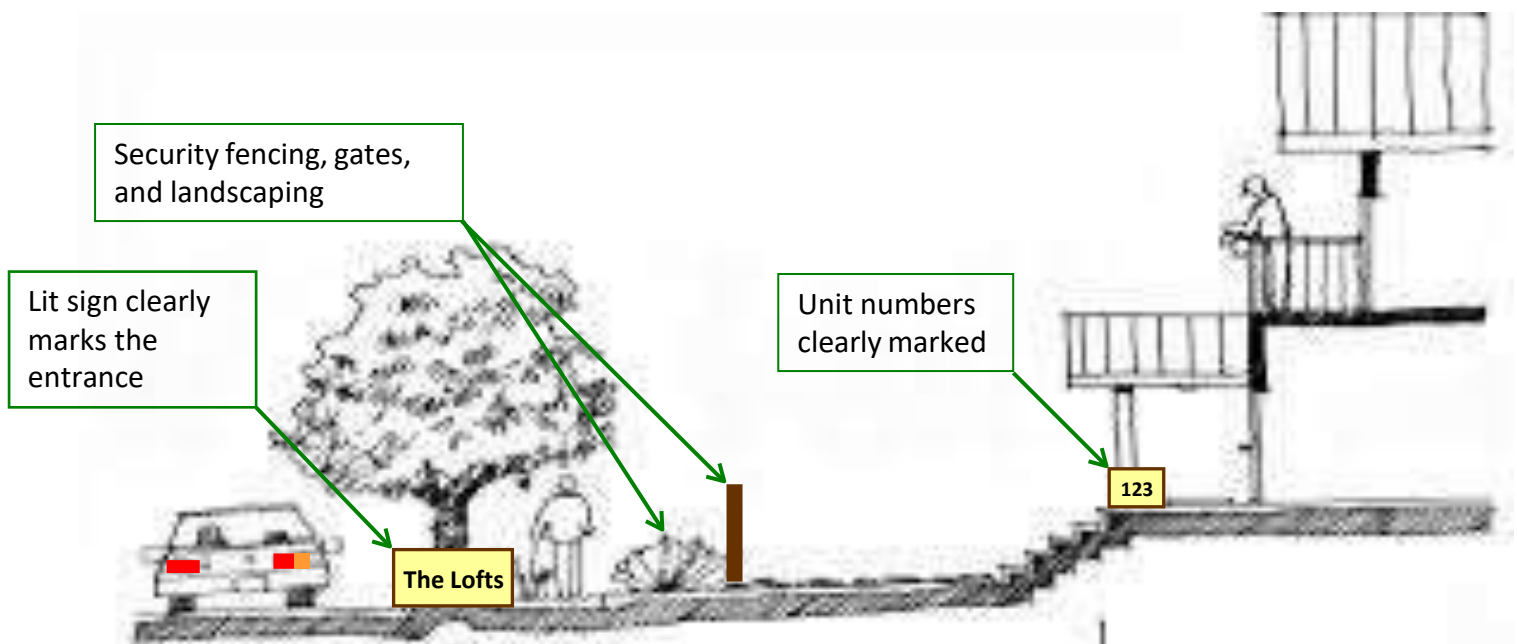

Trimmed and maintained vegetation offers curb appeal, clears visibility, and rids concealment opportunities for the criminal element.

Natural Access Control

Natural Access Control is the physical guidance of people coming and going from a space by the placement of entrances, exits, fencing, landscaping, and lighting.

- Clearly define entrances and exits
  - Minimize uncontrolled movement
  - Well lit for greater natural surveillance

- Security fencing, **gates, and hostile vegetation**
  - Decreases the criminal element's accessibility
  - Keeps people on the designated path

- Wayfinding throughout the community
  - Community directory
  - Marked community activity spaces, buildings, and units
  - Clearly identifiable walkways with direction

- Layers of security mechanisms
  - Primary locks on doors / windows
  - Secondary locks on door/window locks
  - Security system
  - Surveillance system

Security fencing, gates, and landscaping

Lit sign clearly marks the entrance

Unit numbers clearly marked

The Lofts

123

Territorial Reinforcement

Territorial Reinforcement creates a clear delineation of space and separates your space from non-legitimate users

- Accomplished with landscaping, hardscaping, fencing, signs, flags, artwork, and seating

- Expresses pride and ownership of your space

Owner/Management Teams are responsible for *Private*; *Semi-private;* and, <u>occasionally,</u> *Semi-public*.
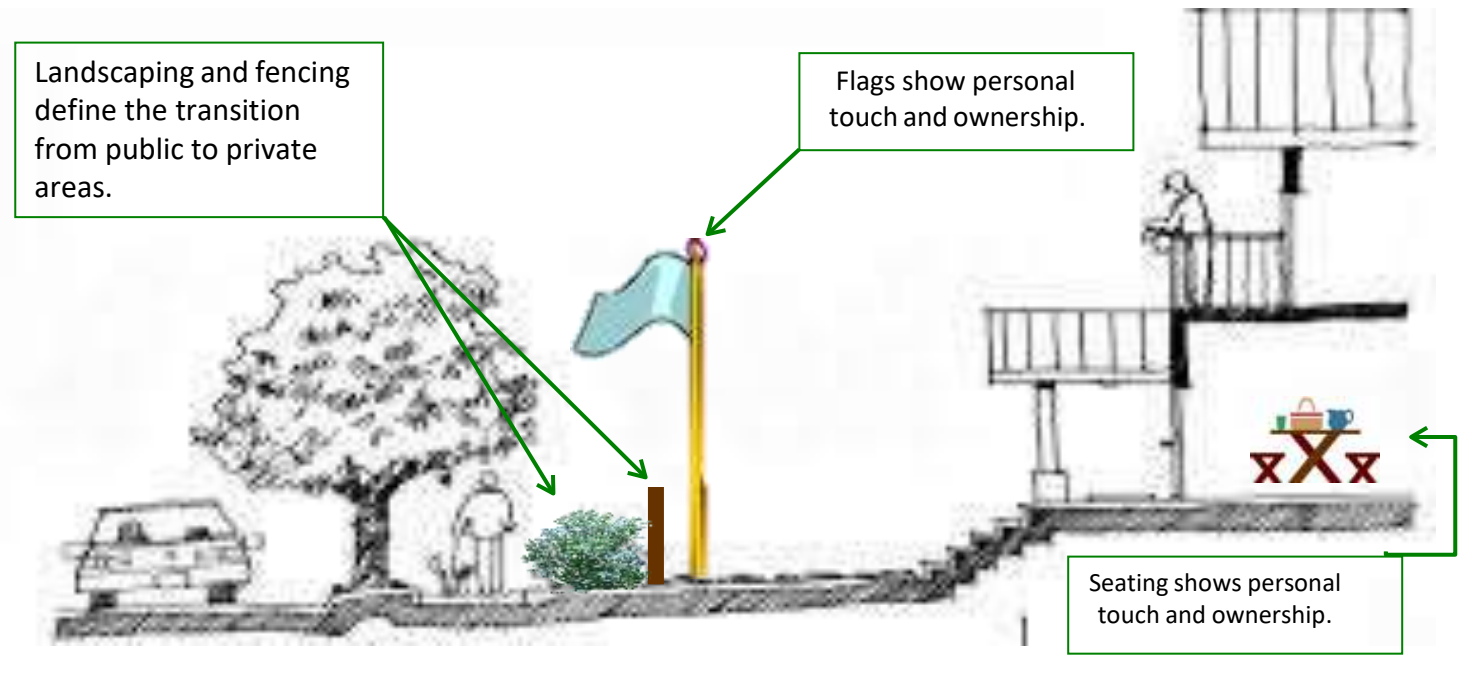

Public is the open thoroughfare for all to travel

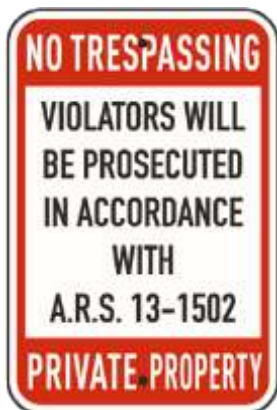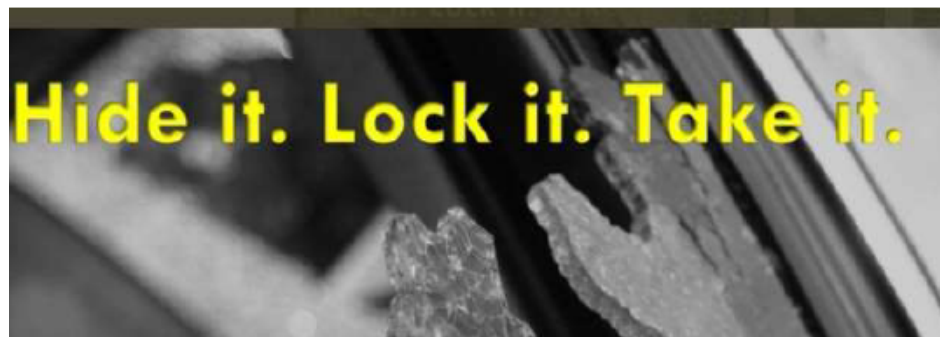*Semi-public* is the public pedestrian space

Semi-private is the front yard, sidewalk, and driveway leading to your home

Private is your porch/patio and home

Examples of Territorial Reinforcement

Landscaping and fencing define the transition from public to private areas.

Flags show personal touch and ownership.

Seating shows personal touch and ownership.

Examples of Territorial Reinforcement Signage

Hide it. Lock it. Take it.

NO TRESPASSING
VIOLATORS WILL BE PROSECUTED IN ACCORDANCE WITH A.R.S. 13-1502
PRIVATE PROPERTY

NO TRASPASAR
VIOLADORES SERAN CASTIGADOS POR LA LEY ASEGUN A.R.S. 13-1502
PROPIEDAD PRIVADA

WARNING
PREMISES PROTECTED BY 24 HOUR VIDEO SURVEILLANCE

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Activity Support

Activity Support encourages activity in a location so that individuals become a part of the natural surroundings, thus creating "natural surveillance."

- An active place that increases the use of the activity space, is enjoyed safely, and adds value to the space, while discouraging actions of non-legitimate users.

- This is accomplished with active and passive efforts.
  - Passive – design elements that make area appealing and safe , such as parks, pools, playground, community rooms
  - Active – scheduled events or steps taken to attract users to the area, such as picnics, community and sporting events, concerts, play groups

Parks and Playgrounds

Examples of Activity Support

This image depicts an area that was unutilized or under-utilized, but was repurposed into an active gathering place in the community, creating "Natural Surveillance."

Examples of Activity Support

This image depicts an area that was unutilized or under-utilized, but was repurposed into an active gathering place in the community, creating "Natural Surveillance."

Examples of Activity Support

The creation of community space provided an active gathering place in the community, creating "Natural Surveillance."

BEFORE

AFTER

Maintenance

Routine and preventative maintenance helps ensure CPTED elements serve their intended purpose.

- Allows for the continued use of a space for its intended purpose.

- Serves as an additional expression of territorial reinforcement.

- Demonstrates that someone cares and is watching over the property.
    - Neglected space often results in mistreatment by people
    - Willingness to call the police in the event of suspicious or criminal activity

Property Maintenance

Examples of Maintenance

- Keep apartments to code standards
- Repair any damaged property
- Remove graffiti
- Replace / upgrade lighting

- Keep trash dumpster areas clean
- Maintain landscaping
- Remove abandoned / illegal vehicles
- **Keep grounds** free of trash, debris, and hazards

When done on a regular and consistent basis, maintenance can prevent 'The Broken Window Theory' or perceived lack of concern from becoming a reality in your community.

The Broken Windows Theory

The broken windows theory is a criminological theory that states that visible signs of crime, anti-social behavior, and civil disorder create an urban environment that encourages further crime and disorder, including serious crimes. The theory suggests that policing methods that target minor crimes, such as vandalism, loitering, public drinking, jaywalking and fare evasion, help to create an atmosphere of order and lawfulness.

The theory was introduced in a 1982 article by social scientists James Q. Wilson and George L. Kelling.

In short, when we see things broken or dilapidated, it is perceived that no one cares or is looking after it with any sense of ownership; thus, it is okay to further cause damage or violate the area/community without repercussions. This theory is also applied to people. When a person appears "broken" (e.g. an addict, prostitute, homeless, etc.) it is believed no one cares about them, so they, too, are violated without trouble or repercussion. The criminal's thought is, "Who's going to stop me or report it?" Crime is more likely to occur in communities with *less care*, *less cleanliness*, and *less orderliness*.

The theory states that ___maintaining___ and ___monitoring___ environments to prevent small crimes such as graffiti, trespassing, disorderly behavior, criminal damage, theft, and public drinking helps to create an atmosphere of order and lawfulness, thereby preventing more serious crimes from happening.

Examples of Maintenance

Set and maintain living standards for the community

BEFORE

AFTER

Examples of Maintenance

Properly repair/replace damaged property

Damage this severe requires replacement of the door, _framing,_ and locks.

BEFORE

AFTER

Examples of Maintenance

Remove graffiti – Treat problem area(s) and surfaces with anti-graffiti paint or supplies; it ultimately reduces future costs and labor.

BEFORE

AFTER

Examples of Maintenance

Keep trash dumpster areas clean

Examples of Maintenance

Maintain Landscaping

The above picture depicts overgrown shrubs, creating a visual barrier and hiding places for the criminal element.

Following the 2'/6' Rule, the shrubs are trimmed low, the tree canopies are high, and the properties are clean throughout.

Examples of Maintenance

Remove abandoned, unregistered, and/or illegal vehicles

Examples of Maintenance

Enforce parking standards.

Confirm signage standards with the traffic and/or police departments.

Consider a parking standard that vehicles cannot be backed in, so all license plates are visible.

CPTED Program Suggestions

BASIC

- ❑ Landscaping (2'/6' Rule)

INTERMEDIATE

- ❑ Deadbolts with 1" inch throw
- ❑ 3" strike plate screws
- ❑ Window and sliding door locks

ADVANCED

- ❑ Uniform lighting (table)
- ❑ Solid core doors
- ❑ 180º eye viewer
- ❑ Legible apartment/building numbers
- ❑ Illuminated directory at entrance(s)

Appendix 1: Landscaping

Considerations when landscaping:

• What is the vegetation maturity and growth rate?

• How and what is its shape at full growth?

• Is it poisonous or dangerous to human or animal life?

• Will it interfere with established or future lighting?

• Will it interfere with lines of sight (natural surveillance)?

• Is it friendly to activity space?

• What kind of maintenance will it require?

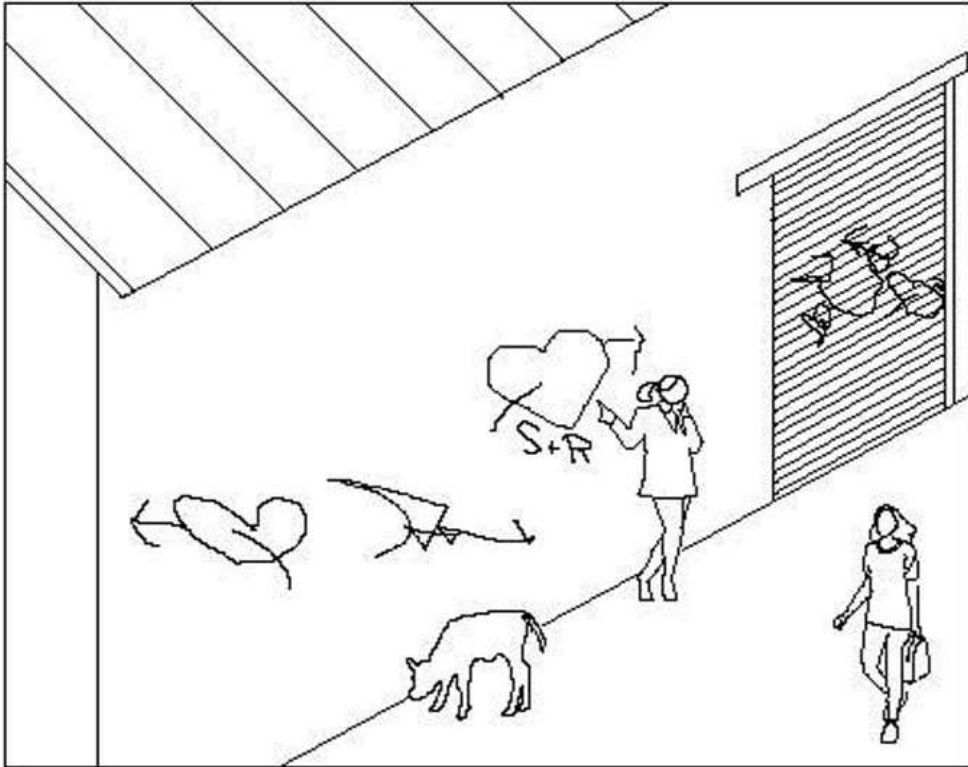• Does it litter?

Landscaping

Requirement for ALL levels is the 2ft/6ft Rule:
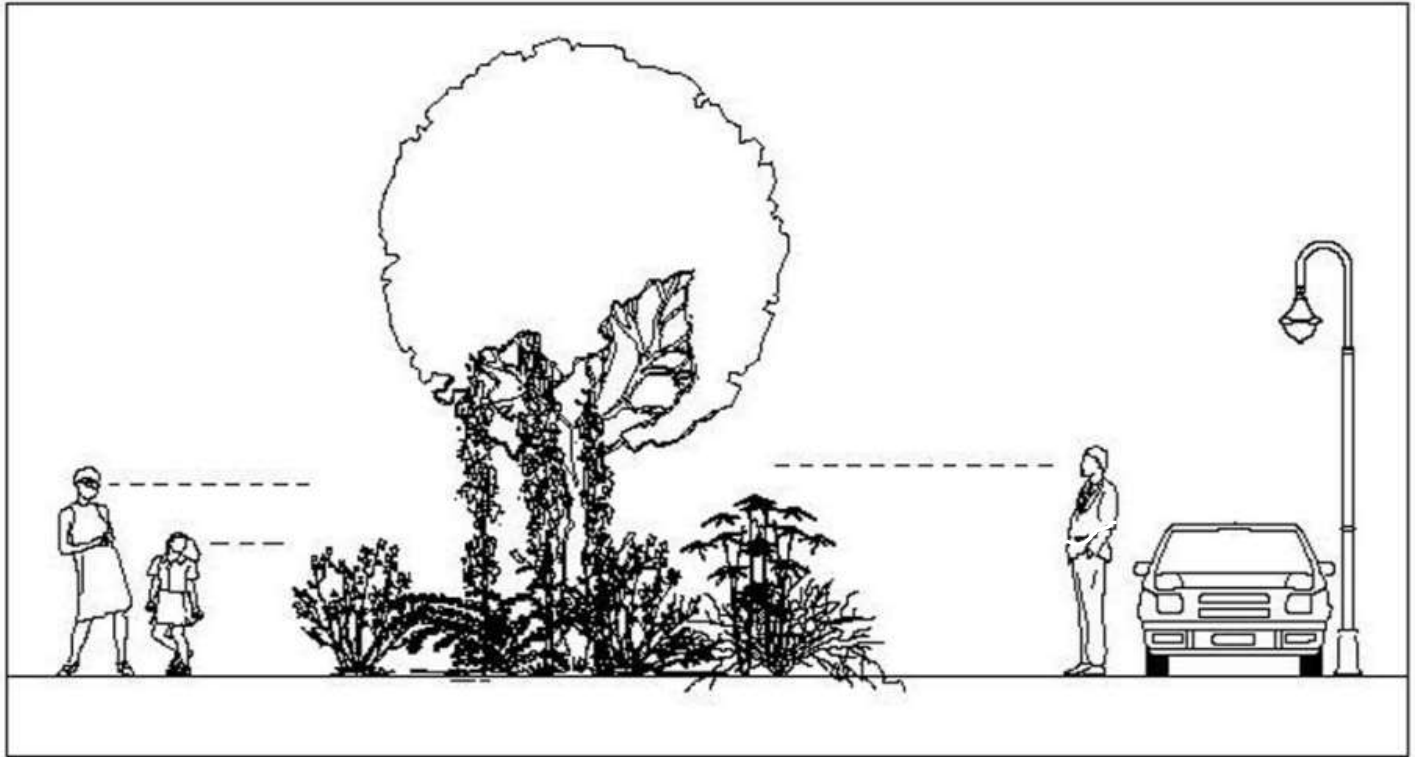
- Trim dense shrubs at 2ft or less.   - Trim tree canopies at 6ft or higher.

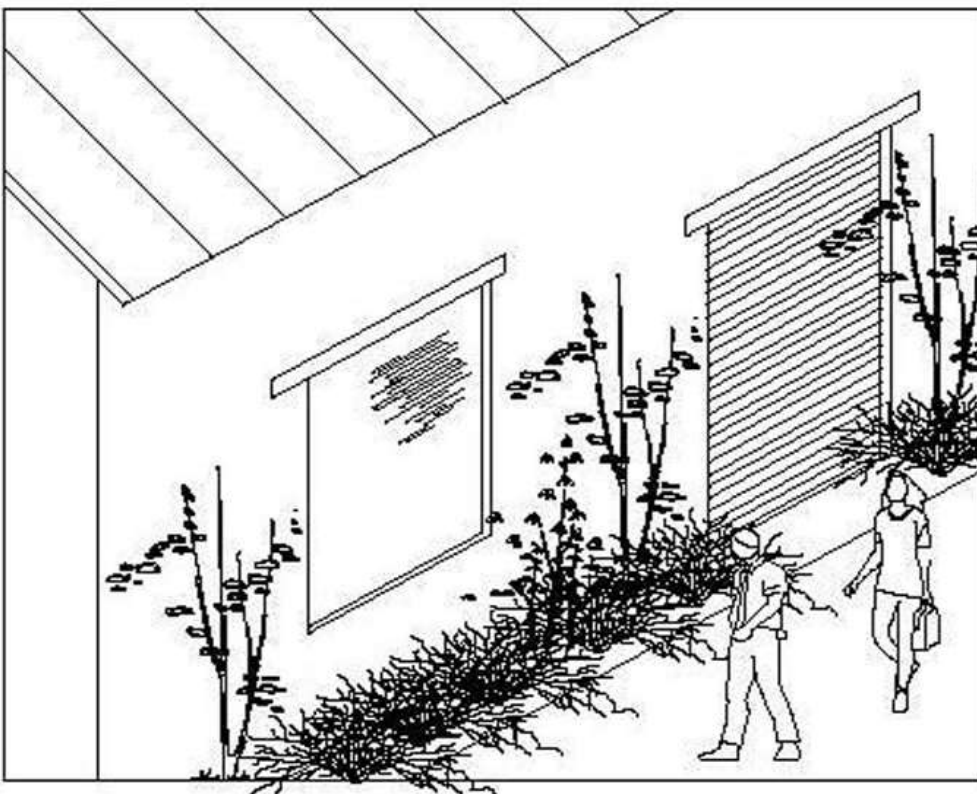Both reduce hiding places and increases lighting and overall visibility.

6 ft

2 ft
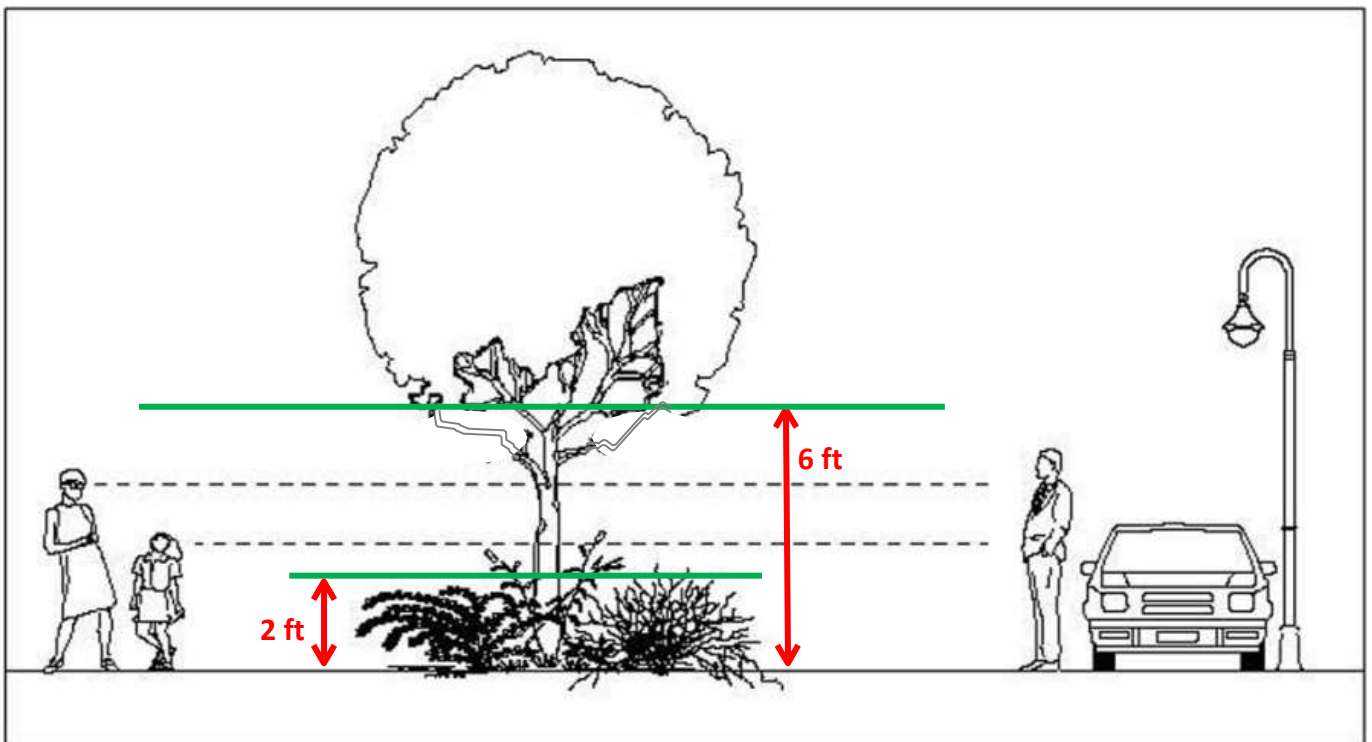
Landscaping

Other recommendations:

Plant hostile vegetation under and along walls and accessible windows.

This deters access to windows, trespassing, and degradation of walls.

Landscaping

Other recommendations:

Avoid the use of rip-rap or river rocks; these become tools of opportunity.

Use small granite rocks in landscaping; it can be heard when walked on.

Table 1:
Suggested Vegetation

Recommended Plant Material:

The following lists are not meant to be all-inclusive, but to represent plants that require minimal maintenance to meet visual surveillance objectives.

SHRUBS		
Ambrosia Deltoidea	Ambrosia Dumosa	White Bursage
Triangle leaf Bur-sage	Artemisia Caucasica	Silver Spreader
Artemisia Schmidtiana	Silver Mound	Artiplex Semiba Obata
Saltbush	Dalea Greggii	Indigo Bush
Dalea	Oaxacana	Eriogonum Umbellatum
Buckwheat	Euphorbia Rigida	Euphorbia
Gutierrezia Microcephala	Juniper (except Procumbens)	Juniperus Chinensis var.
Krameria Parvifolia	Snakeweed	Krameria Parvifolia
Lantana Montevidensis	Spreading Sunshine	Maytenus Phyllanthoides
	Mangle Dulce	

Suggested Vegetation

BARRIER PLANTS (Hostile)		
Acacia Constricta	Acacia Greggii	Agave
White Thorn Acacia	Catclaw Acacia	Pithecellobium
Atriplex Lentiformis	Quailbush, Big Saltbush	Bougainvillea
Carissa	Natal Plum	Condalia Warnockii
Mexican Crucillo	Ferocactus	Barrel Cactus
Fouquieria Splendens	Ocotillo	Texas Ebony
Pyracantha	Firethorn	Rosa
Celtis Pallida	Desert Hackberry	Rose
Cercidium Floridum	Blue Palo Verde	Cercidium Microphyllum
Foothill Palo Verde	Chaenomeles	Flowering Quince
Chamaerops Humilis	Mediterranean Fan Palm	Ilex
Holly	Ilex Vomitoria	Stoke's Yaupon Holly
Lycium Species	Wolfberry, Lycium	Mayt enus Phyllanthoides
Baja Dulce	Opuntia	Prickly Pear
Yucca Aloifolia	Spanish Bayonet	Yucca Baccata
Datil Yucca	Zizyphus Obtusifolia	Gray Thorn

Suggested Vegetation

GROUND COVER PLANTS		
Carpobrotus Edulis	Malephora Crocea	Santolina Virens
Ice Plant	Myoporum Parvifolium	Green Santolina
Clianthus Formosus	Myoporum	Verbena Bipinnatifida
Sturt' s Desert Pea	Oenothera Berlandieri	Verbena
Convolvulus Mauritanicus	Mexican Evening Prim rose	Verbena Peruviana
Ground Morning Glory	Oenothera Stubbei	Peruvian Verbena
Gazania Spp.	Saltillo Prim rose	Verbena Rigida
Gazania	Rosmarinus Officinallis	Sandpaper Verbena
Lantana Montevidensis	Prostrate Rosemary	Verbena Tenera
Trailing Lantana	Santolina Chamaecyparissus	Moss Verbena
Lavender Cotton	Wedelia	Wedelia Trilobata

PERENNIAL WILFLOWERS		
AllioniaIncarnata	Dichelostiemma Pulchellum	Evolvulus Arizonicus
Trailing Windmills	Bluedicks	Arizona Blue Eyes
Bahia Absinthifolia	Dyssodia Acerosa	Ipomopsis Longiflora
Bahia	Dyssodia	Pale Blue Trumpets
Baileye Multiradiata	Dyssodia Pentachaeta	Justicia Sonorae
Desert Marigold	Erigeron Divergens	Sonoran Justicia
Casttilleja Chromosa	Spreading Fleabane	Linum Lewisii
Indian Paintbrush		Blue Flax

Suggested Vegetation

ANNUAL WILDFLOWERS		
Abronia Villosa	Ipomoea Leptotoma	Monarda Austromontana
Sand-Verbena	Morning Glory	Bee Balm
Camissonia Brevipes	Kallstroemia Grandiflora	Monoptilon Belloides
Yellow Cups	Arizona Poppy	Belly Flower
Catharanthus Roseus	Lasthenia Chrysostoma	Nama Demissum
Madagascar Periwinkle	Layia Platyglossa	Purple Mat
Clarkia Amoena	Tidy Tips	Nam a Hispidum
Farewell-to-Spring	Lesquerella Gordonii	Nemphila Maculata
Collinsia Heterophylla	Yellow Blanket	Five Spot
Chinese-houses	Linaria Spp.	Nemophila Menziesii
Coreopsis Bigelovii	Toadflax	Baby Blue Eyes
Desert Coreopsis	Dimorphotheca Spp	African Daisy
Eriophyllum Lanosum	Lupinus Arizonicus	Arizona Lupine
Lupinus Densiflorus	Oenothera Deltoides	Birdcage Evening Primrose
Oenothera Primiveris	Woolly Daisy	Eriophyllum Wallacei
Lupine	Lupinus Sparsiflorus	Desert Lupine
Evening Prim rose	Orthocarpus Purpurascens	Owl' s Clover
Eschscholzia Calif	Machaeranthera Canescens	Pectis Papposa
California Poppy	(Aster Bigelovii) Big Aster	Chinch Weed
Eschscholzia	Machaeranthera Tanacetifolia	Perityle Emoryi
Mexicana	Painted Spurge	Rock Daisy
Mexican Gold Poppy	(Aster) Tahoka Daisy	Matriciaria Grandiflora
Euphorbia Heterphylla	Pineapple Weed	Cream Cups

Suggested Vegetation

ANNUAL WILDFLOWERS (Continued)		
Platystemon Californicus	Gaillardia Pulchella	Fire Wheel Blanket Fl
Gilia Leptantha	Mattiola Longibpetala cv. 'Bicornis'	Evening Scented Stock
Mim ulus Begelovii	Probosacidea Parviflora	Devil' s Claw
Rafinesquia Neomexicana	Showy Blue Gilia	Gomphrene Globosa
Globe Amaranth	Helipterum Sp.	Helipterum
Begelow's Monkeyflower	Mohavea Confertiflora	Ghost Flower
Desert-chicory	Salvia Columbariae	Chia

Security Mechanisms

Intermediate level requirements:

Deadbolt locks on all exterior doors
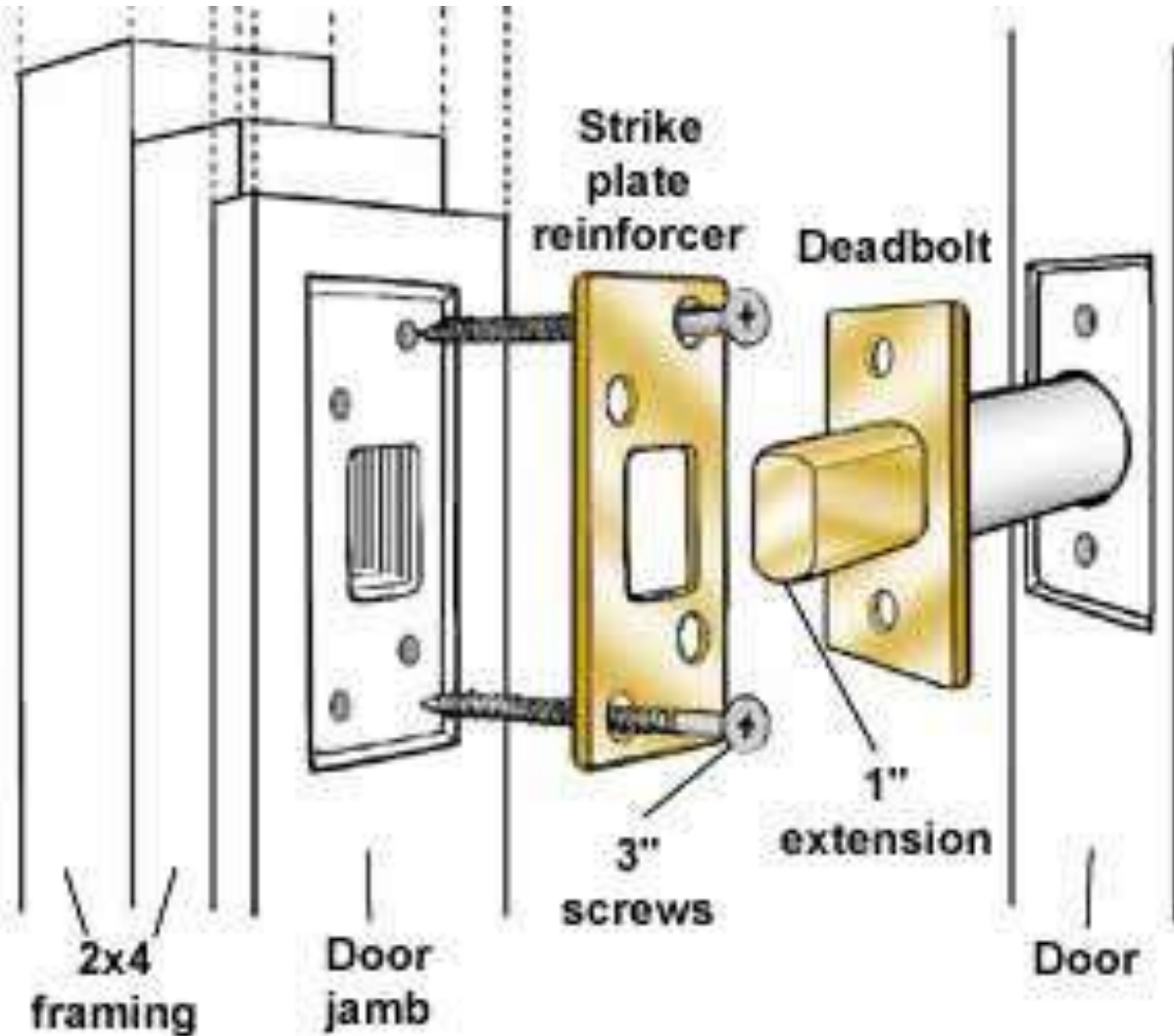
Bolt must have a minimum 1" throw and strike plates installed with 3" screws into the framing.

Security Mechanisms

Intermediate requirements:

Secondary locks (thumb, pinned, rods, etc.) on all accessible windows and sliding doors
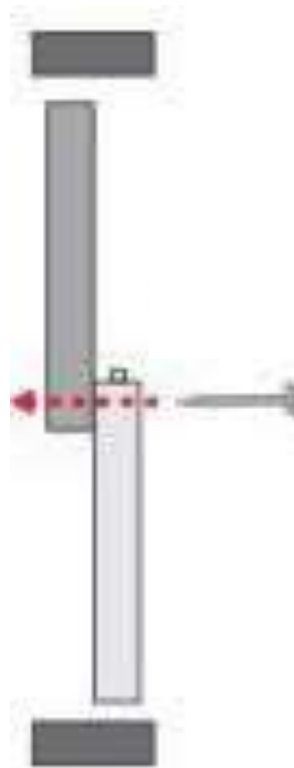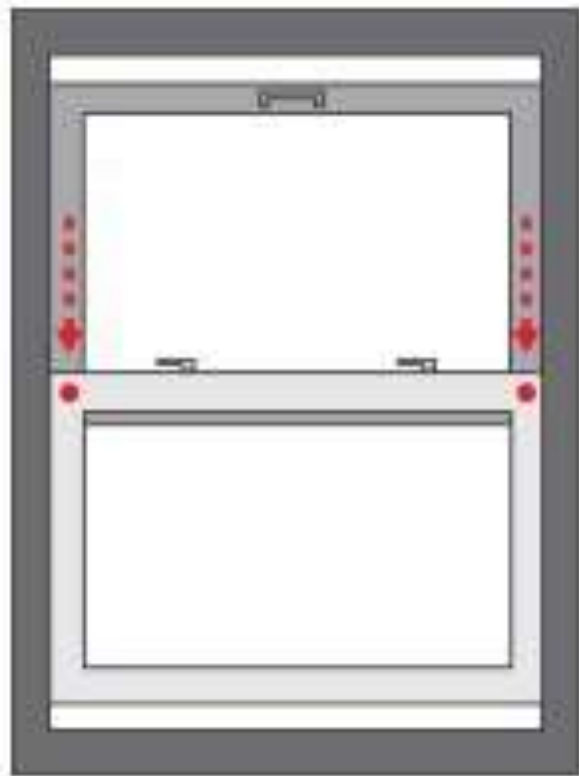
Pins prevent the door or window from opening.

Thumb locks reduce the opportunity of the door or window opening; but if a hole is drilled into the track and the screw is twisted through, then it will prevent the door or window from opening.

Security Mechanisms

Intermediate requirements:

Secondary locks (thumb, pinned, rods, etc.) on all accessible windows and sliding doors
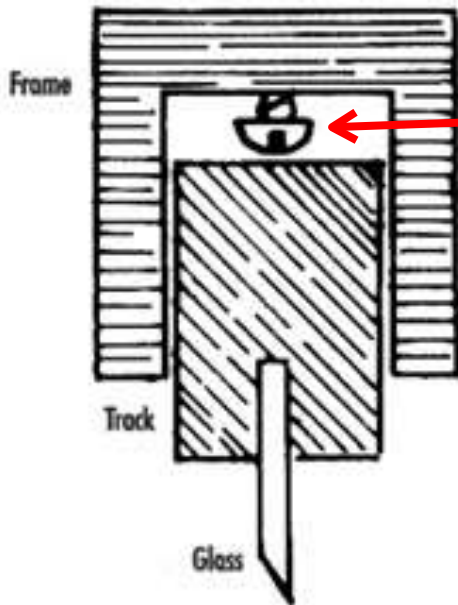
Installing screws above the door's pane prevents lifting.

Installing a drop bar prevents the door from sliding.
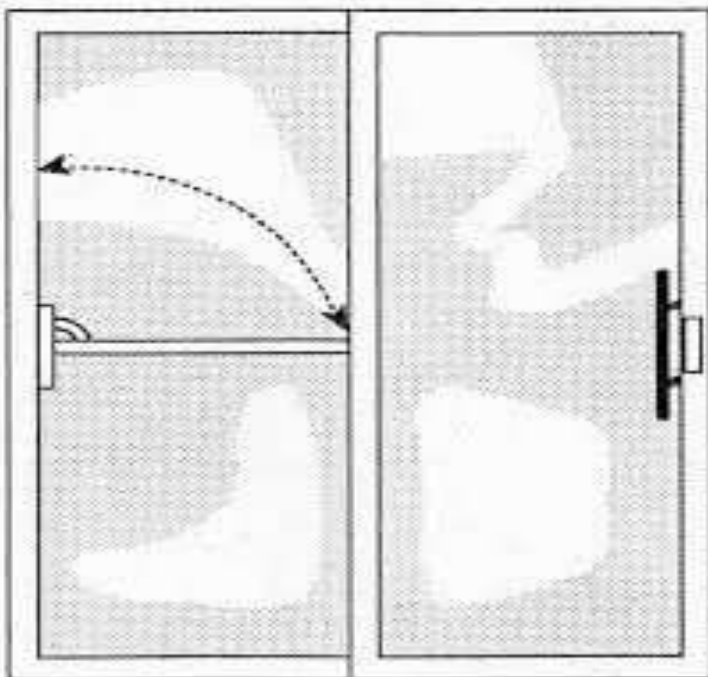
Placing a wooden or metal rod, that fits "snugly," prevents the door from sliding.
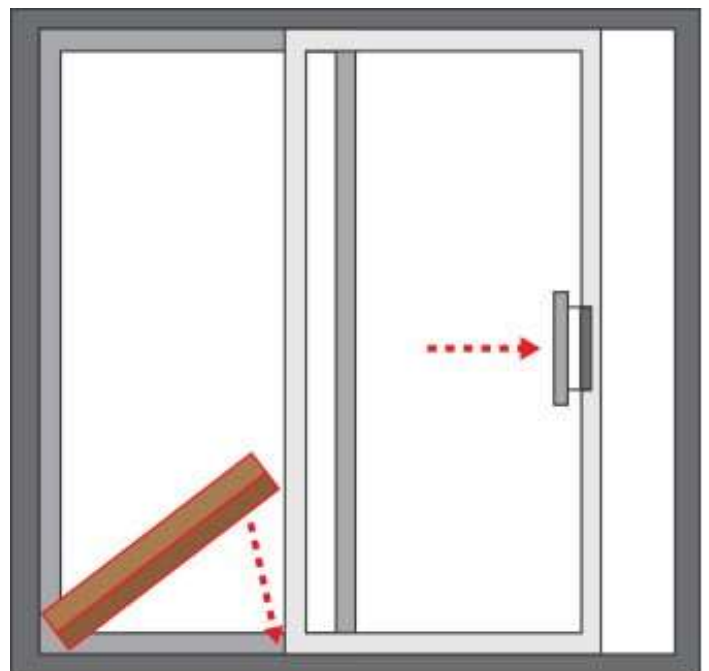
Security Mechanisms

Advanced requirements:

Solid core doors with a minimum thickness of 1 ¾ "
- Wood and metal are BEST

Stave-core exterior

Steel exterior
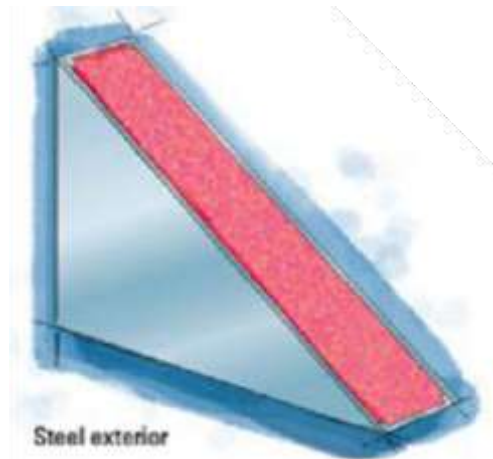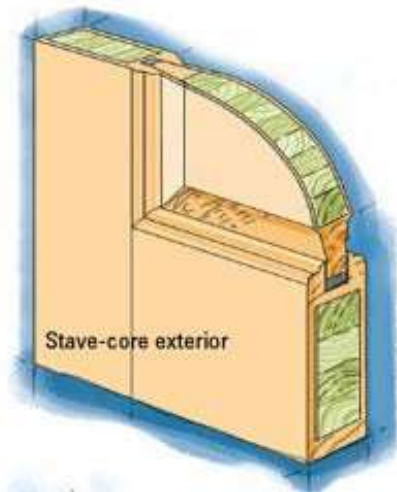
180° eye viewer
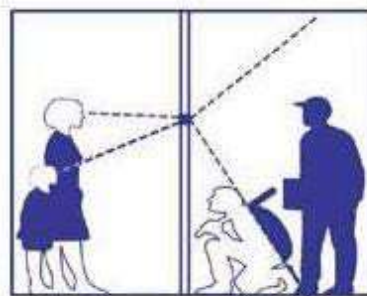
Security Door Viewer
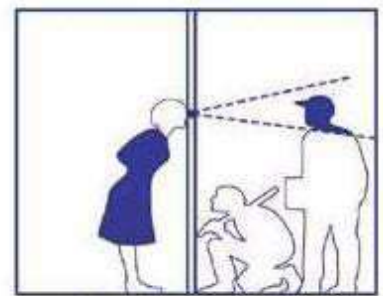
Traditional Peephole

Security Mechanisms

Other recommendations:

Security hinges or replacement screws keep the door locked in place even if the hinge pins are removed.
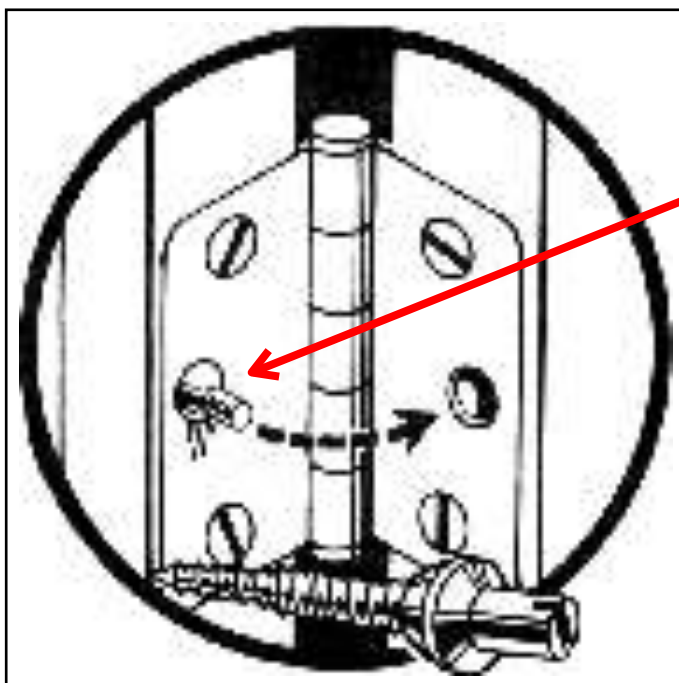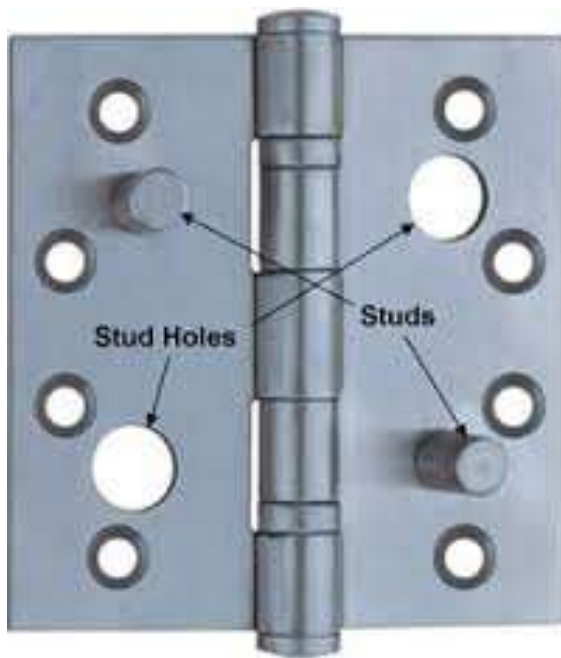
Replace the hinge screws with the security screws.

Community Surveillance Cameras: Table 1

Community safety shouldn't stop at your front door. Flock Safety helps HOAs, Neighborhood Associations, and law enforcement work together to capture the objective evidence needed to reduce crime rates, improve neighborhood security, and protect home values.

Thousands of HOAs already trust Flock Safety to automate their neighborhood watch. Flock Safety may help protect you from neighborhood crime with LPR (license plate recognition) cameras that see like a detective. Their devices capture objective evidence, like license plates and vehicle details, and most importantly with the ability to send real-time alerts to law enforcement computers mounted in police cars so they can take action, even while our citizen's sleep.

When someone is driving a stolen or wanted vehicle into the community's neighborhood, Flock Safety will alert the authorities? With Flock Safety, the community camera can automatically alert police when vehicles associated with crimes, sex offenders, and missing persons enter their neighborhood so that the police can proactively take the appropriate action to keep the community safe.

Neighbors is a neighborhood watch app that provides real-time, local crime and safety information. Download the free Neighbors app on iOS or Android, join your neighborhood, and use the app to: monitor neighborhood activity; share crime and safety-related videos, photos and text-based posts; and receive real-time safety alerts from your neighbors, local law enforcement and the Ring team. Download Neighbors from the App Store or Google Play Store today to join your digital neighborhood watch. For more information visit www.ring.com/neighbors.

With Ring Neighbors Portal App – citizens with Ring technology can take responsibility for the security of their neighborhood. Neighbors Portal Apps provide real-time crime and safety alerts from your neighbors and public safety agencies. With Neighbors Portal App, communities are able to know when and where things are happening in their area and share updates to keep your community informed. Together with the community, police can co-produce prevention and intervention while leading to more effective and fair enforcement.

https://ring.com/neighbors   https://www.flocksafety.com/product-overview/

LIGHTING

Lighting is so much more than screwing in a light bulb!

Lighting is used for the illumination of human activity and security. Lighting by itself does not prevent crime, but it does provide a sense of safety, the ability to SEE a potential threat, which provides the opportunity of choice. Proper lighting allows a person to clearly see and identify a person's relevant descriptors, facial features, and various colorsof clothing or objects at 100 feet.

When applied within the CPTED principles, lighting is a great tool for owners, management teams, and residents to control and reduce FEAR, and the opportunity for criminal activity. Proper lighting, in conjunction with "natural surveillance," is the best application.

Crimes against persons and property are self explanatory, but crimes against society (gambling, prostitution, and drug violations, etc.) represent society's prohibition against engaging in certain types of activity; they are typically victimless crimes in which persons or property are not the object.

Statistics:
- Most **U.S.** crimes occur at night (6p-6a):
  - Crimes against persons: 52%
  - Property crimes: 40%
  - Crimes against society: 55%

Purpose:
- *Reduce:*

  - Crimes   - Trespassers   - Concealment   - Lawsuits

- *Increase:*

  - Security   - Confidence   - Territoriality   - Use/Surveillance

Lighting Comparisons

Light trespass (pollution)

Lighting "Language":

- <u>Foot-candle</u> (FC) – a unit of illumination that is equivalent to the illumination of one candle at a distance of one foot
- <u>Luminance</u> – light reflected from a surface, otherwise known as brightness
- <u>Lumen</u> – measure of the luminous flux emitted by one candle's intensity (brightness)
- <u>Watt</u> – a unit of power
- <u>Uniform lighting</u> – relative or equal luminance over an area
- <u>Adaptation</u> – time for the human eye to adjust to lighting change
- <u>Light trespass</u> (pollution) – unwanted light that crosses property lines

Considerations when planning or retro-fitting lighting:

Lighting should:

- be energy efficient and illuminated during ALL hours of darkness; both are accomplished by using timers or dawn to dusk sensors.

- be vandal and tamper resistant.

- provide uniform and consistent levels of illumination that prevents pockets of shadows or glare where an adult-size person could gain concealment.

- illuminate the following:
    - Building and door numbers (visible from the street, numbers at least 6" in height)
    - Dark walls and corners
    - All exterior doors
    - Pathways
    - Parking structures
    - Specified and common areas
    - Persons or objects at 100 feet

Be certain to replace damaged lighting; and when doing so, consider upgrading to LED and changing the fixtures. (See Tables 2-5)

Maintaining the same style of fixture throughout the community will show Territorial Reinforcement
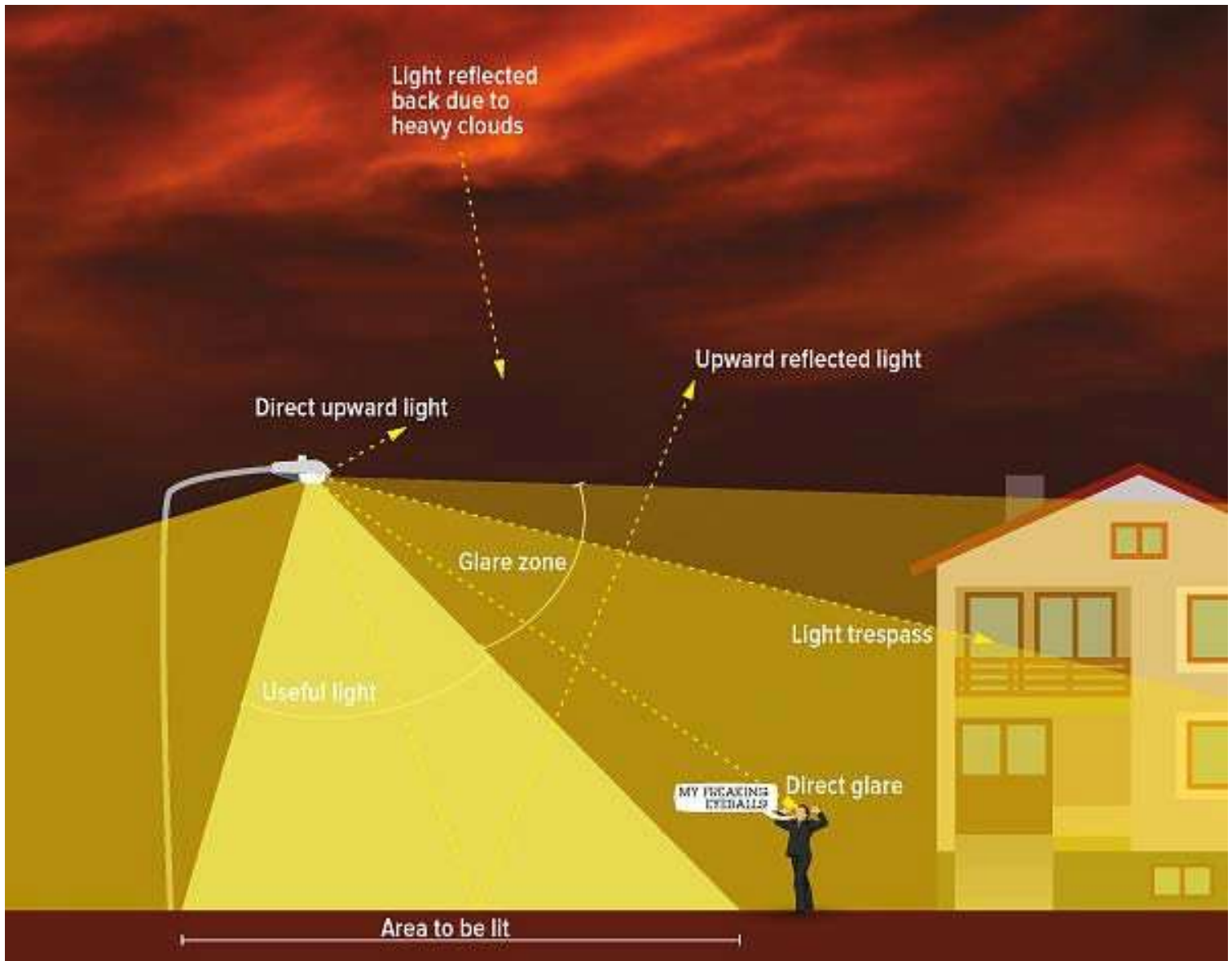
Lighting Comparisons

Light trespass (pollution)

The **BEST** is not always the BRIGHTEST

very bad   bad   better   best
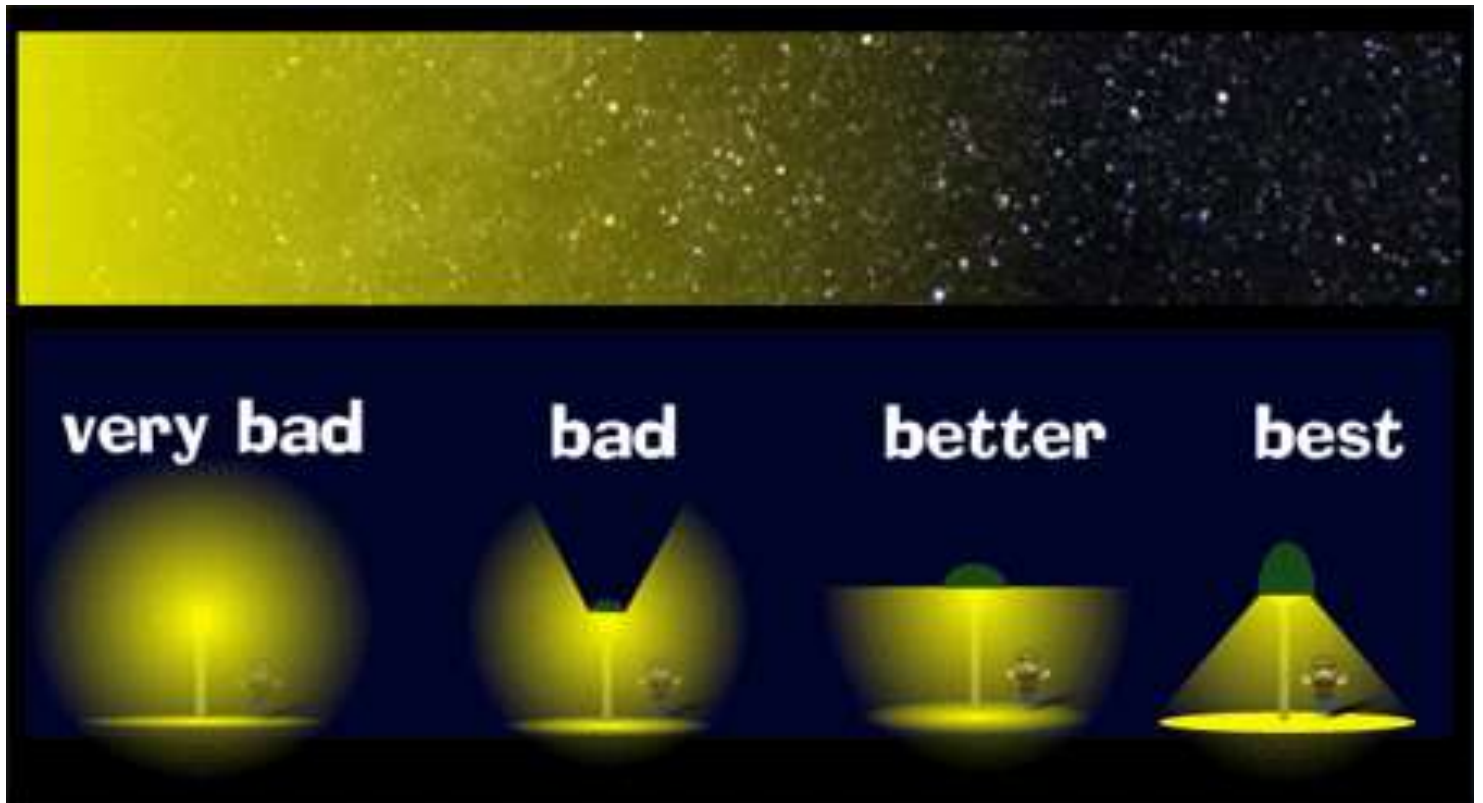
Lighting Comparisons

Light trespass (pollution)

GOOD lighting is intentional and not random.

Lighting Comparisons

Examples of obstructed and unobstructed lighting

The light is obstructed by the tree illustrating the importance of planning and maintaining the landscaping and lighting.

Keep all lights free of any obstruction for the best uniform lighting.

Lighting Comparisons

Examples of obstructed and unobstructed lighting

The light is obstructed by the tree, casting a variety of shadows

Keep all lights free of any obstruction for the best uniform lighting.

Lighting Comparisons

Examples of overly bright and glare

Overly bright lights shock the human eyes and cause a temporary blindness.

Direct vs. Reflected Glare

Direct glare occurs when a source of brightness is in the line of vision.

Reflected glare occurs when brightness from the source is reflected on a shiny surface that is in the line of vision

Glare makes it hard to see, causing an unsafe situation

By simply blocking an overly bright light, we allow you to see beyond it, demonstrating the importance of directed and shielded lighting.

Lighting Comparisons

Examples of glare

HP sodium vapor or metal halide lights without direction: Unable to see subject directly under the light.

Directed LED lights provide uniform lighting: Clearly able to see subject and his surroundings.

Lighting Comparisons

HPS/Metal Halide vs LED

LED lighting:
- directed and reduces light trespass
- reduces energy costs up to 70%
- reduces glare and offers true color rendition
- provides more uniform lighting and reduces shadows

Before

After

Lighting Comparisons

HPS/Metal Halide vs LED

LED lighting:
- reduces energy costs up to 70%
- reduces shadows
- offers true color rendition
- provides uniform lighting
- reduces glare
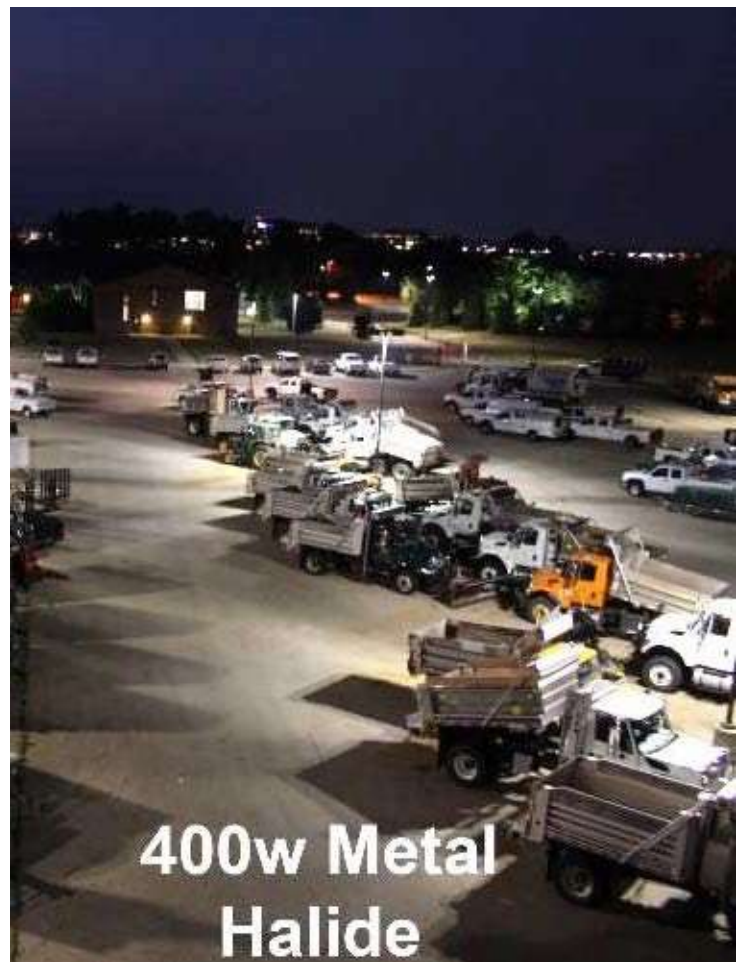
Lighting Comparisons

Range of uniformity and overlap

Pedestrian area is not illuminated.
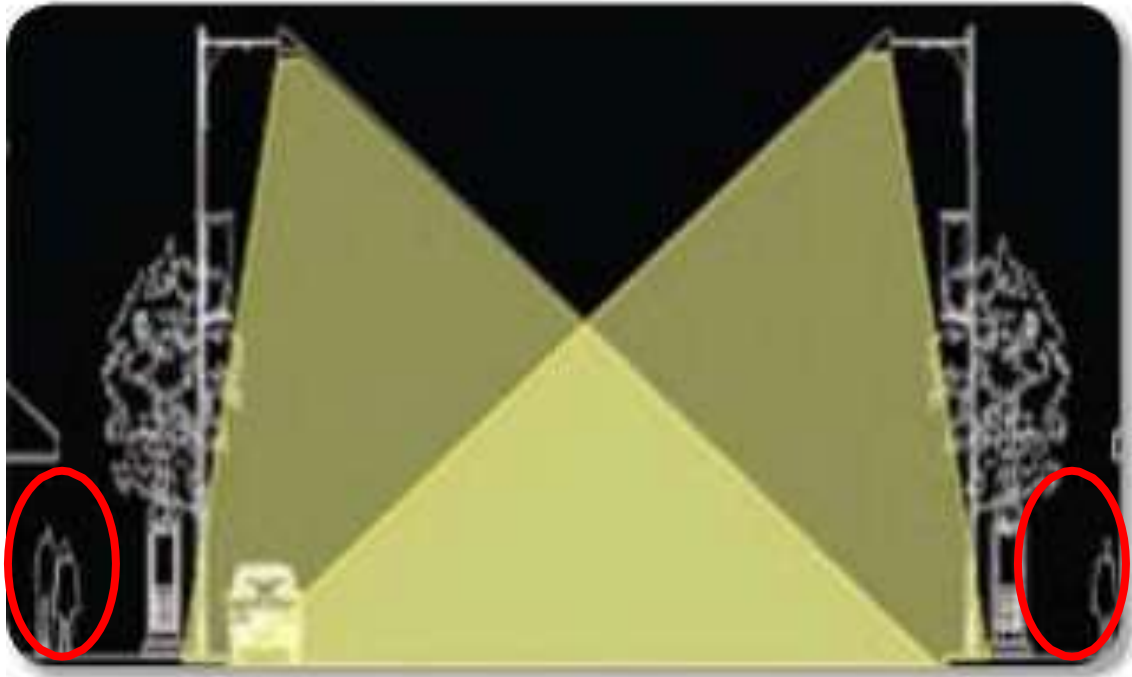
Pedestrian area, parking area, and roadway are clearly illuminated.

Lighting Comparisons

Range of uniformity and overlap

Lighting designed to provide safe levels of visibility for all users

The pedestrian is not illuminated, and several surrounding areas offer great concealment for the criminal element.
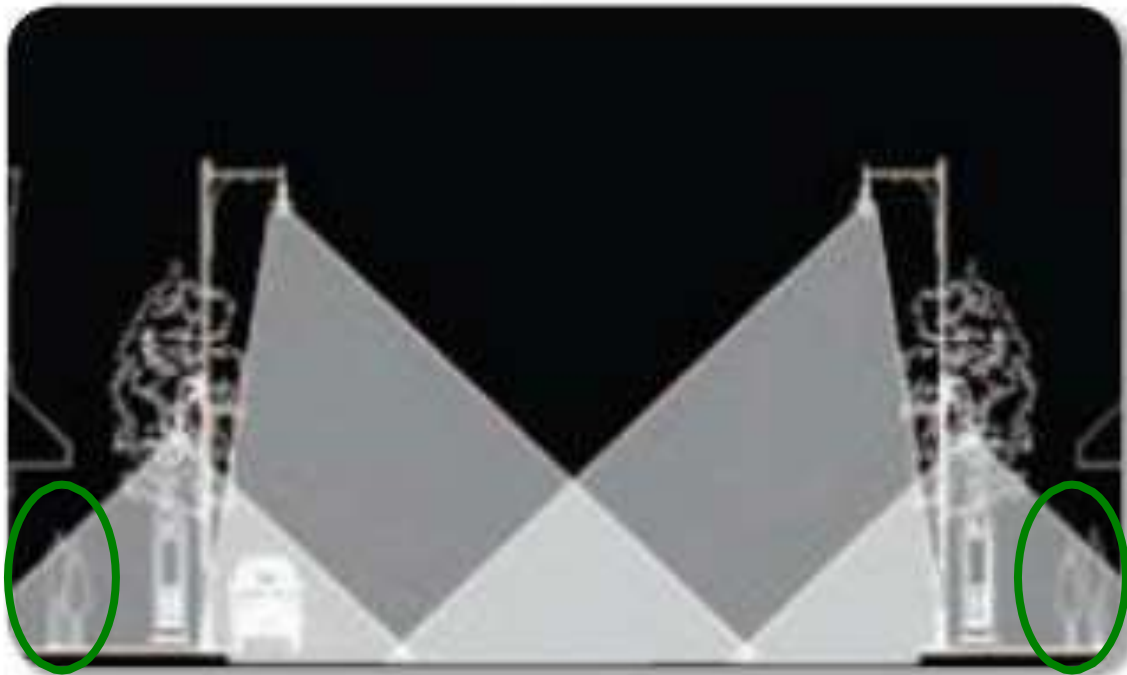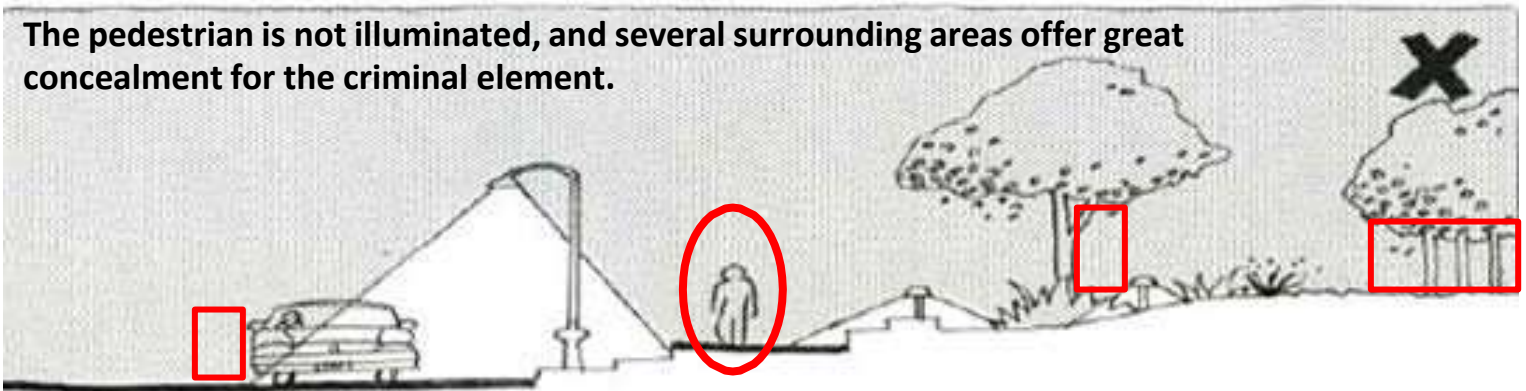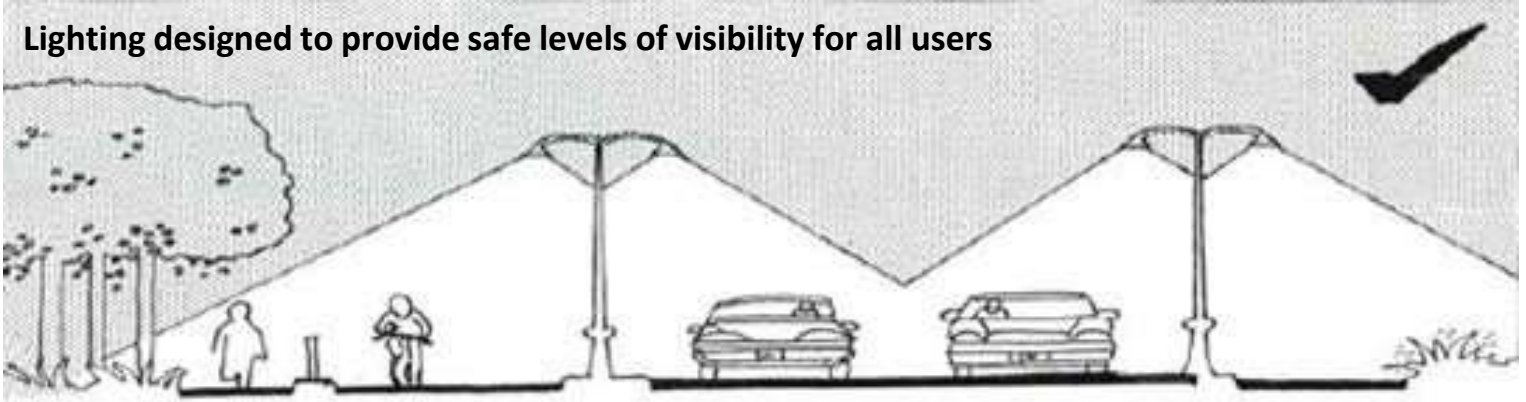
Although the lighting is directional, the failure to overlap allowed shadows and void areas that provides an adult-size person with concealment.
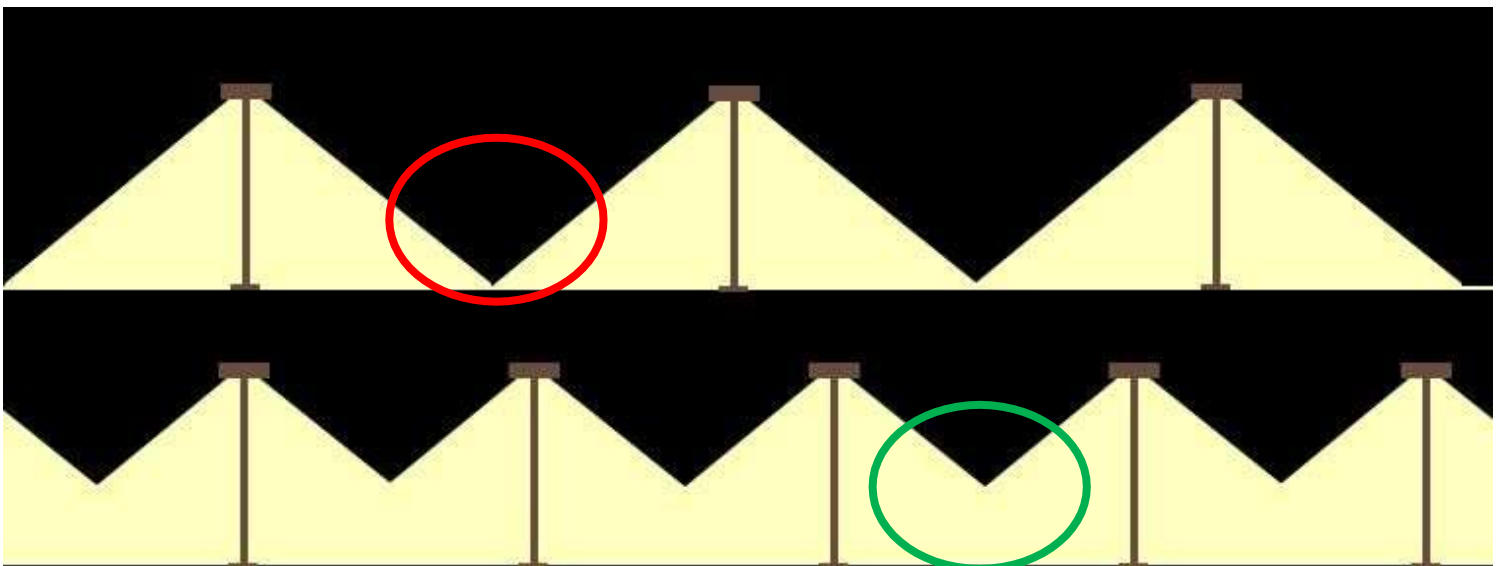
The additional posts provide overlapped and uniform light, effectively eliminating the vulnerable areas.

Lighting Comparisons

HPS/Metal Halide vs LED

Before

It is apparent the LED lighting provides a more uniform, brighter, and pure illumination of the space.

It creates a safer environment.

It enables a person to clearly see a person, object, and true colors (color rendition) at 100 feet or better.

After

Lighting Comparisons

HPS/Metal Halide vs LED

Which street would you rather walk along?

Before (Meets RP-8) After (Meets RP-8)

100 Watt Lamp 44 Watts

Situational Crime Prevention

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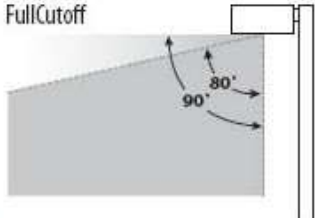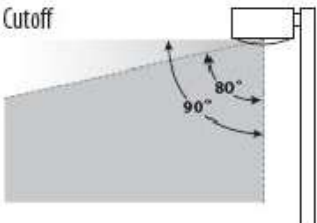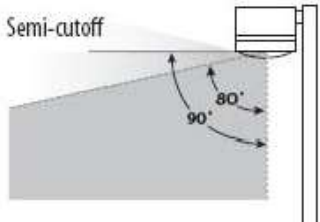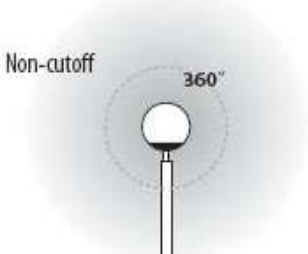
Increase the Effort	Increase the Risks	Reduce the Rewards	Reduce Provocations	Remove Excuses
1. **Target harden** • Steering column locks and immobilisers • Anti-robbery screens • Tamper-proof packaging	6. Extend guardianship • Take routine precautions: go out in group at night, leave signs of occupancy,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

Table 1:
Lighting Type and Cost Analysis

Type	Initial Costs	Energy Costs	Life Hours	Pros	Cons
Light Emitting Diodes (LED)	$25.99	$82.17	60,000	Longest life Highly rugged Instant light Silent operation Low energy costs Best color rendition	Continuous development High initial cost
High Pressure Sodium	$19.99	$92.50	24,000	Low energy costs Good life Good optical control	Moderate initial cost Fair color rendition Contains mercury Restart time Cycle at end of life
Low Pressure Sodium	$29.99	$19.54	14,000	Low energy costs High efficiency	High initial cost Worst color rendition Safety concerns
Metal Halide	$18.19	$38.20	12,000	Low energy costs High efficiency Good optical control Great color rendition	Moderate initial cost Restart time Short life Contains mercury
Compact Fluorescent (CFL)	$4.98	$191.73	10,000	Minimal initial cost Good efficiency Moderate life 90% less heat Good color rendition Instant ON response	Full intensity at start-up Contains mercury
Fluorescent	$15.99	$92.80	6,000	Moderate initial cost Good efficiency Good color rendition Instant ON response	Moderate energy costs Moderate life Contains mercury
Quartz/Quartz Halogen	$9.98	$789.60	2,000	Good color rendition	High heat Short Life Low efficiency Fragile
Incandescent	$1.38	$821.72	750 -2000	Minimal initial cost	High energy costs Short life High heat Low efficiency Fair color rendition Fragile

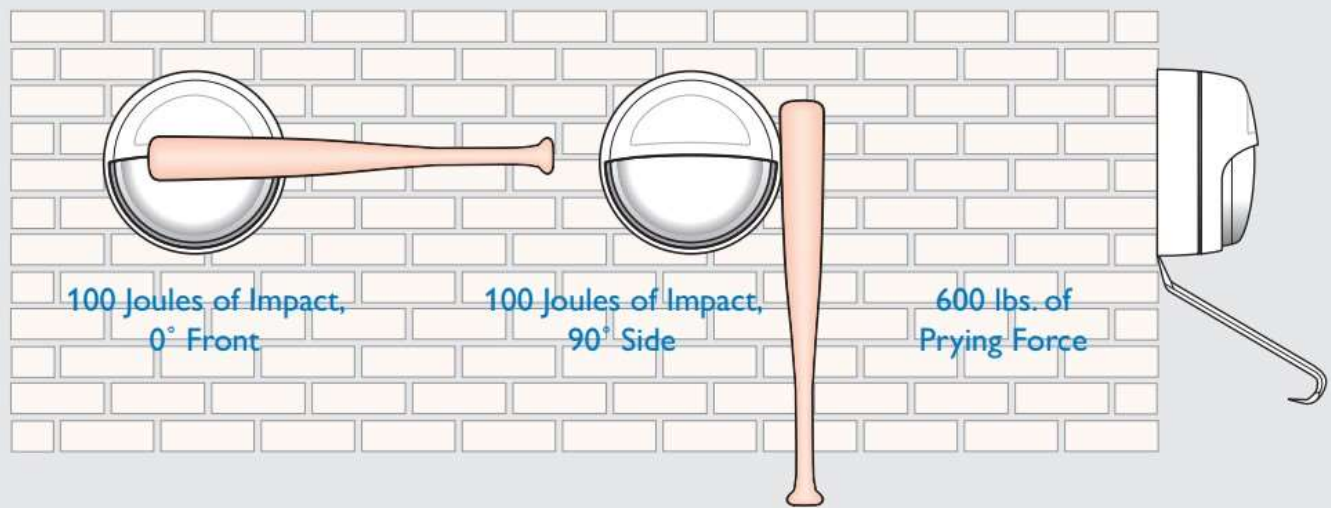**Assessment is based on 60,000 hours of operation of 800 lumens.**

Table 2: Lighting Fixtures

Fixture	Definition	Benefits	Limitations
FullCutoff	BEST - Commonly used for wide coverage in large spaces (parking lots, streets, playing fields, etc.) Zero intensity at or above horizontal .	- Limits spill light onto adjacent property. - Reduces glare. - No light is emitted directly from the luminaire into the sky.	May reduce pole spacing to maintain uniformity; increasing pole and luminaire quantities for proper lighting.
Cutoff	BETTER - Commonly used for wide coverage in large spaces (parking lots, streets, playing fields, etc.) Intensity at or above 90° horizontal no more than 2.5%.	Small increase in high-angle light allows increased pole spacing.	- May allow some up-light from fixture causing trespass. - Typically a small overall impact on sky glow.
Semi-cutoff	GOOD - Commonly used for wide coverage in large spaces (parking lots, streets, playing fields, etc.) Intensity at or above 90° horizontal, no more than 5%.	High-angle light accents taller vertical surfaces such as buildings. Most light is still directed downward.	- Little control of light at property line. - Potential for increased glare when using high wattage luminaires. - Typically directs more light into the sky than cutoff.
Non-cutoff	No limitations on light distribution at any angle.	Uniform luminous surfaces such as internally illuminated signs or globes. Wattage should be limited. Suitable for sports lighting, facade, landscape, or other applications where luminaires are tilted due to limitations in pole or fixture locations.	- Location and aiming are critical. - Most likely of all categories to produce offensive brightness and sky glow. - Easily shaken and broken
Vandal Resistant	Lighting fixtures designed for use in abusive environments; most common forms of abuse are impact and prying.	- Increased safety - Durable - Reduced maintenance - Reduced costs - Aesthetically pleasing	- Initial cost - Application options regarding lamp posts
Bollard	Provides elements of safety for larger outdoor spaces.	- Defines space and boundaries - Physical barrier - Illuminate pedestrian areas - Greater light than standard decorative lighting for pedestrians	- Initial costs - Reduced amount of Illumination

Lighting Fixtures

Fixture	Definition	Benefits	Limitations
Up-lighting	Known as spotlights, flood lights, and well lights. Often used to illuminate building numbers, flags, landscaping	- Illuminates building numbers - Aesthetically pleasing with a dramatic effect	- Greater opportunity of light trespass
Decorative	Small, limited illuminating lighting fixtures to add ambient lighting to a space	- Defines space and boundaries - Aesthetically pleasing	- Initial costs - Reduced amount of Illumination - Not likely to be vandal resistant

Vandal / Tamper resistant fixtures

100 Joules of Impact, 0° Front

100 Joules of Impact, 90° Side

600 lbs. of Prying Force

Example: A luminaire rating of VR5+P6 would be able to withstand an impact of 50 joules and have a pry-off resistance strength of 600 lbs. More information on individual luminaires is available by visiting www.survivrseries.com.
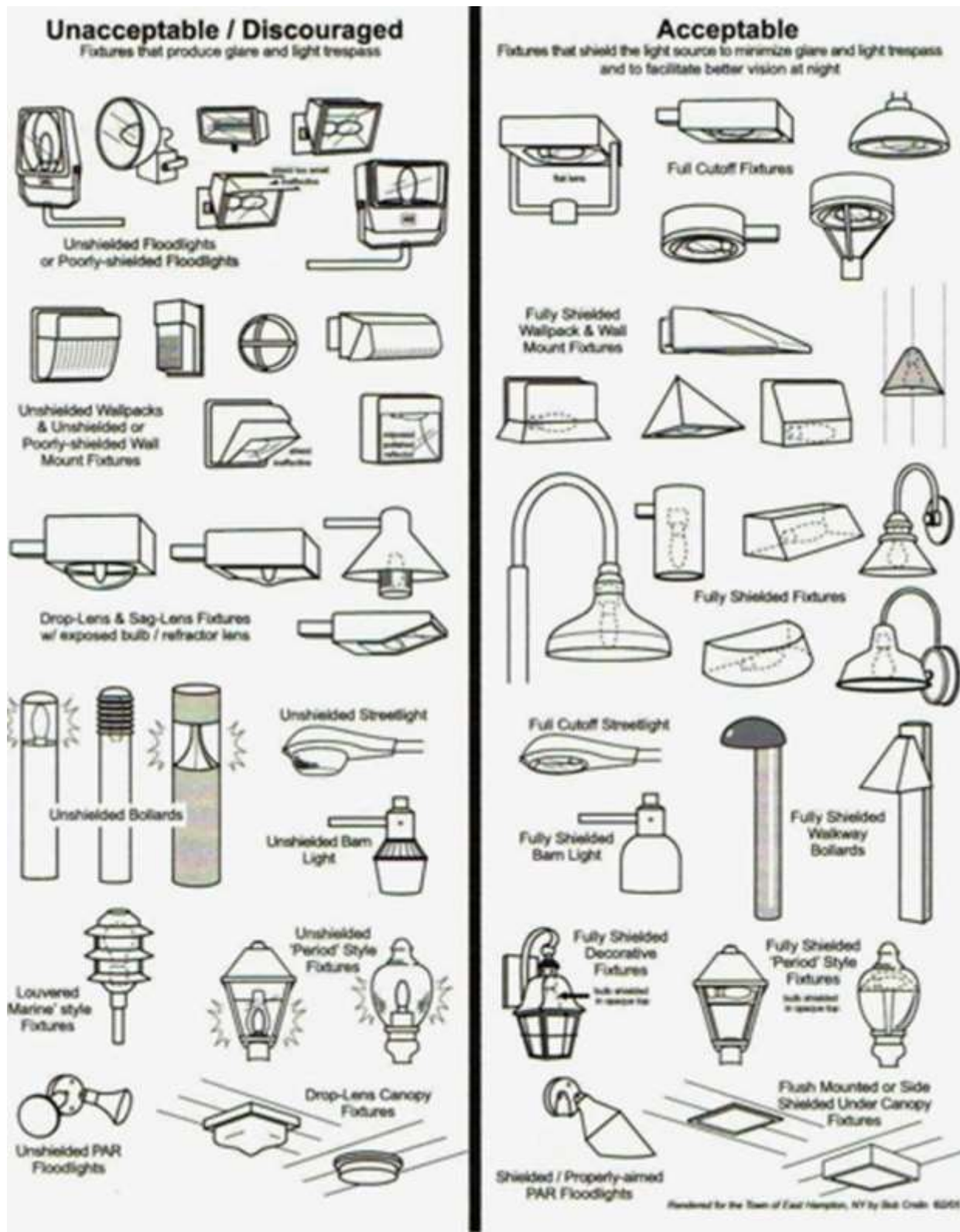
Install lighting fixtures with tamper resistant screws.

Table 3: Directional Lighting Fixtures

Directional style lighting

Most of the lighting on the LEFT does NOT provide direction and permits lighting trespass and lighting pollution.

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