CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN

Technical Guideline 7:
Planning Public Outdoor Areas

Prepared by

Larry S. Bell, Westinghouse Electric Corporation
John P. Koteles, University of Illinois
Luis Noriega, University of Illinois
Nick Dah-Jyh Young, University of Illinois

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Westinghouse Electric Corporation
Arlington, Virginia 22202

PRELIMINARY MANUSCRIPT

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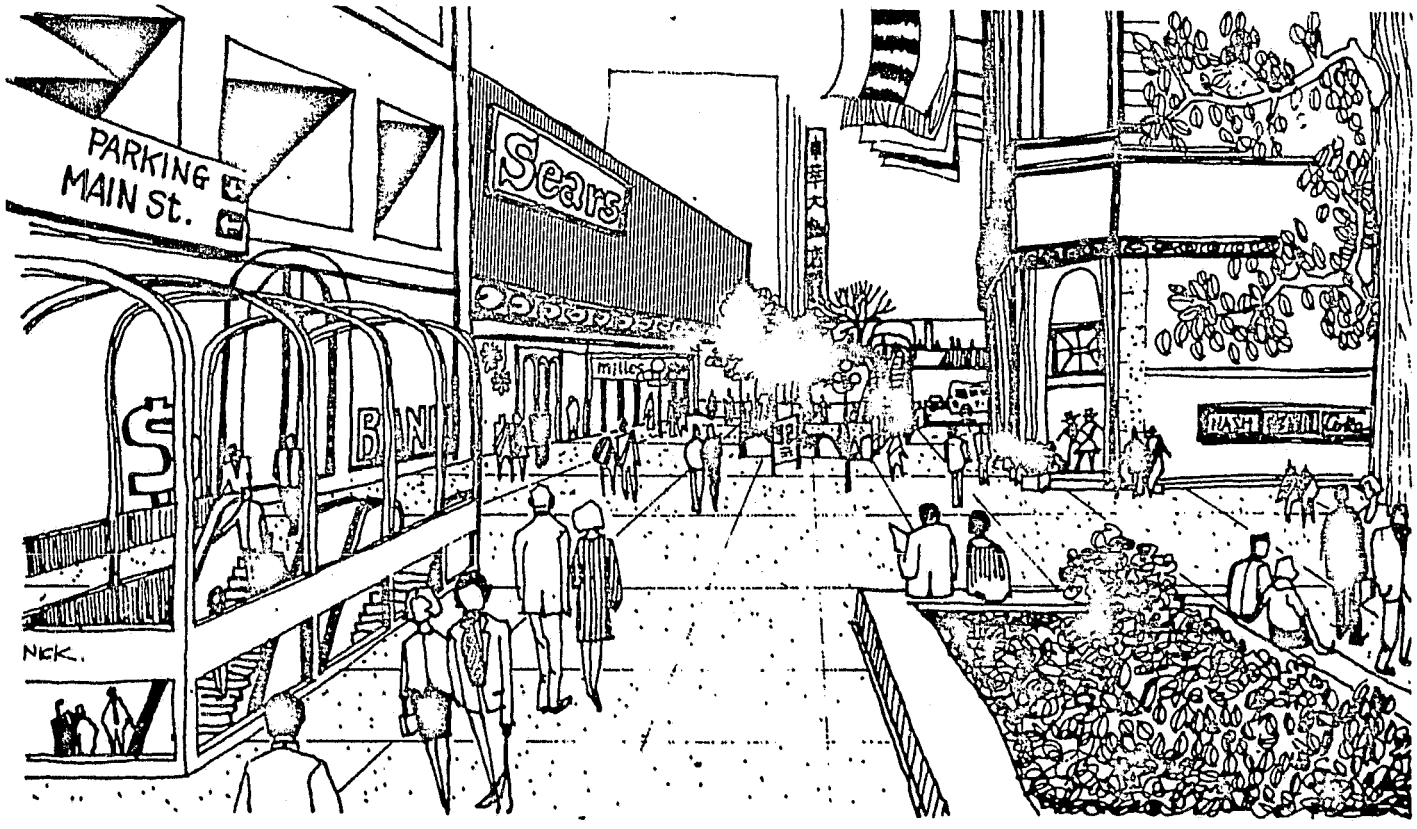
CHAPTER 1. INTRODUCTION

In 1974, a contract to initiate a national program called Crime Prevention Through Environmental Design (CPTED) was awarded to a consortium of firms headed by the Westinghouse National Issues Center, Arlington, Virginia, by the Law Enforcement Assistance Administration (LEAA). The CPTED Program is being sponsored by LEAA's research arm, the National Institute of Law Enforcement and Criminal Justice (NILECJ), focusing upon three general types of settings: commercial business strips; residential neighborhoods; and public high schools. This report has been prepared in support of a key CPTED Program objective--to distill research findings and design concepts into guidelines that will be useful to architects, planners and developers. The purpose of the report is to offer crime prevention considerations and examples to protect pedestrians from stranger-to-stranger offenses along streets and in other open public areas.

1.1 Background

Relationships between crime and environmental design have attracted increasing public attention in recent years. Widespread interest was first stimulated in 1961 by a popular book The Death and Life of Great American Cities, written by Jane Jacobs. In her book, Jacobs took issue with the common trend of urban planning to functionally separate types of community land use. She argued that by carefully mixing land uses along neighborhood streets, social interaction can be encouraged to promote informal (or "natural") surveillance and increase street safety.

Shlomo Angel agreed that street activity levels can affect crime, but disagreed with Jacobs about mixing land uses or attempting to stimulate street activity as a general approach. As a result of his 1968 Oakland, California study, Angel concluded that crime most often occurs when there is enough street activity to attract offenders, but too little to provide witnesses and people to intervene--a situation which he described as a "critical intensity zone." To help avoid critical intensity zones, Angel advocated dividing neighborhoods into daytime and evening activity areas and locating major pedestrian channels near establishments that remain open at night.



While development efforts aimed at increasing activity levels can be used to provide more eyes on the street, "critical intensity zones" where there are enough people to attract offenders, but too few to deter victimization, should be avoided.

Many researchers and writers have contributed additional observations and theories, stressing, for example the importance of good lighting and open planning to facilitate surveillance by residents and police; promoting "defensible space" approaches that encourage proprietary control of private territories through real and symbolic barriers that define ownership claims; and advocating community education programs that teach ways to make premises more secure, improve problem awareness and vigilance, and increase police-community understanding and cooperation.

Efforts to determine the relative effectiveness of various crime prevention strategies are invariably highly speculative and conditional. Many reported "changes in crime rates" can be more realistically attributed to changes in reporting rates or tabulation interpretations. And it is difficult to know with certainty how much crime was prevented in one area, only to be displaced to another. In point of fact, we don't know of any guaranteed panaceas for preventing outdoor crimes. We can only recommend some considerations that seem reasonable for typical urban conditions. Accordingly, this report is not intended as a crime prevention cook book with recipes for all occasions. Rather, it is intended to be an idea and information resource book to supplement the professional expertise and good judgment of planners and administrators who must make decisions based upon a wide variety of priorities, crime and vandalism prevention being two concerns among many.

1.2 The CPTED Hypothesis

The Westinghouse CPTED research activities upon which this report is based have been guided by a central hypothesis that crime and fear can be reduced through proper design and effective use of environments.

The term "design," as it is applied here, refers to techniques that involve social and economic as well as physical planning. So, for example, zoning is viewed as a process through which appropriate land uses are designated. Design also is used to describe the planning of programs--incentive programs for mobilizing community cooperation and support in preventing crimes; programs to reverse economic deterioration trends and restore vitality; and disincentive programs intended to make crime unprofitable for offenders by increasing the risk of apprehension and reducing potential payoffs.

The comprehensive nature of the Westinghouse-CPTED approach demands participation by a broad array of participants, many of whom may not be popularly associated with crime prevention roles. These actors include executives of lending agencies and insurance companies whose policies influence neighborhood rehabilitation incentives; transportation planners and public transit operators who influence street activity levels and mobility patterns; park and lighting bureau authorities whose plans affect natural surveillance by police and residents; resident, business, civic and religious organization leaders and members who influence and communicate local priorities; government officials who control municipal policies and funds; police; and many others. Crime prevention is everyone's responsibility.

1.3 Organization of Guidelines

This report primarily emphasizes physical planning considerations. It is aimed at readers who are involved and/or interested in decisions affecting the security of open public spaces which are beyond the proprietary control of a single interest or user group.

The three chapters that follow address technical considerations related to key areas of physical design concern (outdoor lighting, landscaping with plant and surfacing materials and built landscape elements). These areas of design concern are highly interdependent. Basic mechanisms for improving surveillance opportunities, promoting neighborhood confidence and social control, and reducing vandalism problems are suggested.

Chapter Five discusses potential relationships between various land uses and common crime/vandalism problems. User characteristics and needs are considered and alternative planning approaches are outlined.

The final chapter presents illustrative environmental design approaches applied to a hypothetical neighborhood comprised of prototypical problem settings.

CHAPTER 2. OUTDOOR LIGHTING

2.1 Introduction

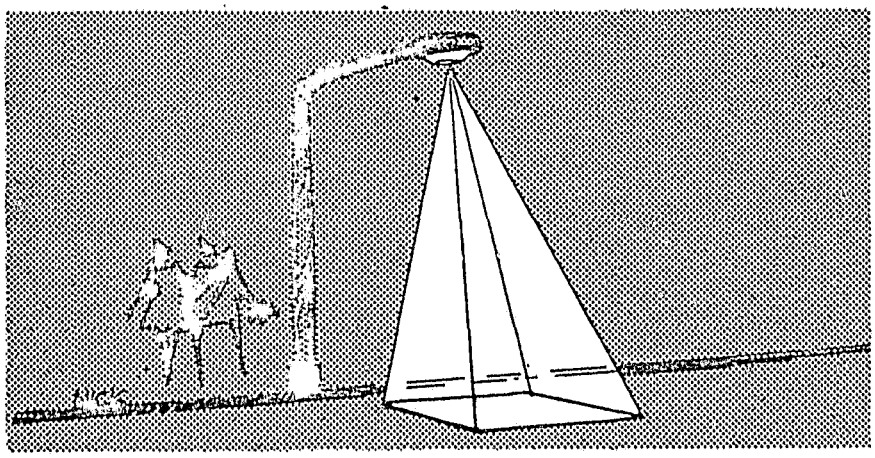
While there is no conclusive proof that crime rates automatically decrease when lighting levels are increased, improved street lighting is being implemented in many cities as a crime deterrent. Assumed relationships between lighting and crime seem reasonable in common instances where darkness and shadows provide good cover for offenders to stake out their targets, gain undetected entry to buildings or surprise victims outdoors, complete their acts and escape without being recognized or perhaps even observed. And studies have concluded that whether or not improved lighting actually increases personal safety, it does often make people feel safer.

2.2 Quantitative and Qualitative Considerations

When evaluating or planning lighting, quality is more important than quantity. The quality of a lighting system has much to do with the color, degrees of glare, diffusion patterns, field contrasts, and locations and viewing angles. Quantity is measured in terms of lumens and illumination levels. All of these characteristics must be tailored to the special needs of each setting in order for the lighting plan to be properly designed. Before considering ways to determine area lighting needs, brief explanations of important terms and standards may be helpful.

Lumens measure the unit flow rate of light emitted from a light source. This flow rate is analogous to liquid measures such as gallons per hour.

A level of illumination, or simply illumination, describes the quantity of light (lumens) falling on a unit area. If the unit area is measured in square meters the unit of illumination is called lux (lx). When measured in square feet the unit is called a footcandle (fc).



The level of illumination on a surface produced by a light source is dependent upon the intensity of the source, its height, and the reflecting characteristics of the surface. Illumination is measured in terms of lux or footcandles.

The Illumination Engineering Society recommends minimum levels of illumination for street areas which are based upon pedestrian and vehicular traffic. These levels are measured at the street.

	Vehicular Traffic Classification			
Pedestrian Traffic	Very Light (under 150)	Light (150-500)	Medium (500-1200)	Heavy (1200-up)
Heavy	0.6	0.8	1.0	1.2
Medium	0.4	0.6	0.8	1.2
Light	0.2	0.4	0.6	0.8

TABLE 2.1 I.E.S. RECOMMENDED AVERAGE HORIZONTAL FOOTCANDLES (LUMENS PER SQUARE FOOT)

Street light fixtures and light sources (often referred to as luminaires) are available in a wide range of shapes, sizes and types.

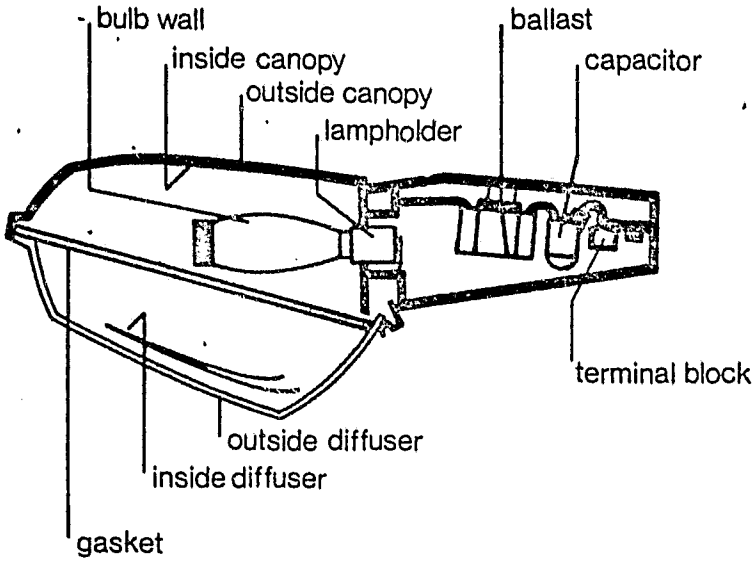
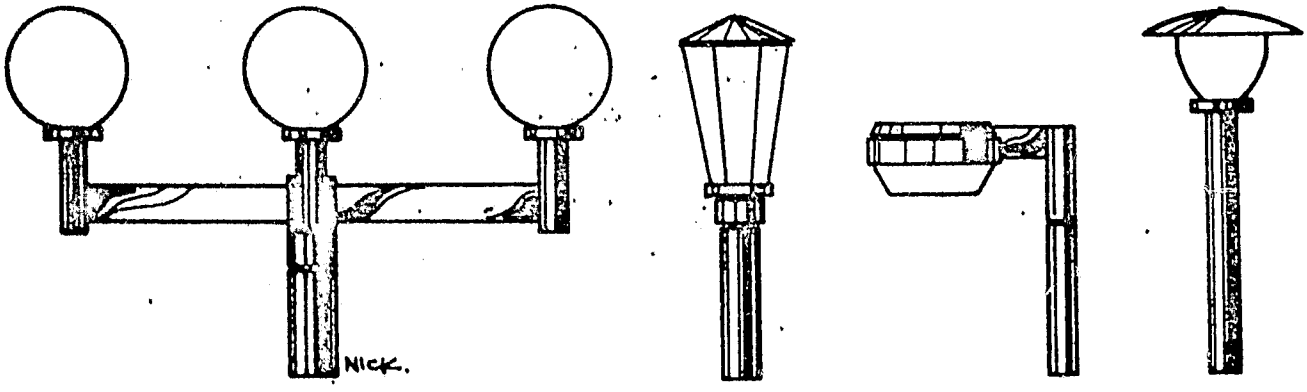
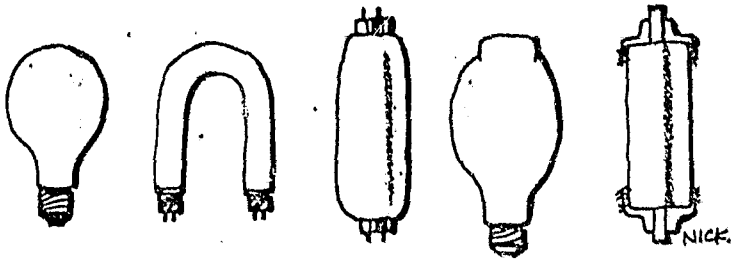


FIGURE 2.1 COMPONENTS OF TYPICAL LUMINAIRES



Luminaires come in widely varying shapes and sizes for different architectural applications and lighting requirements.

The actual light producing device, the light source, is the single most important element of a luminaire. While many different luminaire forms are being marketed, most outdoor types use a few basic light source designs.



common light source shapes

The flow rate of lumens emitted from most light sources are not constant throughout the life of the lamps. Accordingly, more than one measure of output is usually needed to adequately evaluate a source.

As would be expected, initial output ratings for most types of sources refer to outputs when the sources are first turned on. However, flourescent lamp ratings are an exception. Since flourescent light output usually decreases rapidly during the first 100 hours of operation, initial ratings refer to 100-hour values.

Since all light sources except low pressure sodium depreciate with age, rated values of mean light output over a lamp's life and values at the end of rated life should be considered in planning and evaluations.

The rated life for a lamp is defined as the period of time in which 50 percent of the lamps in an installation are likely to fail.

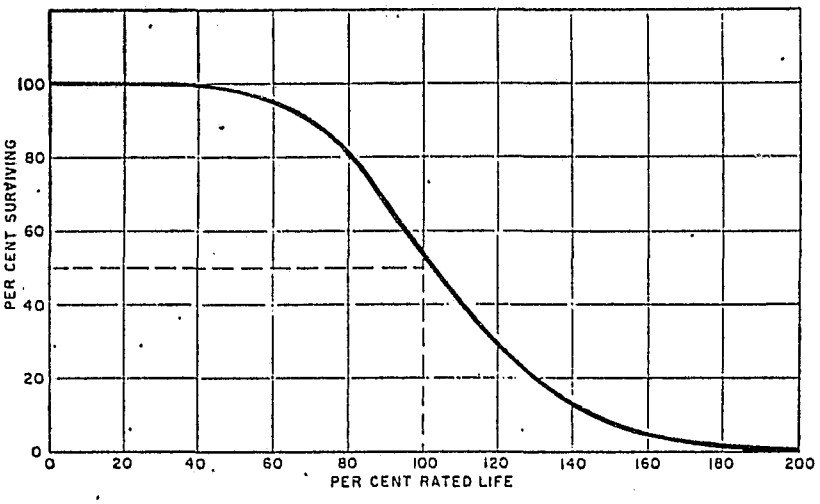


FIGURE 2.2 TYPICAL MORTALITY CURVE FOR ESTIMATING AVERAGE BULB LIFE IN A LARGE LIGHTING INSTALLATION

Rated bulb life is the period of time when only 50 percent of the sources are still operating. (From I.E.S. Fundamentals Course)

National energy shortages and escalating electrical costs make it increasingly important to consider operating expenses and efficiencies of alternative lighting systems. Efficiencies are measured in terms of lumens per watt.

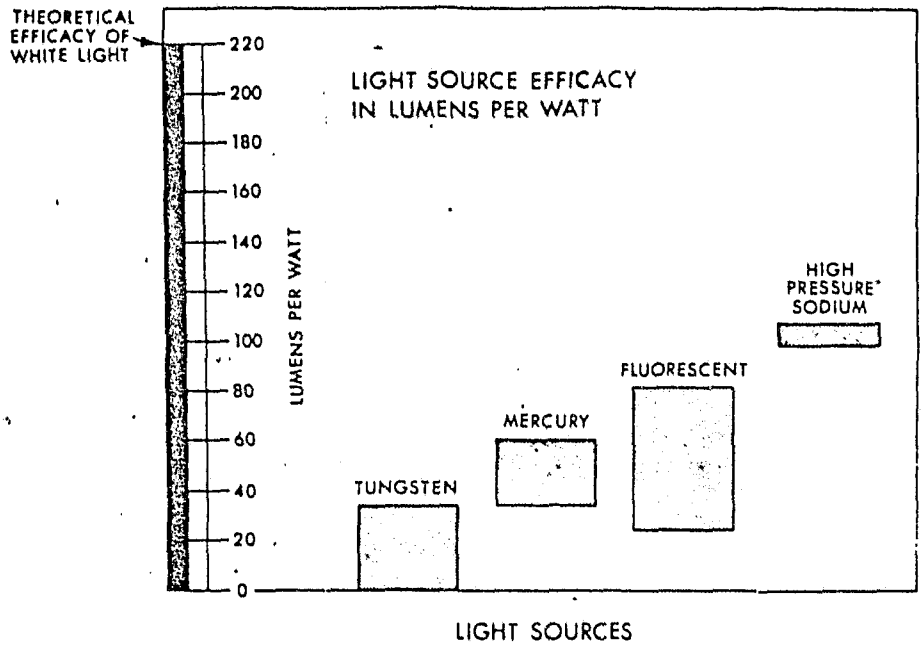


FIGURE 2.3 EFFICIENCY RANGES FOR COMMON LIGHT SOURCE TYPES (FROM I.E.S. FUNDAMENTALS COURSE)

Each type of light source has a characteristic color or color range associated with it. While research shows that colors of illumination do not affect visibility, colors can significantly affect perceived levels of danger. For example, the distinct blue-green color of mercury-vapor lighting renders red objects black. Neighborhoods lit with these lamps often appear unfamiliar and unnatural with friendly faces of residents becoming more difficult to recognize. These effects can promote disorientations and atmospheres condusive to suspicion and fear, all of which undermine positive benefits of street lighting programs.

Light sources are divided into general categories that refer to the methods through which they generate light. Some important characteristics of popular outdoor light sources are summarized in the charts that follow.

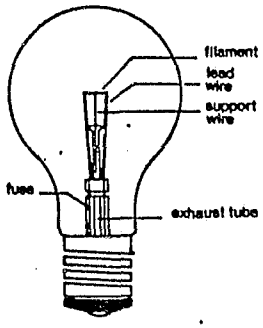
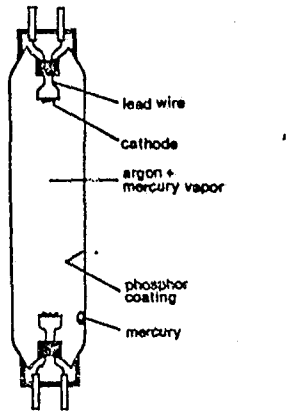
	INCANDESCENT	FLUORESCENT
Components		
Light Output Initial Mean End of life	750-34,400 lm 60% Initial lm 30% Initial lm	127-16,000 lm 73-86% Initial lm 60-78% Initial lm
Lamp Efficiency	10-40 lm/watt	30-80 lm/watt
Life % survival at 10,000 hours	750-2,000 hours 0	7,500-18,000 hours 60-75%
Strength	Susceptible to vibration and shock.	Virtually free of vibration and shock failures.
Electrical Char. Wattage range Auxiliary equip.	 0-1,500 watts None required	 4-215 watts Ballast or starter
Color Acceptibility	Yellow-white Excellent	Wide range Good to high
Degree of light control	High	Low
Advantages, disadvantages, and special considerations	Voltage fluctuations strongly influence bulb life; operate at high temperatures; concentrated filament approximates a point source, enabling good optical control; low initial cost; operate over a wide range of temperatures.	A linear source; relatively low surface luminance; relatively high initial costs due to auxiliary equipment; temperature and humidity sensitive; cause radio interference; relatively few lumens for physical size of lamp.

TABLE 2.2 INCANDESCENT AND FLUORESCENT LIGHT SOURCE CHARACTERISTICS

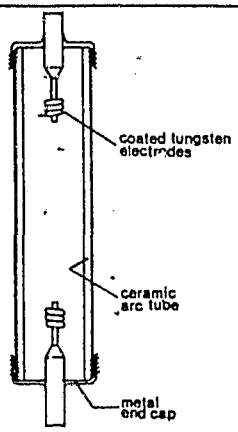
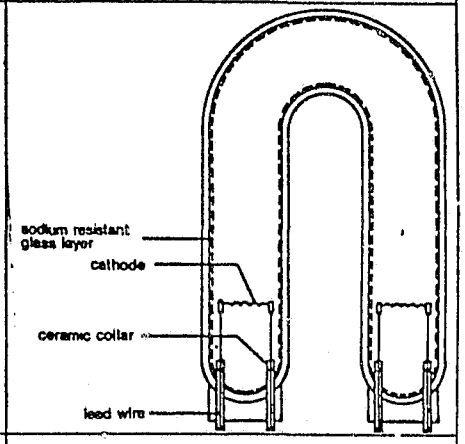
	LOW PRESSURE SODIUM	HIGH PRESSURE SODIUM
Components		
Light Output Initial Mean End of life	4,650-33,000 lm 100% Initial lm 100% Initial lm	25,000-47,000 lm 90-93% Initial lm 60-70% Initial lm
Lamp Efficiency	133-204 lm/watt	100-130 lm/watt
Life % survival at 10,000 hours	18,000 hours 90%	10,000-15,000 hours 40-60%
Strength	Virtually free of vibration and shock failures.	Virtually free of vibration and shock failures.
Electrical Char. Wattage range Auxiliary equip.	35-180 watts Ballast required	250-1,000 watts Ballast or ignition circuit required
Color Acceptibility	Amber Fair-Good	Golden Fair-Good
Degree of light control	Good	Good
Advantages, disadvantages, and special considerations	Sodium lamps are generally superior to other light sources in most respects; low pressure lamps do not have efficiency deterioration with use after 100 hours; require 8 minutes of run-up before full output.	Sodium lamps are generally superior to other light sources in most respects; high pressure lamps require from 3 to 15 minutes of run-up before full output.

TABLE 2.3 LOW AND HIGH PRESSURE SODIUM LIGHT SOURCE CHARACTERISTICS

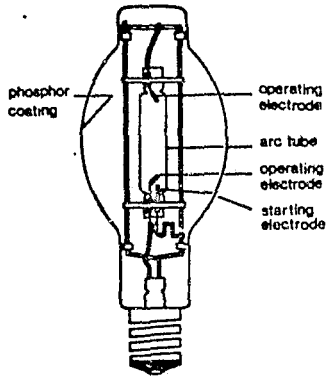
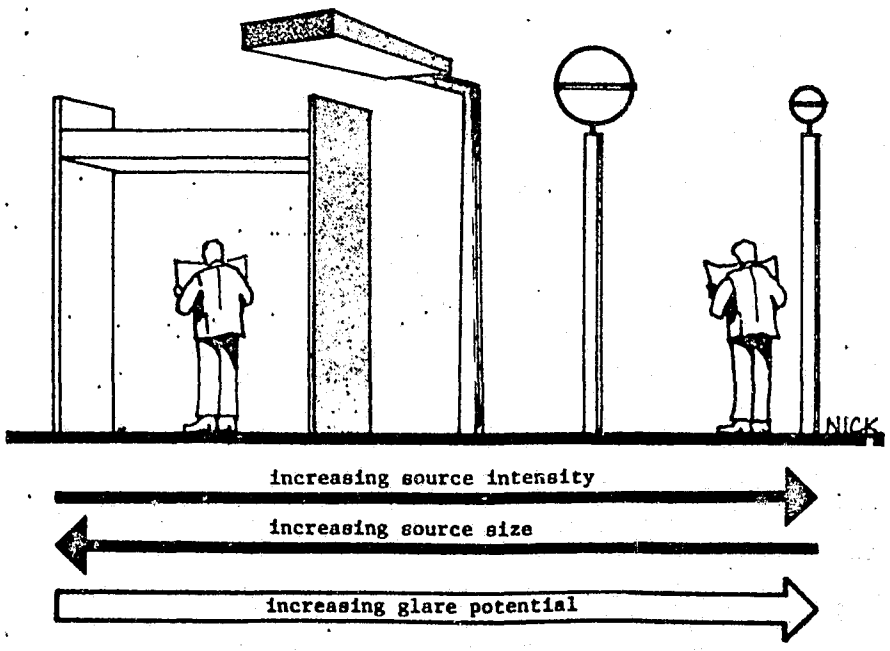
	MERCURY VAPOR
Components	
Light Output Initial Mean End of life	1,200-63,000 lm 64-92% Initial lm 32-85% Initial lm
Lamp Efficiency	30-65 lm/watt
Life % survival at 10,000 hours	10,000-24,000 hours 40-80%
Strength	Almost free of vibration and shock failure.
Electrical Char. Wattage range Auxiliary equip.	 40-2,000 watts Ballast required
Color Acceptibility	Blue-green Low-Fair
Degree of light control	Good
Advantages, disadvantages, and special considerations	Approximately 15 minutes run up time to full output; high ultraviolet output in standard lamps is unused but newer coated lamps convert the ultraviolet light to visible light. The greenish blue light is very poor for natural color rendition by standard lamps, but color rendition by coated lamps is fair.

TABLE 2.4 MERCURY VAPOR LIGHT SOURCE CHARACTERISTICS

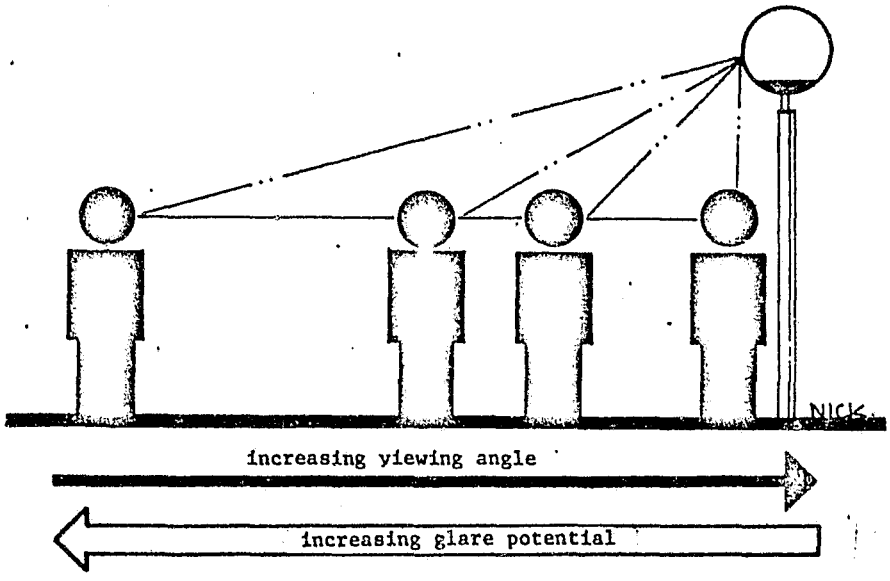
Sizes of light sources must be considered along with intensities when determining glare potential. The greater the ratio of lighting intensity to the size of a source, the greater the potential for glare. Very large low level light sources are least likely to cause glare, and intense pin-point sources are most likely. Yet both can be designed to provide the same illumination level for an area.

Evidence of inadequately planned lighting often becomes painfully apparent in the form of glare. This term is used to describe lighting characteristics that cause discomfort, visual interference, or eye fatigue. For example, any light source in the visual field which has an intensity that is greater than the general level to which most eyes are adapted will produce glare.

A luminaire that has a high light output is more likely to cause a serious glare problem than a low luminance lamp, but it should not be assumed that high intensity light sources necessarily cause glare problems. Other factors must also be kept in mind.



Locations of lighting sources should also be considered along with sizes and intensities in order to prevent glare problems. For example, a glare problem that has been caused by a light source located in an important line of pedestrian vision can be reduced by raising the luminaire above the range of annoyance. Luminaires should generally be placed at high angles (45-90 degrees from the horizontal line of sight) since the eye is least sensitive to light in this sector of the visual field. Care should be used when planning light locations since viewing angles change as a function of each observers distance from a source.

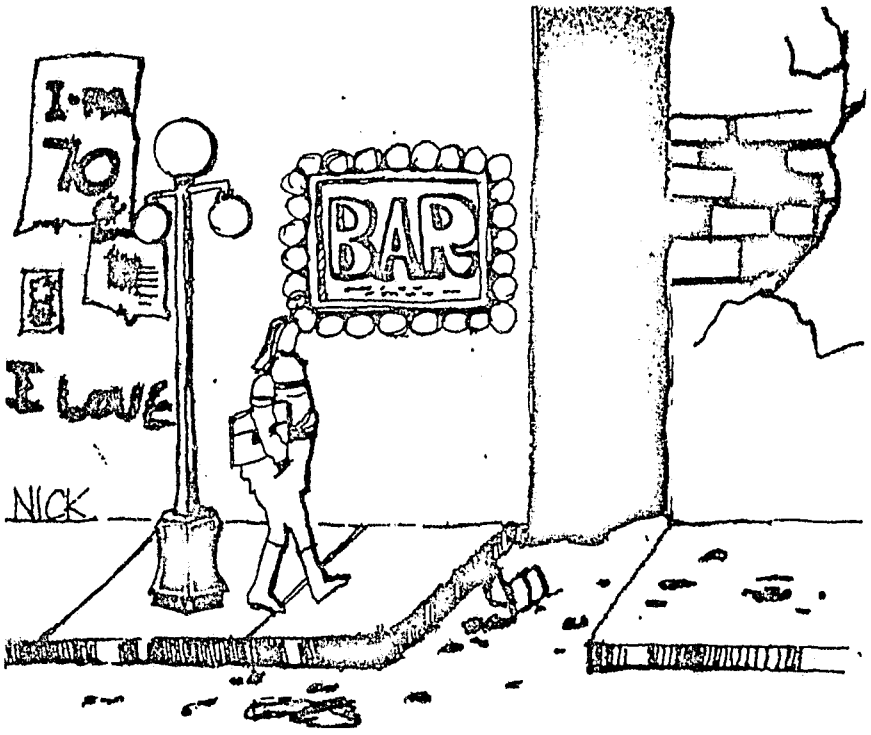


Lighting system manufacturers are keenly aware of glare problems associated with different types of sources and provide a large variety of pole (or "standard") heights. High intensity light sources are conventionally placed high and are cantilevered over streets to reduce glare into adjacent building windows and throughout traffic areas. Low intensity lamps with large globes are often set into much lower standards suited to the scale and visual character of pedestrian corridors.

HEIGHT RANGE OF STANDARDS	GENERAL CATEGORY	TYPICAL USES AND INSTALLATIONS
54 - 138 feet	High Mast	Large Highways Wide Intersections Roadside Rest Areas Large Parking Lots Sports Fields
24 - 45 feet	Lighting Columns (A)	Streets and Intersections Parking Lots Large Open Park Areas Commercial Alleyways
15 - 18 feet	Lighting Columns (B)	Secondary Streets Major Pedestrian Areas Residential Alleyways
12 feet	Amenity Lighting	Malls Mini-parks General Decorative Uses

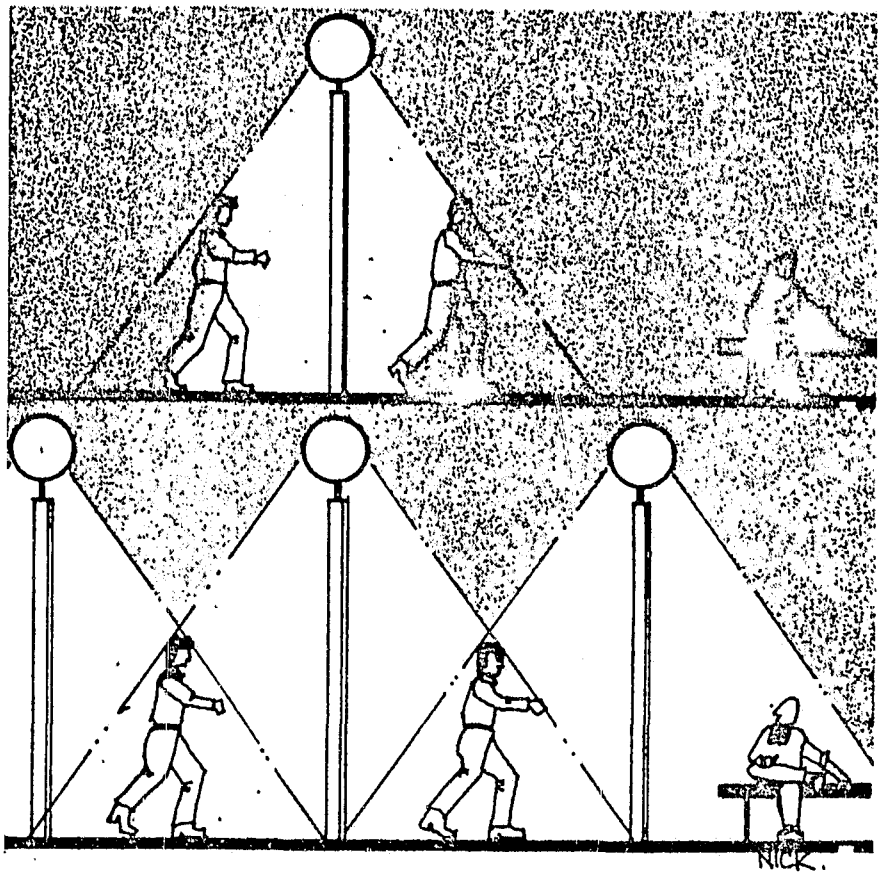
TABLE 2.5 HEIGHT RANGES FOR TYPICAL STANDARDS

Blinding glare problems are often caused by light sources which were installed for commercial purposes unrelated to comfort or safety. Such sources include large billboards, advertising signage with flashing lights and area lighting surrounding automobile lots and other properties. Sign ordinances are gradually gaining public support in many communities to reduce some of these problems and rising energy costs can be expected to also have an increasing influence.



Glare problems caused by street signage and other uncontrolled sources can interfere with natural surveillance.

Glare problems that arise from uncontrollable sources can often be reduced by increasing background illumination to avoid sharp contrasts or "hot spots." Another approach for obtaining a more balanced lighting quality, of course, is to persuade businesses that have invested in troublesome advertising lighting to switch to lower intensity sources or place translucent covers over lamps to provide a dimming effect. An argument to persuade owner cooperation is the fact that crime prevention objectives are in his or her best personal and business interests.



Multiple light sources can provide diffuse and even illumination to avoid harsh shadows and reduce glare.

Rather than depend upon a single type of lighting unit it is often desirable to implement a combination approach which provides flexibility to address varying conditions and needs. These combinations will typically include high intensity sources for efficient broad area coverage, supplemented by low intensity sources for in-fill balancing and pedestrian and residential area use. Well balanced lighting is diffused--with illumination coming from many directions to avoid harsh shadows and silhouettes that make it difficult to distinguish details of street objects or features of faces. Diffuse lighting also has the effect of calming the visual character of the street to reduce fear.

The duration of exposure to illumination sources also influences relative levels of glare experienced. For example, lights that continually shine into nearby bedrooms and living rooms can be an annoyance that severly erodes resident satisfaction with a lighting program.

Some typical precautions and remedies for lighting glare are summarized in the chart that follows.

GLARE FACTORS	PRECAUTIONS AND REMEDIES
1. Size and intensity of the source	- Decrease the intensity of the light source. - Increase the area of illuminance of the lighting fixture.
2. Position of the source	- Mount the light source on tall standards to increase the viewing angle. - Shield the source to reduce the glare of a luminaire mounted at a low viewing angle.
3. Source contrast with the background field	- Increase background illumination to balance lighting levels. - Reduce the intensity of the source.
4. Lack of adequate diffusion	- Use a combination of high and low intensity lighting units that are strategically located to provide balanced illumination levels. - Provide an adequate number of light sources to insure illumination from many directions and avoid silhouetting.
5. Duration of glare exposure	- Relocate the light source. - Shield light in the direction of the glare problem.

TABLE 2.6 COMMON GLARE CAUSES, PRECAUTIONS AND REMEDIES

Information about potential or actual lighting distribution levels is important for planning a new system or determining requirements for upgrading an existing installation. In the case of existing system evaluations the information can be obtained through estimations based upon manufacturer's specifications, or by direct measurement.

Estimates offer the quickest and least expensive method of determining general lighting distribution levels--but introduce theoretical ideals based upon "new installation" circumstances which do not allow for environmental factors. With proper consideration of all potential causes of reduced lighting levels, Illuminating Engineering Society standards may have to be increased by 50 percent or more to account for predictable declines.

CAUSE OF REDUCED LIGHTING LEVEL	EFFECTS OF THE PROBLEM
Dust Depreciation Breakage	Even with good maintenance these factors may reduce lighting by 25%; with poor maintenance, reduction may be 50%; breakage reduces output to zero.
Reflectance	Departures from favorable reflectance (10%) requires adjustment of I.E.S. (Illuminating Engineering Society) standards by as much as 50% upwards.
Foliage	Reductions of lighting output may be up to 95%, requires seasonal checking of plant growth.
Buildings and other Exterior Obstructions	Obstructions may cause illumination to fall to zero in shadowed areas; intense contrast also detract from quality of lighted areas as well.

TABLE 2.7 COMMON FACTORS THAT REDUCE LIGHTING SYSTEM EFFICIENCIES

These are recommended minimum levels to be delivered at the street level, based on the number of vehicles per hour traveling on the street for the maximum night hour in both directions.

Pedestrian Traffic	Vehicular Traffic Classification				Vehicular Traffic Classification			
	Very Light (under 150)	Light (150-500)	Medium (500-1200)	Heavy (1200-up)	Very Light (under 150)	Light (150-500)	Medium (500-1200)	Heavy (1200-up)
Heavy	0.6 FC	0.8 FC	1.0 FC	1.2 FC	0.9 FC	1.2 FC	1.5 FC	1.8 FC
Medium	0.4 FC	0.6 FC	0.8 FC	1.2 FC	0.6 FC	0.9 FC	1.2 FC	1.8 FC
Light	0.2 FC	0.4 FC	0.6 FC	0.8 FC	0.3 FC	0.6 FC	0.9 FC	1.2 FC
	Original I.E.S. Recommended Levels				Levels Adjusted for Environmental Factors			

TABLE 2.8 RECOMMENDED LIGHTING LEVELS ADJUSTED TO ALLOW FOR TRAFFIC CONDITIONS AND ENVIRONMENTAL INTERFERENCE

System distribution estimates are achieved by mapping the distribution patterns of individual lamps in the system and computing illumination levels in areas of overlap between nearby units. Since illumination levels (measured either in footcandles or lux) are additive when coincident, levels for overlaps can be tabulated quite easily.

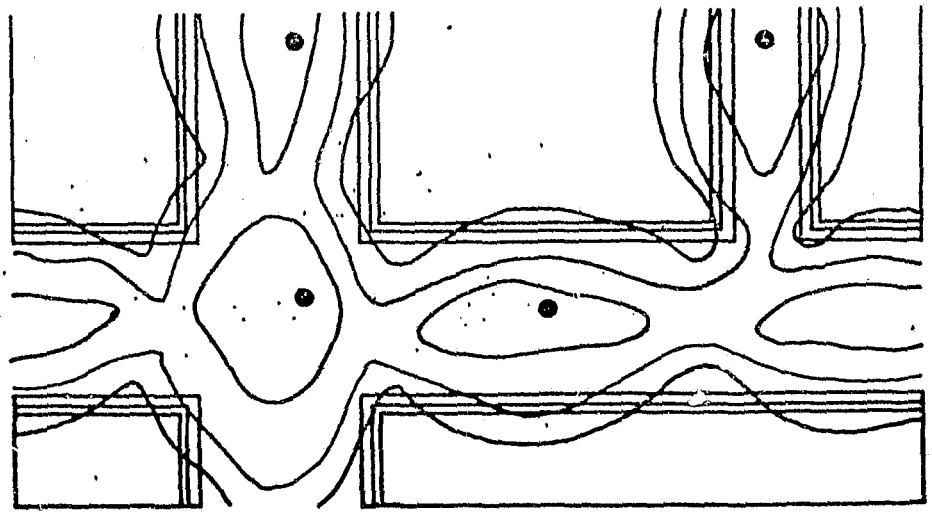


FIGURE 2.4 MAPPING LIGHTING SYSTEM DISTRIBUTIONS

Directly measured distributions are mapped in the same manner as estimated distributions, the difference being that plots are based upon gathered field data rather than extrapolations of manufacturers' specifications.

2.3 Evaluating System Alternatives

Since lighting priorities and alternatives vary in different locales, a scheme which is accepted as being appropriate in one neighborhood may not be popular in another, even if the two neighborhoods are of the same general type. It is very important to involve residents in the planning process so that local concerns and objectives are recognized. For example, a high intensity lighting system may be welcomed in a residential area where citizens are aware and fearful of crime problems due to publicity about a notorious event or series of events. Residents of a similar appearing but less crime aware neighborhood may reject the lighting as an unnecessary glare annoyance that shines in windows to interfere with sleep. Or in a case involving dissimilar neighborhoods, citizens in a residential area may find the color and intensity of a sodium or mercury vapor system to be too conspicuous and unnatural, while proprietors in an adjacent business area welcome the dramatic lighting changes along their strip as evidence of overdue municipal support and progress.

The effectiveness of an outdoor lighting plan should not be determined on the sole basis measureable crime reduction or any other narrowly defined objective. Good lighting serves many social needs, making open spaces appear more secure and inviting, reducing traffic hazzards, enhancing the visual quality of a community and dramatizing important focal points, fostering an atmosphere condusive to social interaction, and in general, contributing to an improved quality of life.

References

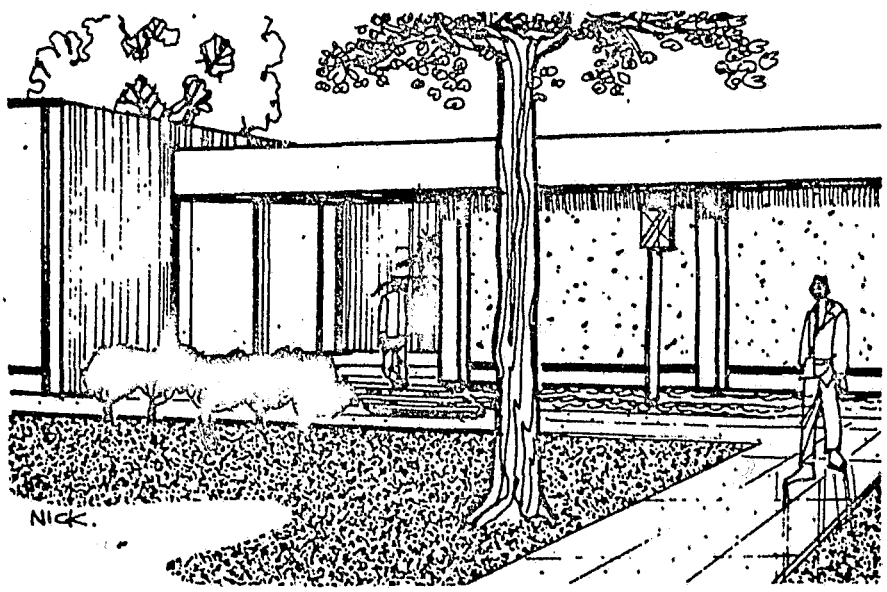
- Crime in Minneapolis: Proposals for Prevention; D. W. Frisbie, et. al.; Governor's Commission on Crime Prevention and Control, Community Crime Prevention Project; St. Paul, Minnesota; May, 1977.
- Essays on Lighting; J. G. Holmes; Crane, Russak, and Co., Inc., New York, New York; 1975.
- I.E.S. Fundamentals Course; Illuminating Engineering Society; New York, New York; 1971.
- Lamps and Lighting; S. T. Henderson and A. M. Marsden; Crane, Russak, and Co., Inc.; New York, New York; 1972.
- Primer of Lamps and Lighting; W. Allphin; Chilton Co.; New York, New York; 1959.
- Street Lighting Projects: National Evaluation Program Phase I Final Report; James M. Tien, et. al.; National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, U. S. Department of Justice; Washington, D.C.; 1977.

CHAPTER 3. LANDSCAPING WITH PLANT AND SURFACING MATERIALS

3.1 Introduction

Studies have concluded that areas of high user satisfaction are often low in vandalism. One factor influencing user satisfaction is the aesthetic appearance of an area, reflecting resident commitments to quality of life priorities. Carefully planned and maintained landscaping can be important in this respect. Appropriately selected and cared for plant materials, streets and sidewalks that are in good repair, and open spaces that are well kept and show evidence of owner concern can help to bolster neighborhood confidence and pride.

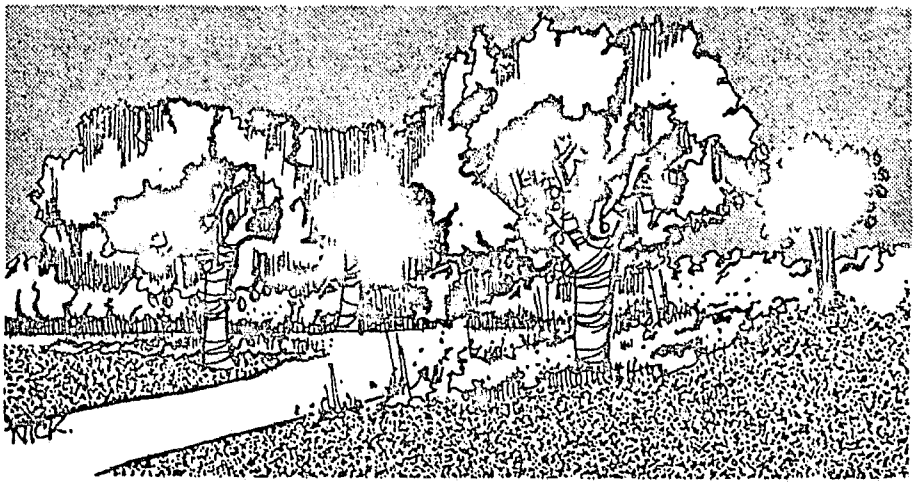
Well planned outdoor landscaping can also be important to facilitate natural surveillance opportunities for residents and police by avoiding or eliminating visual obstructions that can conceal crime dangers.



Landscaping should be planned so as not to obstruct views of building access points and other potential problem areas.

3.2 Landscaping Influences Upon Activities

Landscape treatments, whether carefully planned or not, often influence use of outdoor spaces in significant ways. The treatments can encourage take-overs by neighborhood "toughs" by creating undifferentiated open spaces where the strongest users take control. The treatments can also contribute to the creation of unsurveillable pockets along pedestrian corridors which prudent people are afraid to walk past or through during evening hours. Or the treatments can encourage safe and enjoyable use by diverse or specialized groups by supporting desired activities and activity levels and by restricting undesirable times and types of use.



Overgrown vegetation can create blind areas which prudent pedestrians are afraid to enter or pass.

Landscaping can influence crime and vandalism-related activities through several environmental devices:

- By defining or re-defining circulation paths which channel flows to optimize natural surveillance opportunities.
- By introducing soft and hard surfaces that are appropriate to reinforce desired uses, avoid rapid deterioration which will detract from visual quality and/or require continuous maintenance, and resist or discourage vandalism.

- By providing physical boundaries that divide spaces into smaller activity areas that are appropriate to support desired functions and reduce control problems.
- By providing or aesthetically masking physical barriers that restrict areas and/or times of use.
- By matching the selection and placement of plant materials to site configurations, topographical features and lines of sight from adjacent activity areas to facilitate natural surveillance opportunities.
- By selecting types and placements of plant materials which are not highly vulnerable to vandalism damage.

3.3 General Planning Considerations

As with lighting, "appropriate" landscaping requires knowledge of local conditions and objectives. If the planned use of an open space is inappropriate in relation to surrounding land uses and neighborhood problems and issues, landscaping that supports that intended use, however carefully planned, is bound to be improper in a real sense. And while careful landscaping can often reduce undesirable qualities of a particular site by reinforcing or redefining uses and improving surveillance opportunities, it should not be regarded as a substitute for more appropriate site selection.

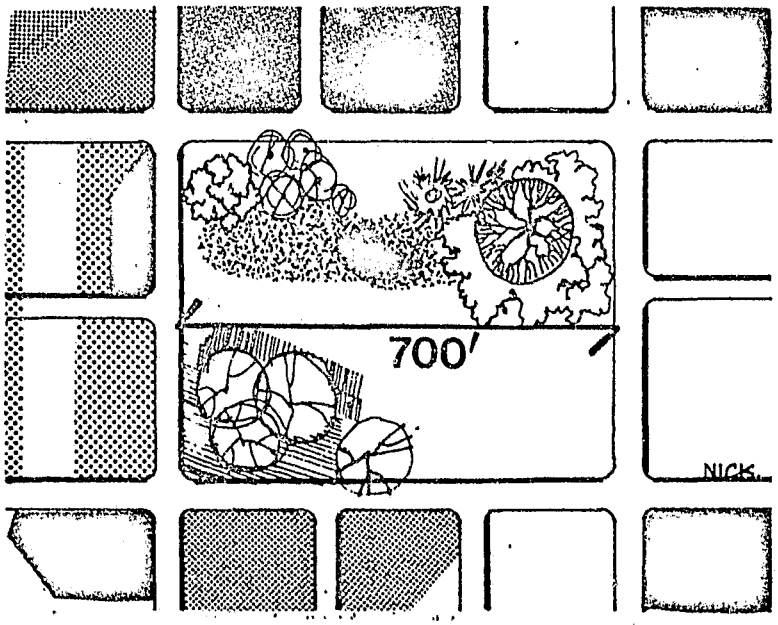
Planned uses for public outdoor areas should be guided by realistic understandings of constraints of surrounding areas. Familiar planning errors include:

- "Parks" in uncontrolled high crime locations which are "no-man's lands" that most residents are afraid to enter.
- Spaces which were intended for use by families, children and/or elderly that are taken over by teenagers from a near-by high school or popular youth gathering place.
- Public areas that are not conveniently accessible to intended users due to remoteness, ill-conceived pedestrian and vehicular links to areas of user origins, and inadequate public transit and parking provisions.

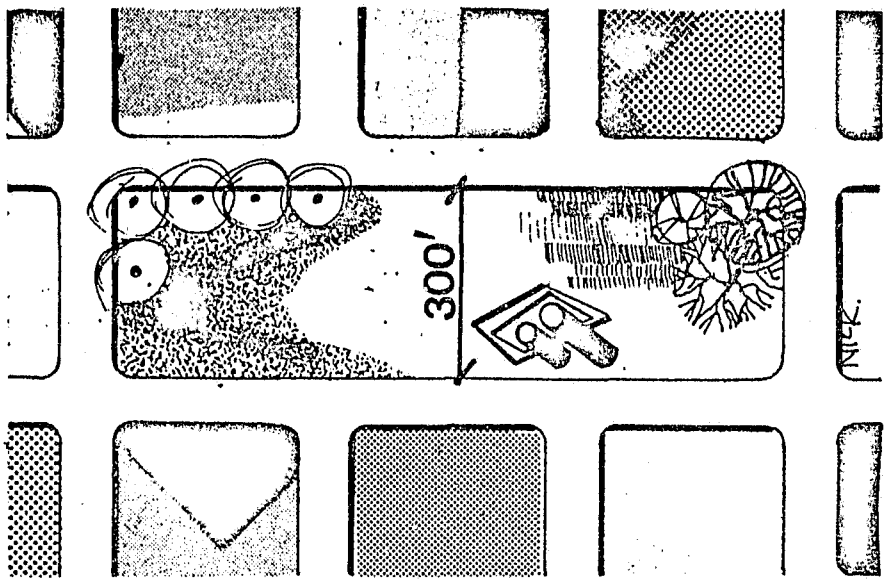
- Public uses that are incompatible with prevailing land-use or time use patterns of the surrounding area.

Many sites pose serious surveillance problems by nature of their shapes and terraine features. For example:

- Large wide parks in high crime locales are often difficult for police to efficiently patrol because of few internal roads and site distances which are too far to see across.

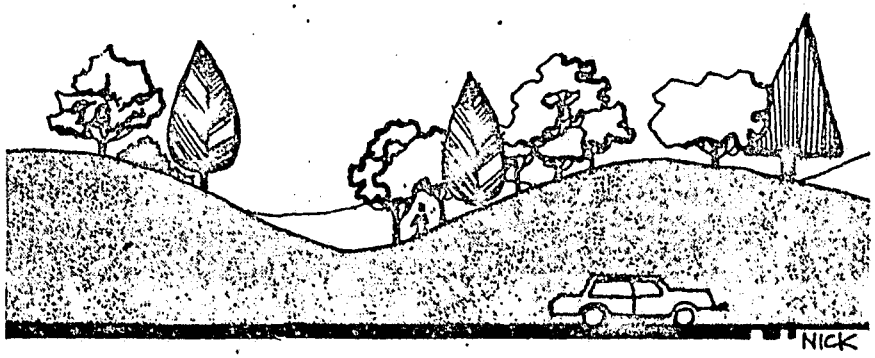


The maximum range of vision for clear surveillance is 700 feet or less. Therefore long, wide parks in high crime risk locales should not exceed this dimension unless penetrated by roads that facilitate patrol activities.



Narrow parks (300 feet or less in width) can have long dimensions and still provide surveillance opportunities provided that landscaping does not obstruct cross viewing.

- Abruptly changing site elevations create pockets that conceal people who are in them from street surveillance.



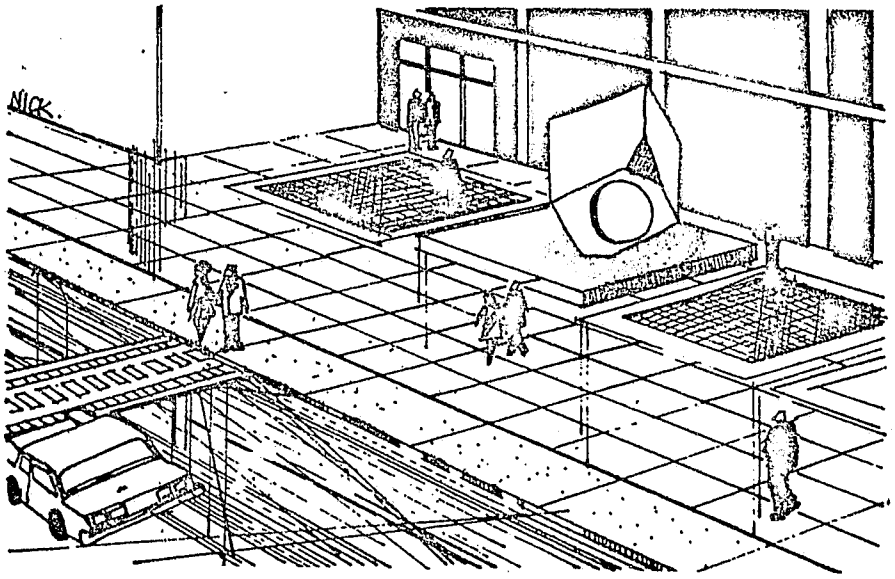
The aesthetic value of wooded, rolling parks in high crime risk locales may often be outweighed by victimization problems that they create by concealing criminal activities.

3.4 Landscaping Streets and Pedestrian Ways

Landscaping can be important to both physically and visually direct people through areas in ways which will enhance user enjoyment, yet still provide opportunities for danger detection by citizens and police. This can be accomplished through proper design of surface treatments and through careful plant selection and placement to define boundaries, create barriers and highlight focal points.

Surface treatments along pathways can encourage people to follow prescribed routes by offering direction, safety and convenience:

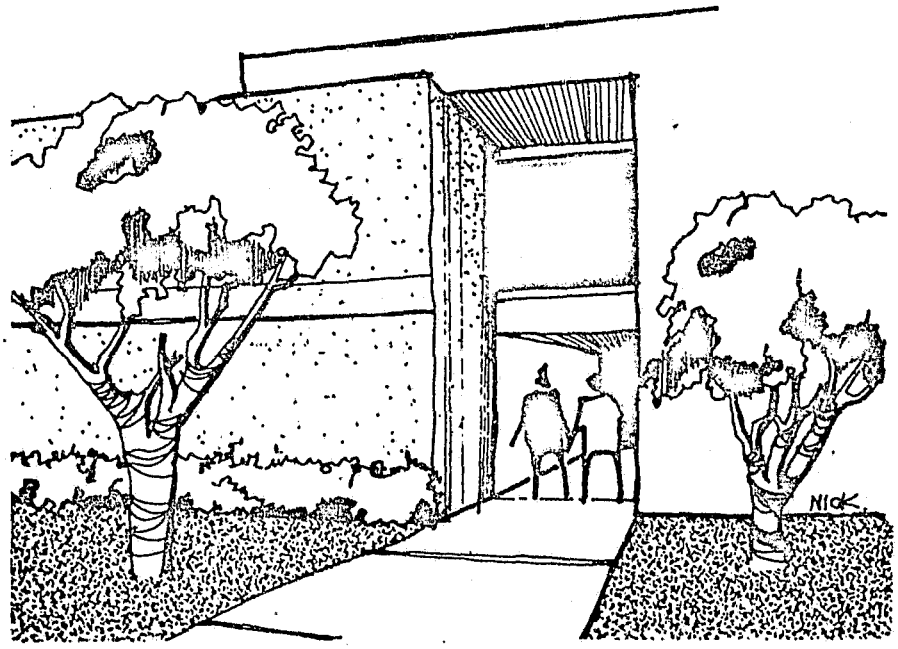
- Direction can be provided by changes in materials, colors and textures (e.g. using brick pavers to identify a crosswalk on an asphalt street).



Changes in paving used for both directional and decorative purposes.

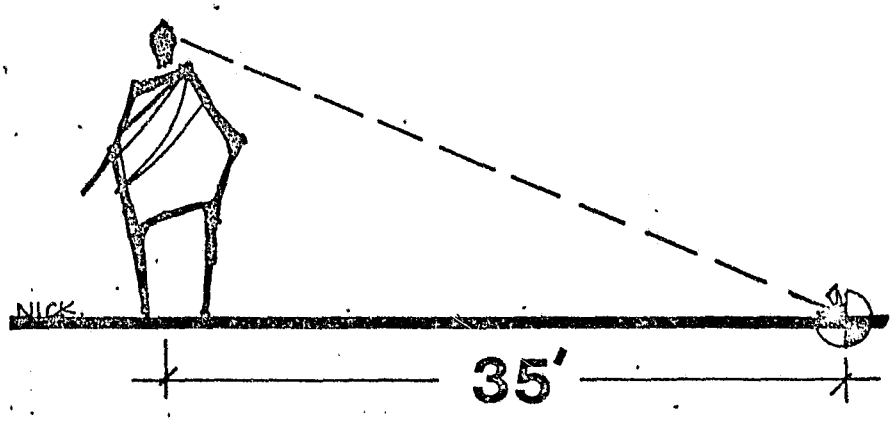
- Safety has to do with providing routings that facilitate natural surveillance from near-by streets, buildings and other activity areas. It also has to do with choice of materials and provision of maintenance to prevent accidental injuries.
- Convenience requires that paths either offer the shortest routes, or that in cases where they don't, very pleasant and interesting routes that make deviations seem worthwhile. (Landscaping can be used to help achieve the latter.)

Landscaping with plant materials can reinforce directional guidance afforded by surface treatments by emphasizing important destination points in the distance so that pedestrians have a better sense of where they are being led to. This can be accomplished by removing obstacles that block existing focal points; visually framing focal areas with trees, setting the areas off from the rest of the site; and/or creating new focal points with planted and man made elements.

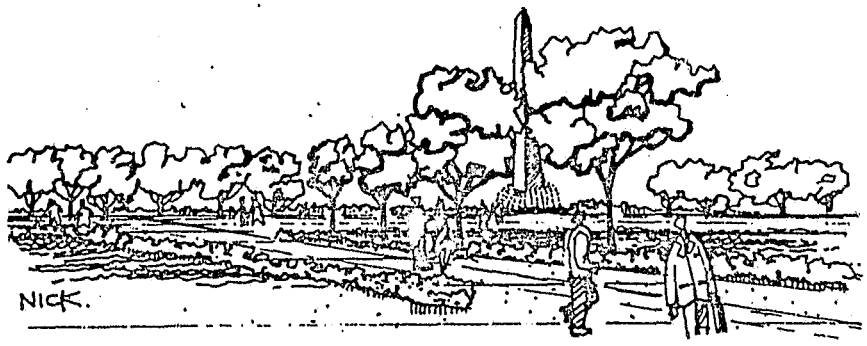


Plant materials used to dramatize a site or building entrance.

Planted borders, including trees, should be located far enough back from pathways and be periodically trimmed as required to provide uncrowded visual corridors that are not encroached upon by foliage. Since the visual focus of strolling pedestrians is usually about 35 feet ahead, people tend to feel most comfortable and secure when site conditions allow them clear views of that distance or more.

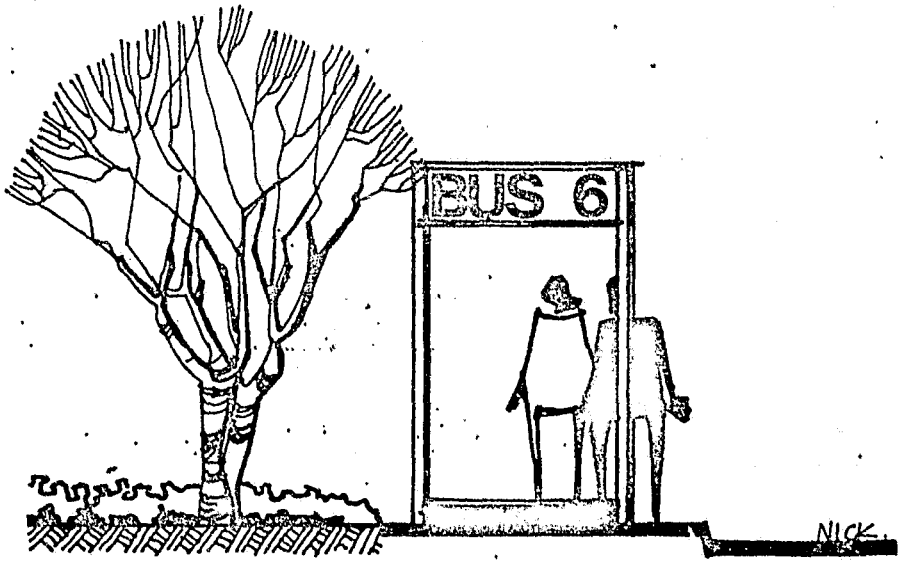


Plant materials placed along pedestrian ways can provide subtle and attractive controls that prevent people from straying into unsafe or unauthorized areas. It is important to remember, however, that shrubbery should not be more than 2 1/2 to 3 feet tall to avoid interferring with natural surveillance. Single row shrubbery borders at this general height are sufficient to psychologically discourage cross traffic. Thorny shrubs are particularly effective for discouraging people from climbing over or hiding under them.



Low shrubbery used for directional traffic control.

In high crime areas, densely planted shrubbery that is 2 feet tall or lower is preferrable to eliminate potential hiding places for offenders. Pathway corners and intersections are particularly critical, and should be free of all visual obstructions that can conceal dangers.



Low, wide ground cover used to provide a clear view of rear approach to bus shelter while restricting access to front entry.

Tall, wide, densely planted shrubbery can be used as a barrier device to close off areas that are "off-limits" to the public, provided that visual surveillance into those areas from ground level is not essential. To be effective, the barriers must be tall and wide enough that it cannot be leaped over, and sturdy enough to resist penetration efforts.

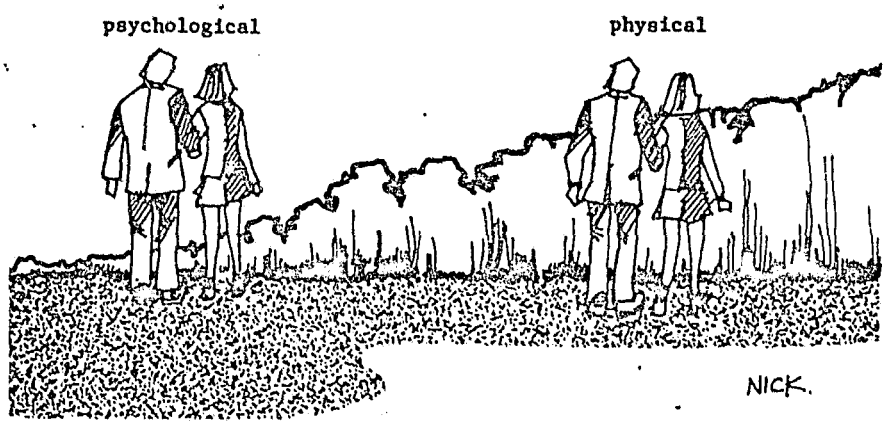


FIGURE 3.1 BARRIER IMPACT DUE TO HEIGHT

Shrubs that have stiff, dense, prickly branches and obnoxious odors are especially appropriate for barrier use.

PLANT CHARACTERISTIC RATING FOR BARRIER EFFECTIVENESS

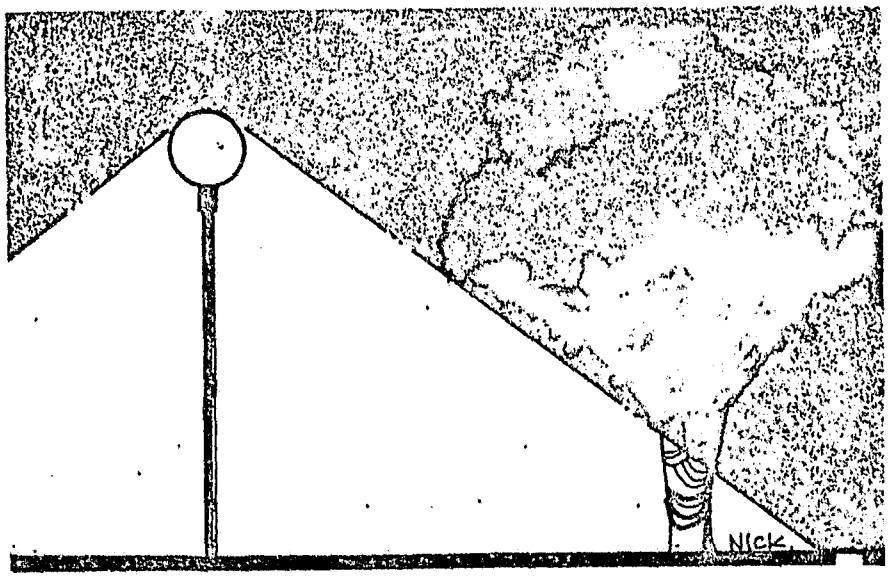
Minimum Effectiveness	1.	single stem	no thorns	flexible branches
	2.	single stem	no thorns	stiff branches
	3.	multi-stem	no thorns	flexible branches--open
	4.	multi-stem	no thorns	flexible branches--less open
		multi-stem	no thorns	stiff branches--open (example: Nine bark)
	5.	multi-stem	no thorns	stiff branches--dense
		single stem	thorns	flexible branches (examples: Father Hugo's Rose, Mountain Currant)
	6.	single stem	thorns	stiff branches (example: Rugosa Rose)
	7.	multi-stem	thorns	flexible branches--open
	8.	multi-stem	thorns	flexible branches--less open
		multi-stem	thorns	stiff branches--open
	9.	multi-stem	thorns	flexible branches--dense
		multi-stem	thorns	stiff branches--less open (example: Buckthorn)
Maximum Effectiveness	10.	multi-stem	thorns	stiff branches--dense

TABLE 3.1 PLANT CHARACTERISTIC RATING FOR BARRIER EFFECTIVENESS

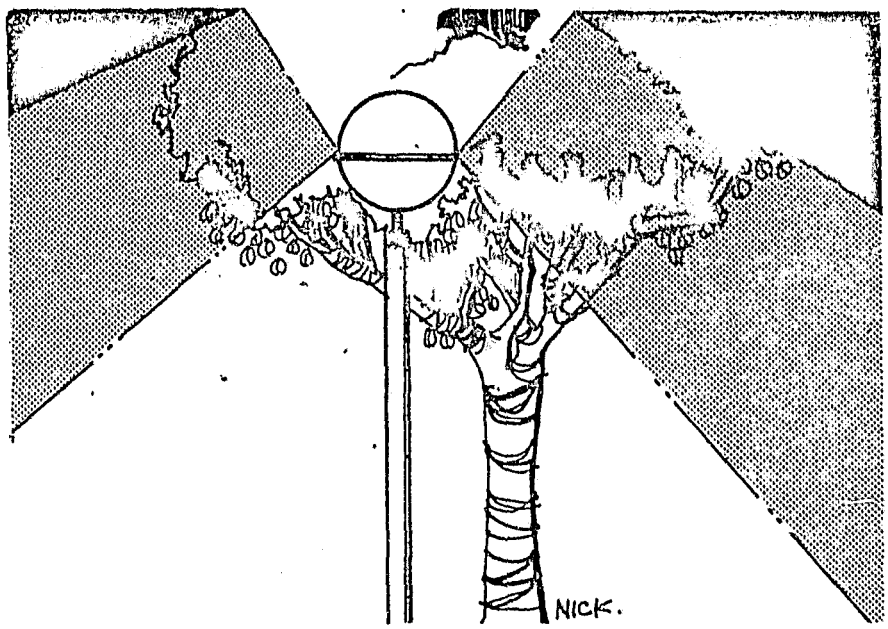
Taken from: Plants, People and Environmental Quality by G. O. Robinette

Shade trees can be used to enhance pedestrian use of pathways, but care should be taken to plan them so as not to interfere with natural surveillance from the street or from higher levels within adjacent buildings. Canopy trees that are 12 feet or taller with high branching characteristics are often used along streets where surveillance from above is not an important factor.

Trees and other elements should be selected and placed to avoid interference with lighting and electrical wiring to the extent possible and necessary tree trimming should be planned as part of a continuing maintenance program.

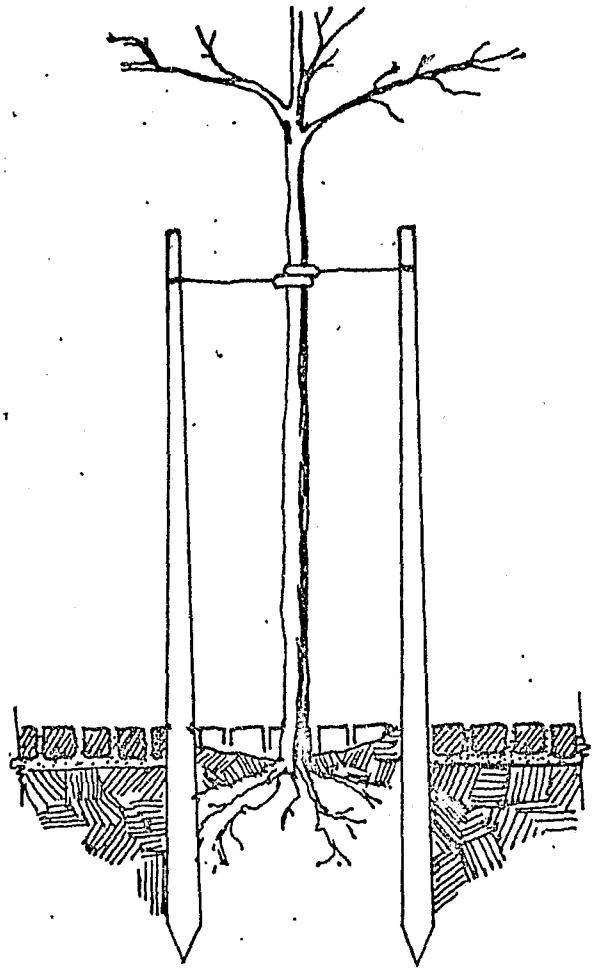


If planned and maintained properly, tree foliage can be used to increase lighting efficiency. Light that would otherwise be diffused into the sky and wasted can be reflected down to user areas by leaves.



During seasons of tree foliage, light can be reflected by leaves to increase street illumination levels.

When selecting trees, their maturation characteristics should be taken into account. Desired characteristics of some types of trees may require 30 years to realize while others will reach substantial maturity in as few as 5 years. Small young trees may often require protection if they are to survive potential vandalism and traffic damage threats. In locations with heavy traffic such as commercial areas, tree guards may be advisable to prevent breakage--and grates may be needed to prevent root compaction. Protective wires, screens and fencing offer other alternatives for problem locales.



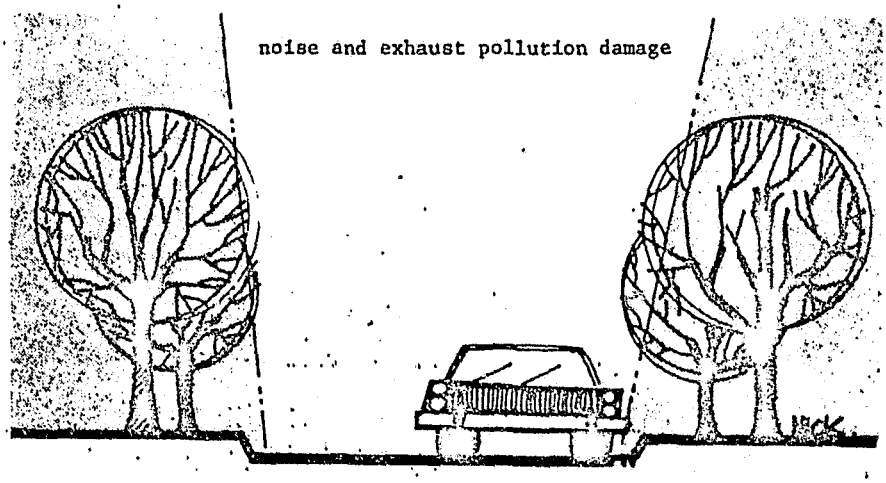
Tree guards and supports are often advisable to protect young plants from young people.

Proper selection and placement of plant materials requires forethought about climate factors and seasonal foliage changes. First, to be appropriate, plants must be able to endure weather and soil conditions of the particular locales. Accordingly, native plants should be given strong consideration because they often require the least amount of maintenance and stand the best chances of surviving. This is especially true in extremely hot, cold, dry, moist or changeable environments.

Seasonal influences upon plants can have enormous impacts upon natural surveillance opportunities. During spring and summer, dense foliage can interfere with lighting efficiency, cast shadows, and block views of pedestrian spaces. In fall and winter when branches are bare streets take on much more open characters. These characteristics may help to partly explain why crime rates in most northern communities tend to be highest in summer and lowest in winter.

The ability of plants to survive automotive exhaust pollution and noise is important in areas where traffic levels are high. Plants that have low tolerances to street traffic can be expected to require continuing and expensive care and replacement.

Different species and varieties of plants have widely ranging tolerances.



Only noise tolerant plant materials should be used along heavy vehicular traffic streets.

TABLE 3.2 EXAMPLES OF GROUND COVERS RATED BY ABILITY TO TOLERATE FOOT TRAFFIC

Most Tolerant

Least Tolerant

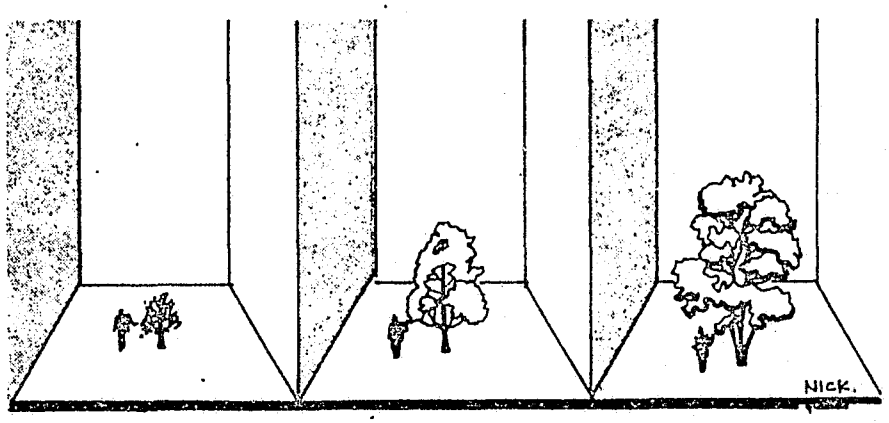
1. Poa Pratensis--Kentucky Bluegrass
2. Thymus Serpyllum--Thyme
3. Anenaria Verna Caespitosa--Moss Sandwort
4. Anthemis Nobilis--Camomile
5. Martricaria Rhinatchenii--Turning Daisy
6. Cerastium Tomentosum--Snow-In-Summer
7. Hedera Helix--English Ivy
8. Ajuga Reptans--Bungleweed
9. Cotoneaster Adpressa Praecox--Creeping Cotonwood
10. Rosa Wichuraiana--Memorial Rose

3.5 Landscaping Parks and Other Open Areas

While most of the landscaping considerations that have been discussed for streetscapes also apply to other public spaces, some other factors should be contemplated as well. Much of the emphasis so far has been upon optimizing natural surveillance through adequate lighting, open planning and channeling pedestrians near safe activities that provide "eyes on the street." When planning open multiple use spaces (e.g. parks), other types of design influence upon behavior and security warrant special attention.

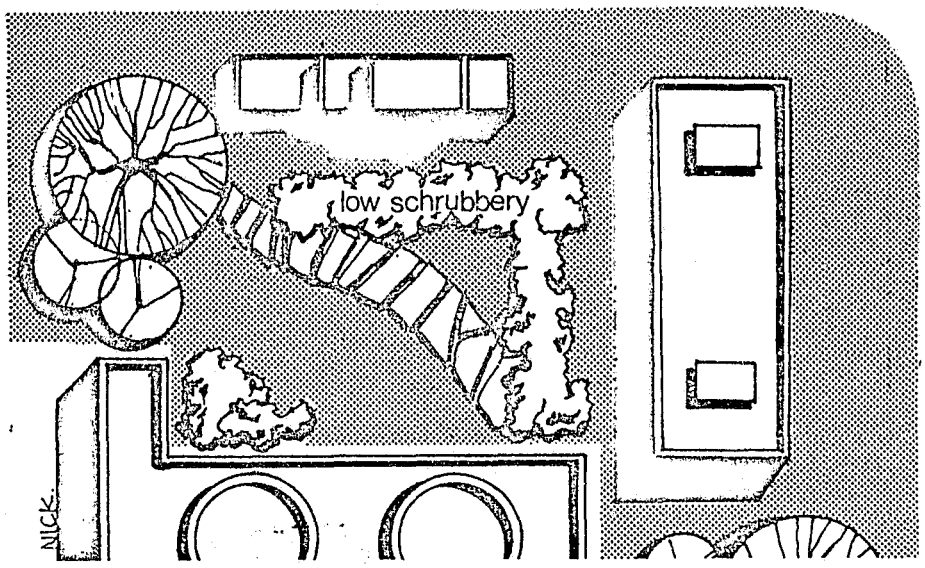
The physical design of environments can influence who the users are most likely to be and the nature of activities that occur by setting up both physical and psychological (or symbolic) incentives and constraints. "Proper design" in this instance refers to plans which match these incentives and constraints to realistic needs and desires of preferred user groups, to the disadvantage of users and uses that would harm the community. The term "activity support" has come to be used to describe efforts to define and reinforce desirable uses of space through design. Landscaping can often play an important role in achieving this objective.

We have probably all had the experience of let-down after seeing a beautiful architectural proposal of an inviting looking building development emersed in foliage and later view the finished structures as harsh, massive elements on freshly bulldozed sites. This "before and after" comparison (in reverse) can serve to illustrate the important influence that landscaping has upon our perceptions of environmental warmth and "humanness." Landscaping can appear to reduce the scale of spaces and structures so that people feel more comfortable and welcome--in effect, attracting use. Landscape elements can also provide attractive interest features which provide needed visual relief to spaces, producing calming effects on people.



Selection of types and sizes of trees can influence perceived scale by softening architectural geometry and offering natural scale transitions.

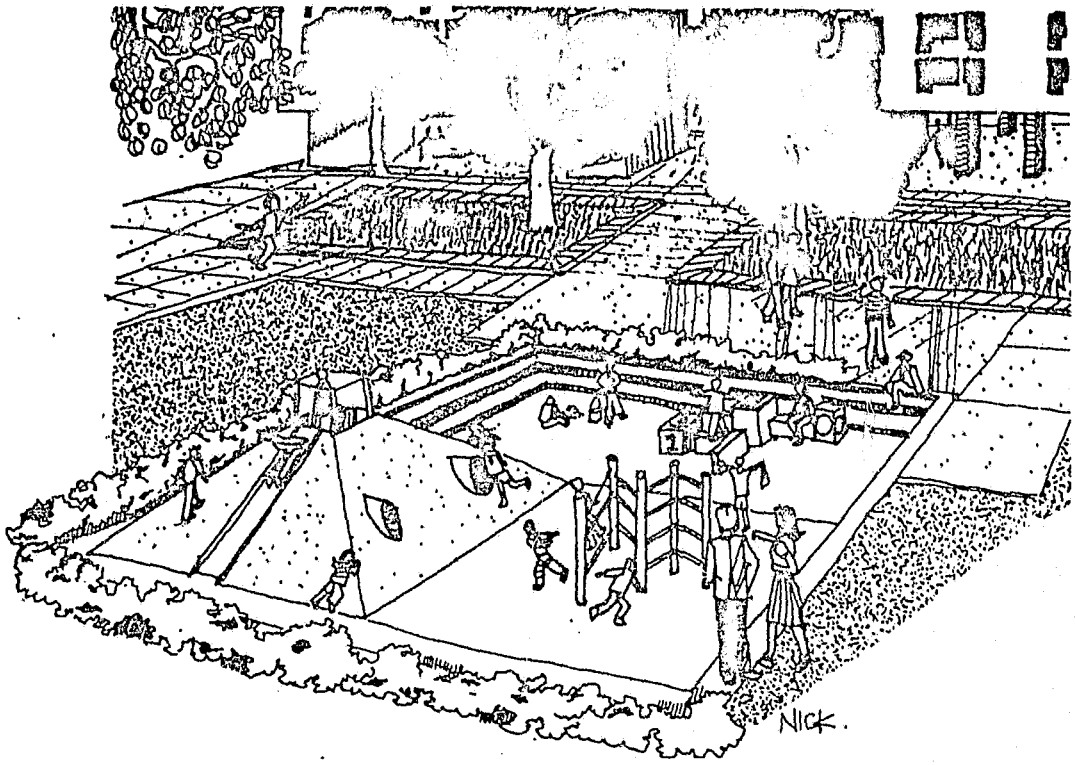
As previously discussed, landscape elements should be planned so as not to unnecessarily interfere with natural surveillance. "Vest pocket" parks should be designed for adequate observation from near-by streets and buildings. Care should be taken not to create blind spots that can conceal dangerous activities or illegal entries through doors or windows of adjacent buildings. And appropriate lighting should be provided to enable nighttime control.



A vest pocket park which is readily surveillable from adjacent office buildings that define its boundaries.

Landscaping can be used to size, shape and change the topography of open spaces to properly accommodate desired activities while limiting others. In doing so, it can divide large spaces into smaller ones and define appropriate visual and circulation linkages between adjacent activity areas--as well as establish necessary levels of privacy within each. Some examples follow:

- A play area for young children is set-off from a larger park area used by older youths in a location near a neighborhood store. Parents often bring children to the play area while they shop, knowing that other parents, older brothers and sisters, and the neighborhood-at-large will keep watch. Dense vegetation is used at the sides and rear to visually frame the play area, prevent young children from wandering off, to ensure that the older youths activities don't spill into the play area, and to define a territory where older strangers are carefully scrutinized.



Play area with well defined boundaries for small children.

- An area for elderly people containing shuffleboard courts and game tables is located in a park between a senior citizens housing development and a large high school. Before the new area was created elderly were afraid to use the park or even pass near it because of frequent incidents of purse snatch, robbery and assault in which young people victimized old. A screen of dense, shrubbery now cordons this special space off from the more public park area on the high school side and visually connects the area with the housing development. Shade trees frame the space and new pedestrian scale lighting has been provided. People now feel safe using the area to socialize because there is constant activity. It has also come to be a convenient and important bus pick-up point for elderly.

Special private areas designed for elderly can reduce fear of victimization by youths.

Surface materials also influence use of outdoor areas. Soft surface materials, for example, can psychologically promote relaxed, leisurely activities, while hard surfaces are often associated with movement. Soft surfaces such as lawns, meadow grasses and low ground covers should be planned for locations where heavy usage will not destroy vegetation and cause prohibitive maintenance costs. Concrete, bricks and other hard surface materials should obviously be used where traffic levels are high. Loose gravel and small stones should be avoided for paving and decorative use in areas where broken windows and other vandalism problems are likely to result.

3.6 Considerations in Selecting Plant Types

The items that follow summarize general characteristics of different types of plants that should be considered during area planning processes:

Ground covers ranging in height from 6-12 inches require less maintenance than grass. Some species and varieties require almost no maintenance at all. Most ground covers can not tolerate traffic, the result being quickly worn paths and broken branches. They can be used to define edges of low activity areas to psychologically deter cross-overs but offer little or no barrier value.

Tall ground cover and low shrubs develop deeper root systems and require less water than lower categories and can be used to provide limited barrier effects. Barrier impact is increased with species and varieties of plants that are sturdy and have dense, thorny textures. Relatively low heights enable acceptable surveillance opportunities for most locales.

Shrubs and trees with low branches ranging from 4-20 feet tall often require substantial trimming and maintenance. While they can be densely planted to create beneficial screens and barriers, care should be taken that they not obstruct surveillance of critical areas. They are useful for modulating the scale of building sites.

Research has shown that sites that are well maintained are less likely to suffer vandalism damage than those that aren't. Grounds areas which are left unattended so that litter accumulates and plant materials die or become overgrown compromise the healthy self image that is necessary to maintain neighborhood pride and vitality.

TABLE 3.3 RELEVANT PLANT CHARACTERISTICS BY CATEGORIES

Plants for Effective Barriers (Evergreen)

Name	Kind
Kangaroo Thorn (Acacia armata)	shrub
Knife Acacia (Acacia cultriformis)	shrub
Whorl-leafed Acacia (Acacia verticillata)	shrub
Saltbush (Atriplex)	shrub
Black Barberry (Berberis gagnepainii)	shrub
Wintergreen Barberry (Berberis jullanae)	shrub
Threespine Barberry (Berberis triacanthophora)	shrub
'Barbara Karst' Bougainvillea	vine
'Sandiego Red' Bougainvillea	vine
Natal-plum (Carissa grandiflora)	shrub
Citrus	shrub-tree
Pampas Grass (Cortaderia sellona)	ornamental grass
Gooseberry (Douyalis caffra)	shrub
Golden Dewdrop (Duranta erecta)	shrub
Russian Olive (Elaeagnus angustifolia)	tree
Thorny Elaegnus (Elaeagnus pangens)	shrub
Sweet Hakea (Hakea suaveolens)	shrub
English Holly (Ilex aquifolium)	surub-tree
Chinese Holly (Ilex cornuta)	shrub
Chinese Junipers (Juniperus chinensis)	shrub
Junipers (many varieties)	shrub
Oregon Holly-Grape (Mahonia aevifolium)	shrub
Leather Leaf Mahonium (Mahonia bealei)	shrub
Prickly Pear (Opuntia)	cactus
Osmanthus Holly (Osmanthus heterophyilus)	shrub
New Zealand Fiber-Lily (Phormium tenax)	perennial
Firethorn (Pyracanthus)	shrub
Saw Palmetto (Serenoa repans)	palm
Adams Needle (Yucca filamentosa)	shrub-tree

TABLE 3.3 CONTINUED

Plants for Effective Barriers (Deciduous)

Name	Kind
Opopanax (Acacia farnesiana)	shrub
Japanese Barberry (Berberis thumbergi)	shrub
Blackberry	shrub
Quince (Chaenomeles)	shrub
Jerusalem-Thorn (Parkinsonia aculeata)	tree
Pamegranate (Puneia granatum)	tree
Currant (Ribes)	shrub
Japanese Rose (Rosa multi flora)	shrub

Sturdy Trees 30-50 ft.

Name	Comment
Silver Wattle (Acacia decurrens)	slow growing but persistent
Blue Spruce (Picea pungens)	slow growing but persistent
Amur Cork Tree (Phellodendron amurens)	good shade tree
50-75 ft.	
Tree of Heaven (Ailanthus altissima)	hardy
Green Ash (Fraxinus pennsylvanica lanceolata)	
London Plane Tree (Platanus acerifolia)	sturdy
Red Oak (Quercus borealis)	hardy
Black Locust (Robina psuedoacacia)	
75-100 ft.	
Broadleaf Maple (Acer macrophyllum)	vigorous
Beech (Fagus sylvatica)	good street tree
Austrian Pine (Pinus nigra)	
Plane Trees (Platanus)	
White Oak (Quercus alba)	
Little-Leaf Linden (Tilia cordata)	good street tree
Silver Maple (Acer saccharinum)	hardy, vigorous
Ginko (Ginko biloba)	disease and insect free
Honey Locust (Gleditsia triacanthus)	fast, hardy, thorny
Sweetgum (Liquidambar styraciflua)	good street tree
Douglas Fir (Pseudotsuga menziesii)	parks and roadsides
American Basswood (Tilia americana)	hardy

TABLE 3.3. CONTINUED

Plants that Psychologically Discourage Traffic (often used in parking areas)

Name	Kind
Warty Barberry (Berberis Verruculosa)	shrub
Bearberry Cotoneaster (Cotoneaster dammeri)	shrub
'Santa Cruz' Pyracanthus	shrub

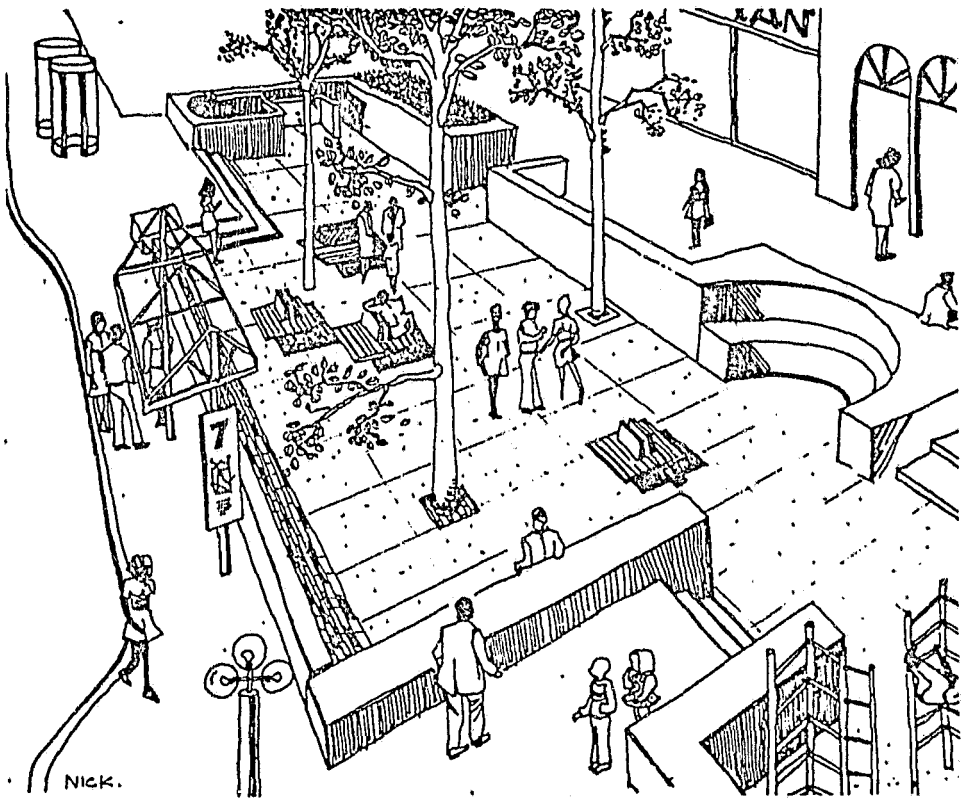
Lawn Substitutes for Large Areas

Name	Kind
Natal Plum (Carissa grandiflora)	shrub
Reyes Ceanothus (Ceanothus gloriosus)	shrub
Bearberry Cotoneaster (Cotoneaster dammeri)	shrub
Creeping Cotoneaster (Cotoneaster adpressa)	shrub
Wintercreeper (Euonymus fortunei)	shrub
English Ivy (Hedera helix)	vine
Junipers (varieties)	ground cover
Halls Honeysuckle (Lonicera japonica halliana)	vine
Japanese Spurge (Pachysandra terminalis)	shrub
'Santa Cruz' Pyracanthus	shrub
Periwinkle (Vinca minor)	ground cover
Big Periwinkle (Vinca major)	ground cover

References

- Behavior in Public Space; Erving Goffman; Free Press of Glencoe; New York, New York; 1963.
- Easter Hill Village; Clare Cooper; Free Press of Glencoe; New York, New York; 1975.
- Housing for the Edlerly: The Development and Design Process; Issac Green, et. al.; Van Nostrand Reinhold; New York, New York; 1975.
- Personal Space: The Behavioral Basis of Design; Robert Sommer; Prentice-Hall; Englewood Cliffs, New Jersey; 1969.
- Plants, People and Environmental Quality; G. O. Robinette; U.S. Department of Interior, National Park Service; Washington, D.C.; 1972.
- With Man in Mind; Constance Perin; M.I.T. Press, Cambridge, 1970.

CHAPTER 4. BUILT LANDSCAPE ELEMENTS



4 1. Introduction

Built elements can affect outdoor security in many ways:

- Selection, design and placement of built furnishings and features often define what spaces are intended for, determine who the users will be, and influence the quality and nature of use enjoyment.
- Street furniture and other pedestrian amenities can reinforce preferred circulation patterns for purposes of channeling flows for optimum natural surveillance; stimulating activity and social interaction to provide more eyes on the street; and improving the visual and human quality of neighborhoods to bolster local pride and social control.

- Bus shelters can be planned and designed to provide comfortable and surveillable places for people to wait for public transportation.
- Public/emergency telephones can enable and encourage citizens to report suspicious events, dangers or crimes, and accidents in a timely manner to enable quick, effective responses.
- Signage and kiosks can be designed to provide information without creating visual clutter and obstacles that interfere with natural surveillance by citizens and police.
- Abandoned, deteriorated structures can be removed to enhance neighborhood confidence and pride and to eliminate public safety hazards.
- Screens and walls can be put in place to limit or prevent access to unsafe/unauthorized areas.

4.2 Major Planning and Design Challenges

Vandalism is a major concern in planning and designing outdoor equipment, both from the standpoint of minimizing expenses for repair and replacement, and from the standpoint of the impact of vandalism abuses upon the community-at-large. Such abuses detract from neighborhood confidence and control, and when left unattended, promote further destruction.

Proper design begins with efforts to understand the special needs and priorities of localities to determine what spatial uses are appropriate and who the users will be. Users should be expected to include potential victim and offender groups. Since planted and built landscape elements are important for defining spatial uses and boundaries, effective planning can only result if the elements support functions that are appropriate to the specific areas--an issue that will be emphasized in the two chapters that follow.

The principal purpose of this chapter is to discuss ways that selection, design and placement of common types of outdoor elements can influence behavior and to recommend considerations for reducing violent crime and vandalism opportunities and impacts. General principles that have been discussed for planning of lighting systems and plant/surface materials for natural surveillance and activity support are applied and extended. Types of elements that are discussed include play equipment; outdoor furniture and related amenities; bus shelters; emergency telephones; signage and other public information devices; barriers to close off unauthorized areas; and deteriorated structures to be eliminated.

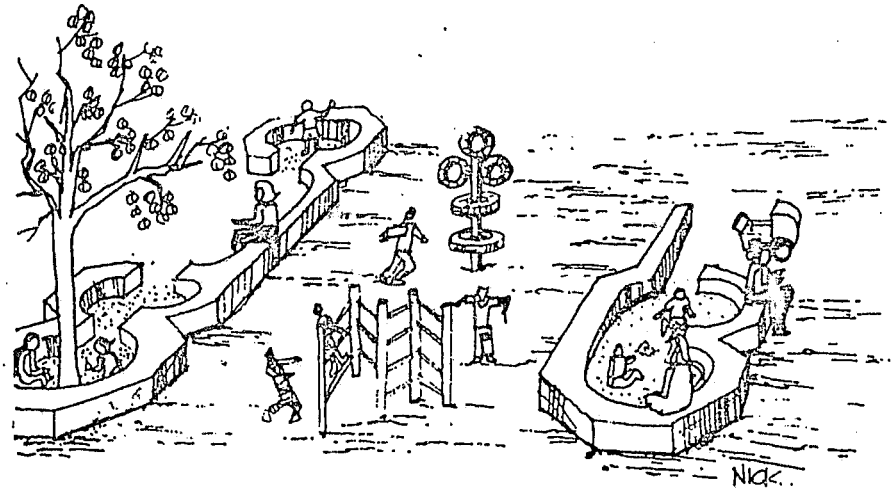
4.3 Facilities for Children and Teenagers

Facilities that attract young people often present serious security and vandalism problems for three reasons:

- Young people in their teens and early twenties constitute the largest offender group for fear-producing person-to-person crimes. Even pre-teen youths can represent major menaces to the safety and sense of security of elderly, handicapped and women who are common targets of pursesnatch and intimidation. Areas where young people gather can be dominated by gang elements.
- Youths and children are frequent victims of older, stronger offenders. Play areas can become stalking grounds for drug pushers, bullies and small-change robbers and sexual deviates seeking easy prey.
- Vandalism is generally defined as a youth problem. Youth facilities and areas near locations where young people gather often suffer substantial vandalism damage.

The design of youth and child areas should take the special needs and potential problems of different age groups into account. Areas for young children should be planned to facilitate supervisory control. Planners should consider possible means for

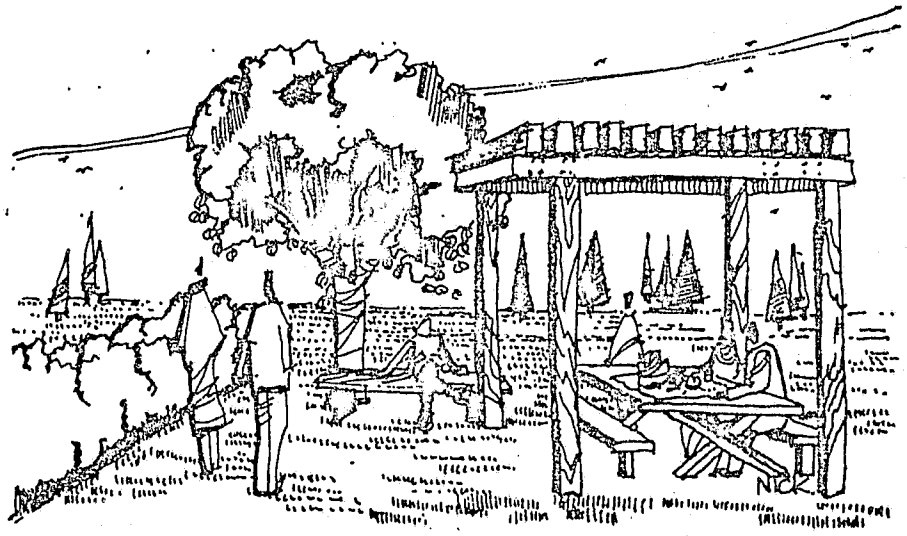
containment to prevent youngsters from wandering into uncontrolled areas; open planning which enables easy visual supervision; and comfort amenities such as benches for adult observers. Play equipment should be responsibly selected and located for optimum safety.. Activity spaces for small children (providing wading pools, sand boxes, etc.) should be placed in locations that are protected from rough play by older children (containing swings, ball fields, etc.). Seating and key play areas should be strategically located in relation to one another to optimize adult control over children of all ages.



Active, rough play equipment should be kept safely away from more passive areas used by smaller children.

Large undifferentiated spaces in problem neighborhoods are often taken over as the "private turf" of youth gangs. Such takeovers are less likely to occur if "activity magnets" are provided which successfully attract other users to set up challenges to gang domination. In some cases, these activities also provide safe and enjoyable outlets for energies which might otherwise be directed to anti-social acts. Tennis courts, swimming pools and ice skating rinks, for example, can promote wholesome mixed-group day and evening activity to displace or re-direct gang interests. However, cautions are advised in planning new activities:

- Investigations should be undertaken to determine whether the new facilities are likely to be sufficiently valued and used by residents to warrant construction--or conversely, whether they might only attract enough people to increase victimization risks.
- Potential impacts of youthful users upon adjacent business and residential areas should be considered. New facilities may attract more young people who will compound existing crime and vandalism problems.
- Care should be taken to provide adequate security precautions, including: arrangements for responsible management, supervision and police protection; proper lighting; and physical means to control times of use (if necessary).

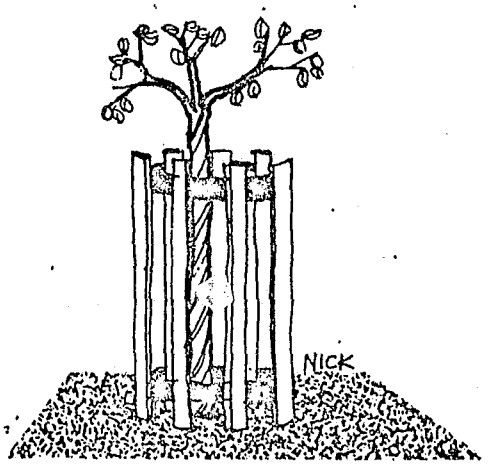


Amenities such as picnic facilities and shelters can sometimes attract family users to areas to promote adult supervision and control of public recreation areas.

Not all property damage that is called vandalism is intentional or malicious. Sometimes damage occurs accidentally when youthful energy and desires to impress peers lead to carelessness and lapses in judgment and restraint. For example:

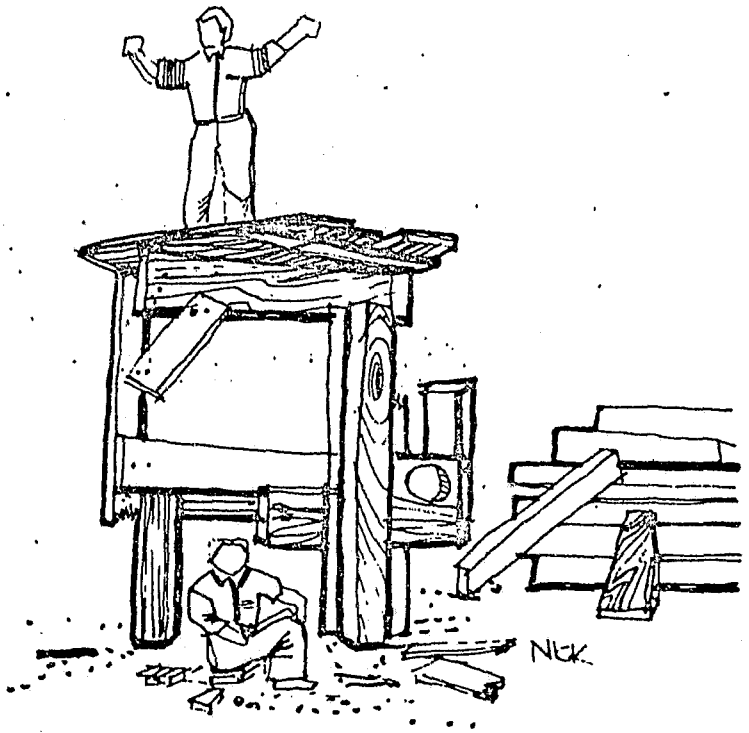
- Windows near ball fields or other activity areas are accidentally broken by thrown or batted objects. (Damage might have been avoided if the play areas had been more appropriately located, or if protective screens had been provided over windows.)

- Trunks branches of small trees are broken because they were run into by bicycles or were climbed and swung from. (Tree guards might have protected the trees from bicycles and young Tarzans or more sturdy, mature trees might have been planted in the areas.)



Young trees planted in areas used for play should be given special protection to prevent accidental vandalism.

Sometimes areas which are not designated for use by young people --or areas that are intended for play but which are inappropriate or inadequate, are "adapted" in ways that do not meet prevailing adult standards for "improvements." For example:



Accessible materials are sometimes appropriated for non-intended purposes through adaptive vandalism.

- Teenagers playing street hockey spray paint a goal on a wall. (If a space for such play had been provided, or if help had been provided to paint neater lines, the "vandalism problem" might have been averted.)
- Children dismantel materials from nearby construction or equipment to create a clubhouse or fort (because no one thought to provide materials for these purposes).

Graffiti is often used by youngsters as a means for calling attention to themselves, identifying territories, and publicly avowing concerns and feelings. Property damage might often be reduced or avoided if alternate forms of self expression were made available. For example:

- Names are painted on buildings and walls or carved in benches to say in effect "I was here; I exist; I am important"; perhaps motivated by similar needs for recognition that motivate business owners to use their own names on signs and other advertising. In other instances, painted messages inform passers-by that John loves Marsha or express other personal beliefs with varying amounts of artistic merit, tact and social decorum that would not always be acceptable in newspaper notices. Special graffiti panels and kiosks could be provided in problem areas to localize and contain these "announcements."
- Youth clubs (or "gangs") spray paint their organization name or emblems on property to identify territorial boundaries and to signify sovereignty over specific areas. Such markings proclaim to neighboring organizations and adults "we are organized and must be reckoned with." Labor unions advertise similar assertions, but usually do so in more socially acceptable ways.

As an alternative to these ad-hoc, unauthorized activities, programs can be initiated to encourage and assist young people to paint attractive neighborhood identity murals and implement other environmental improvements. These programs can promote

a sense of achievement for the participating individuals and for neighborhood residents in general--leading to unified efforts to prevent environmental abuses that would detract from the achievements.

Some signature vandalism problems might be avoided if alternate forms of expression such as neighborhood art/improvement projects are implemented.

Some forms of vandalism are highly deliberate and call for defensive tactics aimed at curbing dedicated efforts, or reducing losses when damage is not preventable. For example:

- Outdoor lights are common targets for vandals. When broken, the reduced illumination levels make nighttime surveillance more difficult, potentially contributing to more vandalism, higher crime risks for pedestrians and fear. Light fixtures in high vandalism-risk locales should be mounted out of easy range of offenders (at least 14 feet above the ground) and shielded by grilles, wire mesh or impact resistant globes/lenses whenever possible. Damaged and burned-out lamps should be regularly replaced.
- Decorative walls and screens, parked cars, and other visual obstacles often make visual surveillance of high vandalism-risk areas difficult or impossible. Such obstructions should be eliminated or relocated whenever possible.

- Walls and screens that have rough surface textures or large perforations sometimes provide means for vandals to climb into windows or onto roofs of adjacent buildings. Physical objects such as trash cans, trees, and low buildings also offer potential climbing devices. Climbing access opportunities should be eliminated by removing or effectively enclosing elements that can be used as ladders.
- Built elements such as outdoor furniture and recreational equipment should be constructed to resist abuse and/or enable easy and inexpensive repair and replacement.

TABLE 4.1 GENERAL CHARACTERISTICS OF FASTENING DEVICES IN RELATION TO COMMON VANDALISM PROBLEMS

	Class	Type	Special Considerations
Semi-Permanent	Screws	Allen Head	Allen, phillips head and tamper-proof screws cannot be removed easily by vandals with pocket knives, coins, keys, etc.--require special screwdrivers or wrenches. Therefore, grooved head screws should only be used for low vandalism risk applications
		Phillips Head	
		Tamper-Proof	
		Grooved Head	
	Nuts and Bolts	Hex Head	Hex head bolts facilitate easy maintenance in hard to see and reach locations and allow use of "blind" nuts--but can be removed with simple pliers. Round head allen types resist tampering. Self-tightening nuts and bolts and spring loaded washers make tampering difficult. Nylon embedded bolts are extremely tight to resist tampering also.
		Round Head	
		Self-Tightening	
	Washers	Standard	
		Spring Loaded	
Permanent	Rivets	Soft Metal	Removal usually requires the use of light, hand-held tools so rivets are highly tamper resistant. Steel rivets are useful for critical vandalism risk applications.
		Steel, Heavy Duty	
	Welds	Spot	Spot welds are easy to apply on site with standard equipment but are often imperfect. Continuous arc welds are more difficult to apply but also much stronger and vandal proof.
		Continuous Arc	
	Bonds	Epoxy	Epoxies are very strong but some types lose mechanical strength through aging. Concrete fillers are used to plant threaded metal anchors for high resistance to abuse.
		Concrete Filler	

TABLE 4.2

GENERAL CHARACTERISTICS OF MATERIALS IN RELATION TO COMMON VANDALISM PROBLEMS

			Bending Breakage	Impact Breakage	Chipping/Tearing	Gouging/Cutting	Burning	Special Considerations
Metal	Ordinary Steel	Sheets						Broken parts can be welded on site or repaired with a variety of different mechanical fasteners.
		Tubing						
		Castings						
	Stainless Steel	Sheets						Corrosion resistant but difficult to clean/repair.
	Ordinary Aluminum	Sheets						Corrosion resistant but susceptible to breakage and difficult to repair since welding is often not possible.
		Tubing						
		Castings						
	Steel-Backed Aluminum	Sheets						Corrosion resistant and rugged but difficult to repair.
Wood	Hardwood	Boards						Resist deep gouging and impact damage--expensive.
	Softwood	Boards						Easy to gouge and break but inexpensive to repair.
		Plywood						Easy to gouge but rugged and inexpensive to repair.
	Particle Board	Panels						Highly impact-resistant but difficult to fasten.
Plastic	F.R. Polyester	Shells-Panels				G	*	Highly impact-resistant with great flexural strength--does not corrode but weathers poorly.
		Tubing				G	*	
	Acrylic	Sheets				G	*	Highly impact-resistant but easily scratched--expensive.
	F.R. ABS	Shells-Panels					*	Highly impact-resistant and good weatherability.
	Structural Foams	Solid Volumes				G	*	Optimal for thick, solid volumes where resistance to beatings and overloading is required.
		Panels				G	*	
Conc.	Concrete	Precast						Rugged and heavy to discourage movement out of position. Difficult to repair when broken.
		Cast on Site						

Highly Resistant

Moderately Resistant

Highly Vulnerable.

*Note: All plastics are combustible. And while several types of fire retardants can be added, they only prevent ignition; and do not protect from surface scorching, scarring or blackening.

TABLE 4.3

GENERAL CHARACTERISTICS OF SURFACES IN RELATION TO COMMON VANDALISM PROBLEMS

			Impact	Bending	Abrasion	Peeling	Scorching	Spray Paint	Special Considerations
Metal	Ordinary Steel	Textured Enamel							Enamel finishes can be repaired but require continued maintenance. Porcelain enamel and P.V.F. have longest life expectancies (20 yrs. normal). Porcelain is cheapest. Textures hide marring. Vinyl coatings offer corrosion resistance but are difficult to repair.
		Smooth Enamel							
		Porcelain Enamel							
		P.V.F. Coated							
		Vinyl Coated							
	Stainless Steel	Polished							Natural stainless gets dirty and stained easily. Porcelain enamel hides dirt and lasts long on stainless.
		Porcelain Enamel							
	Aluminum	Polished							Polished surfaces show dirt and grease. Brushed surfaces help to hide scratching. Aluminum scratches easily. Treatments such as porcelain and P.V.F. are harder to scar. Anodizing is easily scratched and stained with spray paint. Anodizing is also expensive.
		Brushed							
		Porcelain Enamel							
		P.V.F. Coated							
		Anodized							
Wood	Hardwood	Natural Smooth							Rugged surfaces on beams or walls hide marring. However, if devastated with deep gouges they cannot be resurfaced as easily as flat surfaces which can be sanded. Varnishes peel off. Paints are more durable and easier to maintain.
		Natural Rugged							
		Painted							
		Varnished							
	Softwood	Natural							The same general considerations apply to softwoods that have been mentioned for hardwoods--except that softwoods are even more susceptible to gouging and denting problems.
		Painted							
		Varnished							
Plastic	F.R.P. Polyester	Polyester Gel Coat							Epoxy and glass-filled gel coats are very hard and can withstand considerable abrasion. Polyester absorbs impacts even better than steel (without denting) but gel coats cannot be resurfaced on site. Enamel is much easier to repair.
		Epoxy Gel Coat							
		Glass-filled Gel Coat							
		Enameled							
	F.R.P. ABS	ABS Gel Coat							ABS can absorb more concentrated impacts than polyester, but enamel coatings are easier to apply.
		Enameled							
	Acrylic	Textured							Acrylic is very difficult to break but scratches easily. Lexan and some other polycarbonates are harder to scratch.
		Clear/ Colored							
	Structural Foams	Rugged							There are many types of foams--some nearly as hard as steel. Expensive in small quantities. Good for light weight strength.
		Smooth							
Concrete	Concrete	Natural Smooth							A major disadvantage of bare concrete is porosity which makes grafitti difficult to remove. Painted surfaces can facilitate maintenance.
		Natural Rugged							
		Painted							

Highly Resistant

Moderately Resistant

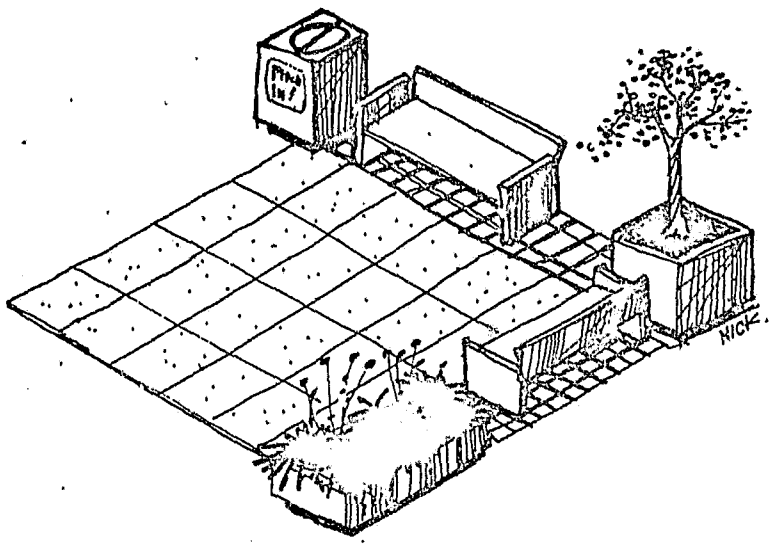
Highly Vulnerable

4.4 Street Furniture and Other Amenities

Well designed and appropriately placed benches, litter receptacles and planters can enhance pedestrian comfort, encourage social interaction, strategically reinforce eyes on the street in critical locations, and promote healthy neighborhood identities and civic pride. Improperly designed and placed elements can become targets for vandalism abuse which detracts from neighborhood confidence and comprise expensive maintenance nuisances.

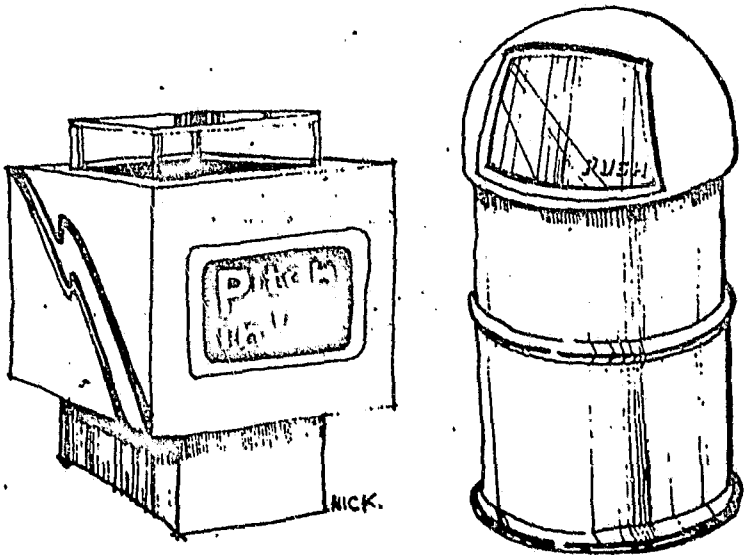
Attractive, comfortable seating areas along streets can provide popular and safe places for people to rest, meet, converse, and leisurely watch other people. However, if they are uncomfortable or are located in places people regard to be unsafe or unpleasant, they can be expected to have little use or value.

- Seating areas neighborhoods with significant crime-risks and fear levels should be located in places that can be readily observed from near-by activity nodes. Good lighting should be provided and visual obstructions such as tall shrubbery that could interfere with area surveillance should be avoided.
- Seating areas should be located in locations that have some weather protection (such as wind breaks) whenever possible. Benches should be designed to enable rain to run off rather than collect in puddles.
- Benches should be sized and placed with forethought about use requirements and objectives for specific sites. For example, in some areas that are dominated by young people, long benches or benches that are placed close together may cause unruly groups to cluster and intimidate other pedestrians--particularly elderly. In other areas which are frequented by elderly, close groupings of benches may promote a sense of security and foster constructive social interaction.



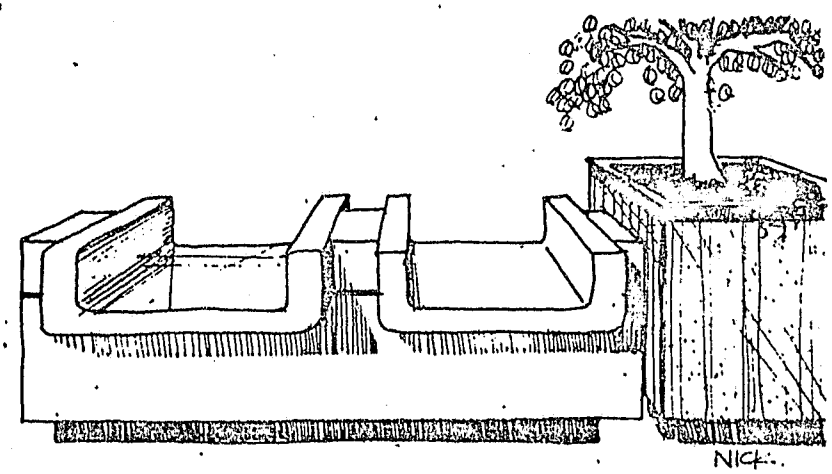
Well designed seating areas can enhance community identity as well as provide comfort.

Abundant, convenient trash receptacles can reduce litter problems and help to promote a good neighborhood image. The receptables should be provided with lids that prevent debris from falling or blowing out. They should be designed or anchored so as not to be easily tipped over.



Receptacles should be sturdy and stable to resist vandalism and accidents.

Planters and other decorative elements should be constructed of materials that require little or no maintenance and should be designed for easy clean out of debris so that they continue to enhance rather than detract from the visual quality of the settings. They should not visually obstruct traffic safety or surveillance of critical areas (such as seating areas).



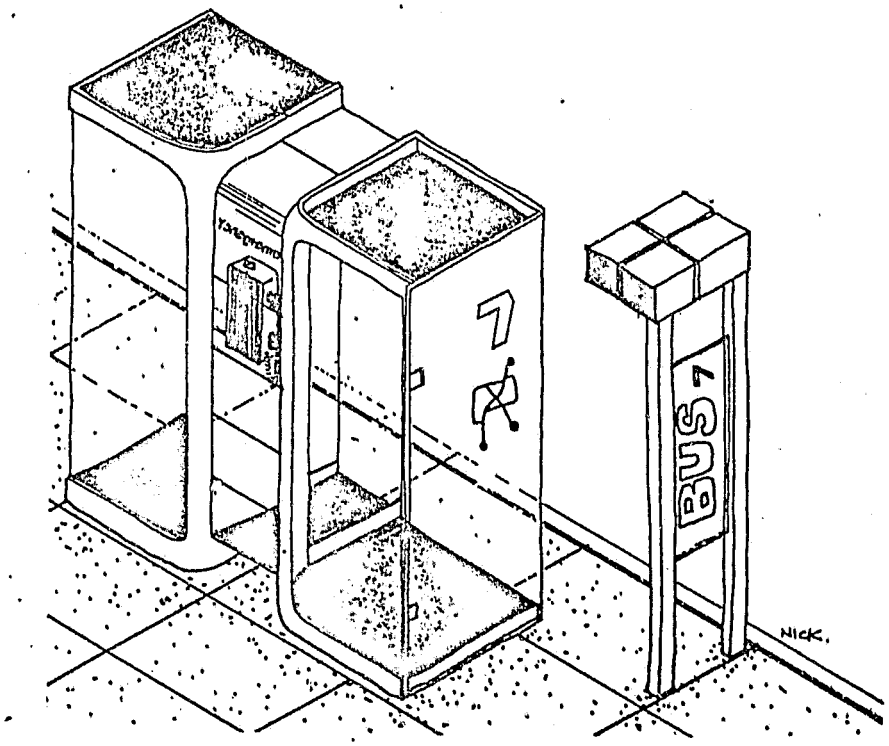
Seating and planters are frequent targets for vandals. Some precautionary construction considerations are presented in Tables 4.1, 4.2, and 4.3.

4.5 Bus Shelters

Bus transit stops offer primary interface points between public transportation-dependent residents (often people who are poor, elderly and/or handicapped) and means of access to remote services. Well-designed bus shelters can help to promote increased rider satisfaction and patronage by providing security, protection from weather, and general comfort while waiting.

Bus shelters should be designed in manners that encourage people to use the facilities by making them feel safe.

- They should be placed in locations that are visible from nearby buildings or other activity zones whenever possible to reduce isolation.
- Good lighting should be provided to enable bus drivers and other observers to see waiting patrons, and enable patrons to see their environments.
- The walls should be designed to provide maximum transparency to facilitate visibility through and from the shelters. (Vandal-resistant acrylic or similar window material should be used.)



Bus shelters should be designed to provide good surveillance and vandalism resistance.

Bus shelters can be helpful in all seasons to protect people from sun, wind, rain and snow.

- Analyses of prevailing wind directions should be made at specific locations to determine construction requirements or orientations to shield both waiting and boarding passengers. Access to shelters should not be positioned to cause shelters to act like sails, or to collect rain, snow or rubbish.
- In locales that have great variations in seasonal climates, it may be desirable to incorporate flexibility into shelter design. Relocateable wind screens, for example, can provide greater protection in winter, along with freer air flows in summer.
- The roofs should be designed to permit natural daylight to enter shelters and to provide shade as well. Ceiling structures should be able to hold light fixtures for nighttime illumination in a manner that protects the lamps from vandals. Heat lamps should be provided in very cold locales.

4.6 Emergency Telephones

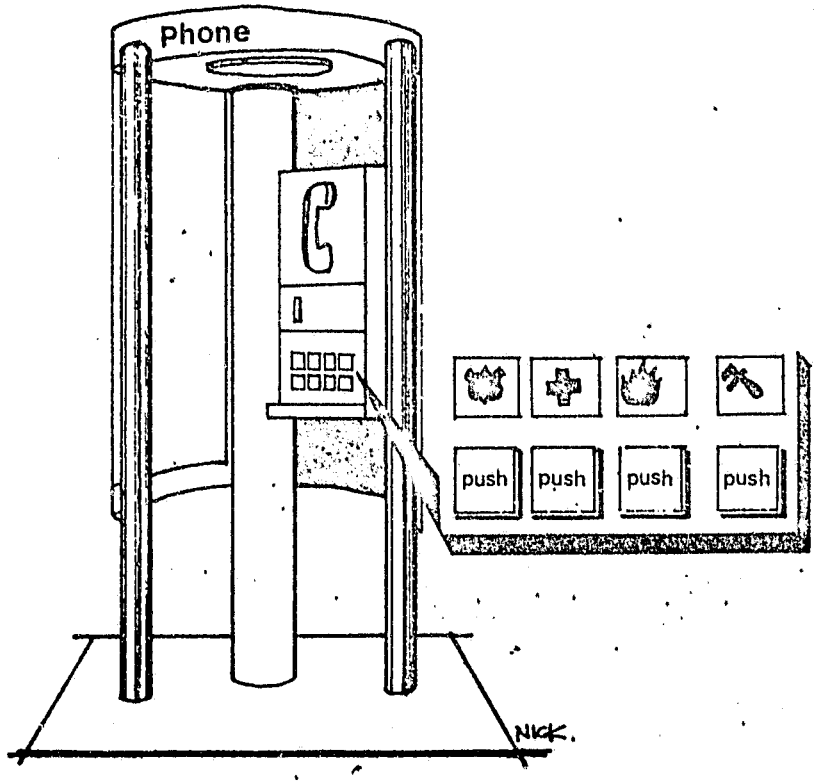
Public telephones should be provided at strategic, convenient locations on the street to enable and encourage people to quickly report dangers and accidents. The presence of telephones can be reassuring to pedestrians as a reminder that potential help is close at hand.

In order for telephones to be optimally effective for improving security and reducing fear, they must be readily accessible and useable.

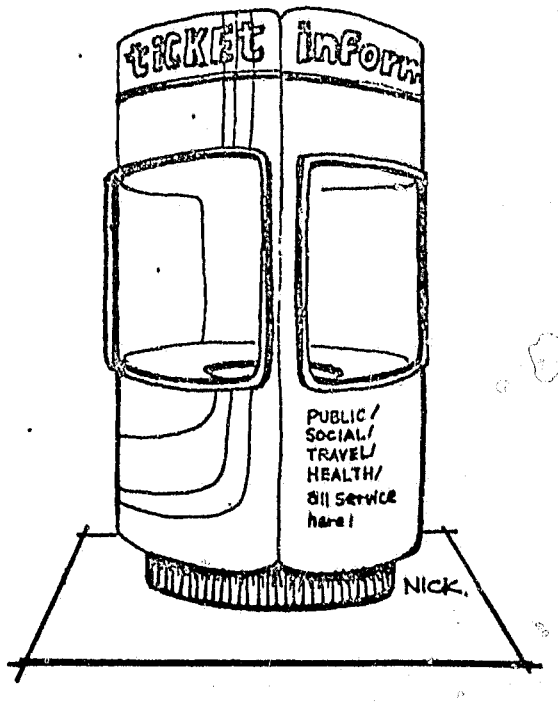
- Dial-free connections with police, fire departments and ambulances can eliminate emergency delays caused by lack of proper change.
- Telephones should be conveniently located at predictable and convenient places where they can be used in safety such as at bus stops.

4.7 Signage and Kiosks

Well designed signage can lend richness and vitality to the appearance of business areas as well as provide useful information. More typical, however, is a tendency for cities to be dominated by large billboards that obstruct pedestrian and motorist views; flashing lights on signs that are distracting; and general signage clutter that has resulted from competition for visual attention at the expense of overall environmental quality. This glut of nuisance information and exhibitionism interfers with needed information about street and important service locations. Confusion and impeded natural surveillance often result.



Dial-free connections with emergency services can improve response time.



Public information areas can help to eliminate pedestrian confusion.

Some cities are implementing ordinances to bring signage under control. Whether through ordinances or by voluntary cooperation, efforts to plan and coordinate information systems with the interests of the community in mind can have dramatic impacts upon the characters of neighborhoods.

- Signage systems can be coordinated to prevent large or gaudy signs that detract from the image and quality of surroundings.

Uncontrolled signage creates a confusing, chaotic atmosphere and impairs natural surveillance.

- Placements of signs can be controlled to prevent unnecessary visual distractions or obstacles from blocking important pedestrian and vehicular traffic views.
- New, well designed signage can be provided to inform the public of important service locations (e.g., police offices, rest areas and information desks) to reduce confusion for visitors.

- Kiosks and other devices can be constructed to enable organizations and individuals to post notices about items of concern and upcoming events. (The kiosk areas should be well lighted and properly designed to facilitate natural surveillance and resist vandalism.) Casual information areas of this type can help to promote neighborhood identity and offer means for special needs and activities to be announced to strengthen social cohesion.

Information about the neighborhood can help to stimulate community awareness, involvement and pride.

4.8 Deteriorated Structures

Abandoned, deteriorated structures often attract vandalism that spills into adjacent areas. This vandalism is prompted by an appearance that the neighborhood will tolerate physical neglect and abuse--that it lacks adequate pride and control mechanisms to defend itself. Community confidence and investor confidence in such areas becomes diminished, often leading to further deterioration and crime.

Community programs which are aimed at restoring deteriorated structures and preventing landlord neglect can help to revitalize areas where vandalism and fear of crime have injured local pride and optimism about the future.

- Community development organizations, small business associations and private lending institutions can issue low interest home and business improvement loans.
- Community groups can offer volunteer services to assist elderly and poor people in repairing property.
- Youth programs can be sponsored to provide part time jobs for young people to work on paint-up/fix-up projects.
- Public health and code enforcement agencies can crack down on absentee landlords who have neglected to provide needed improvements.

Structures that are too deteriorated or obsolete to warrant refurbishing should be torn down and sites should be cleared.

- Communities can provide low cost demolition and clearing services as an incentive for removal of deteriorated structures.
- Communities can obtain deteriorated buildings and sites through condemnation processes and clear the land.

4.9 Limiting Access to Problem Areas

Non-public areas that pose potential dangers for pedestrians or vandalism risks for equipment should be closed off whenever possible by means of tall fences and walls.

- Public access to problem areas can be controlled through the use of attractive fences or walls with lockable gates. Fences with large mesh perforations and walls with very rough surface textures that can provide toe-holds and hand-holds for scaling should be avoided.
- Branches on trees and other objects near fences and walls that might be used as ladders for scaling can defeat the effectiveness of the barriers.
- Scaling deterrants such as spiked or barbed elements at tops of fences and walls can lend added protection.

Special lighting and electronic detectors and alarms can be valuable for protecting high danger and vandalism risk locations.

- Perimeter and interior lighting can be used to improve night-time surveillance opportunities for police, area personnel, neighbors, and passers-by.
- Electronic trespass detectors and silent or deterrant types of alarms can be provided at gates and within site interiors, as required.
- Closed-circuit television installations can be set up in vandal-proof locations to survey critical areas.

References

- Environmental Psychology: Man and His Physical Setting; Harold M. Proshansky, et. al.; Holt, Rinehart and Winston, Inc.; New York, New York; 1970.
- Pedestrian Planning and Design; John J. Fruin; Metropolitan Association of Urban Designers and Environmental Planners, Inc.; New York, New York; 1971.
- The Pedestrian Revolution; Breins, Simon, Dean and Williams; Vintage Books; New York, New York; 1974.
- Special Inquiry Into Passenger Shelters at Bus Stops; American Transit Association; Washington, D.C.; April 9, 1968.
- Streets for People; B. Rudofsky; M.I.T. Press; Cambridge; 1969.
- Vandalism; Colin Warn; Van Nostrand Reinhold Company; New York, New York; 1973.

CHAPTER 5. PRIORITIES AND ALTERNATIVES

5.1 Introduction

The three previous chapters have discussed some potential relationships between environmental design and crime prevention and have presented general guideline considerations for planning lighting systems and other landscape elements. However, no formulas for the design of specific types of areas have been offered, and none will be, due to enormously varying user requirements and priorities; site characteristics and problems; and resources and constraints in different locales:

- Concepts of "proper design and effective use of environments" are always circumstantial and subjective and must be determined through processes which take diverse community values and objectives into account. What might be considered to be proper by one group can often be viewed as discriminatory and outrageous by other groups that are impacted by a plan. For example, efforts to revitalize a neighborhood might consciously or inadvertently displace businesses and users who are least able to adapt to the changes; often the poor, elderly and minority residents.
- The nature, urgency and perceptions of crime problems must be considered in relation to other local priorities in order to determine which courses of action are most reasonable. Plans that propose to eliminate trees and provide new lighting systems to improve surveillance should be guided by concerns for preserving environmental quality and conserving energy to the extent possible.

- Crime prevention plans should be tailored to match local implementation opportunities that are realistic, and maintenance resources that are dependable. This means that planning efforts should involve all important actors whose support will be required to ensure long-term success. For example, if no one takes responsibility for maintaining a newly landscaped area that was intended to stimulate constructive use and pride, the "improvement" may soon become a major public liability.

5.2 Design and Use Priorities

Decisions regarding proper design and effective use of environments to curb crime should be based upon considerations of who the users are and who they should be, and upon the nature of the crime problems in the locale.

From a crime prevention perspective, site users fall into two general categories, victims and offenders. Representative characteristics and priorities for both user categories should be taken into account throughout planning and design:

- A "population-at-risk" is comprised of all site users who are potential crime victims. If, for example, pursesnatch incidents present a major crime problem in a locality, the principal population-at-risk can be expected to be women--elderly women in particular. If intended uses will attract many women, design strategies aimed at preventing pursesnatch should be given a high priority. Or if fear of nighttime rape is a problem, nurses changing shifts at a near-by hospital may represent a key population-at-risk for a proposed park or parking lot.
- Victimization studies have shown that some segments of the population suffer proportionately more predatory crimes than others. According to a 1967 National Opinion Research Center (NORC) survey, victims of robbery, assault, murder, rape and personal larceny are most likely to be non-white and of low income brackets. Among whites, men are most often victims of robberies and assaults, while among non-whites, women are more

heavily victimized. Assault victims, both men and women are most often in a 20-29 year old age group. According to a 1973 National Crime Panel (NCP) survey, people under the age of 24 bear the brunt of robberies and rapes, and elderly are disproportionately often the victims of robbers and other personal thefts.

- Relative levels of "social dependency" should also be considered when assessing user priorities. Whereas a particular victim group may not be statistically dominant, its members may suffer the greatest victimization trauma and fear, and have no alternatives for avoiding risk exposure. Elderly people on small fixed incomes, for example, must often walk on streets that they fear because they cannot drive or cannot afford automobiles. They usually are not agile and commonly have physical disabilities, are targets of abuse by youngsters, are highly susceptible to serious injuries, and can little afford thefts.
- Large "offender populations" in certain vicinities may logically preclude site uses which can be expected to exacerbate existing problems. For example, a neighborhood park that is proposed for a site located near a large, tough, inner-city high school will pose predictable vandalism, robbery/assault and drug problems. Popular use of the park for family recreation is improbable. If a similar park is proposed near a Skid Row area, principal users may be prostitutes and vagrants, as well as people who prey upon prostitutes and their clients. Such uses and users run counter to general community interests and quality of life priorities.
- The chart that follows presents the percentage distribution of suspected offenders of common crimes by sex, age and race categories.

TABLE 5.1 COMMON CHARACTERISTICS OF SUSPECTED OFFENDERS

Offense Charged	Percent Male	Percent Female	Percent Distribution						
			Under 15	Under 18	Under 21	Under 25	Total	White	Negro
TOTAL	84.9	15.1	9.5	25.6	39.3	53.5	[1]100.0	74.0	24.3
Criminal homicide:									
(a) Murder and nonnegligent manslaughter	84.6	15.4	1.5	10.9	24.6	43.7	100.0	27.5	67.8
(b) Manslaughter by negligence	88.2	11.8	1.1	9.4	26.1	46.8	100.0	72.1	24.6
Forcible rape	100.0	. . .	4.2	19.8	40.0	62.6	100.0	37.5	60.0
Robbery	93.5	6.5	10.4	31.9	54.0	75.9	100.0	24.9	73.5
Aggravated assault	86.8	13.2	5.8	17.5	30.3	47.3	100.0	49.3	48.8
Burglary - Breaking or entering	94.8	5.2	21.7	51.0	69.8	83.3	100.0	67.7	30.8
Larceny - theft	70.3	29.7	24.4	49.7	65.2	77.2	100.0	70.1	28.4
Auto theft	94.3	5.7	13.7	53.6	71.5	83.8	100.0	67.2	30.8

Source: FBI UCR 1972.

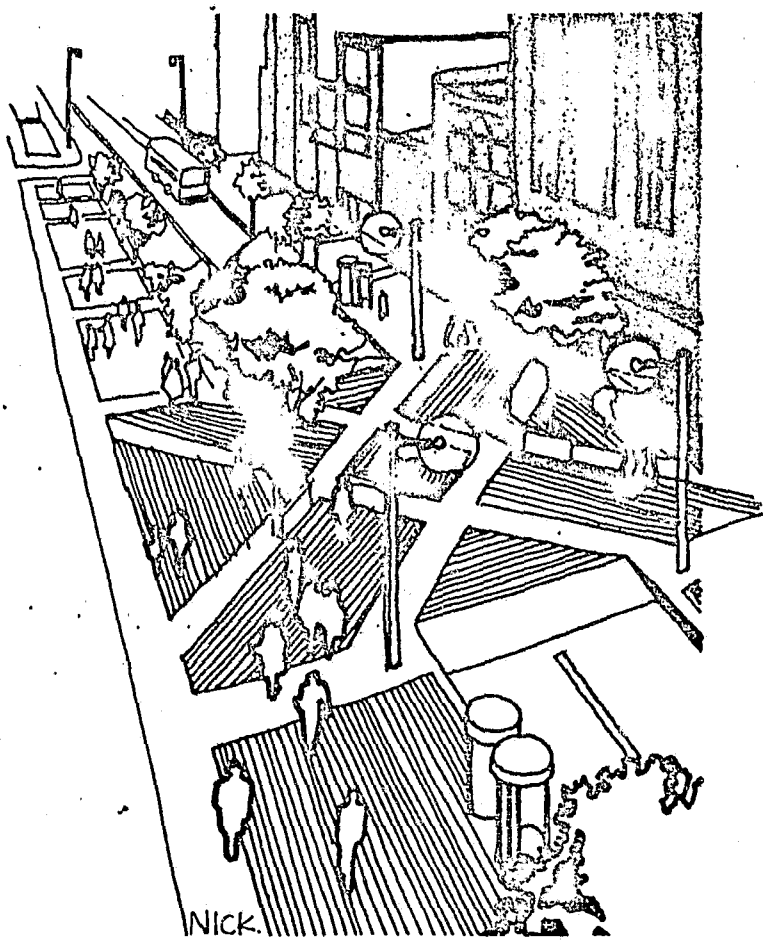
In order to develop design proposals which are appropriate, planning efforts must be guided by realistic information about specific crime-environment problems and priorities. This information can be provided through police record reviews, interviews with law enforcement officers and local residents, and (if possible) formal resident surveys. The items that follow reflect some potentially useful investigations.

- Determine the approximate number of crimes of different types that have occurred in the neighborhood. Who are the principal victims and offenders? Will the proposed new development or improvements attract more potential victims and/or offenders into the area? What crime prevention objectives are of paramount importance to the success of the plan?
- Determine where most crimes of each type presently occur in the neighborhood (i.e., which streets, parking lots, alleyways, open areas, etc., are most dangerous?). How might the proposed new development or improvements influence crime displacement to the site or to other locations?
- Determine when key types of crime most often occur (e.g., time of year, month, week and day). How might the new development or improvements effect these time patterns? For example, will more people be drawn into an area that has a high rate of nighttime crime for evening shopping or entertainment? Might proposed lighting improvements reduce danger and fear of nighttime crime? In what ways will daily or seasonal weather changes influence activities and design requirements?

5.3 Strategic Alternatives

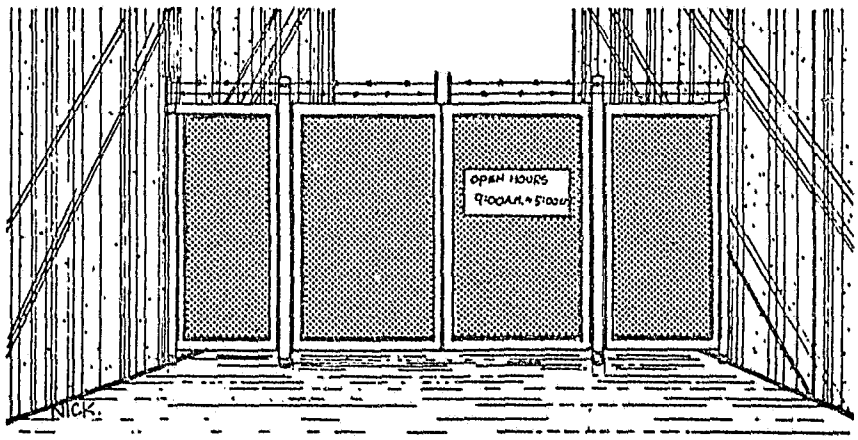
Environmental design strategies can reduce opportunities for crime in three general ways: by attracting large enough numbers of users to provide safety; by providing users and security personnel with tactical advantages over offenders; and by making vulnerable crime targets inaccessible to potential offenders. These approaches can facilitate supportive social, economic, management and law enforcement mechanisms aimed at complementary objectives.

"Desirable" users can be attracted to provide safety in numbers (e.g., eyes on the street and social control) through design efforts that support neighborhood needs and revitalization initiatives. Earlier chapters discussed ways that environmental design can help to define and reinforce intended uses and promote neighborhood confidence essential to stimulate activity.



Active use provides eyes on the street.

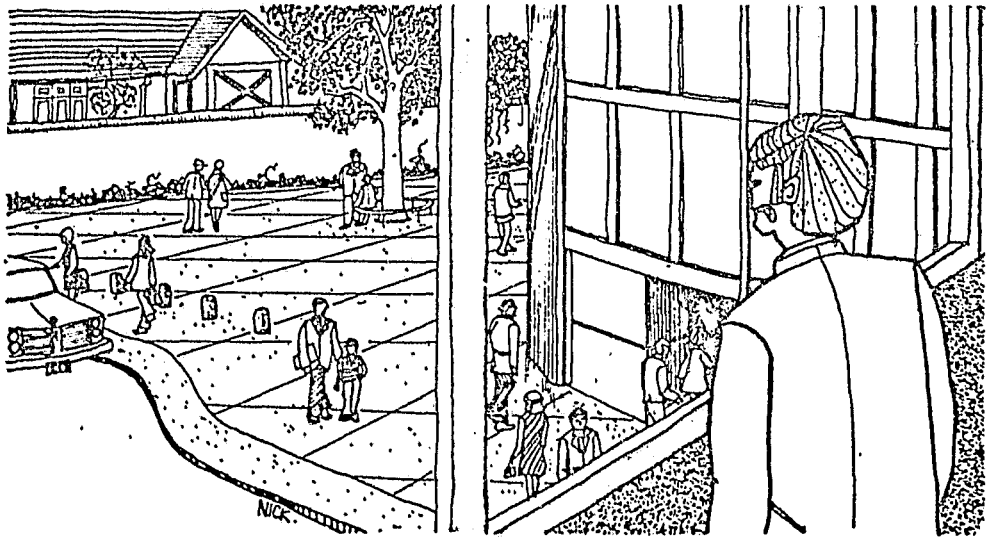
- Good lighting, attractive landscaping and appropriately selected and placed amenities can encourage residents to make more active use of public areas. However, if the improvements and amenities do not serve perceived needs, if they are inadequately maintained, or if they are located in inconvenient, unpleasant or unsafe appearing sites, activity objectives are naive.
- Activity areas that draw people through or into uncontrolled locales can create high crime-risk situations which Shlomo Angel referred to as "critical intensity zones"--conditions where there are enough users to attract offenders but too few to provide witnesses to make the areas safe. Remote public parking lots which are open for night use are common examples. Remedial strategies include relocating the activity areas, providing additional activities nearby to increase promote social control, or restrict times of use to active day time periods by means of perimeter barriers.



Environmental design techniques can be applied to improve opportunities for dangers to be detected and avoided or blocked to protect potential victims and aid in the apprehension of offenders. When successful, these techniques can make site users feel more secure, and at the same time, increase risks of capture

as a deterrant for would-be perpetrators. Categories of approaches include devices to improve the surveillability of outdoor areas, promote active surveillance, and facilitate rapid reporting.

- Open planning and good lighting have been discussed as means for improving surveillance opportunities for residents and police. It is widely believed that offenders are often less willing to commit illegal acts when their opportunities for surprising unwary victims are reduced and their intentions and actions can be observed by passers-by or neighbors. Design for easy surveillance enables pedestrians to avoid possible dangers, whether real or not, to help alleviate both risk and fear of crime.
- Care should be taken to plan so that critical areas where people gather are observable from near-by buildings and other activity nodes wherever possible. Such critical areas include bus stops, children's play areas, and parking lots.



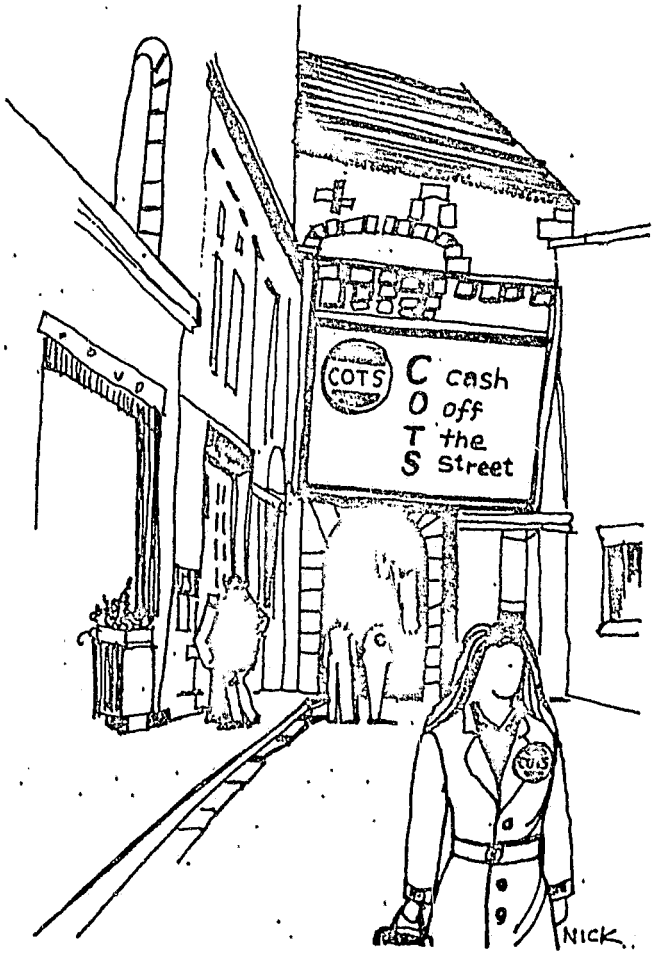
Natural surveillance from building interiors should be provided when possible.

- "Block watch" programs can be initiated in neighborhoods to encourage residents to remain on the look-out for suspicious events and to report them to police. Special police campaigns that advertise the fact that informer identities will be protected can help to encourage cooperation by people who fear possible retaliation.
- Conveniently located public telephones with dial-free connections to police departments and other vital services can facilitate rapid reporting of emergencies and timely, effective responses.

A third general way to reduce opportunities for crime is to separate offenders from their objectives. This can be accomplished by removing vulnerable people from high risk situations, eliminating criminal incentives such as cash carried by pedestrians, and by placing physical barriers between offenders and crime targets.

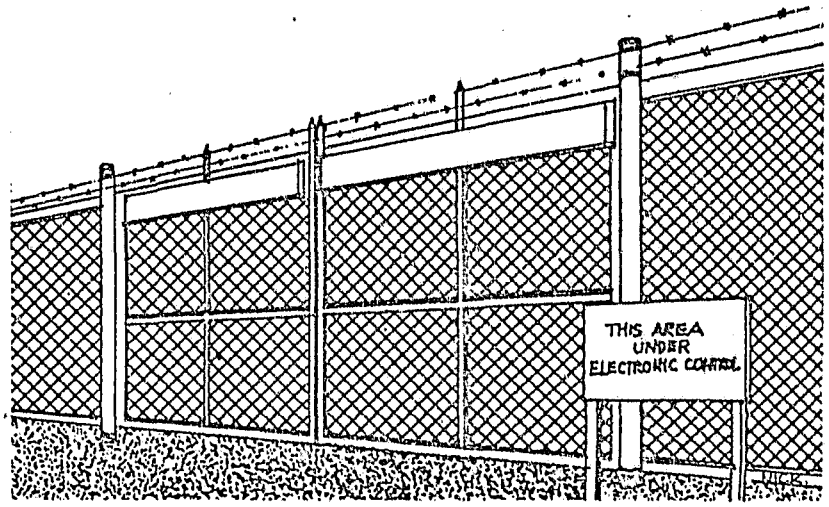
- Public transportation agencies can play an important role in reducing exposure to street crime risks by providing adequate service to avoid the necessities of long walks to transit stops and long waits at transit stops. Service improvements are often particularly critical for people who are most public transit dependent; the poor, elderly, handicapped and young who do not have the option of driving private automobiles. These same people are often highly vulnerable to crime since their lack of defense renders them popular targets. In many communities, dial-a-bus services are being sponsored by public and private organizations to provide home pick-up and return for people with special needs at low costs. Organizations also sponsor special activities such as group shopping trips and "meals on wheels" for elderly and handicapped people which offer similar crime prevention benefits.

- A "Cash Off The Streets" (COTS) program has been planned as part of a commercial CPTED demonstration in Portland, Oregon. The purpose of COTS is to encourage people to use credit cards, personal checks or travelers checks in lieu of cash whenever possible to avoid the need for carrying substantial amounts of cash in purses or wallets. People will advertise the fact that they are not carrying cash to would-be pursesnatchers and robbers by means of special buttons or whistles conspicuously attached to clothing and handbags.



Special programs can be implemented to encourage people not to carry large amounts of cash outdoors.

- As previously discussed in Chapter Four , areas containing high theft or vandalism-risk equipment can be closed off by means of tall fences and walls with lockable gates to separate criminals from property targets. This approach is commonly referred to as "target hardening."

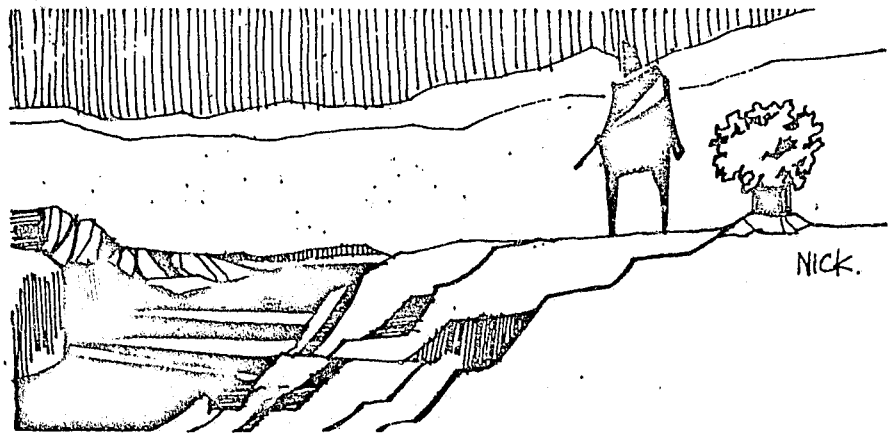


Target hardening can be accomplished through the use of tall fences and walls with lockable gates. Spiked elements along the tops and electronic detection devices offer increased protection.

5.4 Environmental Assessments to Evaluate Alternatives-
Planning for new space uses or improvements to existing uses should take existing physical characteristics and traffic flows of the neighborhood into account. Assessments of existing conditions can provide insights about the feasibility and relative merits of different crime-related design options.

Special problems and opportunities in neighborhoods can often be predicted on the basis of geographic, land use and qualitative features. These features include proximity with high crime-risk land uses, physical boundaries that inhibit crime displacement, and qualitative indicators that reflect levels of neighborhood confidence and vitality.

- Different land uses are often correlated with special crime problems that are influenced by the types of users they attract, activity levels and schedules, building and open space configurations and densities, and local property values. Land uses that bring large numbers of transient people into neighborhoods should be analyzed in terms of common user characteristics that pose potential problems. For example, schools may bring in young vandals and victims that will create daytime problems; theater areas often attract muggers who prey upon men that patronize nighttime massage parlors and street prostitutes. Permanent residents of some types of areas also warrant special consideration. Examples include large public housing developments that generate large numbers of offenders and elderly projects that generate large numbers of candidate victims.
- Potential impacts (or displacements) of high crime rate locales upon adjacent areas are often reduced by natural or man-made boundaries that divide them. The boundaries may act as physical barriers (e.g., rivers and expressways), or psychological territory markers (e.g., railroad tracks, park strips, land use or property value changes, and major streets). Psychological boundaries sometimes shift or fade as a result of regional and local economic and demographic pressures.



Natural and man-made barriers often prevent crime displacement between adjacent areas.

- Environmental neglect is often a signal that social cohesion to ward off crime and vandalism has broken down. Indicators include abandoned and deteriorated structures, lawns that are overgrown with weeds, sidewalks and streets in disrepair, graffiti, and broken street lamps.

Environmental features of neighborhoods can influence opportunities afforded for natural surveillance by residents, transients and police. These features include physical characteristics and activity patterns which enable potential crimes to be detected before they actually occur; function to deter criminal acts by increasing risk to offenders; provide opportunities for evasive or interventionary actions by citizens and police; and improve the abilities of observers to identify offenders for follow-up response.

- Examples of physical features that influence natural surveillance are lighting quality; the extent to which visual barriers impair clear viewing of important areas; and the general layout of buildings, streets and alleyways to permit casual observation of pedestrian areas.
- Activity patterns to be considered include pedestrian levels on local streets during different periods of the day and year; vehicular traffic volumes on streets during peak and off-peak periods; and the intensity of police patrol efforts in the neighborhood. (The charts that follow offer some considerations.)

TABLE 5.2 POTENTIAL RELATIONSHIPS BETWEEN PEDESTRIAN TRAFFIC LEVELS AND CRIME

	ADVANTAGES	DISADVANTAGES	PRECAUTIONS
Areas With High Pedestrian Traffic Levels	Provides a large number of eyes on the street to deter pursesnatch and violent crimes.	Facilitates pick-pocket incidents by creating crowds.	Eliminate obstacles such as trash cans and posts that can block the traffic stream.
	Can discourage take-overs of sidewalks for loitering by youth gangs and vagrants.	Crowds make visual surveillance by police difficult, particularly from squad cars.	Coordinate signage and provide parabolic overhead mirrors to improve surveillance opportunities.
	Can promote an atmosphere of safety.	People on crowded streets often ignore incidents--don't want to get involved.	Provide and advertise plain clothes police operations to deter criminals.
Areas With Low Pedestrian Traffic Levels	Can increase pedestrian awareness of dangerous-looking people.	Provides few eyes on the street to deter pursesnatch and violent crimes.	Upgrade street lighting and fence off areas where offenders can hide.
	Can increase pedestrian awareness of safe refuge areas, emergency telephones, etc.	Often corresponds with areas/times that have limited public transit--resulting in long waits at isolated bus stops.	Provide public telephones with dial-free emergency numbers at strategic locations.
	Can increase use of street space for socializing to and promote social involvement and control.	Can facilitate take-overs of pedestrian spaces by gangs or vagrants.	Provide activity areas for young people and enforce curfews.
	Can facilitate visual surveillance by police from squad cars.	Often corresponds with areas/times that have limited police patrol activity.	Organize block watch activities to supplement police surveillance.

TABLE 5.3 POTENTIAL RELATIONSHIPS BETWEEN VEHICULAR TRAFFIC LEVELS AND CRIME

	ADVANTAGES	DISADVANTAGES	PRECAUTIONS
Areas With High Vehicular Traffic Levels	Theoretically provides many eyes on the streets for surveillance benefits.	People in automobiles are often unaware or choose to be uninvolved with events that take place on sidewalks.	Encourage people to report crimes--organize special CB radio crime-watch reporting networks.
	Areas with high traffic levels often attract businesses that stimulate economic vitality and pedestrian activity.	Can create parking problems that cause people to walk several blocks on deserted side streets when going to and from cars.	Provide special lighting treatments along walkways that connect with parking areas and in parking areas.
	Street activity can reduce opportunities for parked cars to be burglarized or vandalized.	Parked cars can block visual observation of sidewalks and buildings to impair police surveillance.	Provide off-street parking in secured locations for residents and visitors.
Areas With Low Vehicular Traffic Levels	Potentially provides opportunities to create pleasant pedestrian uses of streetscapes to promote social control.	Areas with low traffic levels often have limited business opportunities--the result being few economic incentives to create vital pedestrian spaces.	Provide adequate lighting, attractive landscaping and comfort amenities such as benches to create an atmosphere conducive to socializing.
	Often makes it easy for people to find parking places close to destinations and avoid walking on deserted side streets.	Areas with low traffic levels often have low pedestrian levels as well, so even short walks to parked cars may be hazardous.	Provide convenient and well secured parking areas for residents and visitors.
	Can lend a less transient character to a neighborhood to facilitate resident interaction and cohesion.	Reduces the number of potential eyes on the street that could provide surveillance benefits. This includes a low intensity of police operations.	Create cul-du-sacs or provide speed bumps to prevent/discourage non-residents (including offenders) from driving through residential neighborhoods.

References

- Discouraging Crime Through City Planning; Shlomo Angel; Working Paper No. 75; Prepared for the Center for Planning and Devemopment Research, Institute of Urban and Regional Development; University of California, Berkeley; February, 1968.
- Furnishing The City; Harold Lewis Malt; McGraw-Hill, Inc.; New York, New York; 1970.
- Tactical Analysis of Street Crime; Harold Lewis Malt; LEAA Award No. NI71-091-G; Prepared for the Office of the Sheriff; City of Jacksonville, Florida; 1973.

CHAPTER 6. PLANNING EXAMPLES

6.1 Introduction

Relationships between different types of neighborhood land uses, configurations and user problems are highly variable and complex. Accordingly, the planning examples that are presented in this chapter are principally intended to demonstrate an approach for examining various options--not as ideal solutions for general application.

6.2 The Illustrative Approach

A hypothetical neighborhood is diagrammed to present some common types of crime-environment relationships. General CPTED strategy alternatives are recommended for consideration at different levels of scale, with more detailed design options illustrated for representative high risk sites.

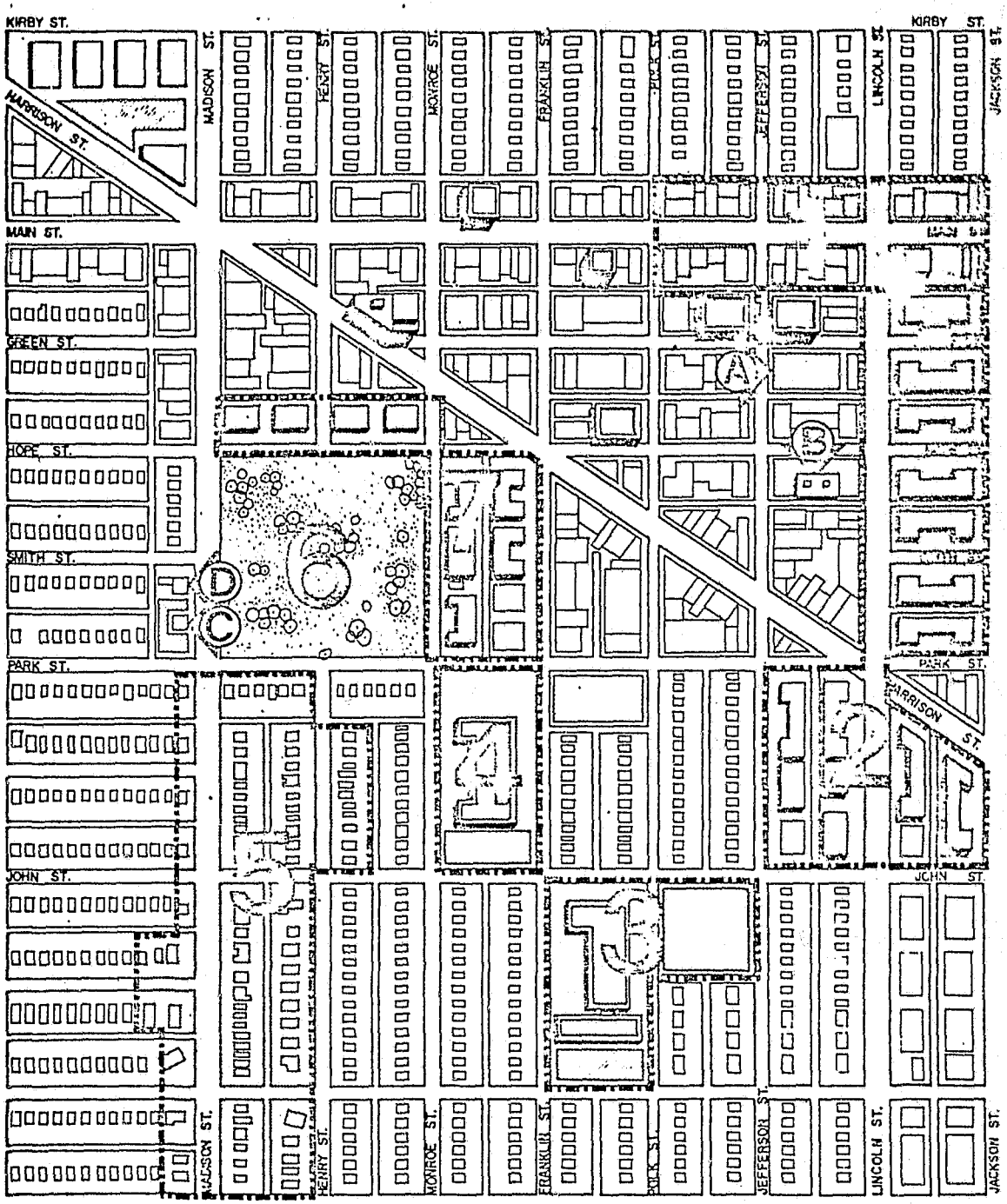
The planning examples that are offered are intentionally modest in scope in recognition of the fact that opportunities to implement sweeping changes in existing neighborhoods are rare. Private investments to create needed improvements are usually difficult to promote in high crime neighborhoods and residents are often not well enough organized or sufficiently influential to successfully compete with more affluent neighborhoods for public improvement funds. Ironically, these neighborhoods are in most urgent need for immediate improvements since they are typically comprised of disproportionate numbers of "captive" residents who are elderly, poor, and traumatized by fear with nowhere else to go.

Many crime problems might be significantly reduced in a particular neighborhood by relocating problem sources. High crime neighborhoods usually contain disproportionately large numbers of offender residents and problem activities which have been closed out of other locales. Economic circumstances and public housing policies concentrate poor, broken families and children lacking adequate supervision into housing developments and other ghetto areas. Enterprises that are not tolerated elsewhere (e.g., porno establishments, prostitution, gambling and drug trafficing) operate openly or flourish clandestinely. In theory, "proper design and use" would eliminate these problem concentrations. In practice, planners must accept unfortunate situations that they are not empowered to change as givens, and focus their efforts upon minimizing negative impacts.

6.3 The Hypothetical Locale

The locale that is presented for illustrative purposes is comprised of two principal areas, a residential neighborhood and a commercial zone, which are separated by three major streets. It is located in a midwestern city with a population of approximately one million people. The area has experienced a gradual economic and physical decline since the 1930's and is presently in a depressed but relatively stabilized state. Its crime rate is significantly higher than most other districts in the metropolitan area.

The residential neighborhood was originally a predominately Jewish upper-middle class area with many large homes. During an industrial boom which began in the late 1930's many Italian immigrants began to displace Jewish residents and the neighborhood came to be regarded as a blue collar area by the mid-1940's. A large number of small two story homes were constructed between 1940 and 1960 and a large public high school was built in 1951 to accommodate a rapidly increasing number of young people. In the early 1950's black residents began to move into the neighborhood. They presently represent about 50 percent of the population.



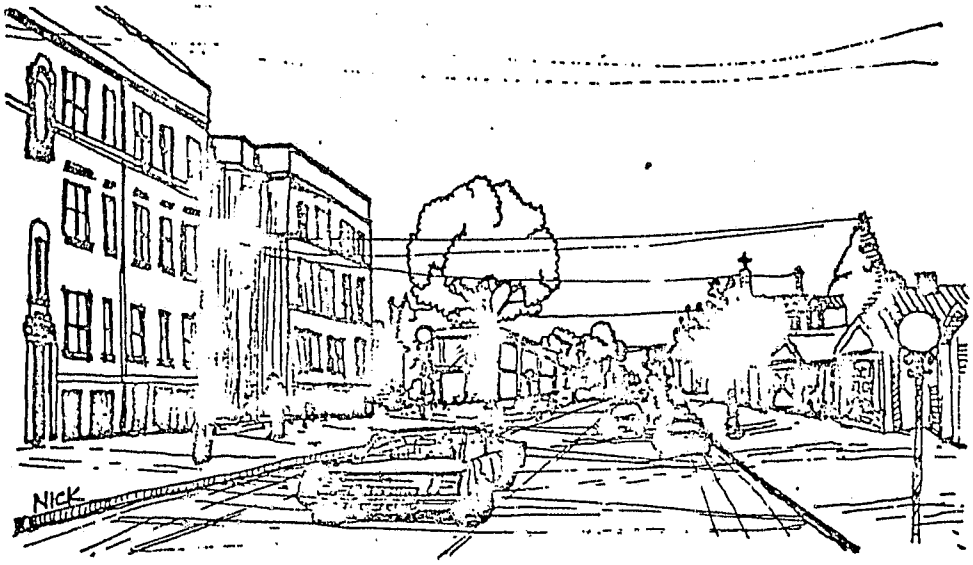
1 Skid Row
2 Family Public Housing
3 Hospital and Parking Areas
4 High School
5 Old Homes Converted to Apartments
6 Park
7 Elderly Housing

A Public Parking Lot
B All-Night Grocery
C McDonalds
D Youth Amusement Area

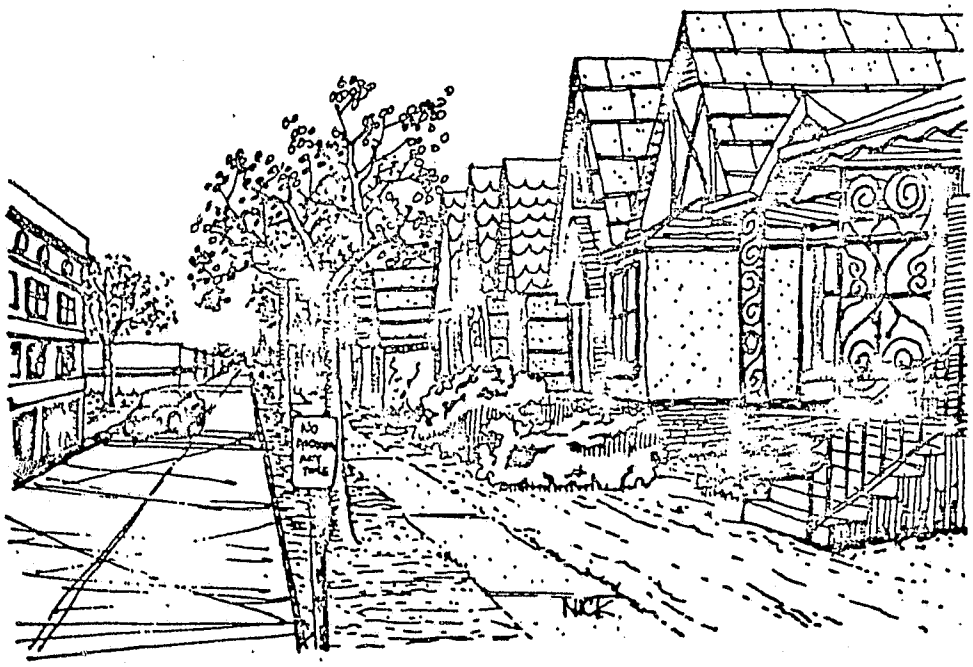
Parking Areas

FIGURE 6.1 SITE PLAN SHOWING LAND USES AND KEY LOCATIONS

Numerous 2-5 story apartment buildings were built between 1955 and 1965, including about 1500 public housing units for families and 850 for elderly. All of the large original homes have now been subdivided into apartments.



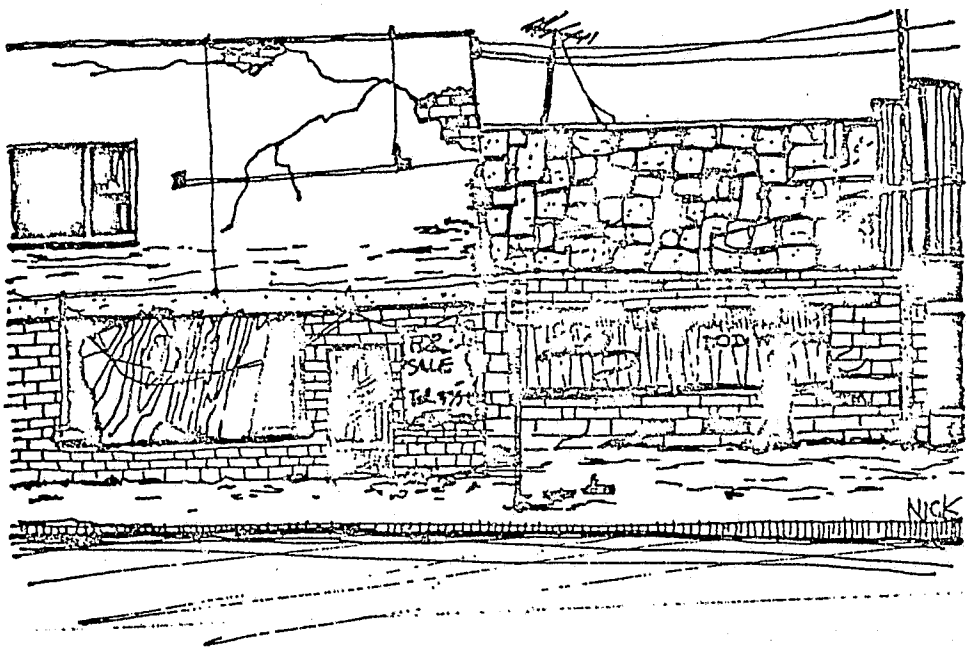
Apartment buildings with small front yards provide many eyes on neighborhood streets but inadequate lighting often hampers nighttime surveillance.



Typical neighborhood homes are small single family dwellings constructed between 1940 and 1960 on 45 ft. by 120 ft. lots. Entrances and living rooms face the street. Many homes have garages with approaches from alleyways that serve all blocks.

Up until the mid-1950's the commercial district was a thriving retail center that served the neighborhood and motorists enroute to and from the city's main Central Business District. In 1954 a new expressway was built which rerouted much city traffic away from local streets and reduced area sales. A major shopping center was built near the new expressway in 1960, less than one mile northwest of the locale, further siphoning away local business.

The district is now marred by many vacant lots, boarded-over store windows, derelict structures, and night spots of dubious reputation. A number of businesses have posted For Sale signs, but investors are reluctant to invest in the area due to fear of crime.



Derelict, boarded-up structures in the Skid Row and family public housing areas detract from investor confidence and neighborhood pride.

Street robberies, assaults, and pursesnatch incidents pose serious problems in blocks north of Park Street which contain a park, an elderly housing area and the commercial district. Most of the offenders are young, between the ages of 10 and 18. Some reported rape incidents and deviant sexual exhibitions in the vicinities of the park, and a hospital have greatly heightened local fear, particularly at night.

The most feared nighttime areas in the locale generally include a Skid Row entertainment area along Main Street and a nearby public parking lot, streets that are adjacent to the family public housing units, and the park. While not widely recognized as a problem area, nearly one-third of all reported outdoor robberies take place in the parking lot of an all night grocery store at Hope and Jefferson Streets.

The most troublesome daytime area is along Park Street. High school youths congregate at a McDonalds restaurant and amusement arcade on Park at Madison, in the park, and along the street between the high school and the family public housing units. Groups of youngsters often intimidate and sometimes abuse people of all ages and cause severe property damage. Many residents avoid the street at all times and parents forbid children from playing in the park for fear of youth attacks.

6.4 Neighborhood-Wide CPTED Considerations

Some of the crime problems in the locale appear to be influenced by factors related to traffic levels and land use patterns. For example, most of the recorded robberies and assaults are noted as occurring during hours of darkness when the majority of retail shops are closed and there are relatively few people on the streets.

Typical victims are persons who frequent the Skid Row bars and patronize local prostitutes as well as workers who depend upon public transportation to travel to and from night jobs. Most of the robberies that take place in the grocery store parking lot also take place at night, in locations which are not readily seen from the store interior or street. Pursesnatch incidents tend most often to involve elderly victims and generally occur when stores are open and young people are on the street (before curfew time). Reported rapes most often take place at night in desolate locations. Nurses changing shifts at the hospital and women walking past or through the park have been typical rape victims.

Figure 6-2 shows hypothetical problem locations for different types of crimes. Table 6-1 summarizes site locations where the crimes most frequently occur and lists probable influencing factors.

Table 6-2 lists a variety of physical approaches that can be considered in response to the crime problems and suspected influences. Many of these approaches are aimed at improving surveillance opportunities to enable detection of crime dangers and incidents so that appropriate interventionary or evasive actions can be taken. It is reasoned that good natural surveillance conditions can also inhibit criminal intentions by increasing risks of detection and capture.

Figure 6-3 shows proposed physical improvement locations.

Table 6-3 lists a variety of social approaches (or programs) that can complement and reinforce the proposed physical improvements.

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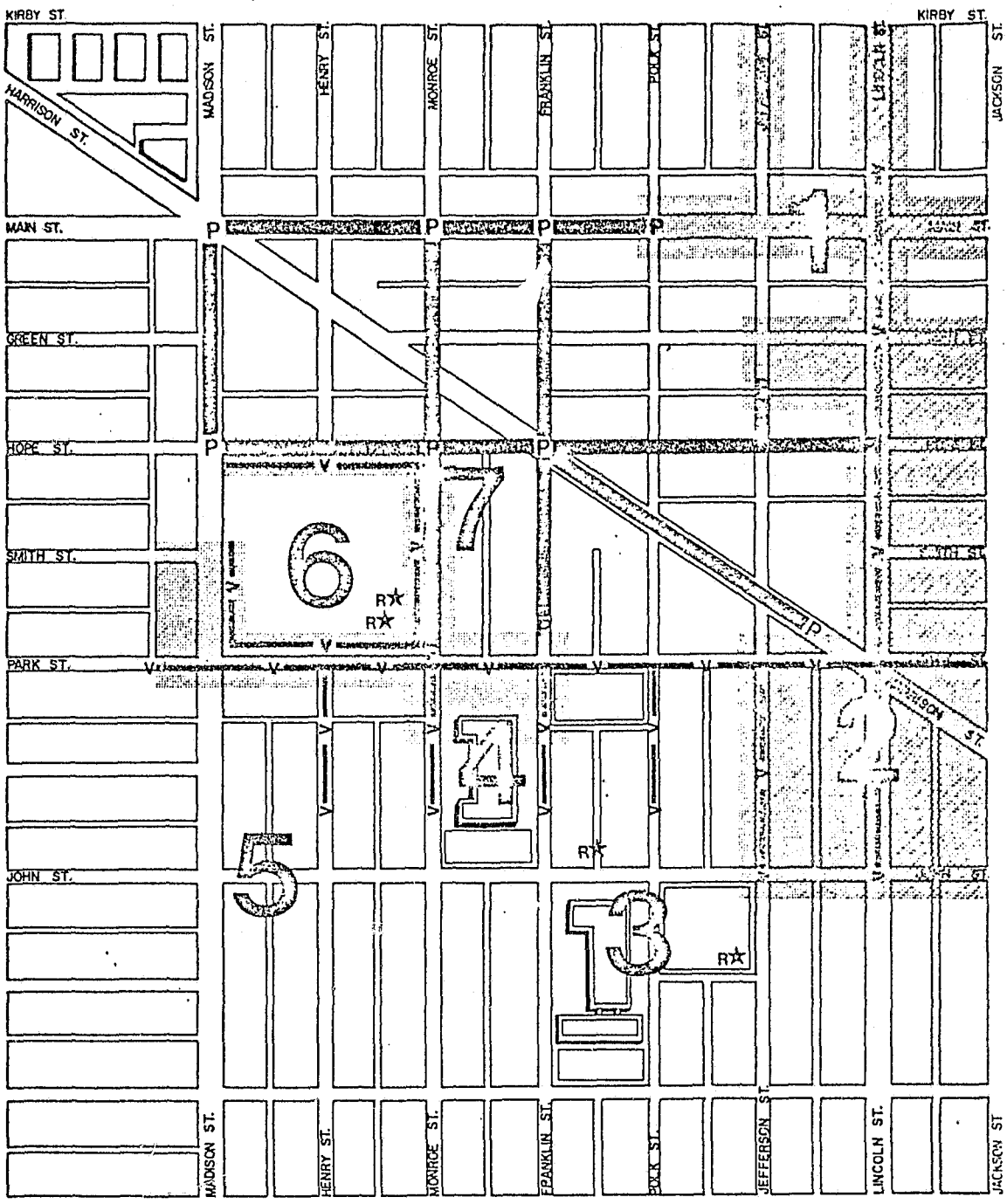


Robberies and Assaults

P Pursesnatch

R Reported Rapes

V General Vandalism

1 Skid Row
2 Family Public Housing
3 Hospital and Parking Areas
4 High School
5 Old Homes Converted to Apartments
6 Park
7 Elderly Housing

Note:
Exact outdoor crime locations are often difficult to pinpoint from police report records because they are typically listed according to nearest building addresses. It is assumed here that problem areas have been generalized from police records and interviews with police, merchants and residents.

FIGURE 6.2 KEY CRIME LOCATIONS

TABLE 6.1 CRIME-ENVIRONMENT INFLUENCES IN KEY LOCATIONS

	GENERAL PROBLEM AREAS	SPECIAL PROBLEM LOCATIONS	COMMON PROBLEM SITUATIONS	POTENTIAL ENVIRONMENTAL INFLUENCES
ROBBERY AND ASSAULT	Franklin, Polk, Jefferson and Lincoln Streets	Public parking lot between Jefferson and Lincoln Streets	People are robbed at night enroute to and from cars	Isolated and inadequately lighted location
		Sidewalks between Main and Kirby Streets	Drunks from nearby bars and prostitute clients are robbed at night	Isolated and inadequately lighted streets near popular offender hangouts
	Main Street	Sidewalk between Franklin and Jackson Streets	Drunken fights in bars over women, gambling, etc. spill out into the street	Skid Row bars which tolerate drugs, gambling, etc.
		Spaces between buildings and alleyways	People are robbed while going to and from cars parked off street	Isolated and inadequately lighted parking lots near popular offender hangouts
VANDALISM	All streets in the family public housing area	Sidewalks and spaces between buildings	Robberies by youths, often directly against young and old victims	Broken streetlights, overgrown foliage and blind spots between buildings obstruct vision
	24 hour grocery at Jefferson and Hope Streets	Parking area	Late night shoppers are robbed of groceries and money by young offenders who hide	There is no barrier that controls site access/egress to prevent easy escape of offenders on foot
RAPE	Park	Interior and at boundaries along Hope, Monroe and Park Streets	People who live in the nearby elderly public housing units are common victims of young assailents. Children are attacked or intimidated by older youths. There has also been sexual exhibitionism.	The park is taken over by toughs from the nearby high school and family public housing area. The area is poorly lighted and avoided by most residents at night--therefore desolate.
VANDALISM	High school and McDonalds	Parking lots and other gathering areas	Fights are frequent, usually involving young individuals or small groups	Youth gathering areas with limited or no adult supervision
	Park Street and intersecting streets	Sidewalk and building areas between Madison and Jackson (E-W); Park and John (N-S)	Large congregations of young people cause property damage	Heavy youth traffic between youth amusement area, high school and residences
RAPE	Hospital	Parking lot and nearby off street blind areas	Nurses have been threatened and raped at night following shift changes. Residents fear nighttime visits to the hospital.	Isolated and inadequately lighted location. A dependable place for offenders to find female victims.
PURSESNATCH	Shopping and access to shopping streets	Retail locations along Harrison, Madison, Monroe, Franklin and Main Street; elderly housing areas along Monroe and Franklin, as noted	Pursesnatchers usually victimize elderly women. Offenders are nearly all young (10-18 yrs. old). Offenses often cause serious injuries.	Incidents are most prevalent in areas where elderly live and shop.

TABLE 6.2 PHYSICAL CPTED APPROACHES

	CPTED APPROACHES	KEY TARGETS
LIGHTING	Evaluate lighting installations with particular attention to areas of high nighttime crime and fear--replace and supplement lighting as required.	Skid Row area, public housing areas, high school and hospital
	Provide tall and/or specially protected vandal resistant outdoor lighting fixtures in problem locations.	Public housing area, the park area and along Park Street
	Encourage businesses to provide adequate outdoor lighting for their premises, both front and back.	Skid Row, 24 hr. grocery and other problem businesses
LANDSCAPE ELEMENTS	Trim or remove shrubbery/trees that interfere with natural surveillance of problem areas.	Park interior and residential streets
	Encourage businesses to remove large signs and other obstructions that interfere with surveillance.	General commercial areas
	Upgrade the physical appearance of the area through coordinated signage, street and sidewalk repairs, kiosks, etc., to promote civic pride and social control.	General
	Undertake demolition and clearing of derelict structures that can hide criminal offenders.	Skid Row area
	Fence off problem areas between or behind buildings that are not intended for public use.	Skid Row, 24 hr. grocery and other problem businesses
	Provide benches and other amenities to encourage pedestrian traffic in appropriate areas, such as along streets that connect activity nodes with major transit pick-up points.	Pedestrian corridors along Hope, Madison, Franklin and Monroe Streets
	Provide public telephones with dial-free connections to emergency services at strategic locations to encourage/ enable people to report crimes rapidly.	Bus stops and other central locations
GENERAL PLANNING	When possible, relocate remote parking lots in high crime risk locations closer to areas of activity to improve surveillance and avoid the necessity for people to walk through desolate areas.	Selected Skid Row and other commercial locations
	If parking lots are located in areas isolated from active locations and cannot be relocated, provide well lighted access corridors that channel and maximize traffic levels.	Selected Skid Row and other commercial locations
	Provide both front and rear vehicle access to commercial businesses, when appropriate, to facilitate police patrol surveillance.	Selected Skid Row and other commercial locations
	Locate bus near areas of safe activity whenever possible and provide open planning, transparent shelters and good lighting to optimize natural surveillance.	High crime risk nighttime activity areas
	Create appropriate new activities in or near problem areas to provide observers to inhibit, intervene to prevent, and report crimes.	Park area

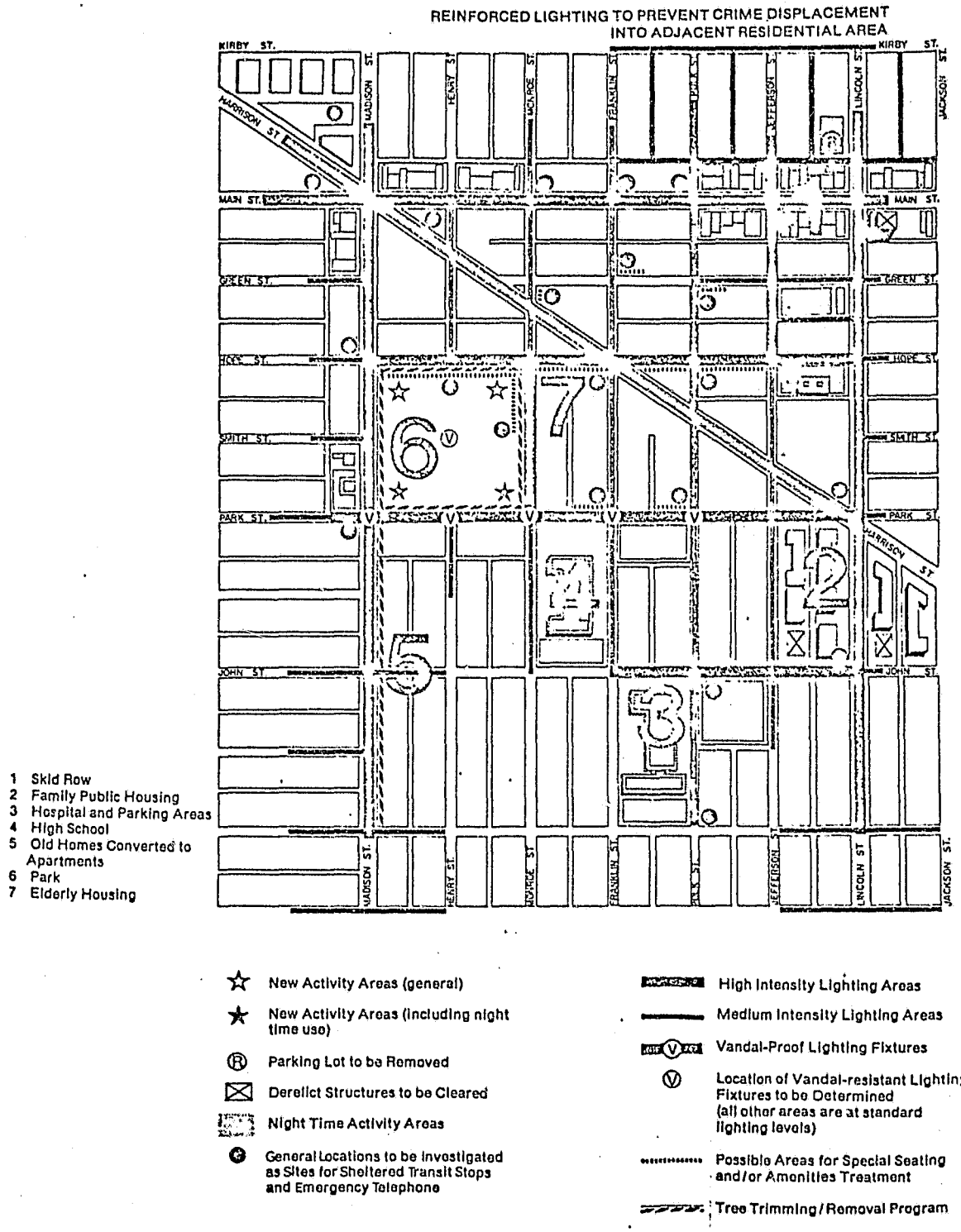


FIGURE 6.3 PROPOSED PHYSICAL CPTED IMPROVEMENTS

TABLE 6.3 SOCIAL CPTED APPROACHES

	APPROACHES	KEY FACTORS
PLANNING AND MANAGEMENT	Coordinate hours of business operation in each block to the extent possible to promote high or low pedestrian densities which avoid creation of "critical intensity zones."	Business proprietors
	Cluster commercial establishments so those with similar operating hours are located together to promote high or low pedestrian densities which avoid creation of "critical intensity zones."	Planning/zoning administrators and business proprietors
	Either locate businesses or other facilities that attract potential offenders (e.g., teenage hangouts) in the midst of heavily trafficked areas where natural surveillance is maximal; or isolate those business enterprises or facilities which attract potential offenders to avoid endangering other activities.	Planning/zoning administrators and business proprietors
ACTIVITY SUPPORT	Promote investor confidence to bring needed economic and social vitality into the neighborhood by advertising business opportunities and special neighborhood advantages through the news media.	Local business associations and Chamber of Commerce
	Promote investor confidence and social cohesion/control by sponsoring special events that bring people into the neighborhood such as weekend open markets, outdoor concerts, art shows, etc.	Local resident and business associations and civic groups
	Sponsor youth programs that make constructive and enjoyable use of young people's talents, energies and time such as athletic teams, summer paint-up/fix-up programs, etc.--in the interest of community pride, youth character development and crime/vandalism avoidance.	Local business associations, church/civic groups, and municipal agencies
AWARENESS AND INTERVENTION	Initiate block watch programs which encourage business staff and home residents to keep watch over the streets and neighborhood properties.	Local resident and business associations and police
	Encourage homes and businesses to post notices on doors or windows that "safe shelter" will be provided for people who feel endangered on streets.	Local resident and business associations and police
	Initiate citizen security patrol programs to work closely with police to report suspicious events.	Local associations and police
	Initiate public awareness programs to familiarize people with the importance of and specific procedures for reporting suspicious events or actual crimes.	Local associations and police
	Create and advertise anonymous crime-reporting telephone numbers to protect the identity of observers.	Police
	Encourage people not to carry significant amounts of cash on the street through media campaigns.	Police and bank groups
TRANSPORTATION	Improve public transit services to reduce the time of street crime exposure at bus stops.	Local transit agency
	Sponsor dial-a-bus programs for elderly and infirm residents to eliminate the need for vulnerable people to be exposed to street crime risks.	Church, civic and government groups
	Sponsor volunteer driver programs to transport elderly and infirm people to and from essential errands, and deliver basic goods and medicines to shut-ins.	Church, civic and resident groups
	Sponsor shopping excursions for groups of elderly and inform to reduce street crime risks.	Church, civic and government groups

6.5 Special CPTED Focus on the Park

As noted in Table 6-1 and Figure 6-2, the park is a key problem area where all types of neighborhood crime have been reported. Table 6-2 and Figure 6-3 present some general approaches that might apply to this area (improving lighting, tree trimming and plant relocation, and creating new activities, for example).

Table 6-4 specifically focuses upon park problems and provides more detailed suggestions for improvements.

Figure 6-4 illustrates design changes that were hypothetically selected for the park based upon problems and approaches outlined in Table 6-4.

TABLE 6.4 PARK PROBLEMS AND DESIGN CONCEPTS

	CRIME-ENVIRONMENT PROBLEMS	CPTED APPROACHES
NATURAL SURVEILLANCE	The park interior and adjacent streets are not adequately lighted to provide good nighttime surveillance.	Upgrade street lighting to illumination levels shown on Figure 5-3 and provide pedestrian scale lighting in strategic interior locations.
	The park is too wide and long to be easily seen across, particularly since trees interfere with views of interior areas.	Different options can be applied singly or in combination: 1) Provide a roadway through the park to facilitate police patrol surveillance 2) Screen of all or part of the park and restrict night access 3) Provide activities in the park which reduce the size of problem areas and induce natural control 4) Place activity areas in strategic locations where they can be readily seen and provide vantage points from which to see potential problem spots 5) Trim or remove major shrubbery obstructions
	Branches of tall trees in front of the 5 story elderly housing along Hope and Monroe Streets block potential views of the park from upper story units.	Trim off branches to the extent possible without seriously detracting from the landscape appearance and avoid future planting of similar tree types.
	Tall shrubbery along the Madison and Park Streets blocks potential views of the park interior from nearby single family dwellings and street/sidewalk traffic.	Trim and remove shrubbery as required to open up views of the park interior from outside vantage points.
USERS AND USES	The park area is taken over by high school age youths who intimidate elderly residents and smaller children during daytime hours.	Create separate activity areas in the park specially designed for different users (elderly, children, families, etc.) and define the areas with plant and/or built barriers.
	The park area is desolate at night and residents are fearful of walking past or through it.	Provide appropriate nighttime activity in or near the park to eliminate desolation. (A strategically located tennis court which is lighted at night, for example.)
	Vandalism by young people is a serious problem in and near the park.	Provide vandal-resistant pedestrian lighting and street furniture in areas where young people usually congregate. (The Park Street side is particularly critical.)

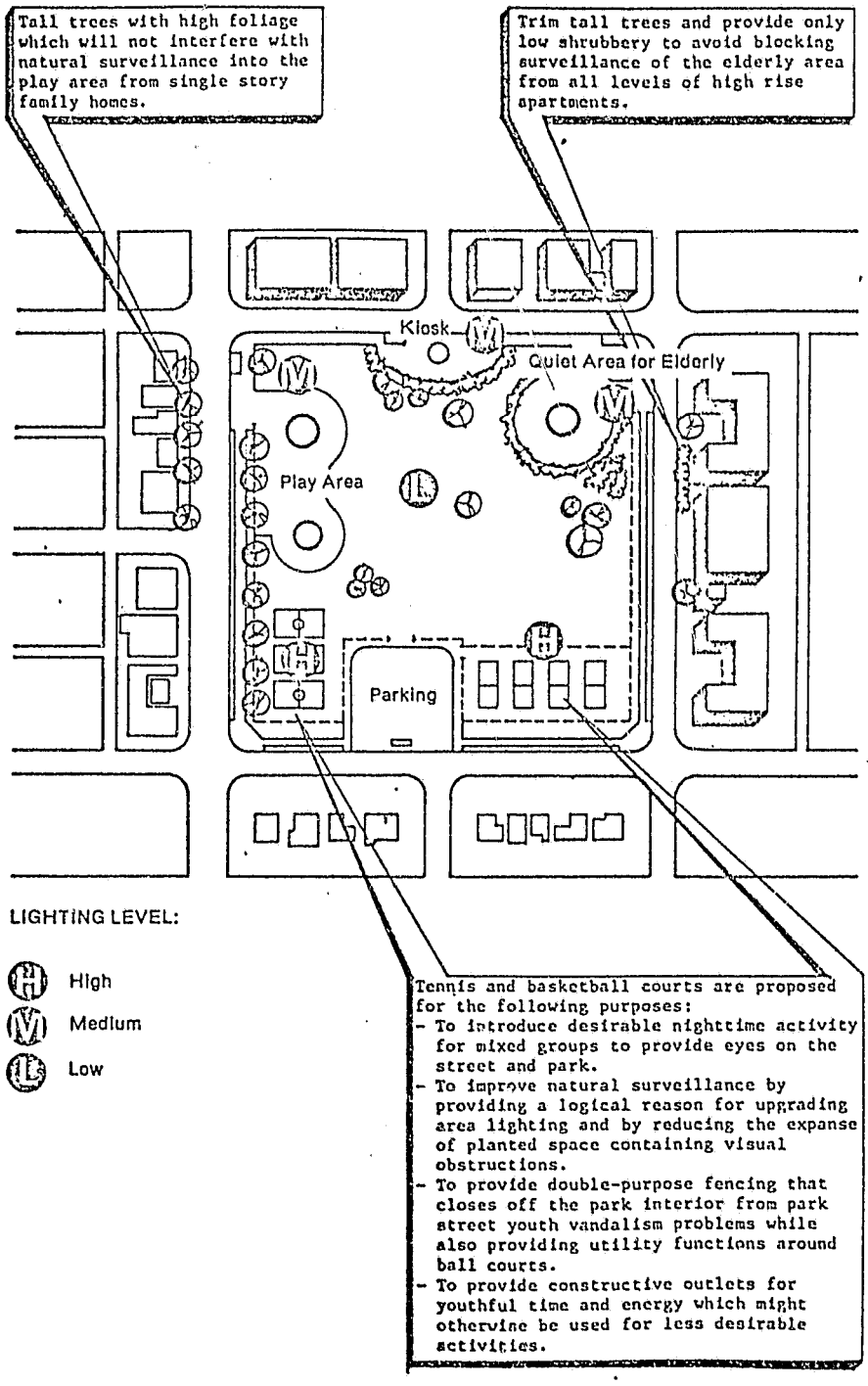
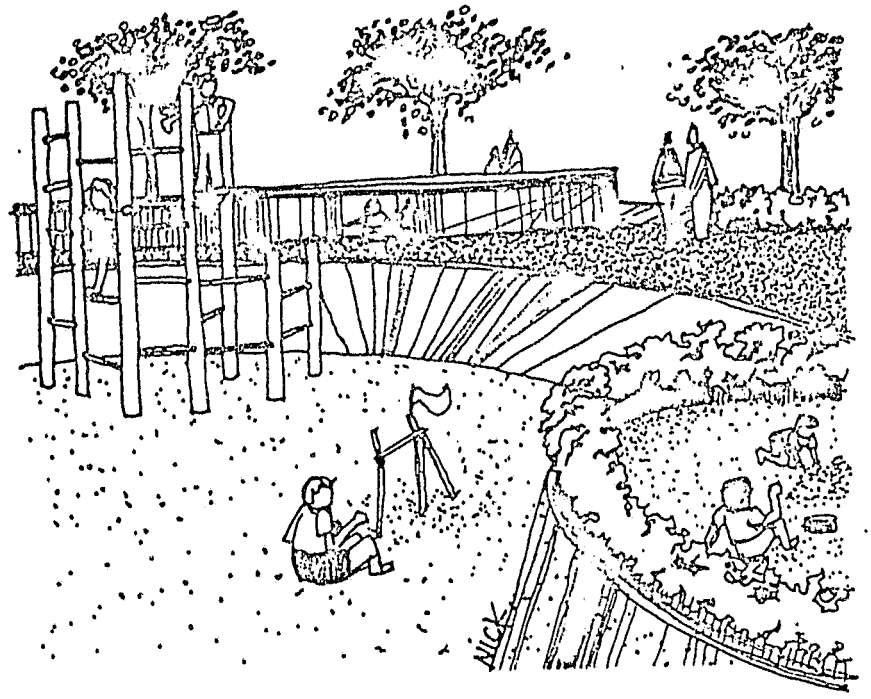
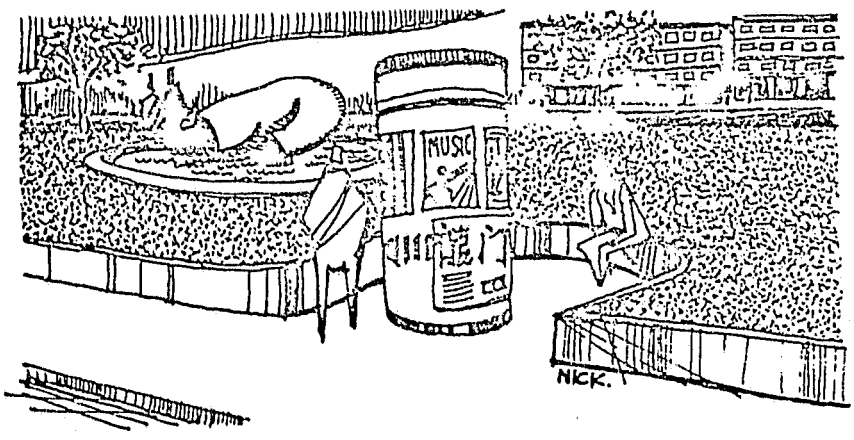


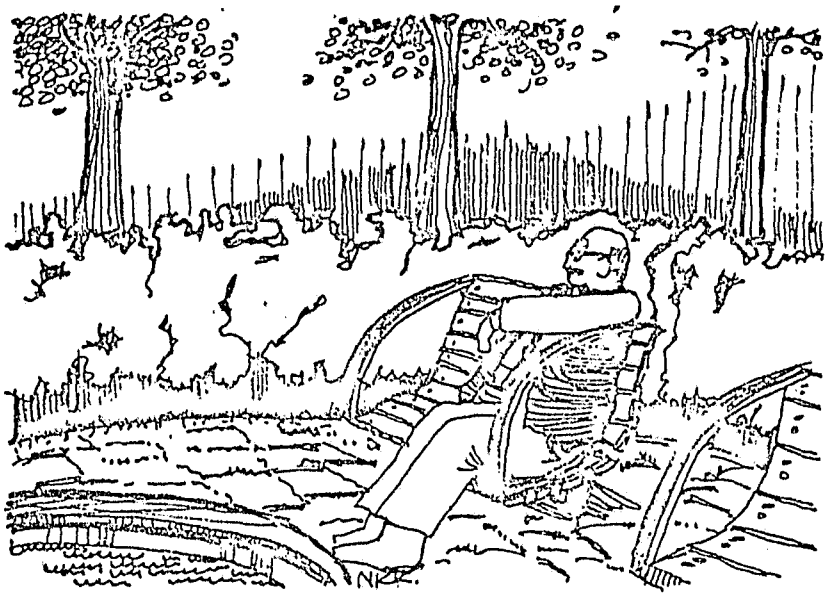
FIGURE 6.4 PROPOSED DESIGN CHANGES FOR THE PARK



The active play area is separated from street traffic and older youth congregating areas by a tall wire fence. The passive area for very young children is bounded by low shrubbery to provide protective control



A kiosk will be provided to inform residents of upcoming local events and news items of general interest.



Benches in the elderly area of the park should be designed for comfort and be provided with arm rests to enable infirm people to support themselves when sitting down and rising.

6.6 Special CPTED Focus on the High School Grounds

Outdoor school areas which are not directly supervised are often taken over by groups that pose real or implied threats to other groups and individuals. This condition presents a serious problem on the high school grounds along Park Street, most often occurring when minority groups band together out of common interests and/or in joint defense against majorities. The groups intimidate other students or residents that enter or pass by their "territories."

Table 6-5 identifies some crime-environment factors that appear to influence the general problem and lists some potential CPTED intervention approaches.

Figure 6-5 illustrates design changes that were hypothetically selected for the school grounds area along Park Street based upon conditions and approaches outlined in Table 6-5.

TABLE 6.5 SCHOOL GROUNDS PROBLEMS AND DESIGN CONCEPTS

	CRIME-ENVIRONMENT PROBLEMS	CPTED APPROACHES
NATURAL SURVEILLANCE	Supervisory control in many school grounds areas is limited due to natural surveillance problems.	Locate/relocate informal group congregation areas to places that are readily observable by supervisory staff (e.g., near administrative and/or faculty offices) when possible.
		Remove unnecessary visual barriers such as tall shrubbery that can interfere with natural surveillance from supervisory locations.
USERS AND USES	Areas are taken over as private territories of gangs who intimidate students and residents who pass by or through.	Provide functional activities such as ticket sales and snack concessions in problem areas to attract mixed student use.
		Keep bench areas where students congregate far enough away from major circulation paths to prevent groups from interferring with people passing by.
		Provide benches and tables that are designed and positioned to accommodate only small groups to discourage gang domination.
		Fence off school ground boundaries to separate outdoor congregating areas from general public pathways.
	Outdoor furniture suffers extensive vandalism damage.	Provide vandal-resistant benches within the school grounds and in nearby areas.

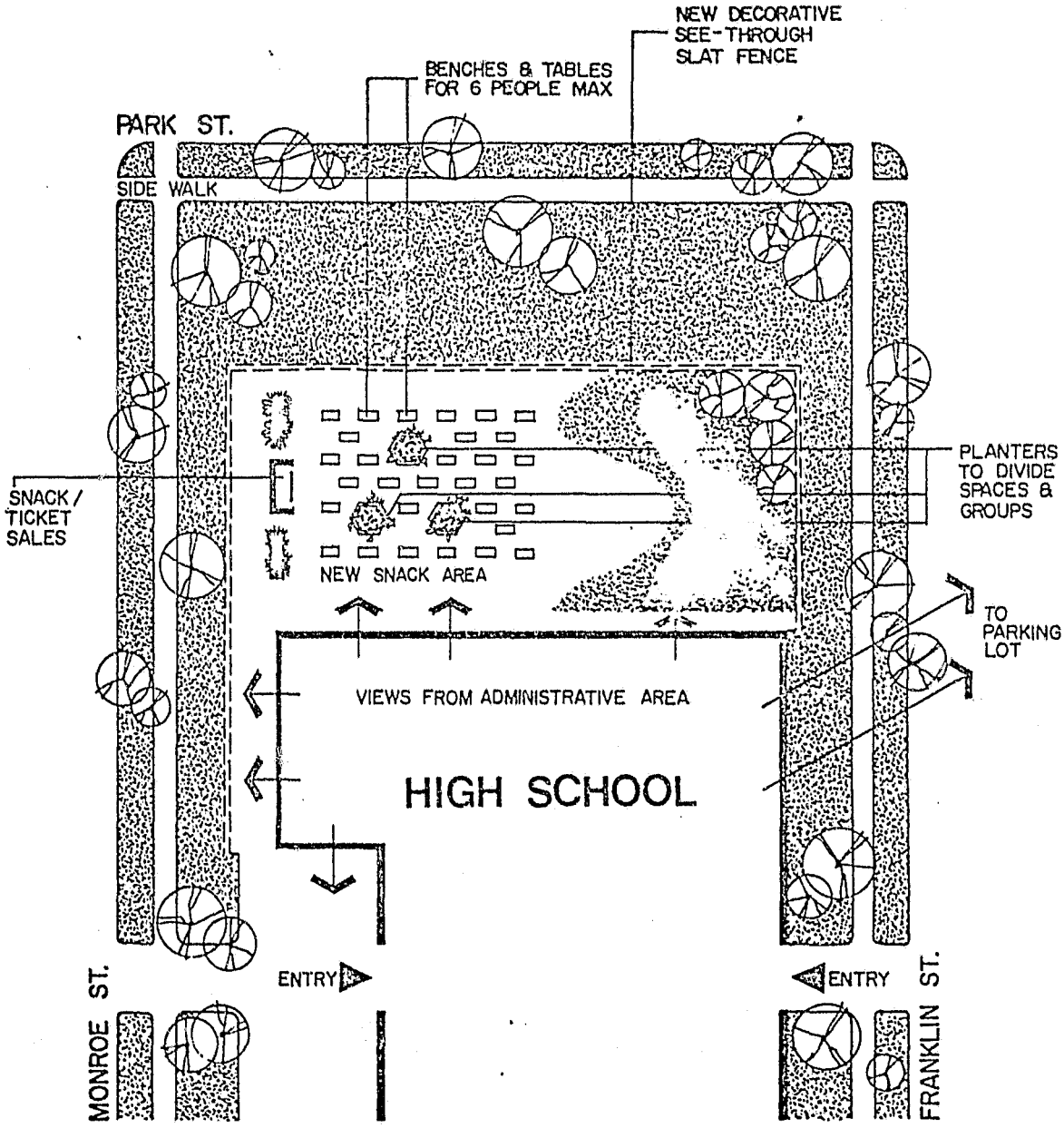
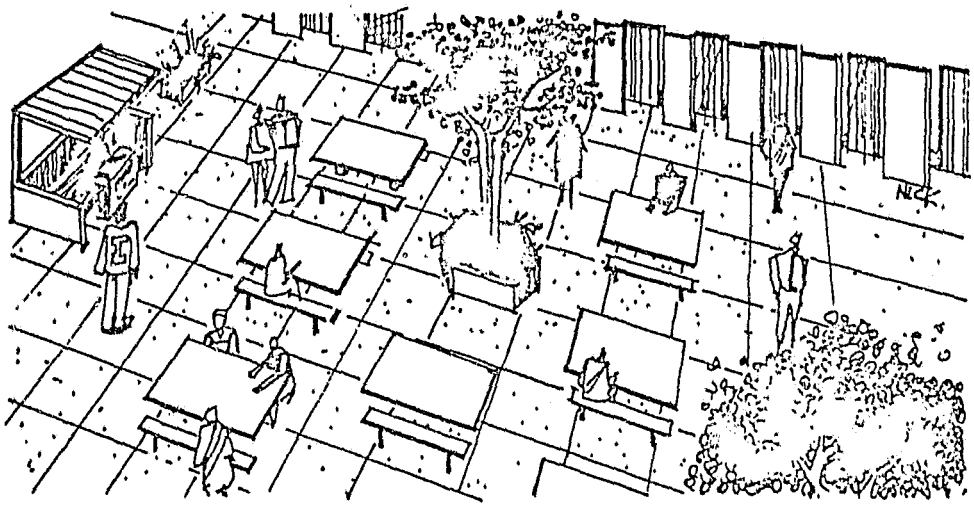


FIGURE 6.5 PROPOSED DESIGN CHANGES FOR THE SCHOOL GROUNDS



Short vandal-resistant benches and tables are to be provided to restrict group sizes and encourage relaxed conversation. Planters divide large spaces into smaller areas to break down institutional scale and introduce soft greenery and shade in paved places. A snack/ticket sales facility can provide a surveillance point for supervisory personnel.

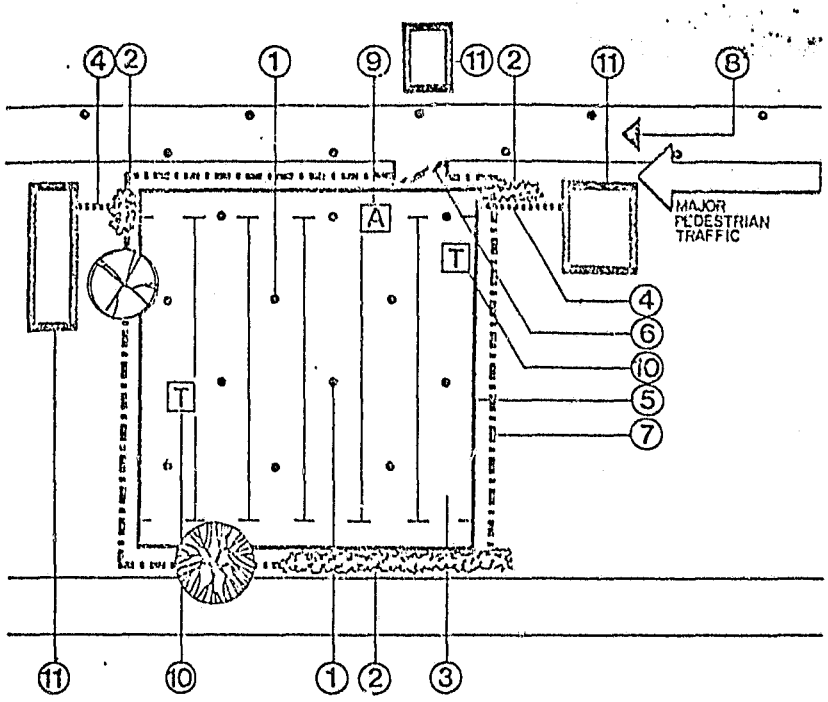
6.7 Special CPTED Focus on Parking Lots

Many pursesnatch, robbery and assault incidents take place in parking lots that are in remote areas or other locations where surveillance from nearby activity areas is impaired.

Figure 6-6 presents some design considerations for improving security in remote parking lots.

Figure 6-7 illustrates some alternative design approaches for improving security in parking lots that are near activity areas but present common access problems.

Figure 6-8 shows some ideas for securing parking lots that surround buildings.



DESIGN ALTERNATIVES

Improve lot lighting.

Trim/remove plants and clean-up trash that interfere with good natural surveillance and obstruct lighting.

Orient parking lot rows along lines of sight from principal vantage points when possible to optimize natural surveillance.

Use fencing or shrubbery to block routes of quick escape such as alleys adjacent to the parking lot.

Enclose the lot with a fence. Close the lot at night and post directions to more secure lots.

Enclose the lot with a fence and restrict access to authorized users by locking devices at pedestrian and vehicular entrances.

Block three sides of the lot with a fence, allowing access through the most secure access route.

Provide a "safe" pedestrian corridor to the lot by upgrading street lighting and security.

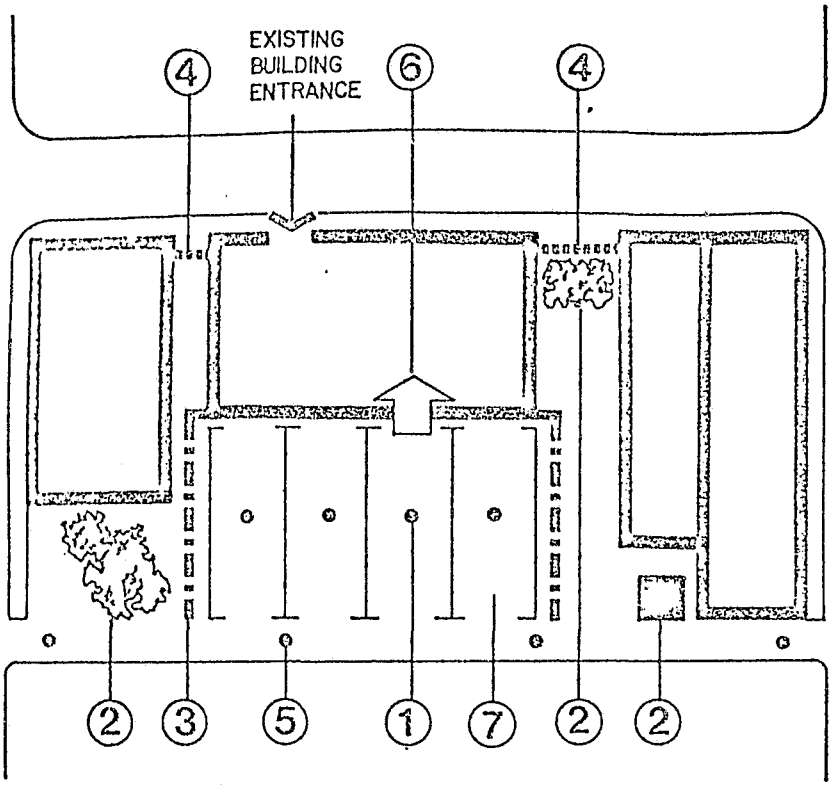
Provide a parking lot attendant as an observer in the lot.

Provide electronic surveillance devices, such as closed-circuit television, and post signs warning surveillance to discourage criminal attempts.

Encourage the relocation of user activities to locations nearer the lot and draw new user activities to the vicinity of the lot.

Relocate the lot, if feasible or necessary.

FIGURE 6.6 CPTED RECOMMENDATIONS FOR REMOTE PARKING LOTS



DESIGN ALTERNATIVES

Improve lot lighting.

Trim/remove plants and clean-up trash that interfere with good natural surveillance and obstruct lighting.

Block three sides of the lot, allowing access through the most secure route.

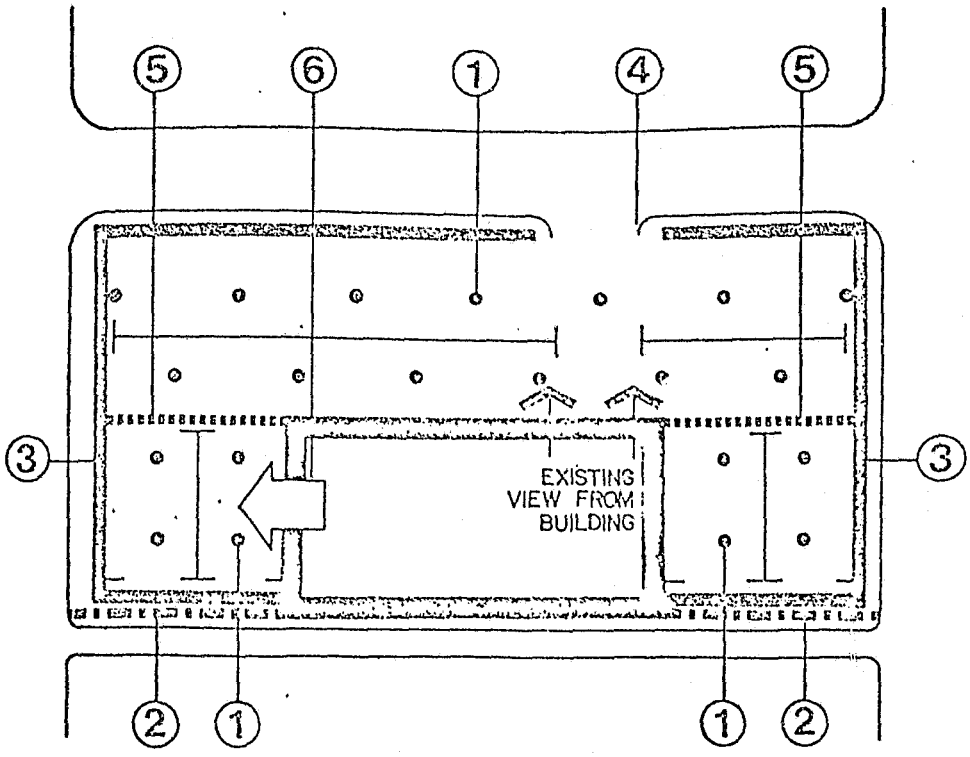
Close off unsafe access routes between buildings and open lots.

Provide a safer access route by upgrading access lighting and security.

Create new, more direct entrances to user buildings and provide lot surveillance from building interiors.

Orient parking lot rows along lines of sight from principal vantage points when possible to optimize natural surveillance.

FIGURE 6.7 CPTED RECOMMENDATIONS FOR PARKING LOTS BEHIND BUILDINGS



DESIGN ALTERNATIVES

Improve lot lighting.

Use fencing or shrubbery to block routes of quick escape such as alleys adjacent to the parking lot.

Block three sides of the lot with a fence, allowing access through the most secure route.

Use fencing and/or shrubbery to focus entry to those points of highest surveillability.

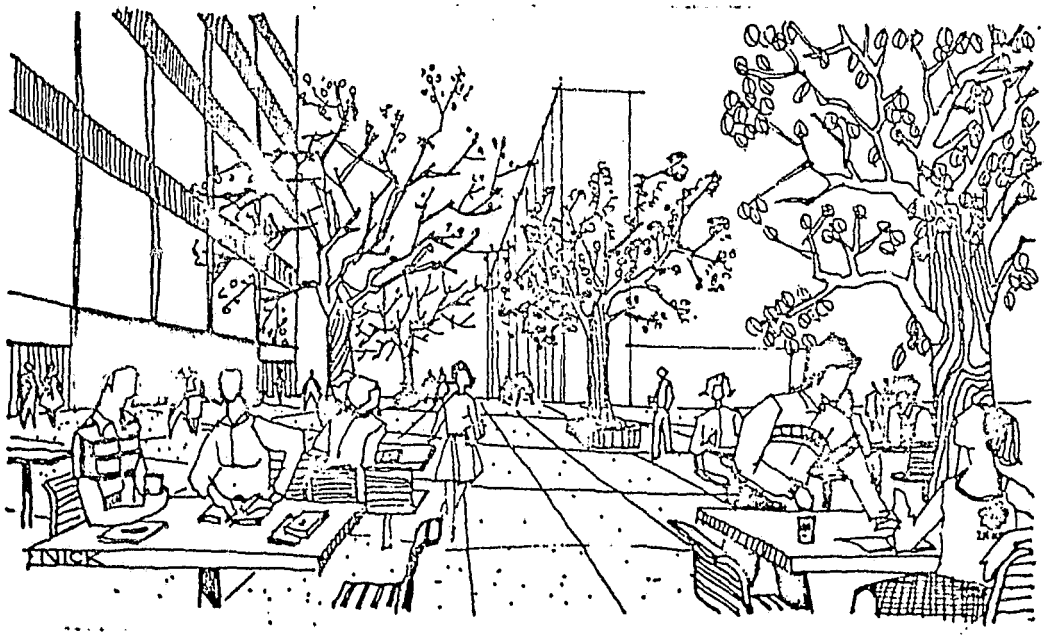
Close those sections of a lot at night that are most crime prone and difficult to survey.

Provide lot surveillance from building interiors.

FIGURE 6.8 CPTED RECOMMENDATIONS FOR PARKING LOTS SURROUNDING BUILDINGS

6.8 Concluding Remarks

The design concepts that were selected for application in this chapter were intended to be illustrative rather than prescriptive. The decision to put well lighted tennis and basketball courts in the park to increase nighttime activity levels and improve natural surveillance was only an idea for a special set of problem circumstances. Opponents to the idea might ultimately have won out, arguing that the courts would attract more young people and compound existing problems along Park Street; or point out that the courts would not be used during long winters--and that some other choice of activities should be made. Most ideas have proponents and opponents with good supporting arguments on both sides. That is why local residents as well as "experts from across town" should be involved in decision processes.



Environmental design is a potentially creative activity demanding inventive, reasonable participants who are sensitive to local problems, opportunities and constraints. Placing a crime prevention emphasis on an environmental design activity in no way alters this need for imagination tempered by cautious sensibility.

One of the big problems is the fact that crime prevention was not given much or any consideration when many neighborhoods were built. Perhaps this is quite understandable. The only environments that we consciously create for "bad people" are prisons (which have included low-income public housing). Neighborhoods usually start off well and prosperous enough. The problems often come to light generations later as a result of economic and demographic shifts which are difficult to predict. In this context, much of what is described as environmental design is really environmental repair.

Since neighborhoods are nearly always being influenced by forces that are reshaping their physical, social and economic structures, CPTED should be viewed as a dynamic concern which is applied through continuing planning activities rather than through "one-shot" programs. In simple terms, CPTED is characterized by a concern for the way that changes will affect human behavior and quality of life satisfaction.

END