



National Institute of Justice

R e s e a r c h R e p o r t

Physical Environment and Crime

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*Physical Environment
and Crime*

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**A Final Summary Report Presented to the
National Institute of Justice**

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Introduction

Can physical features of the environment prevent crime or reduce problems thought to be crime related, such as fear of crime or residents' concerns about neighborhood viability? Crime prevention through environmental design (CPTED) focuses on the settings in which crimes occur and on techniques for reducing vulnerability in these settings.

This report discusses assumptions surrounding work in this area and the major studies that link neighborhood and street block physical features with crime, fear of crime, and other related outcomes. Four major sets of physical features are emphasized in the research literature: housing design or block layout, land use and circulation patterns, resident-generated territorial features, and physical deterioration. Each of these approaches is discussed individually, and their policy implications are highlighted. The report ends with a series of questions that have not yet been answered by research.

Assuming a Rational Perspective

How might physical features influence behavior? Researchers have made several assumptions about how physical features affect both potential offenders and residents or users in a setting.

Offenders often operate in a rational fashion; they prefer to commit crimes that require the least effort, provide the highest benefits, and pose the lowest risks. Researchers have applied this rational offender perspective to a range of crimes (Clarke, 1983, 1992; Clarke and Cornish, 1985). This view suggests that crimes are most likely to occur when potential offenders come into contact with a suitable crime target where the chances of detection by others are thought to be low or the criminal, if detected, will be able to exit without being identified or apprehended. In short, the crime site lacks a natural guardian.

Physical environment features can influence the chances of a crime occurring. They affect potential offenders' perceptions about a possible crime site, their evaluations of the circumstances surrounding a potential crime site, and the availability and visibility of one or more natural guardians at or near a site. Offenders may decide whether or not to commit a crime in a location after they determine the following:

- How easy will it be to enter the area?
- How visible, attractive, or vulnerable do targets appear?
- What are the chances of being seen?
- If seen, will the people in the area do something about it?
- Is there a quick, direct route for leaving the location after the crime is committed?

These questions assume a rational offender perspective. The relevance of this perspective to an understanding of crime depends on a range of factors, including the type of crime and the familiarity between offender and victim or target.

The offender-based perspective relates to residents or users in a setting when it suggests potential offenders consider a setting's

natural guardians. Much of the work in this area, which relies on empirically grounded models of human territorial functioning (Taylor, 1988), assumes residents or users may respond to potential offenders. The probability and type of response depends on a range of circumstances—social, cultural, and physical. Physical features may influence reactions to potential offenders by altering the chances of detecting them and by shaping the public vs. private nature of the space in question.

Overview of Four Approaches

Assuming that potential offenders and residents or users of a setting are affected by this rational perspective suggests four approaches to making a location more resistant to crime or crime-related problems.

- **Housing design or block layout.** Making it more difficult to commit crimes by (1) reducing the availability of crime targets; (2) removing barriers that prevent easy detection of potential offenders or of an offense in progress; and (3) increasing physical obstacles to committing a crime.

- **Land use and circulation patterns.** Creating safer use of neighborhood space by reducing routine exposure of potential offenders to crime targets. This can be accomplished through careful attention to walkways, paths, streets, traffic patterns, and location and hours of operation of public spaces and facilities.

These strategies may produce broader changes that increase the viability of more micro-level territorial behaviors and signage. For example, street closings or revised traffic patterns that decrease vehicular volume may, under some conditions, encourage residents to better maintain the sidewalk and street in front of their houses.

- **Territorial features.** Encouraging the use of territorial markers or fostering conditions that will lead to more extensive marking to indicate the block or site is occupied by vigilant residents. Sponsoring cleanup and beautification contests and creating

controllable, semiprivate outdoor locations may encourage such activities. This strategy focuses on small-scale, private, and semipublic sites, usually within predominantly residential locales (Taylor 1988, chapter 4). It is most relevant at the street block level and below. It enhances the chances that residents themselves will generate semifixed features that demonstrate their involvement in and watchfulness over a particular delimited location. This approach has not proven directly relevant to crime, but it is closely linked to residents' fear of crime.

• **Physical deterioration.** Controlling physical deterioration to reduce offenders' perceptions that areas are vulnerable to crime and that residents are so fearful they would do nothing to stop a crime. Physical improvements may reduce the signals of vulnerability and increase commitment to joint protective activities. Physical deterioration, in all probability, not only influences cognition and behavior of potential offenders but also shapes how residents behave and what they think about other residents.

This focus on physical incivilities or signs of disorder (Skogan, 1990) is distinct from the preceding focus on territorial features.¹ First, there is a difference in scale. Reduction of incivilities addresses larger physical problems than does a territorial focus. An incivilities reduction program might emphasize any of the following:

- Securely closing or "capping" private vacant dwellings to prevent further deterioration and to preserve house values and a neat block appearance.
- Removing trash and abandoned cars from a large vacant lot.
- Razing deteriorated vacant houses.
- Repaving worn sidewalks in a commercial area with bricks.

These efforts often require significant involvement from city agencies or community-development or private corporations. Citizens and neighborhood associations clearly can and do play roles in initiating and assisting such efforts. Whereas a territorial

1. Social as well as physical signs of disorder exist. The authors focus here solely on physical ones.

focus concentrates on small-scale, resident-controlled spaces and resident-based dynamics, the incivilities approach is more inclusive. Although it is concerned with the impact on residents, the physical features considered can be located in residential or nonresidential spaces.

Second, the level of physical deterioration is usually too extensive for management by resident-based groups. Residents are not responsible for preventing large numbers of vacant houses or stores in a locale or for removing graffiti from the walls of a large school. One researcher has noted specifically that residents presume that deterioration emerges as a failure, in part, of public agencies (Hunter, 1978).

Third, there is a difference in emphasis. The territorial approach concentrates on cues from resident involvement, maintenance, and protection; the incivilities situation represents large-scale lapses in the local order.

Incivilities reduction, however, may complement improvement strategies based on resident-generated territorial marking and signage. Reductions in larger physical problems may encourage such markers and signage.

Each of the four approaches can reinforce the others separately or collectively. For example, incivilities reduction may complement the strategic focus on building design and block layout. If two vacant units being used as crack houses on a block are razed, the number of potential offenders may be reduced. The interlocking aspect of the four approaches suggests that where possible, practitioners consider how each may be of help when they look at a particular setting. Stated differently, varying intervention points and levels of intervention may make or encourage physical improvements that may enhance safety and feelings of safety (see “Success Stories”).

An indepth discussion of each approach will show how each of these strategies offers a unique perspective that frequently complements the others.

Success Stories

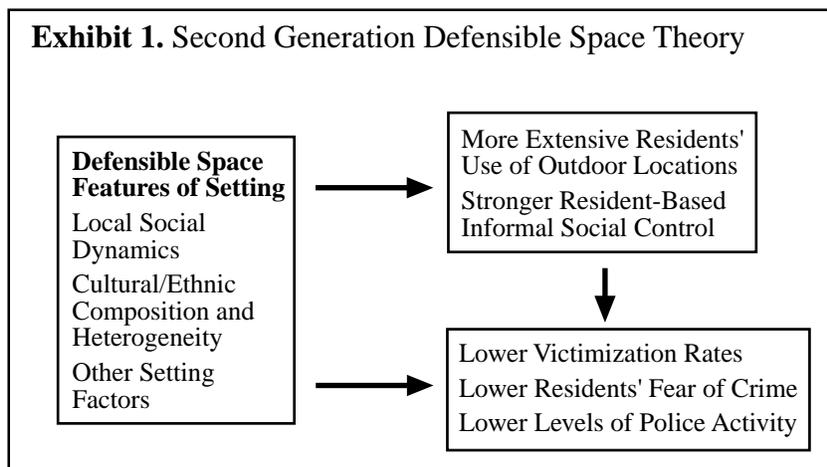
Research and evaluations have provided examples of situations where physical design or redesign appears to have contributed substantially to lowering crimes or to crime-related public order problems.

- **Designing safer public housing.** Buildings with fewer apartments per entryway, fewer stories, and better views of the outside have residents with lower levels of fear and rates of victimization (Newman and Franck, 1980, 1982).
- **Erecting barriers and changing street patterns.** In a North Miami neighborhood, building barriers and altering street patterns seem to have helped residents reduce the volume of drug dealers and buyers driving through the area. The result: Crimes such as auto theft and assault declined more rapidly in their neighborhood than in the city as a whole (Atlas, 1991; Ycaza, 1992).
- **Controlling access to buildings, schools, parks, public housing, or other trouble spots through the use of regulated entry.** Measures used by the Bronx's Community and Clergy Coalition, for example, include requiring an identification card, setting limited hours of usage, diverting traffic through specific checkpoints, and using metal detectors in schools or other public buildings (Weisel, Gouvis, and Harrell, 1994).
- **Creating safer public places.** Seattle's Adopt-a-Park program removes overgrown trees and bushes and increases lighting in neighborhood parks to deter drug dealing, vandalism, and the presence of homeless persons (Weisel, Gouvis, and Harrell, 1994). Success was reported for a similar project in a major downtown public park in Stockholm (Knutsson, 1994).

Housing Design Features and Block Layout

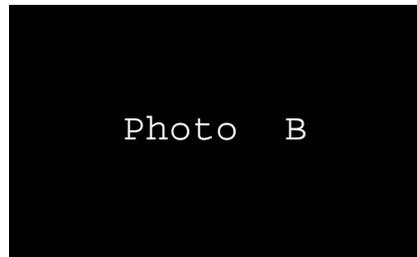
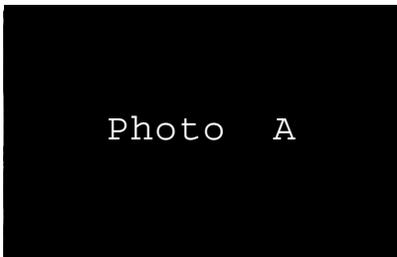
Can housing design and block layout make residents less vulnerable and feel safer? The originally formulated idea is that physical features that offer better surveillance, delineation between public and private space, segmentation of outdoor space into locations controlled by smaller groups, and proximity of sites to well-used locations enable stronger resident-based informal control of outdoor, near-home spaces. Such control should lead to less delinquency, less fear, and less victimization (Newman, 1972; Jacobs, 1961).

Studies of varying quality began testing these ideas in the early 1970's and continued at a rapid pace for the next dozen years. In 1980, a theory was formulated that made a distinction between "first generation" and "second generation" defensible space (Taylor, Gottfredson, and Brower, 1980). In the latter version, researchers considered more carefully how the impact of physical features on fear and victimization may depend upon other social and cultural features in the setting, and they made more realistic assumptions about territorial behavior and cognition (see exhibit 1).



Defensible space theory has received strong supporting evidence from studies of public housing in Britain and the United States and from studies of residential street blocks in the United States (e.g., Newman and Franck, 1980, 1982; Perkins, Meeks, and Taylor, 1992; Taylor, Gottfredson, and Brower, 1984; see Taylor, 1988, for a review). What many consider to be one of the strongest studies focused on 63 public housing sites around the country (Newman and Franck, 1982). The study found that sites with more defensible space features had residents who better controlled outdoor spaces and were less fearful and less victimized.

Practical implications. This work led to implementation of specific design elements in numerous locations. For example, parking garages with outer walls of glass for the stairwells were constructed. In public housing, this perspective led to the construction of low-rise sites with clear segmentation of private space, clear boundaries between public and private space, and good lines of sight. (See photos of the front and back of the Sandtown-Winchester Redevelopment Project in Baltimore, one example of recent low-rise public housing. For a discussion of the social, community, and organizational dynamics surrounding this project, see McDougall, 1993.)



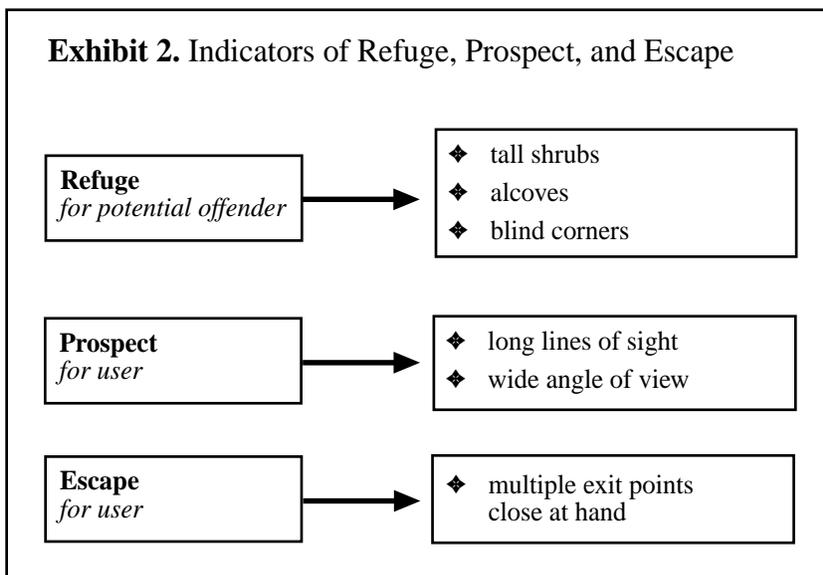
Fronts and backs of the Sandtown-Winchester Redevelopment Project in Baltimore, Maryland. Houses are located at the corner of Whatcoat Lane and Laurens Avenue, just west of Laurens and Calhoun. Note the well-defined outdoor spaces, making it clear the spaces are part of the residential unit, particularly in the backyards with fences. Design also provides excellent surveillance opportunities. (Photographs by Ralph B. Taylor)

Limitations. One of the major limitations to expanding the number of defensible space designs has been the lack of research

about how potential offenders view or use the physical features in question. Researchers have recently recast the discussion of defensible space features into a threefold grouping of physical features: prospect, refuge, and escape (e.g., Fisher and Nasar, 1992):

- Settings with high refuge offer concealment for the potential offender.
- Settings with high prospect allow the legitimate user to survey a wide area.
- Settings with high escape potential offer easy escape for the legitimate user.

This view of defensible space focuses explicitly on potential victim-potential offender dynamics in specific locations (see exhibit 2). Research confirms that fear is higher in locations that offer good refuge for the potential offender but low prospect and escape for the user.



An additional limitation is that the effectiveness of defensible space features depends in part upon the immediate social and cultural context. Defensible space can be left “undefended” (Merry, 1981a). More knowledge is needed about the characteristics of context that allow defensible space features to more effectively support resident-based control. In all fairness, however, this limitation applies to all perspectives that link physical environment features with crime and related outcomes, and it is not unique to this theoretical perspective.

Land Use and Circulation Patterns

The internal layouts, boundary characteristics, and traffic patterns of neighborhoods may encourage or discourage different types of crime. By implication, changes in land uses, boundaries, and traffic patterns may result in higher or lower crime rates because they affect both potential offenders and users. They may alter exposure to potential offenders because they more or less integrate the locale into the offenders’ orbits of activity (Rengert and Wasilchick, 1985).

Neighborhood level. At the neighborhood level, planners classify the relevant features into movement generators, such as high-volume streets, and attractors and nonresidential land uses, such as shopping, that will draw outsiders. Movement generators result in more people moving through a residential locale; attractors and nonresidential land uses generate more people traveling to a residential locale.

Cross-sectional and longitudinal works both suggest strong connections between these physical features and crime levels. Cross-sectional studies in Atlanta (Greenberg and Rohe, 1986; Greenberg, Williams, and Rohe, 1982) and Richmond, Virginia (White, 1990), found that the internal layouts of low-crime neighborhoods were less permeable—more one-way, narrower, and lower volume streets—than those found in higher crime neighborhoods.

A recent study examined effects of physical environment on crime changes. The percentage of lots zoned for commercial use was a significant predictor of increased risk of high robbery rates in Washington, D.C. (Harrell and Gouvis, 1994). But the presence of public housing units, found in many census tracts in Washington, was not significantly related to changes in neighborhood risk of burglary, robbery, or assault in those areas. Longitudinal research in Hartford (Fowler and Mangione, 1986; Fowler, McCalla, and Mangione, 1979) and an unpublished evaluation in Miami (Ycaza, 1992) suggest that physical changes to internal circulation patterns and boundaries were followed by lower crime rates. Planners have routinely worked with neighborhoods across the country to analyze their crime problems and to reduce them by making physical alterations (Gardiner, 1994).

In the studies involving redesign, however, local social or organizational dynamics have often accompanied planned changes. Although it seems likely that design changes themselves have been partially responsible for the impact observed, researchers have not yet precisely estimated their independent contribution to lowering crime, fear, or perceived risk. How much of the benefit has been due to the redesign, and how much has been due to the social and organizational changes surrounding the planned change?

Practical implications. There are several practical implications of this research at the neighborhood level:

- Social and organizational conditions are important when changes in layout, traffic, or land use are being considered. Community involvement of residents, neighborhood organizations, and local businesspersons is essential for developing a plan free of adverse effects on major interest groups.
- Local involvement may be an important precondition not only for rational, maximally beneficial change but also for achieving a redesign that will actually reduce crime. One study suggests that changes in layout, under conditions of community mobilization, appear to have been partially responsible for decreases in some crimes (Fowler and Mangione, 1986). But the crime-pre-

ventive benefits of changes in layout appear to weaken as community mobilization wanes.

- An early step in planning redesign to prevent crime is understanding offender location. For some offenses, such as auto theft, offenders may come from other neighborhoods. For other offenses, such as drug dealing, offenders may live in the area. If they come primarily from outside the neighborhood, can residents readily distinguish between these potential predators and individuals who are in the neighborhood for legitimate purposes? If they can make the distinction, physical impediments to entry and circulation may result in less crimes committed by certain types of offenders.²
- Neighborhood layout and boundaries—ease of circulation, a higher proportion of nonresidential land use—appear linked to higher street crimes and more burglary.

These implications need to be tempered by the recognition that crime prevention is just one objective of land use planning. As one of the anonymous reviewers of this report stated:

Other objectives, such as economic development or equal housing opportunities, might at times conflict with a crime-prevention or fear-reduction objective. The planning process surrounding design or redesign will need to balance these potentially competing goals.

Street block level. At the street block level, nonresidential land use and high traffic volume may interfere with residents' ability to manage activities on the block and to recognize people who belong to the neighborhood. Pioneering research found that residents living on higher vehicle traffic streets used their front yards less and withdrew from neighbors (Appleyard, 1981). Higher levels of foot traffic, often associated with nearby commercial or institutional land use, also caused the same social cocooning (Baum, Davis, and Aiello, 1978). Nonresidential land

2. There are two important caveats to this strategy. First, the limitations on entry and circulation must not severely limit other purposes served by the streets and institutions in the neighborhood. In addition, the distinctions drawn between insiders and potential offenders from outside must be empirically founded and not driven by class-based or ethnically based prejudices.

uses and associated higher foot and vehicle traffic levels make it more difficult for residents to get to know one another and to distinguish between legitimate users of the setting and potential offenders. Such dynamics can be understood in the context of resident-based territorial functioning (Taylor, 1988, chapter 8). In short: Nonresidential land uses create holes in the fabric of resident-based informal control, and higher traffic or pedestrian volumes shrink the geographic extent of resident-based informal control.

Consequently, residents living on blocks with higher levels of nonresidential land use are more concerned for their personal safety and less likely to intervene if they see something suspicious; they experience higher victimization rates and call the police more often. These links have been supported by evidence from numerous studies conducted in different cities around the country (Kurtz, Koons, and Taylor, 1995; McPherson, Silloway, and Frey, 1983; Perkins, Florin, Rich, Wandersman, and Chavis, 1990; Roncek and Bell, 1981; Roncek and Faggiani, 1985; Taylor, Kurtz, and Koons, 1994). Not surprisingly, nonresidential land uses, such as bars, are particularly troublesome on residential blocks (Frisbie et al., 1978).

At the same time, increasing the number of people on or around the block in some settings may enhance informal surveillance and reduce some types of offenses. It also may contribute to other neighborhood goals, such as economic development. Good design and management may, to some extent, reduce some crime risks around facilities and public attractions.

Practical implications. What are the practical implications of these street block dynamics?

- They do not mean that stores and small businesses should be removed from residential settings. As noted earlier, land use planning for crime-prevention purposes may conflict with other legitimate goals, such as economic development. Residents depend on these services. Further, in settings where proprietors have long tenancy or are culturally similar to residents, they

make important contributions to the safety and orderliness of street life (Jablonsky, 1993:80; Jacobs, 1968).

- Nevertheless, in locations where sizable “gaps” exist between residents and entrepreneurs, steps may be needed to draw the personnel staffing nonresidential land uses into contributing to overall street order.

In older urban locations in many cities, residents and entrepreneurs are often of different ethnic backgrounds (e.g., African-American residents vs. Korean entrepreneurs) and therefore have different cultures. It is sometimes difficult for each group to interpret the behavior of the other (Merry, 1981b), which in turn may impede entrepreneurs’ contributions to informal control over events on the street. An important role for police community-relations councils and local business organizations may be to develop strategies so these entrepreneurs can contribute meaningfully to resident-based control over street life.³

Understanding the effects of nonresidential land use on informal control on the street block is limited by a lack of recent work examining relationships between entrepreneurs and residents in inner-city neighborhoods. There are several excellent recent ethnographies of inner-city life by, among others, Elijah Anderson, Elliot Liebow, Terry Williams, and Phillipe Bourgois. None, however, provide significant detail about resident-shop-keeper relationships and how they may condition the connection between land use and crime.

Resident-Generated Territorial Signage

Resident-generated signs of caring and proprietorship signal to other residents and to outsiders that people living there care, are vigilant about what happens on the street, and are willing to intervene if needed. Studies to date suggest that the territorial perspective may be more relevant to the goals of fear reduction and

3. The authors are indebted to Angela Taylor for this suggestion.

bolstering neighborhood confidence than to crime prevention per se.

The theory focuses on street block dynamics and explains how territorial functioning contributes to the smooth running of ongoing residential behavior settings (Brower, 1980; Taylor, 1988, chapter 6). Residents and outsiders alike interpret territorial markers as clues to how residents will act in different situations. Evidence supporting this perspective includes several cross-sectional studies linking territorial markers, local social involvement, and control over nearby public spaces (Brower, 1988; Greenbaum and Greenbaum, 1981). Residents perceive that stronger markers indicate a safer environment: the more threatening the environment, the more markers required to make residents feel safe (Brower, Dockett, and Taylor, 1983).

Practical implications. In keeping with defensible space ideas, planners and designers want to create delimited, semipublic spaces that can easily be overseen by residents. The current boom in urban gardening on vacant lots in inner-city neighborhoods testifies to what people can do with a space they are allowed to manage. The garden gives them a reason to keep an eye out on the street and involves them more in the neighborhood.

In addition, officials may want to publicly support local initiatives that encourage resident-based territorial strategies. Many local community groups already promote extensive efforts to encourage residents to get involved with cleanup and beautification. Local officials do not want to “take over” these activities. Nevertheless, community groups and residents may be appreciative if officials recognize and support the contributions they are making to create safer blocks and overall neighborhood viability.

The territorial approach as it relates to disorder is limited in three ways relevant to crime-related problems. First, it is not yet understood what happens over time. For example, it is not known how fear of crime can hamper territorial functioning or frustrate intervention in a cycle of increasing concern and weakening jurisdiction. Second, it is difficult to separate the relative

contributions to fear reduction of the social and cognitive components of territorial functioning from the physical components emerging from territorial marking. In part, this difficulty emerges from the close, system-like connections between social, cognitive, and behavioral components. Finally, it is not clear how potential offenders respond to territorial signage. Some research suggests that offenders, such as burglars, attend to it (Brown, 1985; Brown and Altman, 1983); other studies theorize that offenders pay attention to different features of house and block context (Bennett and Wright, 1984).

Controlling Physical Deterioration and Disorder

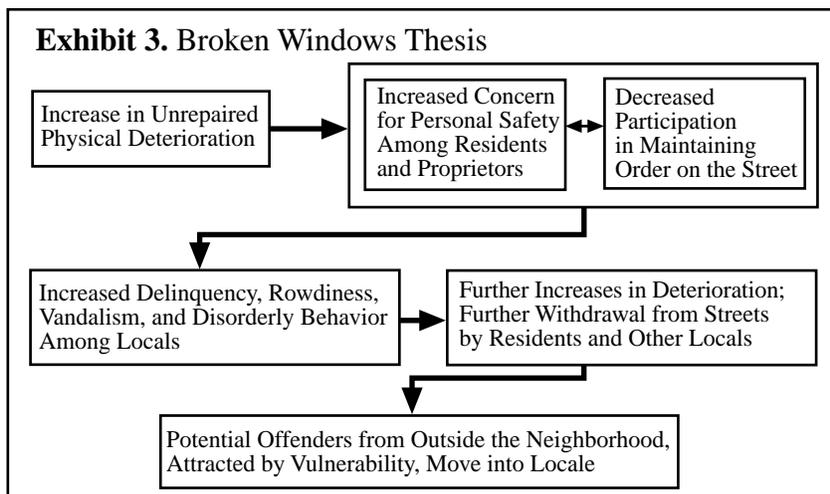
In the 1970's, one researcher proposed that what really made people afraid in cities and concerned about their welfare was not only the crimes they saw and heard about but also the physical and social signs they saw around them that indicated a breakdown in society (J.Q. Wilson, 1975). Another researcher called these indicators "signs of incivility." He argued that such signs made people feel vulnerable because they suggested to residents that the public officials and agencies charged with maintaining order were incapable or unconcerned about following through (Hunter, 1978).

Two researchers then framed the concept of incivilities longitudinally and considered how offenders might respond to signs of incivility (Wilson and Kelling, 1982). They discussed these dynamics in the context of community policing. Their broken windows thesis, depicted in exhibit 3, suggests the following chain of events:

- Physical deterioration, wear and tear, and large-scale accumulations of graffiti and trash routinely occur in many older, urban neighborhoods. If, however, people or agencies do not do anything for a significant period about such deterioration or accumulations, residents and shop personnel working in the neighborhood feel increasingly vulnerable.

- Feeling more concerned for their personal safety, residents and store personnel participate less in the maintenance of order in public places. They are less likely to stop teens or adults who are “messing around,” “being rowdy,” or “hassling people.”
- Sensing fewer “eyes on the street” (Jacobs, 1961, 1968), delinquent preteens and teens in the neighborhood become emboldened and harass or vandalize more frequently. Increasingly convinced they can get away with it, delinquents commit more minor crimes, and youths become increasingly disorderly.
- Residents, sensing that some local youths are becoming increasingly troublesome, withdraw further from the public spaces in the neighborhood and become more concerned about protecting their own person and property.
- At this point, potential offenders from outside the neighborhood sense the locale is vulnerable. They are drawn into the neighborhood because crimes committed there will be less likely to be detected and responded to. The neighborhood crime rate increases dramatically.

Another researcher suggested that incivilities may spur subsequent neighborhood decline because the consequences noted above lead ultimately to resident out-migration (Skogan, 1986;



1990:2). He proposed the following scenario: Vandalism, abandoned buildings, and other evidence of disrepair may be contagious, stimulating additional disregard for property by attracting potential offenders. The neighborhood declines, sometimes more quickly than would otherwise be the case. The decline may be manifested as increasing vacancy rates, higher conversion rates from owner-occupied to rental properties, more dramatic changes in ethnic or racial composition of residents or store owners, or changes in the socioeconomic status of residents.

These ideas have garnered significant attention from urban theorists and policy planners despite some limitations (Greene and Taylor, 1988). What sound empirical evidence is there that links physical deterioration or signs of incivility with crime, fear of crime, or increases in either?

Cross-sectional studies on signs of disorder, crime, and fear have generated different results, depending upon the unit of analysis and the type of measures used (Miethe, 1995). Studies using residents' perceptions of incivilities have found more consistent effects than studies based on onsite ratings of physical features, and studies using street blocks generally have provided more consistent results than studies using neighborhoods.⁴ In neighborhoods where physical deterioration is more widespread, residents have been more fearful when the future of that neighborhood has appeared uncertain (Taylor, Shumaker, and Gottfredson, 1985). The effects of neighborhood deterioration on residents' fear levels is weakened somewhat when deterioration has reached a high level (Taylor and Shumaker, 1990).

Extensive research has linked perceptions of physical deterioration and social incivilities with fear of crime and other outcomes relevant to neighborhood viability (Lewis and Maxfield, 1980; Skogan, 1990). For example, one study found effects of an incivilities index on perceived crime problems, fear at night, and robbery victimization while controlling for neighborhood poverty, stability, and minority status (Skogan, 1990:193–194).

4. This conclusion is closely parallel to but somewhat more sanguine than Miethe's (1995:21): "[T]he empirical evidence on the direct and indirect impact of measures of neighborhood incivilities on individuals' fear of crime is inconclusive."

Both onsite assessments of incivilities and resident perceptions of the incivilities have contributed independently to residents' concerns for personal safety (Covington and Taylor, 1991). This suggests that extant deterioration may make residents more fearful even when they do not express concern about the problems.

Studies of neighborhoods or blocks over time have provided some support for the incivilities thesis. Researchers investigated effects of indirect indicators of physical deterioration and social disorder in Washington, D.C., and Cleveland, Ohio. Prior crime rates predicted subsequent neighborhood risk of burglary, robbery, and assault in Washington and Cleveland across periods of 2 to 5 years. Home ownership, which presumably reflects commitment to maintaining the appearance and value of the property as well as social stability and low turnover, did not predict subsequent risk for high rates of burglary, robbery, or assault independently of prior crime levels. Other indicators of neighborhood decay, however, added significantly to risk prediction based only on prior crime rates. Since arson and delinquency often leave visible scars that act as cues to social and physical incivilities in decaying neighborhoods, arson and delinquency rates predicted changes in neighborhood burglary risk. Family poverty, previously associated with neighborhood disorder (Skogan, 1990), predicted risk of high assault rates in Washington neighborhoods and high robbery rates in Cleveland neighborhoods independently of earlier crime levels (Harrell and Gouvis, 1994).

Physical changes appear to precede crime changes. Using groupings of Los Angeles census tracts and studying them for several decades, researchers found that patterns of owner-to-rental conversion, land use changes, and abandonment predicted the emergence of hardened high-crime areas. The connection remained after controlling for changes in the types of people living there (Schuerman and Kobrin, 1986).

In short, depending upon neighborhood context and other factors, physical deterioration and indirect indicators partially reflecting deterioration appear to be linked to resident fear levels and changing crime rates.

Across street blocks, one study suggested stronger, less conditional connections between incivilities and perceptions of crime-

related problems. A study of 50 Baltimore street blocks found that assessed physical deterioration contributed to the perception of social problems and crime problems on particular blocks after controlling for block layout, stability, and class (Perkins, Meeks, and Taylor, 1992).

Neighborhood- and block-level results thus indicate connections between physical deterioration, features presumably related to deterioration, or perceptions of deterioration and crime-related problems, crime, or changes in crime. This conclusion, however, rests on a small number of studies. It also ignores divergent perspectives on what constitutes acceptable measures of physical deterioration or incivilities.

Implications. There are several implications of such a link. Local planners and officials, if they think that a locale is “at risk” of experiencing sharply higher crime, could work to coordinate housing, zoning, and sanitation personnel in an effort to prevent or slow increases in physical deterioration and housing abandonment (Taylor and Covington, 1990). Such efforts might block the emergence of higher crime rates, higher fear levels, or declining commitment to the community.

For example, in a partially gentrified neighborhood in Baltimore, Maryland, local leaders urged city personnel to move quickly and “cap” several private, abandoned properties in danger of serious deterioration. According to one leader, the city failed to respond despite several months of repeated requests from the association. The walls of one of the targeted properties finally collapsed into an alley. Alleviation of large-scale deterioration may lead to stronger neighborhood commitment.

Limitations. At the same time, what is known has serious limitations.

- It is not known if changes in physical deterioration and incivilities occur independently of, or simply reflect, neighborhood structural change. Due to ecological processes and social, political, and economic factors, neighborhoods naturally change in three ways: socioeconomic status increases or decreases; stability, reflected in the balance of owners vs. renters, shifts; and the

racial and age composition changes (Hunter, 1974; Taylor and Covington, 1988). Do changes in physical incivilities merely *reflect* these structural changes, or do the physical changes emerge independently of these structural changes? The answer to this question has important policy as well as theoretical implications. For example, suppose physical incivility changes simply reflect socioeconomic status changes.⁵ For the long-term purpose of preventing crimes that are already increasing in a neighborhood, it may be more important to provide jobs to residents than to renovate housing.

- At any one point in time, physical incivilities are closely connected to other neighborhood features. For example, blocks with more incivilities also contain a higher proportion of nonresidential land uses (Taylor, Koons, Kurtz, and Greene, in press). It is not yet known if land use mix is more influential in increasing crime than are levels of physical deterioration.
- Little is known about how potential offenders “read” physical incivilities, a key aspect of the broken windows thesis (Wilson and Kelling, 1982). Presumably, offenders from outside read the level of deterioration and base their invasion of a locale partly on those features. Burglars carefully read the environment around contemplated targets (Rengert and Wasilchick, 1985). But it is not known specifically how much attention burglars or other offenders pay to physical deterioration.
- Decreasing deterioration also can be problematic. Studies in Britain and the United States suggest that improved physical environments, such as those found in gentrifying neighborhoods, also may be troublesome and associated with higher crime (Bottoms and Wiles, 1986; Covington and Taylor, 1989). Potential offenders inside or outside the location may infer from physical upkeep that more potentially lucrative targets are available for such crimes as larceny and robbery. A key issue influencing such an outcome may be whether a large pool of motivated, potential offenders is extremely close by.

5. Skogan (1990:173) reports a correlation of .84 between his disorder index and neighborhood unemployment rates.

Pending Issues

A fair amount is known about designing and redesigning locations so that a setting's physical features—given certain social and cultural conditions—help discourage crime or make residents or users feel less vulnerable (Crowe, 1991). There are numerous cross-sectional links at the community and street block level and some links over time between physical environment features and these outcomes. Nevertheless, numerous practical and theoretical questions remain about what works in specific situations and why.

- **The sequence of relationships between physical change, crime events, fear of crime, and perceptions of place vulnerability is not well understood.** Does physical decay precede and predict worsening crime rates, is the reverse more generally true, or does it depend? If one factor depends on the others, on what other characteristics of the setting do these processes rely? Where in these processes do residents' feelings of vulnerability and behavioral withdrawal from street life come into play?

- **How do social, cultural, and organizational features contribute to the success of crime reduction through physical environment modifications?** Research to date clearly counters the notion that physical environment features have stand-alone effects on crime and related problems. Their effectiveness depends on other features of the setting in question, especially local social, cultural, and organizational dynamics. Relations between neighbors, ethnic composition, and initiatives emerging from local organizations and churches determine whether physical design or redesign helps reduce crime or related problems, such as fear of crime. With some exceptions, the specific behavioral and social psychological processes that explain how physical effects on crime and related problems depend on nonphysical conditions is not yet understood.

- **What is the effect of the larger social, political, and economic environment on the risk of crime, and how do these broader issues relate to the physical environment features discussed here?** Some types of offenders follow a multistage planning process that begins with the selection of an area or

neighborhood where they feel they can operate comfortably, with low costs in terms of time and effort, and where they stand a good chance of obtaining a reward for their efforts (Rengert, 1989). Subsequently, they select blocks, buildings, or persons within that area (Taylor and Gottfredson, 1986). Features of the larger environment, such as concentrations of potential offenders or concentrated poverty (Bursik and Grasmick, 1993a; Wacquant and Wilson, 1989; Wilson, W.J., 1991), or lack of political power with limited access to resources (Bursik and Grasmick, 1993b), influence an area's locational crime risk. Do physical features have less crime-preventive benefits in areas with high-locational crime risk due to their position in the broader urban ecology? Understanding connections between urban location and crime-prevention benefits of physical design or redesign has important practical implications. Such an understanding can help agencies focus scarce resources on sites likely to produce maximum crime-preventive benefits. If planners have a choice between two equally needy and qualified locales, they would probably want to assist efforts at the site where success is more likely.

• **Housing disrepair and vacancy, certain land use patterns, vandalism, physical layout, and patterns of traffic and pedestrian circulation may increase the risk of crime.** What is the relative importance of these factors? Does their relative importance for crime-prevention purposes depend on the type of crime in question? Does it depend on other features of the context? What is their relative impact on residents' perceptions of safety in the area? How important are the different features, relative to one another, in making the area appealing to potential offenders?

Conclusion

Research has shown that a wide range of features of the physical environment at the street block and neighborhood levels have proven relevant to predicting crime rates and crime-related outcomes, such as fear of crime and neighborhood confidence. In some of these studies, however, it is difficult to separate the relative crime-preventive or fear-reducing effects of redesign

from the beneficial effects of ongoing local social dynamics or the organizational development surrounding the redesign effort. In sum, the relevance of the physical environment appears contingent on a range of nonphysical factors and the type of crime or crime-related outcome in question.

Research to date has followed four different theoretical perspectives. To the practitioner, these different views on the issue suggest different points and types of intervention. A more powerful understanding of the relationship between crime and design may emerge from an integration of these different perspectives.

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Fleissner, Dan, and Fred Heinzelmann, Ph.D., *Crime Prevention Through Environmental Design and Community Policing*, Research in Action, 1995, NCJ 157308.

Gordon, Corely L., and William Brill, *The Expanding Role of Crime Prevention Through Environmental Design in Premises Liability*, Research in Brief, 1995, NCJ 157309.

Smith, Mary S., *Crime Prevention Through Environmental Design in Parking Facilities*, Research in Action, 1995, NCJ 157310.