U.S. Department of Housing and Urban Development
Office of Policy Development and Research

Creating Defensible Space

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Contractor:
Center for Urban Policy Research
Rutgers University

Contract No. DU100C000005967

U.S. Department of Housing and Urban Development
Office of Policy Development and Research

April 1996

The opinions expressed in this book are those of the author and do not necessarily reflect the views of the U.S. Department of Housing and Urban Development.

FOREWORD

The appearance of Oscar Newman's *Defensible Space* in 1972 signaled the establishment of a new criminological subdiscipline that has come to be called by many "Crime Prevention Through Environmental Design" or CPTED. Over the years, Mr. Newman's ideas have proven to have such significant merit in helping the Nation's citizens reclaim their urban neighborhoods that we at HUD's Office of Policy Development and Research asked him to prepare a casebook to assist public and private organizations with the implementation of Defensible Space theory. Information about this process is presented for three distinct venues: in an older, small, private urban community; in an existing public housing community; and in the context of dispersing public housing throughout a small city.

This monograph is very special because it draws directly from Mr. Newman's experience as a consulting architect. Indeed, we asked the author to share with us both his perspective on creating viable change and his personal observations on key lessons learned.

By publishing *Creating Defensible Space,* PD&R is pleased to be part of the continuing growth and evolution of Defensible Space as both a criminological concept and a proven strategy for enhancing our Nation's quality of urban life.

Michael A. Stegman
Assistant Secretary for
Policy Development and Research

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ACKNOWLEDGMENTS

Firstly, I wish to thank Henry Cisneros, the Secretary of Housing and Urban Development, for his personal support and encouragement in having me prepare these case studies. Early in his administration, he recognized the importance of our work to housing authorities and cities across the country and prepared his own essay entitled: *Defensible Space, Reducing Crime and Creating Community*. The publication has received wide acclaim and distribution. He followed this by having me conduct a series of seminars for U.S. Department of Housing and Urban Development (HUD) personnel and his key staff and Assistant Secretaries to explore how Defensible Space technology could be utilized in various HUD programs.

Michael Stegman, HUD's Assistant Secretary for Policy Development and Research, initially suggested the idea for the three case studies. He then had me meet with Margery Turner, Deputy Assistant Secretary for Research, Evaluation, and Monitoring and with Dr. Hal Holzman to define the scope of the work.

Hal Holzman served as HUD's Project Officer, but more importantly, as my mentor and muse during the entire writing effort, he encouraged me to record experiences and speak to issues I would have otherwise hesitated addressing.

In Dayton, Ray Reynolds, the city's former director of urban development (now planning director for the city of Hollywood, California) bore the full responsibility of seeing the Dayton project through from start to finish. I describe his role in my discussion of Five Oaks. Suffice it to say, the project would not have been realized without his efforts. Others who were germane to the success of the Five Oaks project were: Jaruth Durham-Jefferson, superintendent of police, who brought me to Dayton and helped me at every stage; and Patrick Donnelly, Karen DeMasi, and Bernice Ganble, all residents of the community and professionals in their own right, who served to coordinate community participation during the

planning of the project and provided insights that helped me define the plan and write the case study.

In Yonkers, Pete Smith, the director of the Yonkers Municipal Housing Authority, was my second conscience through my entire 8 years of working there. His role was difficult; as a long-time Yonkers resident, he knew everyone and identified with their concerns and resistance, but as executive director of the housing authority, he also identified with public housing residents and their plight in segregated highrise projects. He knew that what we were planning would help all public housing residents and would not be the destabilizing force everyone in the community feared. Chief of police Robert Olson (now in Minneapolis) was helpful in calming the community's nerves during the process, provided a police presence when it was needed, and had his men bring the community and public housing teenagers together when tempers flared.

Clason Point in the Bronx, New York, was our first effort in modifying public housing projects using the Defensible Space theory. Even though housing authority management was skeptical, two men took to the idea, opened doors, and provided insights and assistance that gave access to data and to sites for experimentation. They were Sam Granville, director of management, and Bernie Moses, director of maintenance, both now retired.

Within our offices, Joanna King, who has served as our institute's administrator and my trusted editor for 20 years, continued her critical work in helping me produce this book. Allen Christianson, architect, prepared the final illustrations from my sketches, as he has in my previous books.

Oscar Newman
Hensonville, New York
April 1996

CHAPTER ONE

Defensible Space Principles

The concept

All Defensible Space programs have a common purpose: They restructure the physical layout of communities to allow residents to control the areas around their homes. This includes the streets and grounds outside their buildings and the lobbies and corridors within them. The programs help people preserve those areas in which they can realize their commonly held values and lifestyles.

Defensible Space relies on self-help rather than on government intervention, and so it is not vulnerable to government's withdrawal of support. It depends on resident involvement to reduce crime and remove the presence of criminals. It has the ability to bring people of different incomes and race together in a mutually beneficial union. For low-income people, Defensible Space can provide an introduction to the benefits of mainstream life and an opportunity to see how their own actions can better the world around them and lead to upward mobility.

Over the past 25 years, our institute has been using Defensible Space technology to enable residents to take control of their neighborhoods, to reduce crime, and to stimulate private reinvestment. We have been able to do this while maintaining racial and economic integration. The process has also produced inexpensive ways to create housing for the poor, often without government assistance. In this chapter, I will briefly explain the origins and principles of Defensible Space and introduce the reader to the results of our various research projects.

Evolution of the concept: Pruitt-Igoe and Carr Square Village

The Defensible Space concept evolved about 30 years ago when, as a teacher at Washington University in St. Louis, I was able to witness the newly constructed 2,740-unit public housing highrise development, Pruitt-Igoe, go to ruin. The project was designed by one of the country's

Figure I–1:
Overall view of Pruitt-Igoe, a 2,740-unit public housing project constructed in St. Louis in the 1960s.

most eminent architects and was hailed as the new enlightenment. It followed the planning principles of Le Corbusier and the International Congress of Modern Architects. Even though the density was not very high (50 units to the acre), residents were raised into the air in 11-story buildings. The idea was to keep the grounds and the first floor free for community activity. "A river of trees" was to flow under the buildings. Each building was given communal corridors on every third floor to house a laundry, a communal room, and a garbage room that contained a garbage chute.

Occupied by single-parent, welfare families, the design proved a disaster. Because all the grounds were common and disassociated from the units, residents could not identify with them. The areas proved unsafe. The river of trees soon became a sewer of glass and garbage. The mailboxes on the ground floor were vandalized. The corridors, lobbies, elevators, and stairs were dangerous places to walk. They became covered with graffiti and littered with garbage and human waste.

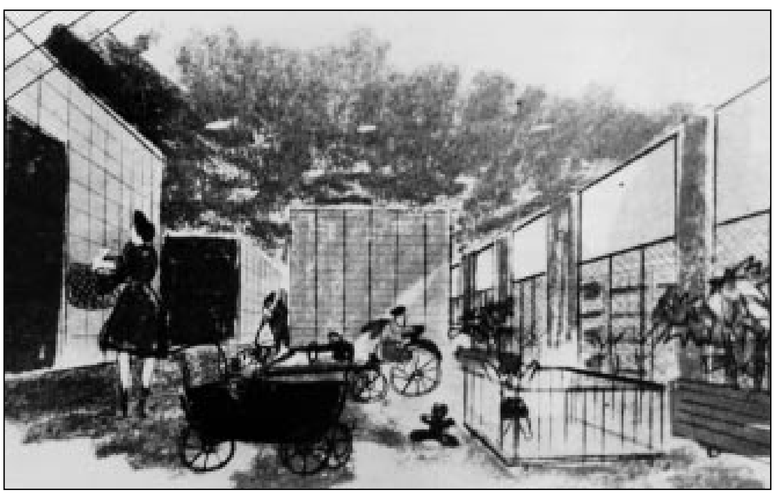


Figure I–2:
The architect's vision of how the 3d floor communal corridor in Pruitt-Igoe would be used.

The elevators, laundry, and community rooms were vandalized, and garbage was stacked high around the choked garbage chutes. Women had to get together in groups to take their children to school and go shopping. The project never achieved more than 60 percent occupancy. It was torn down about 10 years after its construction and became a precursor of what was to happen elsewhere in the country.

Figure I–3:
The 3d floor communal corridor as it actually turned out, showing the vandalism that ensued.

Across the street from Pruitt-Igoe was an older, smaller, row-house complex, Carr Square Village, occupied by an identical population. It had remained fully occupied and trouble-free throughout the construction, occupancy, and decline of Pruitt-Igoe. With social variables constant in the two developments, what, I asked, was the significance of the physical differences that enabled one to survive while the other was destroyed?

Figure I–4:
Vandalism to the large number of vacant apartments in Pruitt-Igoe as seen from the outside.

Walking through Pruitt-Igoe in its heyday of pervasive crime and vandalism, one could only ask: What kind of people live here? Excluding the interior public areas of the development there were occasional pockets that were clean, safe, and well-tended. Where only two families shared a landing, it was clean and well-maintained. If one could get oneself invited into an apartment, one found it neat and well maintained—modestly furnished perhaps, but with great pride. Why such a difference between the interior of the apartment and the public spaces outside? One could only conclude that residents maintained and controlled those areas that were clearly defined as their own. Landings shared by only two families were well maintained, whereas corridors shared by 20 families, and lobbies, elevators, and stairs shared by 150 families were a disaster—they evoked no feelings of identity or control. Such anonymous public spaces made it impossible for even

Figure I–5:
Pruitt-Igoe in the process of being torn down, at a loss of $300 million.

neighboring residents to develop an accord about acceptable behavior in these areas. It was impossible to feel or exert proprietary feelings, impossible to tell resident from intruder.

Figure I–6:
Carr Square Village, a row-house development located across the street from Pruitt-Igoe.

Most of us have seen highrise apartments occupied by middle-income people that function very well. Why then do they not work for low-income families? Middle-income apartment buildings have funds available for doormen, porters, elevator operators, and resident superintendents to watch over and maintain the common public areas, but in highrise public housing, there are barely enough funds for 9-to-5 nonresident maintenance men, let alone for security personnel, elevator operators, or porters. Not surprisingly, therefore, it is within these interior and exterior common public areas that most crime in public housing takes place.

Given that funds for doormen, porters, and resident superintendents do not exist for public housing, the question emerged: Is it possible to design public housing without any interior public areas and to have all the grounds assigned to individual families?

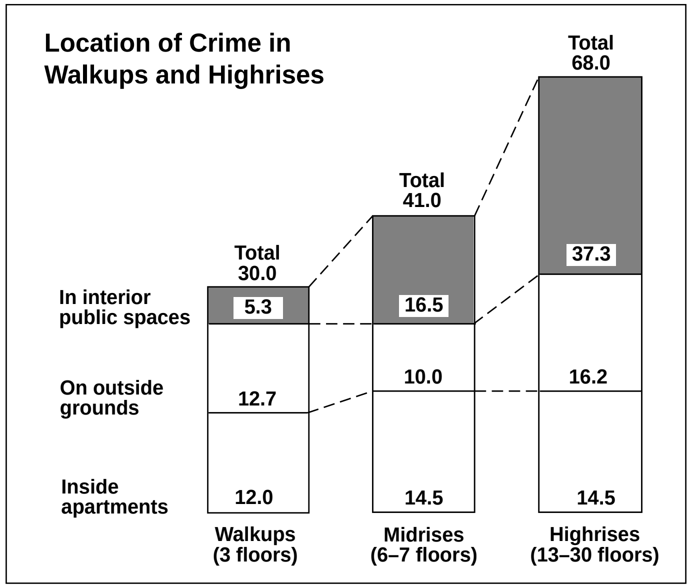


Figure I–7:
Graph showing the relationship between the increase in crime and increased building height and that crime is mostly located within public areas.

The private streets of St. Louis

Also in St. Louis, I came upon a series of turn-of-the-century neighborhoods where homes are replicas of the small chateaux of France. They are the former palaces of St. Louis' commercial barons—the rail, beef, and shipping kings. These chateaux are positioned on privately held streets, closed to through traffic. St. Louis in the mid-1960s was a city coming apart. The influx of people from the rural areas of the South had overwhelmed the city. It had one of the Nation's highest crime rates, but the private streets appeared to be oblivious to the chaos and abandonment taking place around them. They continued to function as peaceful, crime-free environments—nice places to rear children, if you could afford a castle. The residents owned and controlled their own streets, and although anyone was free to drive or walk them (they had no guard booths), one knew that one was intruding into a private world and that one's actions were under constant observation. Why, I asked, could not this model be used to stabilize the adjacent working and middle-class neighborhoods that were undergoing massive decline and abandonment? Was private ownership the key, or was the operating mechanism the closing-off of streets and the creation of controlled enclaves? Through research funded by the National Science Foundation (Newman, Dean, and Wayno, 1974) we were able to identify the essential ingredients of the private streets and provide a model that could be replicated throughout the

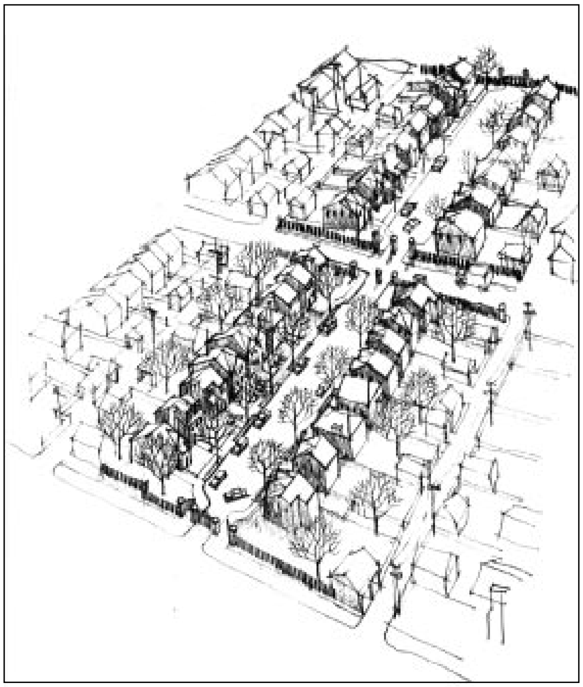


Figure I–8:
Aerial view of typical closed streets in St. Louis.

city. This was done in both African-American and white areas, and its implementation succeeded in stabilizing communities in transition.

The effect of housing form on residents' ability to control areas

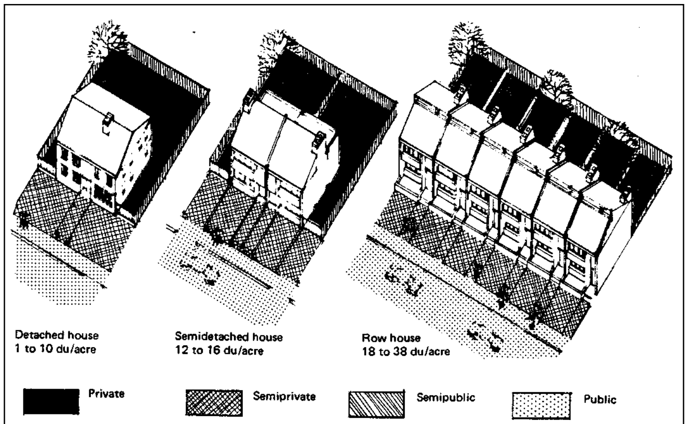
Over the next few pages I will explain how different building types create spaces outside the dwelling unit that affect residents' ability to control them. Firstly, I should explain what I mean by the *dwelling unit:* It is the interior of an apartment unit or home. That is the case whether the unit is one among many in a highrise building or sits by itself on the ground. I am interested in learning how the grouping of units in different types of building configurations creates indoor and outdoor "nonunit" spaces of different character.

For simplification, I have grouped all buildings into the three categories that capture the essential differences among them. These three categories are: single-family houses; walkups; and highrises.

Single-family houses come in three basic types: detached houses; semidetached houses; and row houses (row houses are also called townhouses).

The fully detached building sits by itself, not touching any other building; the semidetached building has two single-family units sharing a common wall; and the row-house building has a few single-family units sharing common walls with other units, one on each side. Although all three types of single-family buildings look different, they share an essential common trait: Within the four walls of each type of building is the private domain of one family. There are no interior spaces that are public or that do not belong to a family. All the interior spaces, therefore, are private. Even the row house is subdivided into a series of distinctly private spaces. There are no interior spaces within any single-family building—whether a row house, a semidetached building, or a fully detached house—that are shared by more than one family.

The fundamental difference in the three types of single-family houses shown is the density at which they can be built—which is to say the number of units that can be put on an acre of land in each of these configurations. The upward limit of the detached house is about six units to the acre. The upward limit of the semidetached house is eight units to the acre, but this allows for a driveway to be put between each unit, something that could not be achieved in detached units at six to the acre. Row houses can be built at an upward limit of 16 units to the acre if one also wishes to provide off-street parking on a one-to-one basis.

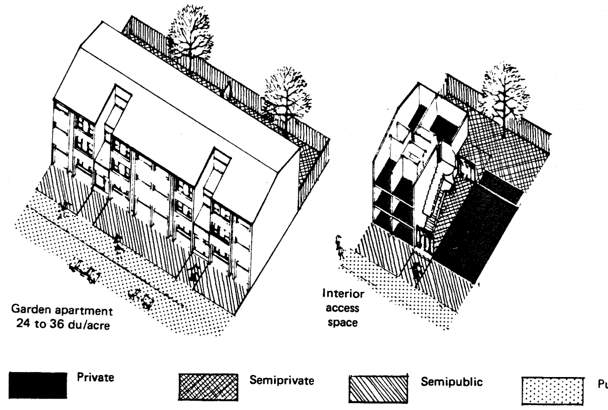


- All interior spaces are within the private domain of the family.
- All grounds around the private unit are for the private use of the family.
- There is a direct abutment between private grounds and the sidewalk.
- The domain of the house encompasses the street.

Figure I–9:
Three types of single-family houses and the nature of spaces in and around them.

When one looks at the grounds surrounding these three types of single-family units, one finds that all the grounds are private because they have been assigned to each unit. Regardless of which type of single-family building we examine, each has been designed so that each unit has its own front and rear yard. The front yard of each unit also immediately abuts the street. If we attempt to categorize the grounds as either private, semiprivate, semipublic, or public, we would have to conclude that the rear yards are certainly private because they belong to individual families and are only accessible from the interior of each unit. The front yards also belong to individual families, but because they are accessible from the street as well as from the interior of each unit their character is different. I have classed them as semiprivate because of this difference, but some people would say that they are really private.

Looking at the next classification of building—the walkup—one finds that a radical new element has been introduced that totally changes the character of both the inside and outside of the building. We now have circulation areas within the building that are common because they are shared by a few families. The number of families sharing these common



- Private space is within the apartment unit only.
- The interior lobby, stairs, and corridor are semiprivate.
- Grounds can be designated for one family but are usually shared by all the families in the building.
- Only a small number of families (three to six) share the interior circulation areas and grounds.
- The street is within the sphere of influence of the dwellings.

Figure I–10:
Walkup buildings and the nature of spaces in and around them.

areas depends on how the entrances, corridors, and stairs are distributed within the building.

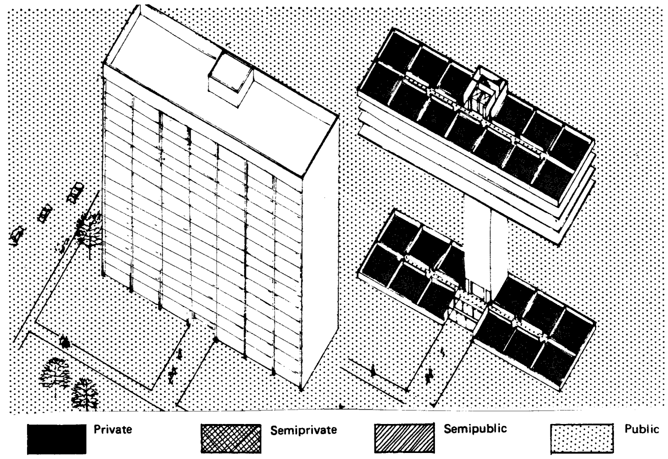
In figure I–10, the walkup building is subdivided so that six families share a common entry and interior circulation stair. Two families per floor share a common landing. Entrances from the common staircase usually exit to the outside at both the front and rear. Such buildings are often called garden apartments.

Walkups can be built at a density of 30 to 40 units per acre if they are 3 stories in height, and at a density of 20 to 30 units to the acre if they are only 2 stories in height. Three-story walkups were commonly built in the 1950s and 1960s, but as these are nonelevator buildings, the 3-story walkup has fallen out of favor with the decline in housing demand.

Because the grounds surrounding 3-story walkups, front and back, belong to all the families living in the building, they cannot be considered private. The grounds in the front of the unit are also adjacent to a public street. For this reason I would categorize the grounds in front as semipublic space. The grounds at the rear of the unit are also not assigned to individual families and the rear of the units are often used for parking. In such a case, the grounds at the back would also have to be considered semipublic. It is, however, possible to modify the design of the rear grounds to make some of the areas private and the remainder semiprivate, and I will demonstrate how to do that shortly.

We come now to the last of our three building types: the highrise. These are elevator buildings and commonly come in two sizes, depending on the type of elevator used. The least expensive elevator is the hydraulic, but it has an upward limit of six stories. The electric elevator can comfortably go up to 30 stories, but it is usually used in 10- to 16-story apartment buildings.

The 15-story building at the right has 195 families sharing common interior areas. Because of the large number of people sharing them, these interior areas can only be designated as semipublic or even public. Even the corridors on each floor are shared by 13 families and are accessible from 2 sets of stairs and 2 elevators that are very public. For this reason I would have to designate these corridors as semipublic, if not public.



- Private space exists only within the apartment units.
- The interior circulation areas and the grounds are public.
- There is no association between buildings and street.

Figure I–11:
The elevator highrise and the nature of space in and around it.

The outside grounds, because of their disassociation from any of the individual units, and the fact that they are shared by 195 families, can only be designated as public.

Summary of the effect of building type on behavior

A family's claim to a territory diminishes proportionally as the number of families who share that claim increases. The larger the number of people who share a territory, the less each individual feels rights to it. Therefore, with only a few families sharing an area, whether it be the interior circulation areas of a building or the grounds outside, it is relatively easy for an informal understanding to be reached among the families as to what constitutes acceptable usage.

When the numbers increase, the opportunity for reaching such an implicit understanding diminishes to the point that no usage other than walking through the area is really possible, but any use is permissible. The larger the number of people who share a communal space, the more difficult it is for people to identify it as theirs or to feel they have a right to control or determine the activity taking place within it. It is easier for outsiders to gain access to and linger in the interior areas of a building

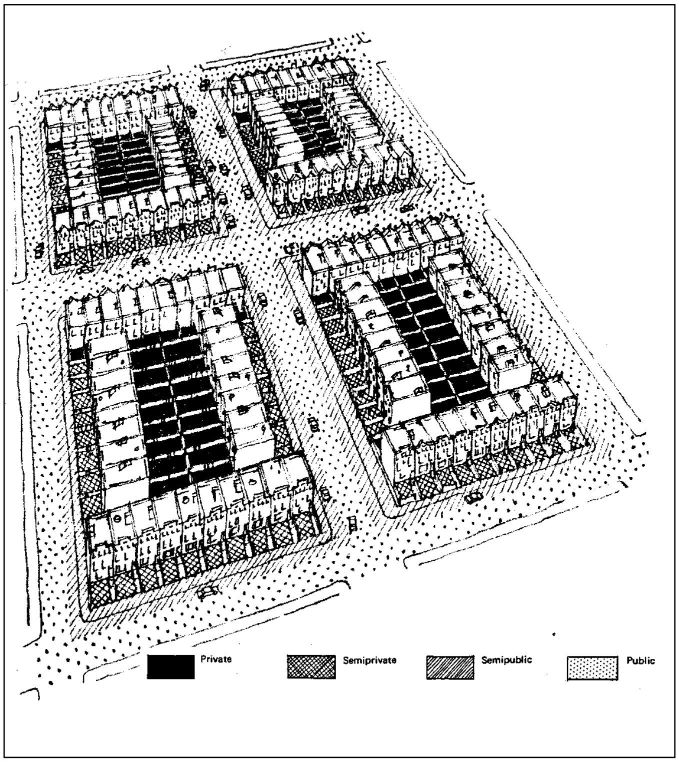


Figure I–12:
A four-city-block row-house development. Only the central portion of the roadbed can be considered fully public.

shared by 24 to 100 families than it is in a building shared by 6 to 12 families.

The effect of building type on residents' control of streets

If we examine the three building types from the viewpoint of residents' ability to exert control over surrounding streets, we again find marked differences.

Figures I–12, I–13, and I–14 graphically summarize the major differences between residents' ability to control the areas around their homes and public streets. The three illustrations show the same four-block area of a city, each developed using a different building type.

Figure I–12 is an illustration of a row-house development built at a density of 18 units to the acre. Each city block has been subdivided so that all the grounds, except for the streets and sidewalks, are assigned to individual families. The front lawns, because each belongs to an individual family, are designated semiprivate. The rear yards, which are fully enclosed, are private. In fact they are only accessible from the interior of the dwelling units. The close juxtaposition of each dwelling unit and its entry to the street contributes to the incorporation of the sidewalk into the sphere of influence of the inhabitants of the dwelling. This is further reinforced by the fact that their semiprivate lawn abuts the sidewalk, and the family car is parked at the curb. Residents' attitudes suggest that they consider this sidewalk and parking area as semipublic, rather than public.

Examining the entire four-block area, we find an urban fabric in which most of the outdoor areas and all of the indoor areas are private. In addition, a good portion of what is a legally public street is viewed by residents as an extension of their dwellings and under their sphere of influence: that is, the sidewalk and that portion of the roadbed on which their cars are parked. Because of the close juxtaposition of the street to the private front lawn of each dwelling, residents are concerned about ensuring its safety and act to maintain and control it. In actual fact, only the very central portion of each street is truly public in nature. If the street were narrow, even the activity in this central portion would be considered accountable to neighboring residents.

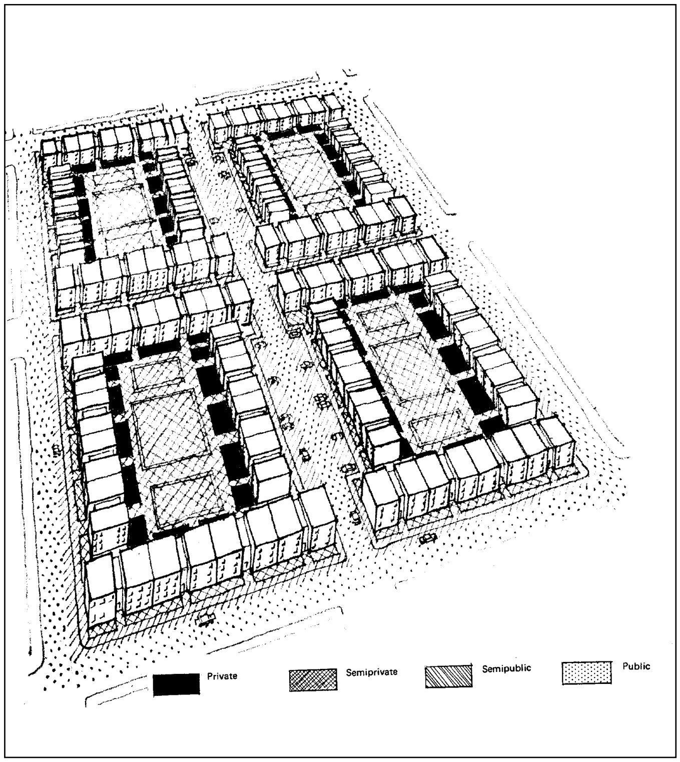


Figure I–13:
A four-city-block garden apartment development. The streets and grounds are encompassed within the domain of the multifamily dwellings.

Figure I–13 shows the same four-block area, this time accommodating 3-story garden apartments built at a density of 36 units to the acre. The rear courts within the interior of each cluster have been assigned both to individual families and to all the families sharing the cluster. The families living on the ground floor have been given their own patios within the interior courts, with access to them from the interior of their unit. These patios are therefore private. The remainder of the interior court belongs to all the families sharing a cluster and is only accessible from the semiprivate interior circulation space of each building, making the remainder of the interior cluster semiprivate.

The small front lawn adjacent to each building entry is the collective area for that entry's inhabitants and is therefore semiprivate. As in the row-house scheme in figure I–12, all the entries face the street, but each entry now serves six families rather than one and is thus semiprivate rather than private. Parking again is on the street immediately in front of each dwelling. Because of the semiprivate nature of the grounds, the sidewalk and street are not clear extensions of the realms of individual dwelling units. But even with all these limitations, the neighboring sidewalk and parking zone on the street are considered by many residents as areas over which they exert some control.

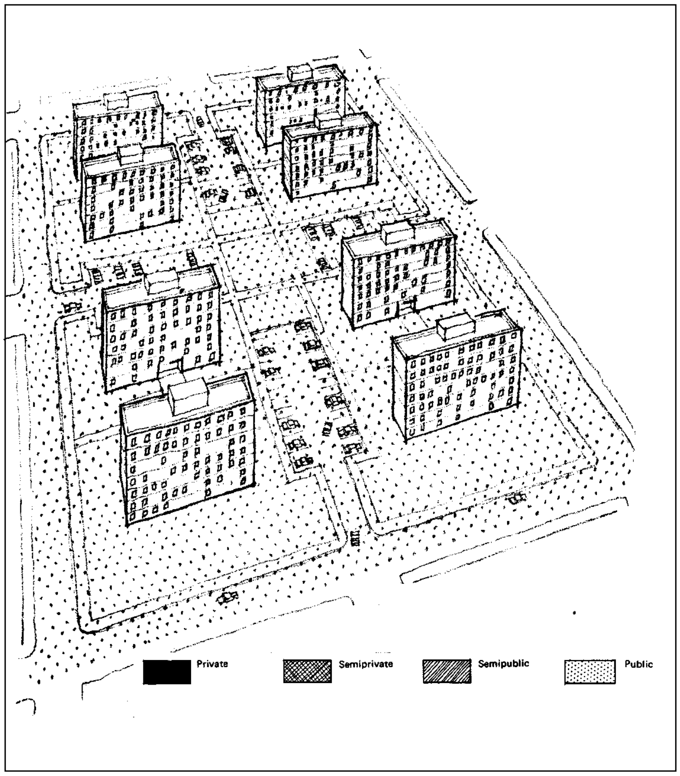


Figure I–14:
A four-city-block highrise development. All the streets and grounds are public.

Figure I–14 is the same four-block area shown in figures I–12 and I–13, but now developed as a highrise superblock at a density of 50 dwelling units to the acre. Each building entry serves 50 families by means of an interior circulation system consisting of a public lobby, elevators, fire stairs, and corridors. The grounds around the buildings are accessible to everyone and are not assigned to particular buildings. The residents, as a result, feel little association with or responsibility for the grounds and even less association with the surrounding public streets.

Not only are the streets distant from the units, but no building entries face them. The grounds of the development that abut the sidewalks are also public, and, as a consequence, so are the sidewalks and streets. This design succeeds in making public the entire ground surface of the four-block area. All the grounds of the project must be maintained by management and patrolled by a hired security force. The city streets and sidewalks, in turn, must be maintained by the city sanitation department and patrolled by city police.

The placement of the highrise towers on the interior grounds has produced a system of off-street parking and access paths to the building that involves many turns and blind corners. Residents in such developments complain about the dangers of walking into the grounds to get to their buildings at night. The proclivity of landscape designers for positioning shrubs exactly at turns in the paths increases the hazards of these access routes. This problem does not arise in traditional row-house or walkup developments where building entries face the street and are set back from the sidewalk no more than 10 to 20 feet. Nor do these fears occur in highrise buildings whose entries face the streets and are only set back slightly from them. In these latter cases, residents are able to move in a

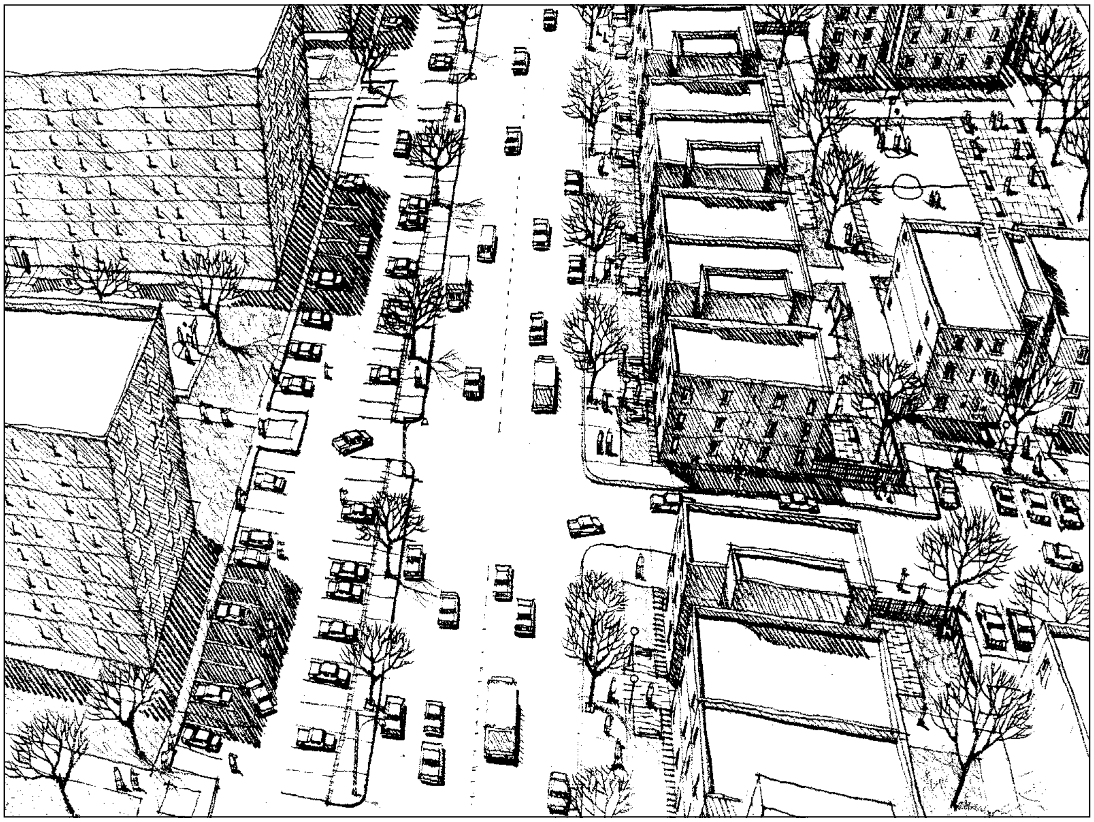


Figure I–15:
A highrise and a walkup built at the same density. The project on the left is turned in on itself, away from the public street, while the one on the right brings the streets within the control of the residents.

straight line from the relative safety of the public street to what they can observe to be the relative safety of the well lighted lobby area in the interior of their buildings.

Figure I–15 shows two housing projects located across the street from one another: a garden apartment complex on the right and a highrise on the left. Both projects are designed at the same density and with similar parking provisions (40 units to the acre and 1 parking space per unit). The highrise project has all building entries facing the interior grounds of the development. Parking has been designed as a continuous strip along the street, further disassociating the buildings from the street. The project on the right is only three stories in height and has all the buildings and their entries juxtaposed with the city streets or the interior streets and parking. Each entry faces the street and serves only 6 families, whereas the highrises have 60 families sharing a common entry. Small play and sitting areas have been provided near the entry to each walkup. This

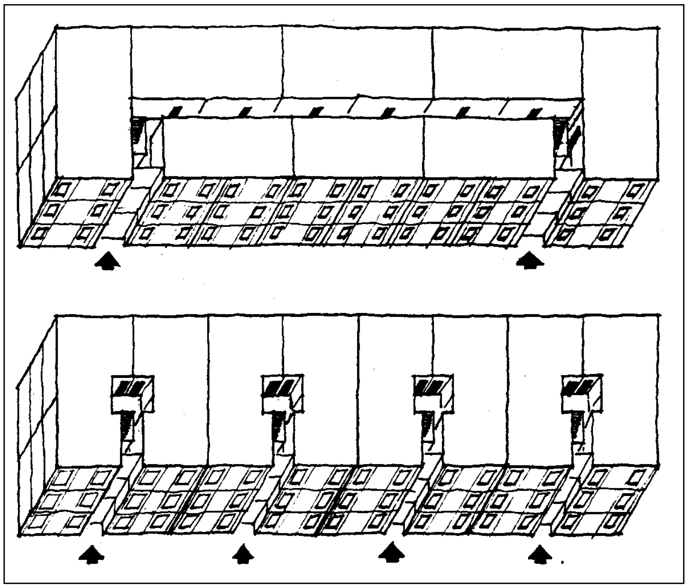


Figure I–16:
Comparison of two ways to subdivide the same building envelope to serve the same number of families, but in radically different ways.

serves to extend into the street the sphere of influence of each of the six families.

The residents in the walkup are a very short distance from the surrounding streets, and because of the positioning of the building entries, play areas, and parking, the neighboring streets are brought within the sphere of influence of inhabitants.

Another important lesson to learn from this comparison is that 2 radically different building configurations can be produced at the same density: in this case a density of 40 units to the acre with 1-to-1 parking. This is a very high density that will satisfy the economic demands of high land costs. The walkup development achieves the same density as the highrise by covering more of the grounds (37 percent ground coverage versus 24 percent). Municipalities that wish to reap the benefits of walkup versus highrise buildings must learn to be flexible with their floor-area-ratio requirements to assure that they are not depriving residents of a better housing option in order to get more open ground space that has little purpose.

What is true for site design is also true for building design: The same building envelope can be subdivided in different ways to produce dramatically different results. For instance, figure I–16 shows two ways of configuring a three-story walkup. Both buildings serve a total of 24 families each. In the upper layout, all 24 families share 2 common entrances and 8 families share a common corridor on each floor, although access to the corridors on each floor is open to all 24 families in the building. In the lower design, only 6 families share a common entry, and only 2 families share a common landing on each floor.

In the lower design, the smaller number of families sharing an entry and landing allows the families to control the public spaces better: They can more readily recognize residents from strangers and feel they have a say in determining accepted behavior. If this were a two-story building rather than a three-story building, it would have been possible, in the lower design, to give each family its own individual entry directly off the street and thus avoid having any interior public spaces at all.

	Correlations with dependent variables			
Social and physical variables	*Indoor felony rate*	*Indoor robbery rate*	*Robbery rate*	*Felony rate*
Percentage of population receiving welfare	(1)[a].51	(1) .46	(1) .47	(1) .54
Building height (number of units per entry)	(2) .36	(2) .36	(2) .36	(5) .22
Project size (number of apartments)	(3) .27	(3) .26	(3) .25	(3) .22
Percentage of families with female head on AFDC	(4) .44	(4) .41	(5) .36	
Number of publicly assisted projects in area	(5) .25	(5) .26	(4) .33	
Felony rate of surrounding community				(2) .41
Per capita disposable income				(4) .49

N.Y.C. Housing Authority police data for 1967: 87 housing projects. .01 level of significance at ±.27, .05 level of significance at ±.21.

[a] Numbers in parentheses indicate rank order of correlation in creating stepwise multiple regressions.

Figure I–17:
Crime rates as explained by social and physical variables.

Social factors and their interaction with the physical

An understanding of the interaction of the social and physical factors that create high crime rates in low- and moderate-income housing developments is useful not only for devising remedies to solve their problems but also for developing strategies for stabilizing neighboring communities composed of single-family housing.

Figure I–17 shows the influence of different social and physical factors on the crime rates in low- and moderate-income projects operated by the New York City Housing Authority. This analytical technique called *stepwise regression analysis* is employed when many different factors interact to produce a particular effect, such as, a rise in crime rates. The technique isolates those factors that contribute to the effect most strongly and independently of other factors. In figure I–17 the percentage of population receiving welfare is shown to be the most important factor, followed by building height or the number of families sharing the entry to a building.

Those social variables that correlated highly with different types of crime also correlated highly with each other. These include: the percentage of resident population receiving welfare (excluding the elderly), the percentage of one-parent families receiving Aid to Families with Dependent Children (AFDC), and the per capita disposable income of the project's residents.

My interviews with residents, management, and police provide the following explanation for the correlation of these social factors and crime rates: A one-parent household headed by a female is more vulnerable to criminal attack; families with only one adult present are less able to control their teenage children; young teenage AFDC mothers are often victimized by their boyfriends; the criminal activity by the poor is tolerated, if not condoned, among the poor; the poor, and particularly the poor of racial minorities, are unable to demand much in the way of police protection; and the commission of crime against residents in ghetto areas requires minimal skill and risk.

The physical factors that correlate most strongly with crime rates are, in order of importance: the height of the buildings, which in turn correlates highly with the number of apartments sharing the entry to a building; the size of the housing project or "the total number of dwelling units in the project"; and the number of other publicly assisted housing projects in the area.

The above suggests that two classes of physical factors contribute to crime rates: (1) those such as "project size" or the "number of publicly assisted projects in the area" that reinforce social weakness and pathology; and (2) those such as "building height" or "the number of units per entry" that affect the ability of residents to control their environment. The first class of physical factors may also be considered another class of social variable: For instance, if certain social characteristics such as the percentage of AFDC families correlate highly with crime rate, then we can anticipate that a large number of such families gathered together in one area may aggravate the crime problems still further and increase the per capita crime rate.

The significance of this aggregation is not simply that the presence of more potential criminals creates proportionally more crime, but also that a concentration of potential criminals actually increases the rate of crime. Thus, large low-income projects, or low-income projects surrounded by other low-income projects, suffer a higher crime rate than small or isolated projects even when the percentage of AFDC families remains the same in all the projects.

A frequent complaint from residents of communities surrounding large public housing projects is that the teenage criminals living in the projects make use of the large, anonymous environment of the housing project as a place to retreat and hide. For example, there is a particularly notorious project in Jersey City that is located adjacent to U.S. Highway 1 entering New York City. A traffic light at an intersection that borders the project forces truckers to stop there on their way into New York. Teenage project residents have developed a pattern of hijacking trucks at the stoplight, by throwing the driver out and driving the truck into the project. The truck is then emptied in a matter of minutes and the loot hidden in vacant apartments.

The relationship between the socioeconomic characteristics of residents and a project's crime rate had long been suspected. The most fascinating finding to come out of the data analysis presented in *Defensible Space* (1972) was, therefore, the influence of building height and number of units per entry in predicting crime rate. Regardless of the social characteristics of inhabitants, the physical form of housing was shown to play an important role in reducing crime and in assisting residents in controlling behavior in their housing environments.

In addition to the fact that buildings with a large number of families sharing an entry experience higher crime rates than those with few families per entry, they are also vulnerable to additional types of criminal activity. Most of the crime experienced by residents of single-family buildings is burglary, committed when members of the family are either away from home or asleep. By contrast the residents of large, multifamily dwellings experience both burglaries and robberies. The higher crime rate experienced by residents in large multifamily dwellings is mostly attributable to the occurrence of robberies in the interior common-circulation areas of multifamily buildings: lobbies, hallways, stairs, and elevators. These are also the areas where criminals wait to approach their victims and force them into apartments for the purpose of robbing them.

Of a total of 8,611 felonies reported in all New York City Housing Authority projects in 1969 (excluding intrahousehold incidents), 3,786, or 44 percent, were committed in the interior public areas of buildings. Of the crimes

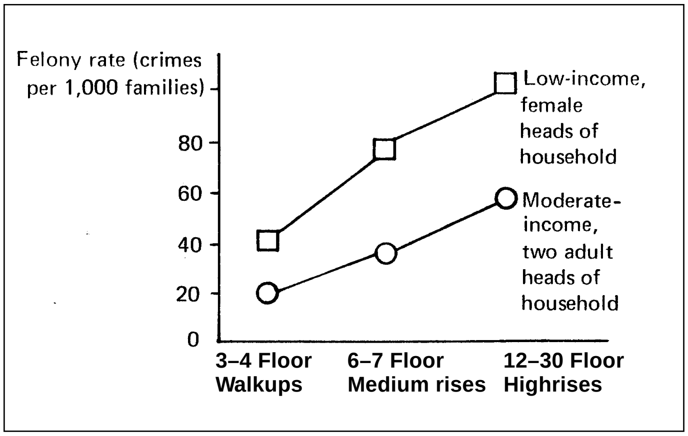


Figure I–18:
Variations in crime rate as produced by different socioeconomic groups occupying different building types.

committed in interior public areas, 3,165, or 84 percent, were robberies. The breakdown by location of the felonies taking place in interior public areas was: elevators, 41 percent; hallways, 22 percent; lobbies, 18 percent; stairways, 9 percent; roof landings, 2 percent; and other, 8 percent.

Although the socioeconomic characteristics of the residents exert a strong influence on crime rate, the physical characteristics of the buildings and the project can exert a counteracting influence. The physical form of residential environment can, in fact, ameliorate the effect of many of the problems created by the concentration of low-income one-parent families with teenage children.

The more complex and anonymous the housing environment, the more difficult it is for a code of behavior following societal norms to become established among residents. It is even difficult for moderate-income families with two adult heads of household to cope with crime and vandalism problems in poorly designed environments, but when poor and broken families are grouped together in such a setting, the results are nothing short of disastrous. The public housing projects now experiencing the highest vacancy rates are those that consist of the worst mixture of social and physical attributes.

Figure I–18 compares the vulnerability to crime of low-income one-parent families in different building types with the experience of moderate-income two-parent families living in the same building types. These are the further results of the 1972 Defensible Space analysis of New York City housing authority data. It shows that low-income one-parent families are more vulnerable to poor building design than moderate-income two-parent families. Although two-parent moderate-income families suffer higher crime rates in highrise buildings than they do in walkups, the crime rate does not increase as dramatically with building height as it does for low-income families. Moderate-income 2-parent families living in 12- to 30-story buildings experience a lower crime rate than low-income 1-parent families living in 6- and 7-story buildings.

The suitability of building types to lifestyle groups

I have explained the problems resulting from housing low-income families with children in highrise buildings. But one should not conclude from this that highrises are not suitable for other lifestyle groups. For instance, elderly people, even those of low income, do very well in highrise buildings as long as the buildings are kept exclusively for the elderly.

Elderly people do not like walking stairs and appreciate an elevator building. Retired elderly often live away from their children, and their elderly neighbors become their new extended family. At the push of an elevator button, they can have access to a hundred other families within a highrise building.

If we also design the ground floor of an elderly highrise as a communal and recreation area, we can create a security station at the building entry door that can be manned by elderly volunteers. If a problem arises, a push of a button summons the police. With the use of gates and fencing, the grounds surrounding their building can also be secured and defined for their exclusive use.

The lesson we can learn from this is that some of the highrise stock we have inherited, because it has proven unusable for welfare families with children, may lend itself to conversion for the exclusive use of the elderly.

However, we should not jump for joy too quickly. Many of our highrise public housing projects in large cities like New York, Chicago, and Boston were built as 1,000-unit agglomerations, and the need for such a concentration of the elderly is, at present, just not there. Also, the community surrounding such a 1,000-unit agglomeration will meanwhile have been devastated—no place to be putting the elderly. It would not be wise to convert 1 of 10 highrise buildings for the elderly, while keeping the adjacent 9 buildings for families with children. The elderly would be victimized and refuse to live in such an environment.

Finally, even when highrises exist in isolation, the cost of converting a building made up of three-bedroom apartments into one-bedroom units may be prohibitive.

Factors influencing crime and instability

Our institute's study of the *Factors Influencing Crime and Instability in Federally-Assisted Housing* (Newman and Franck, 1980) involved 44 moderate-income housing sites and 29 public housing sites in three cities: Newark, St. Louis, and San Francisco. It used a path analysis to take into account the influence of other factors, including socioeconomic characteristics, management effectiveness, quality of city police and security services, and form of ownership.

The results showed that two physical factors and two social factors accounted for most of the variation. The two physical factors were the size of the development and the number of families sharing common entries into a building. The two social factors were the percentage of families on AFDC and the ratio of teenagers to adults. As public housing has become housing for the poorest of the poor, the only variables that lend themselves to modification are the physical, *project size and the number of apartments sharing common entries.*

Project size is a measure of the overall concentration of low-income families in a project or cluster of projects. We found that the larger the concentration, the more residents felt isolated from the rest of society and felt their perceived differences to be greater. Project size affects stigmatization—as perceived both by the outside world and by the project residents themselves. The apathy that comes with stigmatization leads to neglect and withdrawal, first on the part of the residents, then by housing management, and finally by the municipal agencies that service the project: police, education, parks and recreation, refuse collection, and social services. A large project provides a continuous area in which gangs can operate, allowing even one gang or group of drug dealers to contaminate all of its public space.

The larger the number of units *sharing common entries* is a measure of how public the interior corridors, elevators, and stairs are. The more residents who have to share common areas, the more difficult it is to lay claim to them; the more difficult it is to distinguish other residents from intruders; and the more difficult it is to agree with other residents on the care and control of these areas.

The numbers within the brackets below show the amount of variation in residents' behavior that is explained by building size. If the number is preceded by a minus, it means that an increase in building size has a negative effect on that behavior. In the case of residents' use of public areas, for instance, the numbers in brackets mean that an increase of 1 unit in building size will cause a reduction of 0.50 of a unit in residents' use of public areas. This demonstrates that building form has a very strong predictive capacity on public area use, independent of other factors that are also likely to predict it.

Building size has a statistically significant direct causal effect on residents' behavior as follows:

(i) Use of public areas in their development [–0.50].

(ii) Social interaction with their neighbors [–0.31].

(iii) Sense of control over the interior and exterior public areas of their development [–0.29].

Further results of our path analysis showed that building size has important causal effects on fear of crime [0.38] and on community instability [0.39], independent of socioeconomic, managerial, ownership, police, and guard service factors. Community instability is measured by apartment turnover and vacancy rates and by residents' desire to move. However, as in the 1970 New York City public housing study discussed earlier, the findings from our study of moderate-income developments showed that the socioeconomic characteristics of residents also have strong causal effects on fear, instability, and crime.

Independent of other factors, the socioeconomic characteristics of residents have a total causal effect on fear of crime of 0.59, on community instability of 0.51, and on crimes against persons of 0.32. These findings can be interpreted as follows: A unit increase in the percentage of AFDC families living in a development will produce 0.59 of a unit increase in fear of crime.

The data from this analysis can be summarized in still another way by looking at the results of the regression analysis. The R^2 is a sign used to represent the percent of variance in one factor that is predicted by all other factors acting together. The effects of building size, socioeconomic characteristics of residents, management performance, form of ownership, and police and guard service together produce the following: $R^2 = 0.69$ for fear ($p < 0.001$); $R^2 = 0.67$ for community instability ($p < 0.001$); and $R^2 = 0.39$ for crimes against persons ($p < 0.05$). Another way of stating these findings is that the combination of these factors predict 69 percent of the variation in fear, for instance. But more important still, of all the factors in the predictive model, it is the socioeconomic characteristics of residents and building size that together predict most of the variation in fear, instability, and crime.