



DEFENSIBLE SPACE DESIGN IN THE  
CALIFORNIA TOWNHOUSE<sup>1</sup>

*Dennis J. Dingemans\**

An increasing presence of townhouses is one of several important changes taking place in contemporary American suburbs. Few attached, owner-occupied housing units were built in the suburbs during the 1950's, but since then townhouses have appeared in the suburbs of most metropolitan areas. Between 10 and 30 percent of all new houses built in the 1970's have been townhouses, usually in the form of cluster housing subdivisions. Some officials even have predicted that new townhouse units will outnumber new detached houses built during the rest of this century.<sup>2</sup> Ironically, it was in California suburbs that townhouses first began to proliferate.<sup>3</sup> The widespread image of California suburbs as the setting for sprawling ranch homes has been modified to include a sprinkling of "California-style Townhomes."<sup>4</sup>

The purpose of this paper is to review the issue of suburban townhouse developments in view of recent findings about housing design and crime. Providing its inhabitants with a sense of security from crime is one of the most important functions of any housing environment. Cooper and Rainwater, for example, rank the need for security second only to the need for shelter.<sup>5</sup> The degree to which this

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\*Dr. Dingemans is Assistant Professor of Geography, University of California, Davis.

important security function is provided by homes can vary with the type of housing and with the physical design of the area around the homes. Keith Harries, a geographer at the University of Oklahoma, has asserted that "burglary and robbery may be relatively susceptible to control via urban and structural design."<sup>6</sup> Oscar Newman and other architects have explored some specific interrelationships between the physical designs of housing environments and the security from crime afforded to their inhabitants.<sup>7</sup>

The pioneering work by Oscar Newman serves as the starting point for this evaluation of California townhouses. In his book, Defensible Space: Crime Prevention Through Urban Design, and in his other published research, Newman has identified a set of characteristics that should be present in order to protect residents from crime.<sup>8</sup> According to Newman, the two basic components that comprise "defensible space" design to minimize the opportunity for crime are surveillance and territoriality.

Surveillance refers to the ability of residents to survey the open space around their homes from within the house. The proper juxtaposition of windows with home entrances, garages, greenbelts, and recreation facilities permits the residents to observe and become familiar with their neighbors. Suspicious intruders and improper behavior should be more easily noticeable by residents who are kept in close contact with their surroundings while going about their normal household activities.

Territoriality refers to the existence of easily perceived zones of territorial influence around private residences. A clear division of surrounding areas into private, semi-private, and public open space should be made. The adoption of proprietary attitudes toward the surrounding areas will be encouraged by the clear definition of zones of responsibility. Barriers should mark the points of

transition through the hierarchy of increasingly private space--barriers that may be either real or symbolic, but which must effectively communicate that the open space around the homes is not available to anonymous and ambiguous usages.

The desired result of territoriality and surveillance features working in concert is to link together the open space around homes with the private space within homes. Newman argues that Americans tend to retreat into their purely private homes and fail to take responsibility for what goes on in their neighborhoods. By increasing the opportunities for noticing and feeling responsible for neighborhood spaces, Newman hopes that good housing design can reduce the threat of crime.

Newman's principles of defensible space design apply mainly under conditions where public open space is an important part of housing environments. Neighborhoods of detached single family homes contain few areas of public open space. Neighborhoods of public housing, such as Newman concentrated his attention on, provide substantial amounts of shared open space. Almost all of the townhouses being built in American suburbs today are surrounded by shared open space rather than purely private yards, a result of using cluster housing designs rather than the more traditional urban row house plan. Cluster housing has been praised for bringing to the suburbs a more efficient use of valuable land, lower cost housing, and aesthetic improvements over low density home subdivisions.<sup>9</sup> Cluster housing is also a new housing form that departs substantially from the privacy features of the detached house. Communally owned territory substitutes for the individually owned front and rear yards. Greenbelts and walkways, swimming pools and tennis courts, parking lots and tot lots are owned in common by residents of today's suburban townhouses. This reliance on communal open space has particular implications for the security of townhouse

residents, and the security design principles articulated by Oscar Newman may be applied to suburban private housing as well as to urban public housing.<sup>10</sup>

The first step involved in assessing the defensible space qualities of contemporary townhouses was the development of an environmental survey form that would measure the defensible space design present in housing environments. The 36 survey elements presented in Table 1 were derived from a careful study of Newman's less-structured observation methods. Several modifications and trial efforts resulted in a survey form that provides a measure of territoriality and surveillance as Oscar Newman has defined them. The survey form is specifically oriented to the special conditions of townhouses with cluster housing open space, but the same form could be used with a few modifications to evaluate the defensible space characteristics of low rise apartment houses or public housing.

The survey evaluation was executed for a sample of 75 Northern California townhouse cluster housing developments. Most were located in the central portion of suburban Contra Costa County, part of the San Francisco-Oakland metropolitan area where many of the first townhouses were built in California.<sup>11</sup> The Contra Costa County townhouses include a full range of the townhouse designs being built in American suburbs today. The author's visits to townhouse developments in many metropolitan areas of the East, Midwest, South, and West have resulted in the discovery of few townhouse designs that are not in existence in Contra Costa. In fact, several of the designs that were first used in Contra Costa County have been copied by design and development firms elsewhere.<sup>12</sup> The stratified sample included townhouses that were priced in the high (\$55,000 or more in 1976 prices), medium (\$35-55,000), and lower (less than \$35,000) range of prices. Because Contra Costa County did not have very many of the

lower cost homes, and because it was especially important to study the security characteristics of lower cost townhouses, an additional 10 lower cost townhouse developments were selected in Alameda and Sacramento Counties.

Each of the 75 townhouse developments was evaluated by the author in the fall of 1976. The survey results were then tabulated and, based upon the survey, each townhouse development was given a score to reflect its provision of territoriality, surveillance, and overall defensible space design. A score was given to each of the 36 survey elements: one for good, two for moderate, and three for poor defensible space characteristics. A low total score thus reflects good defensible space, while a high score indicates poor design characteristics (Table 1).

The survey results revealed that there are a wide range of defensible space design qualities. Numerous departures from the defensible space ideal were recorded in all but a very few developments. Twenty-three of the 36 survey elements were used for the subsequent analysis. The total scores ranged from 30 (compared to 23, which was the best possible score) to 60 (compared to 73, which was the worst score possible). The mean score was 44.9, the median 45, and the standard deviation 5.9, indicating that scores were approximately normally distributed.

The following examples illustrate the kind of specific design features examined in the environmental inventory. One issue of territoriality is whether *entrances* to the development are limited in number and clearly defined: only 22 of the 75 developments had two or less automobile entrances per 100 units; in 35 of the 75, the pedestrian access points were not surveyed at all from homes. Another issue is whether all of the *cluster open spaces* can be seen from homes: good surveillance was possible in 45 of the 75, but in 32 of the 75 there was incomplete surveillance, with

many sections of the open space not visible from within homes; one particularly frequent problem was a failure to provide surveillance of *garage and parking lot areas*. The importance of providing *kitchen* windows that overlook open spaces has been emphasized by Newman and others, but in 64 developments it was completely impossible to see any of the open space areas around the home from the kitchen; only 11 had good surveillance opportunities from most townhouse kitchens. Surveillance of *children's play areas* would be important if townhouse residents included young children, but in only 7 of the 75 was there a tot lot that was within view of homes; in 20 developments there was no play space specifically designed for children.

The defensible space scores for the 75 sample townhouse developments were examined to see if there were differences in the design characteristics among the cost-specific groups. If need for residential security were the crucial design criterion, then the lower cost townhouses should have better defensible space characteristics. Residents in these homes often cannot afford to pay for supplementary private security personnel or security devices, and they are often located in neighborhoods with higher crime rates. For higher income households living in more expensive townhouse developments, good defensible space design is less critical and merely one alternative against the threat of crime.

The defensible space design scores for each of the three subgroups of townhouses were compared, and based on the t-test there was no significant differences in mean scores (0.05 level). For those townhouses costing \$35,000 or less in 1976 (n = 30), the mean score was 45.6 with a standard deviation of 4.9. For those townhouses costing \$35-55,000 (n = 34), the mean score was 44.6 with a standard deviation of 6.4. For those townhouses costing \$55,000 or more (n = 11

the mean score was 44.2 with a standard deviation of 7.0. The low cost townhouses, those supposedly needing more careful provision of good defensible space, were not designed with any special provision of Newman's security features.

When the territoriality and surveillance components of the total defensible space scores were examined separately, significant differences (0.05 level) were found to exist between the territoriality scores of each of the three subsamples. These differences were, however, in the opposite direction from the initial hypothesis. The low cost homes possessed poorer territoriality design qualities than the expensive homes. Designers of the lower cost townhouses either never intended or failed in attempting to protect future generations of residents from unnecessary threats. Some examples of inexpensive designs that exhibit good defensible space qualities exist, but the admirable design models were seldom followed. Interviews with builders of several of the low cost townhouse developments revealed that design decisions were often made without a systematic search for the best possible design.<sup>12</sup> The superior territoriality features of expensive townhouses may be a result of the lower net densities present there and an emphasis on privacy.<sup>13</sup>

Since the defensible space design criteria are abstractions that are not based upon a single model townhouse design, the desired territoriality and surveillance features might be mutually incompatible. The subscores for territoriality and surveillance were not correlated ( $r = -0.05$ ), and this lack of a strong relationship indicates that there may be no inherent contradiction between good territoriality and surveillance features. The lack of a positive correlation also indicates that the design decisions that produced good surveillance (or territoriality) may not be the result of a self-conscious search for improved residential security.

How effective are well designed, "defensible," townhouse developments in crime prevention? This crucial

question was not satisfactorily answered for high-rise housing, and the present research design can give only partial answers for townhouses.<sup>14</sup> Six townhouse cluster developments in Sacramento, California, were selected for an examination of their actual crime rates. The Sacramento Police Department's residential burglary logs were reviewed and each residential burglary in one of the six developments was noted.<sup>15</sup> The burglary rates (burglaries per 100 housing units) between January 1975 and March 1977 were correlated with the defensible space scores for the six developments. A moderate negative correlation resulted ( $r = -0.45$ )--a surprising contrast to our expectations that good defensible space would result in low crime rates. Both territoriality and surveillance subscores were correlated negatively ( $r = -0.71$ ,  $r = -0.61$ ) with burglary rates. From these data it would appear that the townhouses with the best defensible space design scores are those with the highest crime rates. Further research would be necessary to establish this observation, since there were only six Sacramento townhouses studied (due to the small number of townhouse developments within the city), and the neighborhood surroundings of the six varied considerably (two were in high income neighborhoods and four were in the low income and minority areas). Either design makes little difference in crime prevention, or burglars are selecting the more expensive homes, or both, or other factors may be important.

The possible role of defensible space design in improving "perceived" security (the feeling of safety from crime) was also examined.<sup>16</sup> Residents in ten large (100 units or more) apartment developments in Davis, California, were asked to rate the security of their housing environment. These perceptions of security were then correlated with the defensible space design scores for those housing environments. The resulting positive correlation ( $r_s = 0.71$ ) indicates that

the residents in apartment homes with better defensible space design felt more secure.

These results give preliminary evidence on the potential effectiveness of the defensible space design features--or their measures. Good defensible space design may be effective in minimizing only the fear (or concern about crime) and not the actual incidence of crime. A larger research project, with more and different developments, with developments in similar neighborhoods, and with measures of both the perceived and actual crime threat, would be a logical next step in the investigation. With better data on actual crime rates in a number of townhouse developments it would be possible to refine and improve the environmental survey questionnaire--certain design features may be more important than others as predictors of perceived or actual crime rates. The present study has established methods of measurement that other geographers may wish to adopt and adapt. When used in conjunction with a reading of Defensible Space, a study of the micro-geography of local housing environments can be incorporated into fieldwork exercises for urban geography classes.<sup>17</sup> As an area of geographical research the topic of crime prevention through environmental design can make an important contribution to a major social issue.

In conclusion, this research attempts to focus attention on the potential problems associated with cluster housing forms in California suburbs. Increasingly, suburbanites are being asked to share the use and responsibility for their surrounding yards and open space. This sharing provides many benefits in terms of additional recreational features or less personal attention to yard work, but it is also an unusual requirement in suburbs that are dominated by a pervasive ethos of privatism.<sup>18</sup> The importance of this turn to a fundamentally new housing type is summarized by

Peirce Lewis, who argued that "when the vernacular architecture of a region changes, the culture itself is undergoing wrenching and enduring change."<sup>19</sup>

NOTES

<sup>1</sup>A sabbatical leave from the University of California at Davis during the fall of 1976 made this research possible. The work was supported by the Beatrix Farrand Fund in Landscape Architecture at U.C. Berkeley, a Regents Summer Faculty Research Grant award, and a Faculty Research Grant at U.C. Davis.

<sup>2</sup>This claim was contained in Congressional testimony by Carla Hills, former HUD Secretary, reported in the *Sacramento Bee* (July 11, 1976). A similar assertion by Eli Broad, one of the first and largest builders of suburban townhouses, is reported in the *Sacramento Union* (August 20, 1977).

<sup>3</sup>Reasons for the early emergence of suburban townhouses in California are summarized in: Dennis Dingemans, *The Townhouse in the Suburbs: Changing Urban Morphology and Social Space in American Suburbs, 1960-1974*, unpublished dissertation in geography, University of California, Berkeley, 1975.

<sup>4</sup>Carl Norcross, *Townhouses and Condominiums: Residents' Likes and Dislikes* (Washington, D.C.: The Urban Land Institute, 1973); Dennis Dingemans, "The Urbanization of Suburbia: A Renaissance for the Row House," *Landscape* 20 (Fall 1975), pp. 20-31.

<sup>5</sup>Clare Cooper, *Easter Hill Village* (New York: The Free Press, 1975); Lee Rainwater, "Fear and the House-as-Haven in the Lower Class," *Journal of the American Institute of Planners* 32 (January 1966), pp. 23-31.

<sup>6</sup>Kieth Harries, *The Geography of Crime and Justice* (New York: McGraw-Hill, 1974), p. 78.

<sup>7</sup>Oscar Newman, *Defensible Space: Crime Prevention Through Urban Design* (New York: Macmillan, 1972); Robert Gold, "Urban Violence and Contemporary Defensive Cities," *Journal of the American Institute of Planners* 36 (May 1970), pp. 146-160; C. Ray Jeffery, *Crime Prevention Through Environmental Design* (Beverly Hills: Sage, 1971).

<sup>8</sup>Newman cites four aspects of defensible space, two of which ("image" and "milieu") will not be discussed in this paper because they pertain mostly to public housing. See also: Oscar Newman, *Design Guidelines for Creating Defensible Space* (Washington, D.C.: HUD, 1976).

<sup>9</sup>William Whyte, *Cluster Development* (New York: The Conservation Foundation, 1964); Dennis Dingemans, op. cit., footnote 3, Chapter Two.

<sup>10</sup>Geographers have applied the ideas of Newman in: Robert Tata, Sharyn Van Horn and David Lee, "Defensible Space in a Housing Project: A Cast Study from a South Florida Ghetto," *Professional Geographer* 27 (August 1975), pp. 298-303. Two additional attempts to evaluate and use Newman's ideas are: R. I. Mawby, "Defensible Space: A Theoretical and Empirical Appraisal," *Urban Studies* (1977), pp. 169-179; Franklin Becker, "The Effects of Physical and Social Factors on Residents' Sense of Security in Multi-Family Housing Developments," *Journal of Architectural Research* 4 (1975), pp. 18-24. For a discussion of the differences between the traditional urban row house design and the new townhouse cluster housing design, see Dingemans, op.cit., footnote 4.

<sup>11</sup>Contra Costa County lies within the territory of The Associated Homebuilders of the Greater Eastbay, a builders organization that has been among the most active of the NAHB branches in advocating suburban townhouses. Early experimentation there in townhouse building was a direct result of encouragement by the National Association of Homebuilders. See Dingemans, op. cit., footnote 3, Chapter Three.

<sup>12</sup>At least two of the architectural design firms in Contra Costa County have repeated their locally-built townhouse designs for clients in many other states. Magazines like *House and Home*, *Professional Builder*, and *California Builder* have publicized these Contra Costa models.

<sup>13</sup>The defensible space design scores for low-cost townhouses did not improve between 1962, when the first were built, and 1977. The mean score dropped slightly when 1962-1972 townhouses are compared with 1972-1977 designs.

<sup>14</sup>For example, George McKeon designed his first fourplex townhouses in 1965 and refused to modify his original design during the twelve-year period when his fourplexes were being built by the thousands in dozens of cities around the United States. No architect was consulted and McKeon himself had no formal design training. Only after his death did his firm modify some often-criticized aspects of the design. Larry Freels, designer of the first suburban townhouses in California, was an undergraduate student when he did the design and had little familiarity with urban row house forms.

<sup>15</sup>The average density for low-cost townhouses is 15 units per acre, while moderate-cost units average 12 per acre and high-cost units average only 8 per acre. The 1976 cost of townhouses is computed by determining the original sale price of the least-cost two-bedroom unit, then adding an inflation factor of 5 percent per year before 1972 and 10 percent per year after 1972.

<sup>16</sup>Criticism of Newman's empirical research is summarized in Bill Hillier, "In Defense of Space," *Royal Institute of British Architects* 27

(November 1973), pp. 538-544. Problems in testing the relationship between crime rates and environmental design are given in Becker and Mawby, *op. cit.*, footnote 10. A general criticism of Newman and others (such as Christopher Alexander) who hope to influence social behavior through architectural design is given in: J. H. Bradbury, "The New Environmentalism," *Antipode* 8 (September 1976), pp. 17-28.

<sup>17</sup> This work was done by Jeffrey D. Edgar, U.C. Davis undergraduate research assistant, in the spring of 1977. Other crimes, such as rape or car theft, were not used because so few occurred or because their incidence was not closely linked to environmental design concepts.

<sup>18</sup> This work was done by Scott B. Odell, U.C. Davis undergraduate research assistant, in the winter of 1977. A slight modification of the townhouse evaluation form was required to enable its use in evaluating apartment units.

<sup>19</sup> During the past two years undergraduate students in the upper division urban geography classes at U.C. Davis have been assigned the exercise requiring a defensible space assessment of open space in an apartment complex. Additional readings might include two discussions of defensible space aspects of the micro-geography of residential environments: Dennis Dingemans, Susanne Garfield, and Tonya Olson, *Defensible Space in Suburban Townhouse Design: A Case Study of Six California Developments* (U.C. Davis: Institute of Governmental Affairs Research Report Number 33, 1976); Dennis Dingemans and Robert Schinzel, "Defensible Space Design of Housing for Crime Prevention," *Police Chief* 44 (November 1977), pp. 34-38.

<sup>20</sup> Newman emphasized the important differences between private single family homes, which are the housing norm in the United States, and multifamily housing, in which many low income residents were being placed. By providing cluster housing designs instead of the purely private space of the traditional urban row house design, suburban housing developers are departing from the mainstream of American housing tradition. The urban or suburban apartment house, of course, departs even further from the tradition of privacy.

<sup>21</sup> Peirce Lewis, "Common Houses, Cultural Spoor," *Landscape* 19 (1975), pp. 1-28, p. 3.

Figure 1. Townhouse Evaluation Form.

Surveillance (score components indicated with \*)

- 1\* Do house windows overlook automobile entrances to the development?  
 (a) yes [26]      (b) somewhat [26]      (c) no [23]
- 2\* Do house windows overlook pedestrian entrances to the development?  
 (a) yes [8]      (b) somewhat [32]      (c) no [25]
- 3\* Are house entrances visible to patrolling police on through streets?  
 (a) most [21]      (b) some [10]      (c) few [44]
- 4\* Are major recreation facilities well surveyed from house windows?  
 (a) yes [26]      (b) somewhat [18]      (c) no [31]
- 5\* Are non-cluster open spaces well surveyed from house windows?  
 (a) yes [31]      (b) somewhat [34]      (c) no [10]
- 6 Are tot-lots or children's non-cluster play areas well surveyed?  
 (a) yes [7]      (b) somewhat [2]  
 (c) no [19]      (d) do not exist [48]
- 7\* Are cluster open spaces well surveyed from homes in the cluster?  
 (a) yes [41]      (b) somewhat [22]      (c) no [12]
- 8\* Does each house have surveillance of its surrounding cluster of open space?  
 (a) yes [44]      (b) some [20]      (c) few [11]
- 9\* Can children playing in the cluster open space be seen from their homes?  
 (a) yes [19]      (b) somewhat [40]      (c) no [16]

Figure 1 (continued)

- 10 Are cluster open space areas interesting enough to encourage open curtains?  
 (a) yes [59] (b) somewhat [11] (c) no [4]
- 11 Is surveillance so intense that cluster open spaces will not be used?  
 (a) no [59] (b) somewhat [12] (c) yes [4]
- 12 Do kitchen windows overlook cluster open space?  
 (a) yes [5] (b) some [6] (c) no [64]
- 13 Do living room windows overlook cluster open spaces?  
 (a) yes [31] (b) some [22] (c) no [22]
- 14 Do bedroom windows overlook cluster open spaces?  
 (a) yes [33] (b) some [31] (c) no [11]
- 15\* Are parking areas or garage entrances surveyed by homes in the cluster?  
 (a) yes [14] (b) somewhat [15] (c) no [46]
- 16\* Does each house have surveillance of its own entrance area?  
 (a) yes [46] (b) somewhat [24] (c) no [5]
- 17 What means provide surveillance of entrance areas?  
 (a) window in or next to the door [31]  
 (b) a major downstairs window overlooks the front entrance area [63]  
 (c) a major upstairs window overlooks the front entrance area [52]
- 18\* Do neighboring homes in the cluster overlook the front entrance area?  
 (a) yes [24] (b) somewhat [15] (c) no [36]

Figure 1 (continued)

Territoriality (score components indicated with \*)

- 19\* Are entrances and internal streets differentiated from public streets?  
 (a) yes [40]            (b) somewhat [9]            (c) no [26]
- 20\* Are entrances limited to one or two per 100 units?  
 (a) yes [34]            (b) no [41]
- 21\* Are pedestrian entrances limited to one or two per 100 units?  
 (a) yes [22]            (b) no [53]
- 22 Do homes have parking on or access to regular public streets?  
 (a) yes [24]            (b) somewhat [11]            (c) no [40]
- 23\* Are homes and open spaces grouped into smaller clusters?  
 (a) yes [38]            (b) somewhat [30]            (c) no [7]
- 24\* Are greenbelt open spaces associated with one of the clusters?  
 (a) yes [22]            (b) somewhat [19]            (c) no [34]
- 25\* Do garages and parking areas belong to one cluster only?  
 (a) yes [40]            (b) somewhat [4]            (c) no [31]
- 26 How many homes share each cluster?  
 (a) between 4 and 8 [16]  
 (b) between 8 and 24 [52]  
 (c) more than 24 [7]
- 27\* Are territorial subdivisions and cluster borders legible to strangers?  
 (a) yes [40]            (b) no [35]
- 28\* Are street names and house numbers easy for visitors to find?  
 (a) yes [42]            (b) no [33]

## Figure 1 (continued)

- 29 Is there private open space with each house?  
(a) yes [47] (b) some or unfenced [4]  
(c) no [4]
- 30\* Is the front door approach defined by a porch,  
steps, or platform?  
(a) yes [68] (b) somewhat [1] (c) no [6]
- 31 Are housing units differentiated from others in the  
same structure?  
(a) yes [37] (b) somewhat, by paint or trim  
(c) no [20] detail [18]
- 32\* Is a private or semi-private front yard area  
demarked from cluster space?  
(a) yes [11] (b) somewhat [19] (c) no [45]
- 33 Is the garage or parking area reached through the  
front or rear door?  
(a) yes, garage is attached to house [33]  
(b) garage or parking is at rear [20]  
(c) garage or parking is in front [22]
- 34\* Can children play in cluster without intruding on  
semi-private space?  
(a) yes [38] (b) somewhat [27] (c) no [20]
- 35\* Is the recreation complex clearly part of the  
development's open space?  
(a) yes [37] (b) somewhat [29] (c) no [2]
- 36 Does a greenbelt network link home clusters and  
recreation areas?  
(a) yes [37] (b) somewhat [19] (c) no [19]