

c.1

A SURVEY OF TOWNHOUSE OWNERS' PREFERENCES FOR PRIVATE OUTDOOR SPACE

by

BARBARA JEAN GREIG

B.Sc. (Hons), University of Oregon, 1974

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

in

THE FACULTY OF GRADUATE STUDIES

(Department of Plant Science)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

September 1980

© Barbara Greig, 1980

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the Head of my Department or by his representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of Plant Science

The University of British Columbia
2075 Wesbrook Place
Vancouver, Canada
V6T 1W5

Date October 7, 1980

Abstract

Due to a variety of economic pressures, medium-density housing forms, particularly the townhouse, have become increasingly popular alternatives to detached housing. The design of the communal and private outdoor space in townhouse projects has been criticized for a lack of space and privacy. The objectives of this study were to describe townhouse owners, determine their satisfaction with the project and the size, privacy, and design of back yards, and test whether their evaluations could be predicted from their demographic characteristics, housing background, or their attitudes about housing and the use and design of outdoor space.

To satisfy these objectives, interviews were conducted with ninety owners in nine townhouse projects located in the Greater Vancouver area of B.C. The projects were randomly selected from eligible projects in four municipalities and respondents were selected by interviewing residents found at home during the week or on weekends. Factor analysis, cluster analysis, and regression analysis were used to test for predictors of satisfaction.

The townhouse owners represented a broad range of ages, incomes, family sizes, and housing backgrounds. Overall satisfaction with the projects and yards was high, and the majority rated privacy as adequate. Regression analysis predicted 25% of the variance in general ratings, 20% of the variance in privacy ratings, and 20% of the variance in ratings of social problems in the projects. All three rating measures were predicted by regressions significant at $p=.10$. The most useful predictors included the reasons people were living in townhouses, their attitudes about family use of the back yard, and what kind of housing they had lived in.

Based on the findings, recommendations were made for the size of yards and patios, privacy fencing, paving materials, lawns, plantings, general site design, and management.

Table of Contents

	Page
ABSTRACT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF PLATES	ix
ACKNOWLEDGEMENTS	x
1.0 INTRODUCTION	1
2.0 LITERATURE REVIEW	8
2.1 Theory of Privacy and Outdoor Space Design in Multiple Housing	
Outdoor Space Design in Multiple Housing	8
A Hierarchy of Open Space	9
Privacy	11
2.2 User Research	
The Need for User Research	12
Problems in the Measurement of User Needs	14
2.3 Results from User Studies	
Who are Townhouse Owners?	15
The Desire for Private Outdoor Space	19
The Privacy of Outdoor Space	19
A View vs Privacy	20
Fences for Privacy and Control	21
Use of Private Outdoor Space	21
Size of Private Outdoor Space	22
Front Yards in Townhouses	22
Problems in Townhouse Projects	23
Noise	23
Parking	23
Children's Play	24
Suggestions for Site Design	24
Landscaping	25
Site Layout and Size	25
Recommendations for Private Outdoor Space	26
3.0 METHODOLOGY	28
3.1 Questionnaire	28
Introduction	28
The Interview	29
Pretesting	30

	Page
3.2 Sampling	31
Sampling Frame	31
Sample Selection	33
3.3 The Interviews	33
Selection of Respondents	33
Securing the Interviews	38
Conducting the Interview	38
3.4 Data Analysis	39
Program Package Used	39
Analysis Procedures	39
4.0 RESULTS	41
4.1 Interview Results	41
4.2 Demographic Characteristics and Housing Background	42
Who is the Typical Respondent and What is His Housing Background?	42
Demographics	42
Family size	44
Residence time and plans to stay	45
Last residence	45
Last house type	45
Houses since childhood	45
Reasons people moved from their last house	46
Reasons people chose the project	47
Reasons people chose the unit	51
Ideal housing type	51
Reasons people will move	52
Features of next house	52
Ideal tenure	53
4.3 Ratings, Attitudes, Use, and Preferences for Private Outdoor Space	53
Ratings and Attitudes	53
Project and outdoor space rating	53
House rating	55
Back yard rating	55
Privacy of back yard	55
Back fence rating	56
Function of back fence	56
Visual privacy of back yard	59
"People seeing in bothers me"	59
Concern about noise	59
Problems in the back yard	60

	Page
Features, Use and Preferences for the Back yard	62
Back yard size rating	62
Patio size rating	63
Patio features	66
Patio surface material	66
Connection between patio and house	67
Treatment of yard beyond patio	67
Use of back yard and orientation preferred	68
Gardening and growing vegetables	68
Changes to the back yard	69
Features of ideal back yard	69
Importance of outdoor space	69
Front Yards and Balconies	70
General Site Information	72
4.4 Can Ratings be Predicted by Demographic Characteristics, Housing Background, and Preferences?	73
Introduction	73
Demographic Scales	75
Housing Background Scales	78
Rating Scales	83
Preference Scales	89
Results of Regressions Using Scales	95
Introduction	95
Predictors of General Ratings	97
Predictors of Privacy Ratings	103
Predictors of "Good Fences Make Good Neighbors"	107
Summary	110
5.0 RECOMMENDATIONS FOR DESIGN	111
5.1 Private Outdoor Space Design	111
Size of Yards and Patios	111
Fencing	112
Lawns	113
Trees and Shrubs	115
Connection to the Unit	115
Front Yards	115
Balconies	117
Roof Decks	117
5.2 Site Design	120
Children's Play	120
Parking	120
Swimming Pools	120
5.3 Management	121

6.0 SUMMARY	122
6.1 Who are Townhouse Owners?	
6.2 Are There Any Differences Between Townhouse Projects Which Affect Owners' Satisfaction?	122
6.3 Can a Person's Ratings of His Yard and Townhouse Project be Predicted from His Demographic Characteristics, Housing Background, or Preferences?	123
6.4 Utility of Findings	123
Landscape Architects	124
Planners	125
Management	125
Prospective Townhouse Owners	126
6.5 Further Research	126
BIBLIOGRAPHY	128
APPENDICES	133
1. Questionnaire and Responses	133
2. Letter and Summary of Results Sent to Respondents	154
3. Townhouses in Four Municipalities	157
4. Plans of Private Outdoor Space in Sample Projects	170
5. Equations Used to Compute Scale Scores	180

<u>List of Tables</u>	Page
Table 1. Description of Sample Townhouse Projects	34
Table 2. Comparison of Sample and Sampling Frame by Price	35
Table 3. Comparison of Sample and Sampling Frame by Location	36
Table 4. Comparison of Sample and Sampling Frame by Project Size	37
Table 5. Demographic Characteristics and Housing Background of 90 Residents of Nine Townhouse Projects	43
Table 6. Ratings and Preferences of 90 Residents of Nine Townhouse Projects	54
Table 7. Demographic Factor Loadings	76
Table 8. Summary Statistics for Demographic Scales	77
Table 9. Reliability Coefficients of Scales	79
Table 10. Housing Background Factor Loadings	80
Table 11. Summary Statistics for Housing Background Scales	81
Table 12. Rating Factor Loadings	84
Table 13. Final Rating Scales	86
Table 14. Summary Statistics for Rating Scales	87
Table 15. Preference Cluster Results	90
Table 16. Summary Statistics for Preference Scales	92
Table 17. Pearson Correlations Between the Three Rating Scales	96
Table 18. Results of Separate Regressions on General Ratings with Demographic, Housing Background, and Preference Scales	98
Table 19. Results of the Regression on General Ratings with All Scales	102
Table 20. Results of Separate Regressions on Privacy Ratings with Demographic, Housing Background, and Preference Scales	104
Table 21. Results of the Regression on Privacy Ratings by All Scales	105
Table 22. Results of Separate Regressions on "Good Fences Made Good Neighbors" with Demographic, Housing Background, and Preference Scales	108
Table 23. Results of the Regression on "Good Fences Make Good Neighbors" with All Scales	109

<u>List of Figures</u>	Page
Figure 1. Travel Time to Selected Municipalities From Vancouver City Center	4
Figure 2. Townhouses in Four Municipalities Including Sampled Projects	5
Figure 3. Recommended Yard Treatment	114

<u>List of Plates</u>	Page
Plate 1. The unusual architecture in Greentree Village	50
Plate 2. The stacked form of Forest Meadows allowed low land coverage	50
Plates 3 and 4. The feeling of density inside the False Creek enclave	58
Plate 5. Lower units at Greentree had patios facing out onto an open lawn	61
Plate 6. The upper unit patios at Greentree were considered too small by most residents	64
Plate 7. Patios at Kingswood Downs were small and were surrounded by building walls and fences	64
Plates 8 and 9. The back yards at Forest Meadows lack clear boundaries	65
Plate 10. The large front patios at Greentree Village	71
Plate 11. The more typical front treatment at Country Club	71
Plate 12. The benefit of generous landscaping at Lillooet	116
Plate 13. Landscaping enhances privacy at Springmont	116
Plate 14. Small, private front patios at Mariners Village	118
Plate 15. Front patios at Greentree are removed from the street	118
Plate 16. Some False Creek roof decks were little used because of exposure to sun and wind	119

Acknowledgements

I would like to thank my advisor, Dr. John Neill, for his suggestions at the beginning of the study and his patience throughout, and Dr. John Collins for his unending support and advice.

Staff in the Planning Departments of Vancouver, Richmond, Burnaby, the City of North Vancouver, and the District of North Vancouver all spent considerable time helping me locate the information I needed.

I would also like to thank Sandra Sturgeon for her skill and imperturbable good nature, and Russell Greig for trying to keep me on schedule.

Last, I must thank the ninety people who took the time to answer my questions.

1.0 INTRODUCTION

With the price of detached single family housing continually rising, especially in the Vancouver area, from a combination of increasing land prices, housing costs, and interest rates, many people can no longer afford the traditional single family house (see GVRD, 1974; Koenig, 1975). Housing forms built at higher densities claim savings from land costs because less land is required for each house, from construction costs because multiple units can be built more efficiently, and from servicing costs because higher density housing can be designed so the length of sewers, storm drainage systems, and roadways are much shorter than those required for traditional single family houses (Whyte, 1964; GVRD, 1974). Denser forms of housing have also begun to receive attention as housing alternatives as expanding urban centers seek to attract more residents to central locations and also to encourage more efficient use of the limited supply of available residential land (Whyte, 1964; Koenig, 1975). Advocates of higher density housing also cite the advantages of improved access to schools, stores, recreation facilities, and transit, and the more stable communities created by a greater range of house types (GVRD, 1974).

As an alternative to single family housing, the townhouse has several advantages over other denser forms of housing. Accepting for the moment that the suburban single family house is the housing form preferred by the majority of North Americans, the townhouse has more of the qualities that make single family housing the favorite than any other medium density housing form available on the market in North America today. The townhouse has a separate front entrance, is not attached to other houses above or below, and has a back

yard or patio set aside for the private use of the residents. In typical suburban (non-street-oriented) townhouses, each unit also has a carport or at least a parking space directly in front of the unit, and many have basements.

Problems in townhouse projects that deserve design attention include a lack of privacy in yards, a lack of definition between common areas and private yards, noise, problems with children's play, pets, and inadequate parking. A number of these problems are within the province of the landscape architect.

Of particular interest in this study is the private outdoor space provided with most townhouse units. Typically this is an 8' by 10' concrete slab patio reached from inside the house through sliding glass doors and fenced for privacy by fin walls or short screens between the units. Any fencing that completely encloses the yard is not usually high enough for visual privacy. More commonly the patio is surrounded by grass which merges uninterrupted into a common lawn area. The lawn areas are maintained by a landscaping firm and ambiguity of responsibility for the planted areas close to the unit causes problems in some developments.

From this description it should be apparent that the boundaries of these back yards are usually not very well defined; there is visual privacy only from neighbors to the sides in the areas immediately next to the house, and there is no way to control access to the yard. Depending on the use of adjacent areas, the privacy can be excellent or non-existent. The latter, unfortunately, seems more common; "private" back yards and patios in Vancouver look out onto busy streets, sidewalks, schools, parks, and other townhouse yards with little or no screening by fences or planting. One goal of this study was to see whether townhouse owners were satisfied with the privacy provided in their yards and what improvements were suggested.

The objectives of the study were as follows:

- 1) to identify the demographic and socioeconomic characteristics, housing background, and housing preferences of townhouse owners;
- 2) to find out how these townhouse owners evaluate their projects, particularly the size and privacy of their yards;
- 3) to identify what the yards are used for and what preferences people have for gardening, yard features, and plantings and paving materials; and
- 4) to test whether their evaluations can be predicted from any of the other information collected (demographics, housing background, and preferences).

Thus the scope of the study includes such design aspects as the size of patios and yards, preferences for screening (material, height, and density), paving materials, lawn, garden space and various other features (fountains, benches, etc.), as well as the use of the yard and satisfaction with privacy and more general aspects of the projects.

Three basic questions were asked:

- 1) Who are townhouse owners and how do their housing backgrounds affect their expectations of townhouse living? It is hypothesized that people who have lived in single family housing will want more privacy than most townhouse yards offer, while people who have lived in apartments will be less critical of townhouse privacy.
- 2) Are there are differences in the ratings projects receive which allow design recommendations to be made? A variety of provisions and treatments are represented in the sample. It is expected that some projects will receive higher ratings on some features than other projects, and conclusions can be drawn about preferred design solutions.
- 3) Can a person's ratings be predicted from his demographic, housing background, and preference information?

Information to answer these questions was collected by personal interviews conducted at nine townhouse projects. These projects were selected in a random sampling of projects from the municipalities of Vancouver, Richmond, Burnaby, and the District of North Vancouver (see Figures 1 and 2).

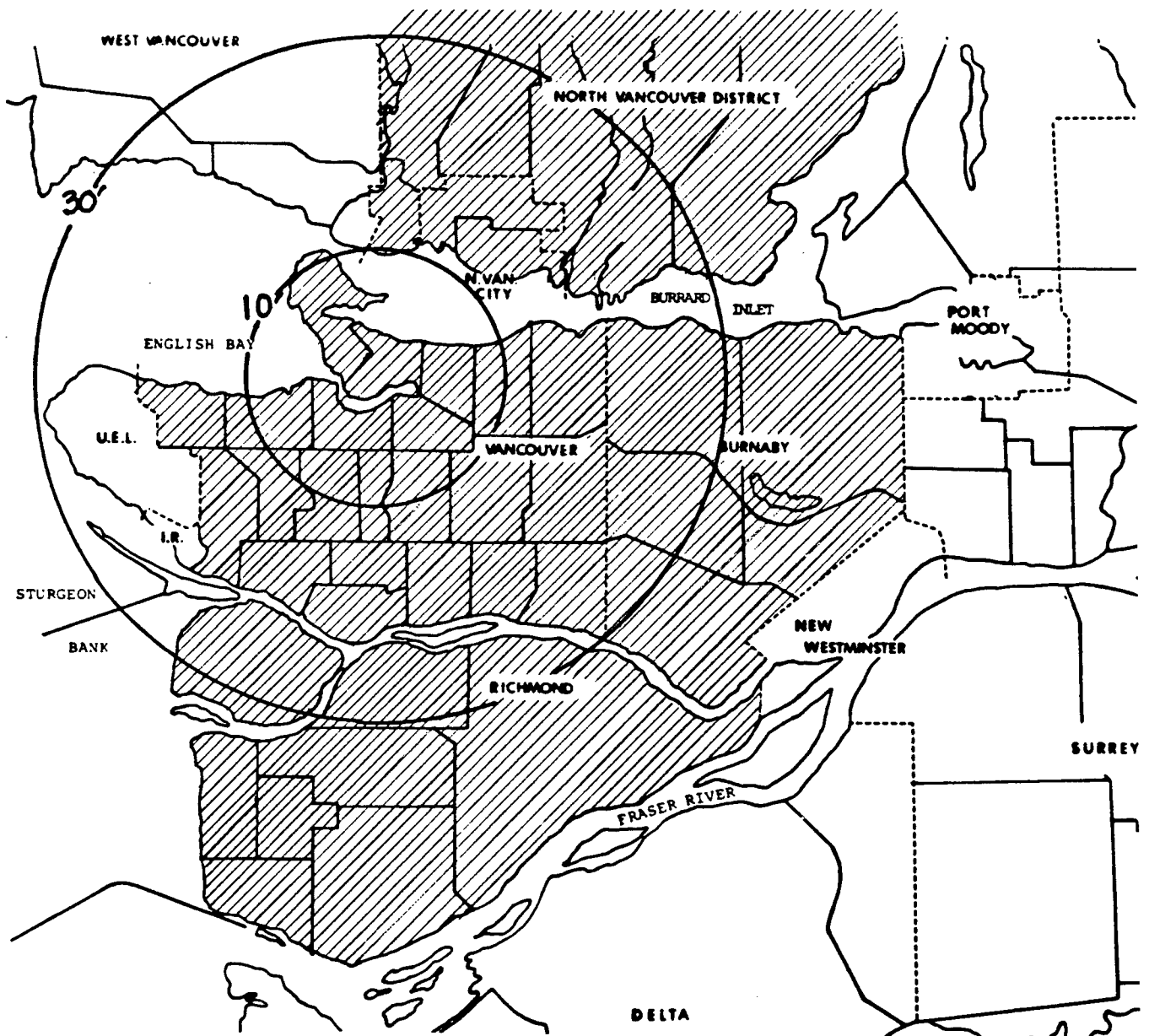


Figure 1. Travel Time to Selected Municipalities from Vancouver City Center
(Selected Municipalities are Shaded)

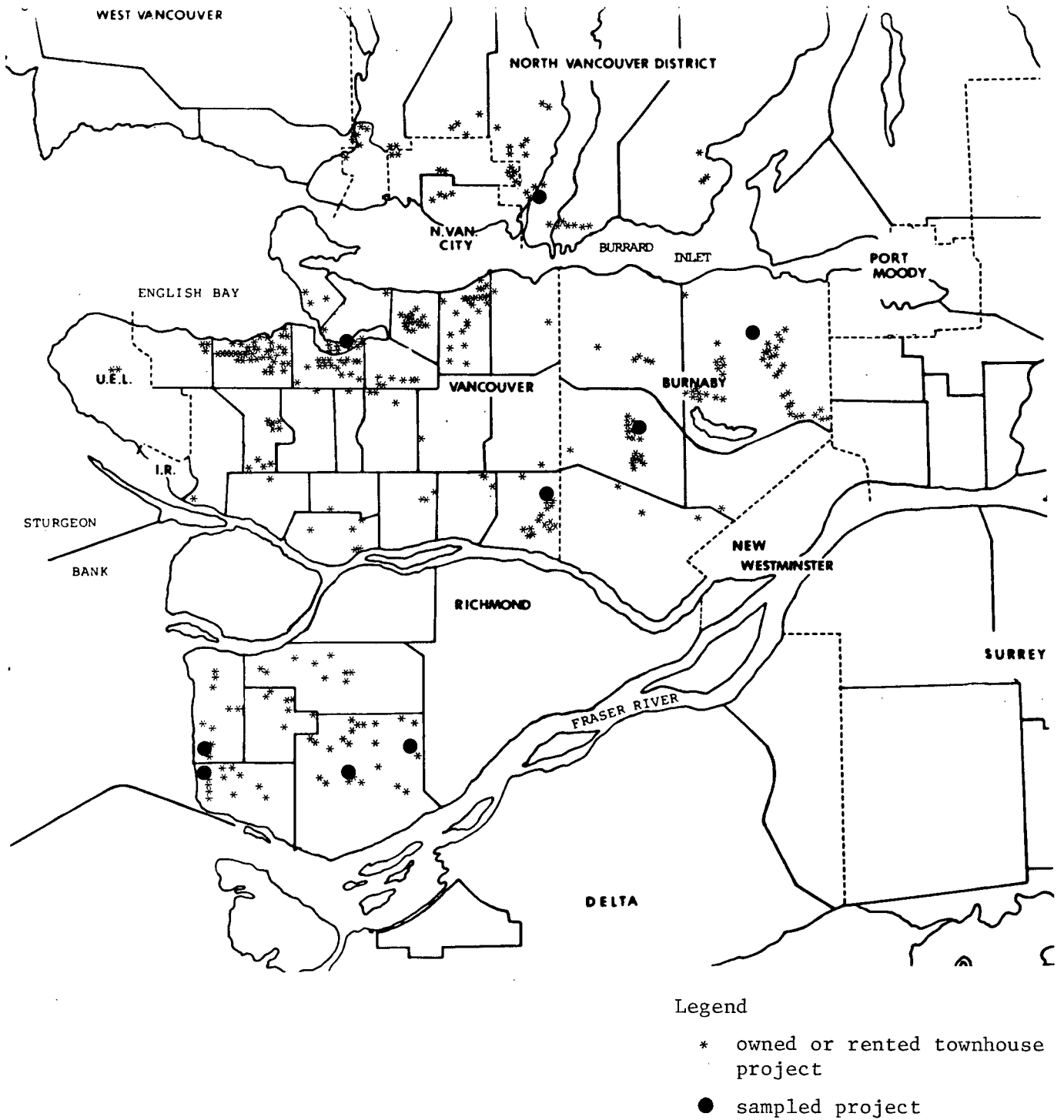


Figure 2. Townhouses in Four Municipalities Including Sampled Projects

There are several terms used throughout the thesis which need to be defined. The term townhouse is used to describe those single family dwelling units having one or more storeys (most commonly two) which are joined at the side walls to other similar units to form a row. The related terms row house, link house, and terrace house are also used to describe similar housing forms. For the purposes of this study, the term townhouse will be used to include all houses which satisfy the definition given above. Detached single family housing will be referred to simply as "single family".

Townhouses are also referred to as condominiums; there is considerable confusion about the precise meaning of this term. A condominium is any dwelling unit owned by the strata title form of ownership; the unit may be an apartment, a townhouse, a duplex, or even a single family detached home. This form of ownership, in contrast to the more familiar title in fee simple, is fairly new in North America and means that an owner holds title in fee simple to his dwelling unit as well as title with all other owners to any common grounds or areas (see Pavlich, 1978). For example, the owner of a condominium in a high-rise apartment building owns his apartment (from the center of the space between the walls) and owns his share of the grounds outside, the parking lot, foyer, elevator, laundry room, and corridors. The owners of a condominium structure automatically belong to their strata corporation and a council of owners is elected to represent the owners and administer the business of the condominium development. This aspect of condominium life is one of the least understood by prospective owners. The strata council sets and collects a monthly maintenance fee from each owner to pay for maintenance of the building exteriors, common facilities such as pools and recreation buildings, fire insurance, and the maintenance of all common landscaped

areas. The strata council hires a management company to advise the council, and the landscaping is usually contracted to a maintenance firm.

Townhouses can be rented, owned by cooperative ownership, or, more commonly, owned as condominiums. The latter may also be known as "strata title" townhouses.

Townhouses can be stacked on top of each other to form a four-storey building, combined with apartments on the bottom or top to form a three-storey building, or mixed with single-storey attached houses. All of these forms are much less common in North America than the traditional two-storey row of townhouses.

2.0 LITERATURE REVIEW

In order to provide the reader with the necessary background, it is important to review the current research on multiple housing occurring in architecture, sociology, and psychology.

The overview begins with literature describing the need for better outdoor space design in multiple housing, the system of open space design founded on graduations of privacy, and current concepts of privacy relevant to outdoor space and housing. Section 2.2 discusses the importance of user studies to successful housing design and reviews the most important failings of current user research. The final section summarizes the information available about townhouse owners and their preferences for the privacy, use, and design of private outdoor space.

2.1 THEORY OF PRIVACY AND OUTDOOR SPACE DESIGN IN MULTIPLE HOUSING

Outdoor Space Design in Multiple Housing

The quality of outdoor space design in multiple housing projects has concerned several authors. Katz (1963, 1966) stated that increasing the density of housing adversely affects three aspects of "liveability" in housing: privacy, individuality, and usable open space. He criticised the general open space planning as poor and a useless waste of land, and said that usable private outdoor space is usually not provided at all.

The principal preoccupation of designers seems to be with buildings - the solids of a site. Once the buildings have been placed on a site and the circulation routes have been added, what remains is leftover space. Yet these voids - areas framed by buildings, walls, planting, etc. - play a fundamental part in the creation of superior environments (Katz, 1966).

Murray and Fliess (1970) confirmed that in Canada:

... Many housing projects provide vast open spaces which are frequently poorly maintained and serve no particular use ... Generally there is a lack of private garden or sitting spaces at no gain to the general use of the open spaces. Many housing projects exhibit a lack of definition between the small private outside space and the cluster spaces.

A Hierarchy of Open Space

This issue of the definition of private outdoor space has been studied by Walkey/Olson (1976), who said that residents' expectations of privacy and liveability have been formed by experience with traditional single family houses where the function and separation of areas of outdoor space are clearer than in multiple housing.

In single family areas the majority of the land with the exception of the streets and lanes is in the private or the semi-private domain. The back yards and side yards offer the greatest privacy while the front yard in most areas is a semi-private domain under the control of the resident, but developed and maintained in a manner acceptable to the neighborhood.

In contrast, the space around medium density developments is almost entirely dedicated to the semi-public realm. The majority of outside space is merely decorative, setting an image to the public world. Balconies and private gardens are minimal and usually are under the control of the collective opinion of the neighbors in the cluster. Often the maintenance and the type of use of outdoor space is regulated by management firms or by restrictive covenants, set down by the original owner. Very little space is in the private domain of the residents. This is one of the new concepts in living which is totally unfamiliar to residents accustomed to single family neighborhoods.

Whyte (1964) stated that " ... it has long been evident that the small, intimate space is the most precious of all to people" and that the transition from the private space to the common is the trickiest problem for the designer.

Chermayeff and Alexander (1963) stressed that privacy is needed most urgently in the home. To build cities which are properly balanced between community and privacy, they recommended a "hierarchy of clearly articulated

domains", which includes: the urban public, urban semi-public, group public, group semi-public, family private, and individual private.

Many cultures have developed clear physical expressions of the need for varying degrees of privacy (Rapoport, 1969), such as the walled homes in some cultures which establish a clear separation between the public streets and the private home. The traditional single family home in North America uses three mechanisms to define privacy and territory: the spatial separation of individual houses on large lots; the separation of spaces inside and outside the home using building form (walls, screens, doorways); and the separation ensured by a social system which dictates the recognition of property boundaries and acceptable behavior in public, semi-public, and private spaces (Walkey, 1976). Walkey compared compact housing being built today with the single family house and concluded that compact housing does not satisfy the needs of people accustomed to single family housing for privacy, territoriality, or individuality, although thoughtful design could make compact housing an acceptable alternative to single family housing.

Gauchat (1978) urged the use of this "suburban metaphor" in the design of outdoor space in higher density housing. He stated that the essential qualities of the suburban yard are the multiple-use nature of the space, the clear privacy transition from front yard to back, and the ability of residents to personalize their back yards. Halkett (1978) also stressed the multiple use and informality of the suburban yard as important aspects of its popularity.

Newman (1972) studied higher density housing and concluded that the boundaries defining territory that are so clear in single family housing are much more difficult to establish in denser forms of housing. He suggested that

both real and symbolic boundary mechanisms can be used to define the privacy hierarchy in housing. Real mechanisms include building form, high walls and fences, and locked gates and doors, and the symbolic mechanisms suggested were open gateways, light standards, short runs of steps, plantings, and changes in the texture of walkway surfaces.

This issue of privacy is important enough to merit a brief review of the definitions in the literature which are relevant to housing.

Privacy

Privacy is defined by most authors as freedom of choice in a person's dealings with people or the control of unwanted contacts with other people. Proshansky et al. (1970) stated that the psychological function of privacy is "to increase the individual's freedom of choice in a particular situation by giving him control over what, how and to whom he communicates information about himself". Marshall (1970) defined privacy as the "ability to control the degree to which others have access to the self, through behavior oriented away from others and the presentation of barriers to the behavior of others oriented toward the self".

The perception of privacy is founded on cultural systems which define the use of space by people. A pioneer in the study of human use of space is Edward Hall (1966), who defined four zones of human interaction defined by distance (intimate, personal, social, and public) and observed the behavioral language used by different cultures to signal when these boundaries were being crossed. Sommer (1969) has studied what he calls the "defense of personal space", the reaction to the violation of privacy by another person, which uses gestures and behaviors such as the avoidance of eye contact and flight, and contrasts this behavior to the human defense of territory, which is accomplished by visible boundaries or markers.

In an effort to understand privacy, several authors have divided the concept into a number of states and components. Proshansky et al. (1970) summarized research which has defined four privacy states: solitude; intimacy; anonymity; and reserve. Marshall (1970) was able to define a person's attitudes toward privacy by means of six components: non-involvement with neighbors; seclusion at home (visual and auditory); solitude; privacy with intimates; anonymity; and reserve. The complexity of the concept of privacy, as shown by these two authors, leads to the realization that privacy in the home environment is a concept not easily defined or measured.

2.2 THE NEED FOR USER RESEARCH

User Research

The value of knowing what people want in their housing has been amply demonstrated by the failure of some high density housing projects erected in the last two decades in North America and Britain (Newman, 1972). Newman stated that the failure of these relatively new housing forms, particularly spectacular in the case of St. Louis' Pruitt-Igoe project which had to be destroyed because vandalism had rendered it completely uninhabitable, is partly due to a lack of the tradition and practice which exist for the more familiar housing forms. In the absence of tradition, designers have either been willing or compelled to depend on their own intuition and assumptions about the way people live. Zeisel (1975) and Cooper (1970) have both discussed why purely intuitive design often fails to produce good multiple housing.

One of the primary pitfalls in the design of housing is that the architect rarely belongs to the group involved (Zeisel, 1975). Lacking information

about the users, who can rarely be identified in advance, the designer must proceed on the basis of his assumptions about how the building will be used by the residents (Cooper, 1970). The only way to test these assumptions is to return when the housing is occupied and see if it works the way the designer intended. Information gained from these "post-occupancy evaluations" can then be used in future designs (see Zeisel and Griffin, 1975), but unfortunately this type of evaluation is rarely done. In fact, many buildings are evaluated by architects based only on their appearance, often before the residents even move in.

Cooper found that if the architect decides to resort to designing the housing so it fulfills purely functional criteria (such as a room must be large enough to accommodate certain activities) there are still problems. The designer may make inaccurate assumptions about the way people use space inside and outside the home (Cooper, 1970), and, also, the functional approach tends to ignore the multiple use of space, which is especially critical in denser forms of housing (Zeisel, 1975).

Designers also tend to apply their own value systems and aesthetic judgements without realizing that lay people see things differently.

Designers often fail to realize how much difference it makes to their view of the world that they respond to buildings and townscapes with eyes more discriminating and intellects more sensitive to design than those of the average layman. Their failure to appreciate this point leads them to make the fallacious assumption that the users of buildings will react to them as they do themselves (Broady, 1966).

Kaiser et al. (1970) and Cooper (1975) found that people do not evaluate their housing by the same criteria that professionals may use. This is one of the best arguments for designers becoming familiar with user research; it helps designers realize that people's opinions about their environments are worth listening to.

Social scientists (psychologists, sociologists, and anthropologists) collect information on user needs and values, but the application of their findings to design problems is often difficult. The studies are not usually intended to produce recommendations for designers, for which few social scientists are qualified to do anyway, and designers are rarely trained to interpret and evaluate the data reported by social scientists (Sommer, 1972). Even without these professional difficulties, the interpretation of user data involves a number of problems.

Problems in the Measurement of User Needs

A number of methods exist for collecting information about people's needs, values, and attitudes, including cognitive mapping, game playing, and open and closed interviews and questionnaires. All of these methods have the same basic problem: how useful is the information received? Researchers admit that user data have the following discomfiting properties:

1. Responses can be strongly influenced by an interviewer's statements, attitudes, or gestures (University of Michigan, 1970).
2. Responses suffer from the "halo effect" - immediate events may temporarily influence a person's opinions and attitudes (Proshansky, 1974).
3. People's needs change with time, with the social context, and with technology (Mann, 1972).
4. The distinction must be made between a person's needs and his aspirations.
5. People's responses differ depending on experience, residential history, relative deprivation, advertising, aspirations, and environmental awareness (Zeisel, 1975).

Other problems include the over-simplification of research models by the elimination of variables which are too difficult to measure, and the eventual problem of deciding where to set standards based on the data collected (Mann,

1972). Partly because of the problems listed above, and partly because people differ, user data rarely provide a clear consensus the designer can use to justify the inclusion or elimination of a design feature. The data are almost always distributed over a range of possible responses; the designer still has to make value judgements in order to decide what goes in the design.

All of these problems argue for the careful collection and interpretation of results from user studies. These results are by no means useless. With the proper qualifications, information about what people want and think is invaluable in the design of the housing environment.

2.3 RESULTS FROM USER STUDIES

Who are Townhouse Owners?

Most housing studies contain a description of the residents surveyed, but older studies and those conducted in other countries (e.g. Britain) are of limited use for comparisons with the data that will be presented in this study. Two studies have sampled Vancouver condominium owners (Condominium Research Associates, 1970 and Eadie, 1978). These studies are discussed below with the understanding that they both include owners of apartments and duplexes, as well as townhouses. The results of a large study of American townhouse projects by Norcross (1973) are also reported; this study also included a small number of duplexes, "four-plexes", and apartments.

Most townhouse owners are married people in their 20's and 30's with one child (Norcross, 1973) and an average family size of 2.8-3.1 people/household. This information was confirmed by local surveys reporting family sizes of 2.7-3.4 people/household in Vancouver area townhouses (GVRD, 1977a,b). The substantial number of people over 35 in the townhouses sampled by Eadie and Norcross contradicts the common impression that townhouses and condominiums

serve only as "transition" housing for young families establishing equity and as a "last stop" for older couples with grown children whose large single family homes have become "empty nests" (Perin, 1977). The existence of a sizable group of satisfied middle-aged townhouse owners should dispel the image of townhouses as makeshift housing.

The majority of condominium owners in Eadie's sample had several years of education after high school and reported incomes above average (Eadie, 1978). Lansing and Hendricks (1967) and Michelson (1969) both found that residents of townhouse and condominium projects had education levels well above average. This picture of townhouse owners as young and middle-aged people with higher than average incomes and education can be contrasted with the findings reported by Battles (1976) in his survey of single family homeowners' attitudes toward townhouses. He found that people thought townhouse owners were all kinds of people except young singles and people in upper income brackets. Both of these groups were found in the townhouses sampled by Norcross (1973) and Eadie (1978).

Most townhouse and condominium owners rented their last residence, which was most often an apartment or a single family house (Condominium Research Associates, 1970; Norcross, 1973; GVRD, 1977 and 1978). Most of the people who had owned homes were older and had moved from single family homes (Eadie, 1978). The most common reasons cited by former owners for moving to a townhouse or condominium were the low maintenance responsibilities of townhouse living and a decrease in family size. Renters usually moved in order to establish equity rather than continue to pay rent, and to get more space (Eadie, 1978).

Condominiums are chosen over single family for reasons of price, lower maintenance, the location convenient to work, project recreation facilities, and the well-maintained neighborhoods and good environment (Norcross, 1973; Eadie, 1978; GVRD, 1977a-c, 1978). Lansing and Hendricks (1967) found that people living in urban townhouses most often cite the convenience and location as their reason for buying, where suburban residents tend to mention features of the house and lot. Eadie (1978) reported that units were chosen for interior features (quality of construction, large rooms, and fireplaces) and for the size of the patio or balcony, and projects were chosen for the landscaping of common areas, children's play facilities, the maintenance of common areas, and the swimming pool.

When townhouse and condominium owners were asked how long they intended to stay, about half (and particularly those over 30) said five years or more (Norcross, 1973; GVRD, 1977a,b). The majority of people moving would look for a single family house; this strong preference for single family houses has been reported by numerous authors (Michelson, 1968 and 1969; Hinshaw and Allot, 1972; Sanoff and Sawhney, 1972; Knight and Menchik, 1974; Cooper, 1975; Battles, 1976; Eadie, 1978). In contrast, there are several reports that residents of townhouses and other multiple housing show more preference for their present kinds of housing than people who have never lived in multiple housing (Lansing and Hendricks, 1967; Condominium Research Associates, 1970; Cooper, 1970; Lansing et al., 1970; Burnaby Planning Department, 1974). This is good evidence for satisfaction with townhouse living; as many as a third of the townhouse owners sampled by these authors no longer saw the single family house as their ideal.

One shortcoming of surveys of housing preference is the confusion of a person's ideal housing with his more realistic expectations for housing. Most

reports seem to concern people's preferences with no reference to economic constraints, but Bell and Constantinescu (1974) collected both kinds of information from multiple housing residents in Vancouver. As their ideal house, 71% chose single family, but if they were unable to afford single family housing, 69% would choose a townhouse and 23% an apartment. This illustrates the need to distinguish between ideals and realistic expectations for housing.

Michelson (1969) and Cooper (1975) have both collected information on housing preference by presenting respondents photographs or drawings of different types of housing and asking them to choose their preferred house type. Michelson showed people drawings of a single family house, a townhouse, an apartment building, and a "futuristic" single family home. The majority of people (83%) chose the traditional single family house and the rest (17%) chose the townhouse. The reasons given for choosing the single family house were the privacy inside the house, the yard making single family housing the best for raising children, and the freedom for family activities with less fear of disturbing neighbors with noise. Cooper showed residents of a public townhouse project near San Francisco photographs of a suburban single family neighborhood, an older single family area with the houses divided into apartments, their own townhouses, and 3-storey urban townhouses. Almost all the respondents (92%) gave the suburban single family area as their first choice, and the older single family houses were second choice, their townhouse project third, and the urban townhouses fourth. Social and environmental reasons (nice neighbors and the appearance and good maintenance of the neighborhood) were given for the choice of the single family suburban house, but the importance of the space between houses was demonstrated by the preference for apartments in separate houses over townhouses.

The Desire for Private Outdoor Space

The desire for private outdoor space on the part of residents of multiple housing has been demonstrated by a number of authors. In several studies, at least two-thirds of the people surveyed thought it was "very important" or "very valuable" to have some private outdoor space (Lansing et al., 1970; Cooper, 1971; Saile et al., 1971; Norcross, 1973; Sandvik et al., 1973; Harding et al., 1975; Vischer Skaburskis, 1980b). When Cooper (1970) asked people whether they would trade some of their private yard for more space inside the unit, over two-thirds said no, and Bell and Constantinescu (1974) found that people's commitment to private yards did not diminish when economic constraints were included in the housing decisions. Townhouse residents surveyed by Cooper (1967) considered their back yards their most valued possession, and a quarter of the people in the study by Gilmour et al. (1970) reported that their private outdoor space was the feature they liked best about their housing.

The Privacy of Outdoor Space

The privacy of these small yards is also important to people. Given the choice of a small private yard or a share of a larger communal yard, Griffin (1974) found that people chose the smaller, private one. Michelson (1969) reported that people who have communal outdoor space would move in order to get private space, primarily so they could do more things in the private yard. Willmott (1962) asked people to choose between their present yard, one that was smaller and more private, and one that was larger and less private. A third (33%) chose the smaller, more private yard, 43% chose to keep their yard as it was, and the rest preferred the larger, less private yard.

Many studies of multiple housing report that the degree of privacy provided in the outdoor spaces is not sufficient for most residents. Up to a

third of the residents of townhouse projects were dissatisfied with the privacy of their yards (Willmott, 1962; Department of the Environment, 1971; Sandvik et al., 1973) in comparison to only 10% of residents in a courtyard housing project (CMHC, 1974).

Kuper (1968) found in a study of British townhouse and apartment owners, that "for an appreciable number of people the ideal would be complete physical isolation" in the back yard. She also found that many people said their activities in the back yard were restricted by the lack of privacy. Willis (1963) found that privacy inside the house and outside could be divided into three categories of privacy: privacy in the home; privacy in social contact with neighbors; and privacy from overlooking (being seen from upper-storey windows). She discovered that overlooking bothers some people more than others, and also depends on what people are doing; for example, people relaxing in their yards mind being overlooked more than people who are gardening. Gatt (1978) found that the only activity for which people wanted privacy was rest and relaxation.

A View vs. Privacy

The courtyard house surrounds its yard or at least three sides and courtyard gardens serve to illustrate one of the conflicts in the design of private outdoor space: which is more important, view or privacy? A truly private garden is completely surrounded by fencing to at least eye level, and there are few views from such gardens. This conflict between view and privacy is usually resolved by architects and builders in favor of the view by providing partially-screened patios and yards. What do the residents prefer?

Results from one courtyard housing survey show that the majority of people (72%) chose their houses because of the private courts and that most had

accepted the limited view in return for the increased privacy (Byrom, 1970). From several studies it is clear that some people dislike a completely enclosed yard and prefer to see people and socialize (Ministry of Housing and Local Government, 1967; CMHC, 1974; Cooper, 1975; Gatt, 1978), but at the same time the evidence of a general preference for enclosed private yards is overwhelming (Cooper, 1970 and 1975; Gilmour, 1970; Saile, 1971; Byrom, 1972; Sandvik et al., 1973; CMHC, 1974; GVRD, 1977a and b).

Fences for Privacy and Control

Various studies indicate that there are two basic reasons for the preference for fences: privacy and control (Norcross, 1973; Cooper, 1975; Zeisel and Griffin, 1975; Vischer Skaburskis, 1980b). Fences are desired for privacy from people seeing in from sidewalks and adjacent yards, to prevent unwanted views out of the yard, and to relieve the feeling of crowding and density in the neighborhood. Many people also want fences in order to have more control over their yard, to define the area that is set aside for their use only, to keep children, other residents, and pets from coming in the yard and damaging plants and lawn, and to create an enclosed play area for small children.

The desire for privacy tends to depend on the activity occurring; several authors report that people want privacy for sitting and relaxing, but that they are not concerned about privacy for gardening and other more active pursuits (Willis, 1963; Gilmour, 1970; Gatt, 1978).

Use of Private Outdoor Space

Zeisel and Griffin (1975) reported that unenclosed back or front yards were rarely used by residents, and Cooper (1967) found that the back yards at Easter Hill were rarely used when company visited because of the almost com-

plete lack of privacy. A number of studies of North American multiple housing have reported the following uses of private outdoor space: barbequeing and eating outside; sitting and sunbathing; growing flowers and some vegetables; children's play; drying laundry; having company over; storage; and messy chores (Cooper, 1967 and 1970; Saile, 1971; Sandvik et al., 1973; CMHC, 1974; Becker, 1974; Zeisel and Griffin, 1975; Beck and Teasdale, 1977; GVRD, 1978; Vischer Skaburskis, 1980b).

Size of Private Outdoor Space

A number of studies have asked residents to evaluate the size of their private yards and the results indicate that a majority of residents are satisfied with a yard of approximately 400 square feet (Willmott, 1962; Department of the Environment, 1971; Ministry of Housing and Local Government, 1969a,b; Sandvik et al., 1973; CMHC, 1974; Cooper, 1967; Gatt, 1978). Kiff (1974) recommended that the size of the private outdoor space should equal the combined area of the unit's living room, dining room, and kitchen, or a minimum of 400 to 800 square feet. Sandvik et al. (1973) suggested that private yards should be large enough for a range of activities, and be sunny and well-ventilated.

Front Yards in Townhouses

Most townhouses are built with some open space at the front of the units and a patio or yard at the back. A number of authors have concluded that a clear distinction should be made between the public front and the private back yard (Cooper, 1967; Shankland and Cox, 1967; Saile, 1971; Kiff, 1974; Cooper, 1967; Beck and Teasdale, 1977; Gatt, 1978). Front yards are used for socializing and to separate the house from the street, and back yards are used for more private family activities, such as eating and relaxing. Some people

would like their open front yards fenced to keep people and pets out and to define their property, but few people want the front yards to be private (Byrom, 1972; Cooper, 1967).

Problems in Townhouse Projects

Noise

One of the most frequently mentioned problems in townhouse studies is noise: noise inside from a lack of adequate soundproofing and noise outside from children playing, neighbors, and traffic (Lansing and Hendricks, 1967; Lansing et al., 1970; Department of the Environment, 1971; Norcross, 1973; Sandvik et al., 1973). Eadie (1978), Gatt (1978), and Bell and Constantinescu (1974) found that residents of multiple housing in the Vancouver area consider the lack of interior soundproofing a very important problem. Bell and Gatt both reported that dissatisfaction with inside noise was significantly related to a person's satisfaction with the development, and Eadie found that lack of soundproofing was the number one complaint of the townhouse owners he surveyed. On the other hand, some authors mention that some people are not concerned about noise and seem to accept it as part of life in multiple housing (Becker, 1974; Gatt, 1978).

Parking

A challenge in designing multiple housing in North America is to provide sufficient parking close to the units without making the development look like a parking lot. From reports in the literature it is clear that it is impossible to satisfy everyone unless carports in front of every unit could be provided (Bell and Constantinescu, 1974). Otherwise, many residents complained that too little parking is available for them and their guests, that spaces should be assigned, that rules against parking in project streets should be

enforced, and that streets should be wider (Condominium Research Associates, 1970; Sandvik et al., 1973; Norcross, 1973), while at the same time Norcross (1973) pointed out that too many parked cars can create a feeling of density.

Children's Play

Children's play is another common problem in multiple housing developments. A critical problem in some projects was children playing in parking lots and streets (Norcross, 1973; Cooper, 1975; Beck and Teasdale, 1977). There were high numbers of children in many developments and they tended to play almost everywhere but the planned play areas, if there were any (Condominium Research Associates, 1970; Norcross, 1973; Cooper, 1975; Eadie, 1978).

Other problems included pets getting into yards, and insufficient outside storage for gardening tools, lawn furniture, and bikes (Saile, 1971; Norcross, 1973; Zeisel and Griffin, 1975; Beck and Teasdale, 1977).

Suggestions for Site Design

There are several aspects of townhouse design that concern residents and researchers, including landscaping, children's play areas, recreation facilities, and the appearance and siting of buildings.

Norcross (1973) recommended that developments should have good landscaping that varies from one part of the project to the other, that yards should be bigger and more private, that the houses should be in shorter rows and in clusters, and that the unit facades should vary.

Battles (1976) reported that residents of single family neighborhoods think that townhouses should have mature trees and good landscaping to soften the impact of the buildings, that there should be some variety in unit design, play areas should be provided, more wood and brick should be used on house exteriors, that units should have their own fenced yards, developments should

look more like single family houses, long rows should be broken up, and that the general appearance of the development is very important.

Townhouse owners surveyed by Eadie (1978) said that the most important project features were well-landscaped common open space, adequate play facilities, well-maintained common areas, a large woods or open area in the project, a pool, and covered parking.

Cooper (1970) found that the development's landscaping, general appearance, private outdoor spaces, safe play areas, and project layout were important factors in resident's general satisfaction.

Landscaping

Several authors confirmed the importance of good landscaping in multiple housing projects. Sandvik et al. (1973) stated that 40% of the residents of one project cited the project's setting, trees, and landscaping as their main reason for giving the project high ratings. Becker (1974) found that landscaping was especially important for satisfaction if a wooded area was preserved on the site, or if good landscaping was in contrast to a barracks-like appearance of the buildings. Cooper (1975) concluded that landscaping was important not just to make the project attractive, but also because residents saw it as a necessary and important feature of an otherwise drab environment.

Site Layout and Size

The importance of site layout and building arrangement to resident satisfaction has been mentioned by Cooper (1970) and Beck and Teasdale (1977). Cooper found that it was important to residents that the site have no through traffic, security, as little noise as possible, and nice views. Beck and Teasdale reported that buildings should be in shorter rows, not directly

opposite each other, and not closer than 35 feet, and that residents preferred an arrangement with the buildings around a court because of the safety for children playing.

Resident evaluation of project size is found to have less to do with actual size than the appearance of size. Norcross (1973) stated that people generally preferred smaller projects, but that larger developments were quite acceptable if the density is fairly low and the houses are divided into neighborhoods. Bell and Constantinescu (1974) also found that people's perception of the size of their project was not based directly on the actual size and that cluster arrangements and variation in facades can make developments seem smaller. Becker (1974) concluded that people's satisfaction with the size of their housing developments was dependent more on the distance between buildings than on the actual size of the development.

Recommendations for Private Outdoor Space

A small sampling was done of recommendations and policies for the design and provision of private outdoor space in multiple housing. This survey is by no means exhaustive but does serve to illustrate the information and guidelines available to architects and developers who are designing multiple housing.

The need for privacy in the outdoor space provided with each unit was recognized by most of the authors (Murray and Fliess, 1970; Kiff, 1974; GVRD, 1975; North Vancouver, 1976; Ottawa, 1977; Surrey, 1977), and several explained the need to establish a hierarchy from public spaces to the private (Calgary, 1970; Murray and Fliess, 1970; GVRD, 1975; Cooper, 1975; Vischer Skaburskis, 1980a), but only one (Cooper, 1975) specified that fencing should be solid enough to ensure real privacy. Most authors stated a minimum height for privacy screens (usually 5 to 6 feet), but there was little or no detailed advice about the degrees of privacy that fencing can provide.

Recommendations for the size of private yards ranged from 150 square feet for a bachelor unit (CMHC, 1977) to 300 or 400 square feet for 3 or 4 bedroom units (Murray and Fliess, 1970; Cooper, 1975; Ottawa, 1977). Calgary (1970) recommended 100 square feet of space per person, Kiff (1975) stated that the size of the yard should be equal to the unit living room, dining room, and kitchen combined, and North Vancouver (1976) stipulated a size equal to 20% of the unit's area.

3.0 METHODOLOGY

3.1 QUESTIONNAIRE

Introduction

A host of methods have been used to collect information about people's use of their environment and their attitudes toward it. Techniques such as observation and time-lapse photography do not involve direct contact with people and so information can be collected which is not biased by any interaction between the researcher and the subject. Certain kinds of studies must obtain data directly from the people being sampled; any research of attitudes, preferences, or satisfaction must collect this information from users. How carefully this kind of information is collected can determine the utility of the study's findings.

Methods for collecting information from people include cognitive mapping (Lynch, 1960), game playing (see Bell, 1974), and questionnaires and interviews. A questionnaire is usually completed by a respondent with little or no interaction with the researcher; the responses to questions can all be predetermined (closed questions) or spontaneous responses can be solicited (open questions). Questionnaires can be sent by mail or hand-delivered, and responses can be mailed or picked up by researchers. Mail-back questionnaires require fewer personnel for distribution but suffer from poor response; often as few as 30% of the questionnaires are mailed back. Questionnaires delivered and picked up by researchers tend to have higher rates of response and may be worth the extra time and expense.

Interviews allow interaction between the interviewer and the respondent and can eliminate confusion about ambiguous questions, allow the interviewer to pursue topics of interest, and provide useful information about the

respondent that the more impersonal methods miss. Interviews can be structured or unstructured; the questions can be determined in advance and discussion encouraged only to clarify answers, or the interviewer may simply have a list of issues that need to be covered and the sequence and length of discussion are determined by the interviewer as the interview proceeds.

The Interview

The structured interview was chosen as the method of data collection for this study. Information was desired on a number of specific topics, such as ratings, uses, and preferences, and could have been collected equally well by a closed questionnaire. The interview was chosen for its higher response rate and the opportunity it provides for collecting comments and explanations useful in the interpretation of the results.

A number of accepted guidelines for the design of interviews and questionnaires were followed:

1. The questionnaire should be as short as possible and still collect all the necessary information. People granting an interview lose interest after a fairly short time and should not be asked irrelevant questions. At the same time, complete information must be collected to make the study worthwhile.
2. Common sense should dictate the order of the questions. Once the topics to be included are selected, the questions are written so that issues follow in a logical sequence, general questions precede more specific ones, and any personal questions are left until near the end of the interview so that rapport with the respondent will permit these questions to be asked without offense.
3. Respondents should be given a copy of the questions and the possible responses. There are three advantages to this method: having a copy allows people to read the question as it is asked and eliminates repeating questions; the respondent can choose a response from the alternatives printed on the page rather than from a series read by the interviewer; and the copy tends to keep the respondent's attention fixed on the interview.
4. Questions should have options for unanticipated responses and respondents should always be allowed to say "no answer". The latter is important especially when personal information is requested, such as age or income.

5. Writing down responses may be better than tape recording the interview. Tape recording the interview tends to make people nervous, at least at the beginning, and is less necessary in a structured interview. The time it takes to write down respondents' comments often encourages them to clarify their answers, and this produces useful information and helps to establish rapport.

A copy of the interview with the responses to each question is contained in Appendix 1. The interview began with general questions asking people to rate their project, its outdoor space in general, and their backyard, including its size, privacy, and fencing. The interview continued with questions about problems in the project, noise, the size, material, and features of the patio, and use of the backyard. Respondents were asked about their evaluation and use of front yards and balconies, and about a number of general project issues, such as maintenance, site design, play facilities, and management. The final questions in the interview collected information about the respondent's housing preferences and housing background and his demographic and socioeconomic characteristics.

Pretesting

A critical step in designing a questionnaire is pretesting. A few trial interviews with eligible respondents can indicate the amount of information required in the introduction at the door, whether any questions are ambiguous, awkwardly worded, or out of sequence, where the list of possible responses is inadequate, and where probes and explanations will be needed to direct the responses. This questionnaire was pretested with six respondents at a Vancouver townhouse project which would have been eligible for the study. The pretest established the amount of time needed to obtain and conduct the interview, the number of people home at different times of the day and on different days of the week, the willingness of people to grant an interview or

make an appointment, and the minimum number of units needed to collect the interviews efficiently.

Several changes were made in the questionnaire as a result of the pretest. Several questions were reworded for clarity, the possible responses on a number of questions were changed, and new questions were added to improve the flow of the questions.

3.2 SAMPLING

Sampling Frame

Before a sample of projects could be chosen, the sampling frame made up of all eligible projects had to be defined. The decision to include the municipalities of Vancouver, Richmond, Burnaby, and the District of North Vancouver was based on two criteria: reasonable travel time from Vancouver, which was the base for the interviewer, and a sufficient number of townhouses available for sampling (see Figures 1 and 2).

Compiling lists of townhouses in each municipality depended on the systems used in the various planning departments. The Richmond, Burnaby, and North Vancouver District planning departments had lists of townhouses and other multiple housing units in their areas which were used with few changes. In Vancouver, however, no such list existed in the city planning department, so the information had to be gathered from land use maps and development permit applications. Tenure and price information for all municipalities was obtained from 1979 B.C. Assessment Authority records, taking as rentals those units with mailing addresses for tax assessments different from the street addresses of the units.

Once lists had been obtained of the location, size, age, tenure, and unit price of townhouse projects in each municipality (see Appendix 3), the sampling frame of eligible projects could be defined based on the following criteria:

1. Units must be townhouses. The definition of a townhouse was expanded to include single-storey attached units and stacked townhouses, but units without access at grade (on ground level) were excluded.
2. Units must be individually owned, not rented or cooperatively owned. This decision was based on the assumption that owners were more likely to be interested and concerned about most of the issues raised in the study. (Whether or not this is true was not tested; for a discussion of the attitudes toward owning and renting, see Perin (1977).) Many projects allow rental of individual units by their owners, and since these rented units were ineligible, the projects had to have a minimum number of owner-occupied units.
3. The project must have at least 30 owner-occupied units. This estimate was based on experience from pretesting, and took into account the efficiency of collecting the interviews and the number of units that might turn out to be ineligible. No maximum size was set. Cooperatives were eliminated from the sample because it seemed likely that the communal system of management might improve resident satisfaction with some aspects of their townhouses, and so the cooperative residents would not be comparable to owners of condominium townhouses.
4. The project must have been occupied for at least 3 months. Setting a three month minimum for residence time ensured that respondents had lived in their house long enough to be able to evaluate their projects.
5. The 1979 B.C. Assessment Authority valuation of the majority of units in each project must be less than \$100,000. A maximum price was selected to eliminate from the sample those units most likely to be occupied by wealthy owners. These "luxury" units were determined with the help of a Vancouver real estate expert and it was thought that making them ineligible would help restrict the study to home owners with more typical economic constraints on their housing choices.
6. The majority of units in the project must have private outdoor space at grade directly accessible from inside the unit. A number of other possibilities exist: a yard on grade reached by stairs from an upstairs unit; or space not on grade, such as decks, balconies, and roof decks. Since the study was concerned with gardening and plants as well as other issues, contact with the ground was considered important.

7. The units must belong to a single strata corporation. Many large townhouse developments are built in sections or phases, and each phase becomes a separate strata corporation. Units within one corporation were all built at the same time and are more likely to have the same type of yards, fences, etc.

Sample Selection

The projects which satisfied the above criteria comprised the sampling frame (see Appendix 3). The sample of projects was chosen by arbitrarily numbering all the eligible projects (for a total of 73), and using a table of random numbers to select nine project numbers (see Figure 2). A total sample size of 90 (ten interviews in each project) was selected to ensure that the sample was large enough to have statistical validity.

The sample projects and brief descriptions are presented in Table 1. Site visits were made to each project to confirm eligibility; the housing form, the number of units, and the private outdoor space were checked to make sure the projects fit the criteria for selection. One project did not satisfy the criterion that the private outdoor space be on grade, so an adjacent project (Champlain Villa) was substituted. It can be seen in Tables 2, 3 and 4 that the sampled townhouses are representative of the sampling frame by price, location, and project size.

3.3 THE INTERVIEWS

Selection of Respondents

Respondents were not selected in advance. If respondent addresses or sex were predetermined, the interviews would have been much more time-consuming to collect because many respondents would not always be home. The sample was selected by interviewing the person who answered the door, as long as they

Table 1. Description of Sample Townhouse Projects

<u>Name</u>	<u>Number from Sampling Frame^a</u>	<u>Address</u>	<u>Number of Units^b</u>	<u>Date Built</u>	<u>Builder or Developer^c</u>	<u>1979 BCAA Valuation</u>	<u>Description</u>
1) Greentree Village (Phase V)	47	4102-4396 Garden Grove Drive Burnaby, B.C.	56(76)*	1975	Daon (Architect: Werner Forster) (L.A.: Dan Matushita)	\$39-44,000	2-storey townhouse built over parking with back at grade and 1-2-storey attached units built at grade
2) Forest Meadows	60	(North of Loughheed Highway at Underhill Avenue) Burnaby, B.C.	76(134)	1977	HCBC (Architect: Bain, Burroughs Hanson, Raimet) (L.A.: John Lantzzius)	\$38-46,900	Stacked 2-storey townhouses with all entries at grade. Lower (eligible) units have back on grade upper (ineligible) units have decks
3) Kingswood Downs	19	1-26/9331 No. 5 Road and 27-62/11751 King Road Richmond, B.C.	62	1973	Adera	\$50,000	2½-storey townhouses
4) Richmond Country Club Estates	25	10680-10980 Ryan Road and 1-32/9030 Ryan Crescent Richmond, B.C.	56	1969	Dunhill	\$38-41,500	2-storey townhouses and 2-storey 6- and 8-plexes with front entries on corridors and backs around perimeter
5) Springmont	34	10800-10840 Springmont Drive Richmond, B.C.	32	1977	Adera	\$43,700	2-storey townhouses
6) Mariners Village	37	1-50/11391 7th Avenue Richmond, B.C.	50	1973	(L.A.: Ekios)	\$52-55,000	2-storey townhouses
7) Lillooet	74	960-1008 Lillooet Road North Vancouver, B.C.	65	1972	Dunhill	\$53-58,000	2- and 3-storey townhouses with entries on grade and backs off living rooms or basements, depending on location on sloping site
8) Champlain Villa	d	3550-3580 E. 49th Avenue and 6600-6900 Arlington St. Vancouver, B.C.	43(110)	1972	-----	\$40,000	2-storey townhouses
9) False Creek-Spruce Neighborhood	5	Ferryrow, Greenchain, Millbank, and Sawcut Streets Vancouver, B.C.	36(48)	1978	Stanzl (Architect: Thomas, Berwick and Pratt)	\$31-92,000	1-3-storey townhouses with back decks

^arefer to Appendix 3^bnumber sampled for interviews^cnumber in parentheses is total number of units in project including ineligible units^dArchitect and Landscape Architect (L.A.) are listed where known

not included in original sample

Table 2. Comparison of Sample and Sampling Frame by Price

	<u>\$30-39</u>	<u>\$40-49</u>	<u>\$50-59</u>	<u>\$60-69</u>	<u>\$70-79</u>	<u>\$80-89</u>	<u>\$90-99</u>	<u>Total</u>
<u>Vancouver</u>								
Sampling Frame	0	181	52	72	96	108	20	529
Sample		110			48			158
<u>Richmond</u>								
Sampling Frame	110	837	927	214	96	0	0	2184
Sample		88	112					200
<u>Burnaby</u>								
Sampling Frame	243	1127	267	0	0	0	0	1637
Sample		210						210
<u>North Vancouver District</u>								
Sampling Frame	0	323	302	86	22	82	0	815
Sample			65					65

Table 3. Comparison of Sample and Sampling Frame by Location

	<u>Sampling Frame</u>		<u>Sample</u>	
	<u>Number of units</u>	<u>% of sampling frame</u>	<u>Number of units</u>	<u>% of sample</u>
Vancouver	529	10.2	158	24.9
Richmond	2184	42.3	200	31.6
Burnaby	1637	31.7	210	33.2
North Vancouver District	815	15.8	65	10.3
	—	—	—	—
Total	5165	100.0	633*	100.0

* Sample represents 12.2% of sampling frame

Table 4. Comparison of Sample and Sampling Frame by Project Size

	<u>20-50 units</u>	<u>50-100 units</u>	<u>Over 100 units</u>	<u>Total</u>
<u>Vancouver</u>				
Sampling Frame	269(8)*	0	260(2)	529(10)
Sample	48(1)	0	110(1)	158(2)
<u>Richmond</u>				
Sampling Frame	230(8)	803(20)	469(3)	2184(31)
Sample	82(2)	118(2)	0	200(4)
<u>Burnaby</u>				
Sampling Frame	238(7)	840(14)	559(4)	1637(25)
Sample	0	76(1)	134(1)	200(2)
<u>North Vancouver District</u>				
Sampling Frame	75(3)	617(8)	123(1)	815(11)
Sample	0	65(1)		65(1)

*Number of units with number of projects in parenthesis

owned the unit and had lived there for at least three months. In order to avoid selecting only people who are at home during the week (most likely women with children), half of the interviews from each project were obtained on the weekend. On each visit to the site, interviewing was started at a different part of the project to avoid selecting people from only one part of the project.

Securing the Interviews

A standard introduction was used (see Appendix 1), explaining that the interviewer was a student at UBC, what the study was about, and what kinds of questions would be asked. People were assured of the confidentiality of their replies and told how long the interview would take. If the person was eligible and willing, the interview usually took place immediately, either in the living room or at the kitchen table. If it was not convenient to do the interview at the time, an appointment later in the day was suggested. If that was not possible, people on the week days were asked if they would mind the interviewer trying again on the weekend. Most people said they didn't mind, and the majority who were home on the weekend did give interviews.

Conducting the Interview

Once the interview was granted, the respondent was given a modified copy of the questions and told that they could read along if they wished, and that the interviewer would write down their answers. People were urged to add any comments as the interview proceeded and reminded that the questions about the use of their yard referred to summertime use. The interviewer made certain to be consistent in the inflection and wording of explanations and probes, and to give neutral encouragement to responses and comments. At the end of the interview people were thanked and, in the first few projects, asked if they would

like to receive a summary of the study results. Almost all said they were interested and wrote down their names and addresses to have the summary mailed. Since the requests were nearly unanimous in the first projects, it was decided to mail all respondents a summary when the study was concluded.

3.4 DATA ANALYSIS

Program Package Used

The data was coded, keypunched, and analyzed with the program package SPSS (Statistical Package for the Social Sciences). This package was selected because it is versatile, relatively easy to learn to use, and well-suited for analyzing data with large numbers of variables.

Analysis Procedures

The method of analysis depended on the nature of the question being asked. When a description of the typical townhouse owner and his housing background, ratings, preferences, and uses of his outdoor space was needed, means, standard deviations, and frequency tables were obtained for the relevant variables (see Tables 5 and 6 and Appendix 1). Some of the variables in the analysis were interval or ratio variables (such as age, income, residence time, number in household), but many were nominal variables. Nominal variables have categories of equal rank or value (such as sex and last place lived), where the mean statistic is obviously of no use. In these cases proportions are reported for each response. Some variables were ordinal; ranking of the responses is possible but the rankings are not equidistant. For example, last tenure and last housing type can be assigned rankings for the purpose of the study, but using the numerical rankings as interval data can only be done with qualifications.

The comparison of responses between projects was done by a series of contingency tables, using the project number as one variable and the response of interest as the other variable in the table. Statistical tests were used to determine the probability that differences obtained could be due to normal variability among respondents, and a 5% level of error was accepted. The statistic used depended on the type of variable being tested for differences among projects. For example, the chi-squared test was used for nominal variables. When significant differences between projects were found, the next question was: which projects are different? Because most of the variables that show differences between projects were nominal variables, nonparametric statistics were used to find these project differences. The Mann-Whitney U Test and the Kruskal-Wallis One-way Analysis of Variance were both available in the SPSS package. The second statistic was used because it made fewer Type I errors (finding differences where none existed).

Most of the variables used in the prediction of ratings from demographic, housing background, and preference information were interval variables. The parametric techniques of factor analysis, cluster analysis, regression analysis, and Pearson's correlation statistic were used.

In order to use the results obtained from factor analysis and cluster analysis, these new composite variables produced by these procedures must be converted into scales. A scale is simply an arithmetic expression which allows the raw data to be converted into scale scores. There are several methods that can be used to construct scales from the component variables. The most straightforward method is used in this study: the variables are weighted and either added or subtracted from the score, depending on their correlation with the factor from which the scale is derived.

4.0 RESULTS AND DISCUSSION

The presentation of results and the discussion of findings have been combined to allow the reader to assess and interpret the information with as little redundancy as possible. The first section (4.1) reports the general response to the interviews. The data collected on the demographic characteristics and housing background of respondents are presented and discussed in section 4.2. Residents' ratings, attitudes, and preferences regarding their projects, backyards, patios, fencing, and privacy are described and interpreted in section 4.3. In the final section (4.4) the construction of scale variables is reported and the results of regression analysis using the scales are presented and discussed.

4.1 INTERVIEW RESULTS

The overall response to the survey was good. Of all addresses contacted, only 17 of 466 (3.6%) refused to be interviewed. In three of the projects (Forest Meadows, Champlain Villa, and False Creek) there were no refusals at all. The majority of people granted the interview the first time they were contacted; only 71 people said it was inconvenient. The favorable response most likely was due to a general desire to help students; many people mentioned this in passing.

The average interview took about 30 minutes; the shortest interview was 15 minutes and the longest was 95. Most people added comments as they answered the questions and this tended to lengthen the interview. This discussion was necessary for clarification and to establish rapport with the respondent, and could not be completely eliminated.

4.2 DEMOGRAPHIC CHARACTERISTICS AND HOUSING BACKGROUND

Who is the Typical Townhouse Owner and What is his Housing Background?

The typical respondent (see Table 5) was a 41-year old woman with a household income of \$29,600 per year. She and her husband had some college or technical training (she had one year less than her husband), and they had an 11 year old child. They had lived in the townhouse for three years and planned to stay another three or four years. They had moved from a rented apartment in Vancouver, and had never lived in a townhouse before. The typical respondent had grown up in single family houses and had rented houses and apartments since then, and eventually wanted to own a single family house on a large lot in the suburbs.

Comparing this typical respondent with reports in the North American literature (Norcross, 1973; Eadie, 1978) shows some differences and some similarities. People sampled in this study are slightly older than townhouse and condominium owners surveyed by Norcross and Eadie, but the incomes and education levels are comparable. The housing backgrounds and ideals reported here confirm the results of Condominium Research Associates (1970), Norcross (1973), GVRD (1977, 1978), and Eadie (1978), who found that townhouse owners were mostly former apartment renters whose housing ideal was single family.

Does this typical description fit respondents from all projects or are some projects different?

Demographics

The demographic characteristics, age, sex, education, and income, were the same for all projects (for summary statistics, see Table 5). This means that all projects attracted the same range of people. The more expensive projects (Mariners Village and False Creek) did not have respondents with significantly higher incomes. This finding is probably due to the elimination of more

TABLE 5. Demographic Characteristics and Housing Background for 90 Residents of Nine Townhouse Projects

<u>Characteristic</u>	<u>Mean (or % Respondents)</u>	<u>% Responses</u>	<u>Standard Deviation</u>	<u>Number</u>	<u>Observed Range</u>
Age (years)	41.2		12.9	90	20-78
Sex					
Male	35.0%			90	
Female	65.0%				
Annual Household Income (in \$1,000)	29.6		14.3	87	10-80
Education (years)					
Males	14.1		3.3	84	8-20
Females	13.6		2.8	87	8-20
Have children				90	
Yes	57.7%				
No	42.3%				
Age of Oldest Child (years)	11.8		7.4	52	1-24
Age of Youngest Child	7.8		5.7	23	1-20
Number in Household	2.8		1.1	90	1-6
Residence Time (months)	37.0		26.1	90	3-99
Last Place Lived				90	
Vancouver	40.0%				
Burnaby	14.4%				
Richmond	13.5%				
North Vancouver, West Vancouver	10.0%				
Other	22.1%				
	<u>100.0%</u>				
Last House Type				90	
Single family	36.7%				
Duplex	8.9%				
Townhouse	5.6%				
Apartment					
Low-rise	34.4%				
High-rise	11.1%				
Other	3.3%				
	<u>100.0%</u>				
Last Tenure				90	
Owned	31.1%				
Rented	68.9%				
	<u>100.0%</u>				

TABLE 5 (continued)

<u>Characteristic</u>	<u>Mean (or % Respondents)</u>	<u>% Responses</u>	<u>Standard Deviation</u>	<u>Number</u>	<u>Observed Range</u>
Last Private Outdoor Space				90	
None	10.0%				
Small balcony	13.3%				
Medium balcony	8.9%				
Large balcony	7.8%				
Small yard	10.0%				
Medium yard	14.4%				
Large yard	35.6%				
	<u>100.0%</u>				
Lived in Townhouse Before				90	
Yes	24.4%				
No	75.6%				
	<u>100.0%</u>				
Childhood House Types				90	
Single family	83.2%				
Single family and townhouse	5.6%				
Single family and rented house or apartment	5.6%				
Rented apartment and/or house	5.6%				
	<u>100.0%</u>				
Other Houses Since Childhood				90	
Single family	11.2%				
Single family and townhouse	3.3%				
Single family and rented house or apartment	41.1%				
Rented apartment and/or house	40.0%				
None	1.1%				
Other	3.3%				
	<u>100.0%</u>				
Ideal House Type				90	
Single family	69.0%				
Duplex	2.2%				
Townhouse	22.2%				
Apartment	3.3%				
Other	3.3%				
	<u>100.0%</u>				
Ideal Tenure				90	
Own	93.3%				
Rent	6.7%				
	<u>100.0%</u>				
How Long Plan to Stay (years)	3.5	1.5		90	1-5
Reasons Moved from Last House				90	
Job change	7.8%	3.7%			
Change in family size	22.2%	10.6%			
Wanted to own	51.1%	24.5%			
Wanted better neighborhood	14.4%	6.9%			

TABLE 5 (continued)

<u>Characteristic</u>	<u>Mean (or % Respondents)</u>	<u>% Responses</u>	<u>Standard Deviation</u>	<u>Number</u>	<u>Observed Range</u>
Wanted better location	14.4%		6.9%		
Wanted house with yard	15.6%		7.5%		
Wanted bigger house	30.0%		14.4%		
Wanted smaller house	17.8%		8.5%		
Wanted less expensive house	4.4%		2.2%		
Other	31.1%		14.8%		
	<u>157.8%</u>		<u>100.0%</u>		
Reasons Chose Project				90	
General appearance	63.3%		25.2%		
Size of project	15.6%		6.3%		
Location	54.4%		21.7%		
Good neighborhood	40.0%		15.9%		
Project features	35.6%		14.1%		
Wanted a townhouse	36.7%		14.6%		
Other	5.6%		2.2%		
	<u>251.2%</u>		<u>100.0%</u>		
Reasons Chose Unit				90	
Available	40.0%		12.8%		
Price	68.9%		22.1%		
Investment potential	28.9%		9.3%		
Inside of house	70.0%		22.4%		
Outdoor space	40.0%		12.8%		
Good location in project	63.3%		20.3%		
Other	1.1%		0.3%		
	<u>312.2%</u>		<u>100.0%</u>		
Reasons Will Move				90	
Change in job or retirement	23.3%		12.9%		
Change in family size	22.2%		12.3%		
Want better neighborhood	7.8%		4.3%		
Want better neighbors	5.6%		3.1%		
Want better location	8.9%		4.9%		
Want bigger yard	33.3%		18.4%		
Want bigger house	47.8%		26.4%		
Want smaller house	7.8%		4.3%		
Want less expensive house	2.2%		1.1%		
Other	22.2%		12.3%		
	<u>147.8%</u>		<u>100.0%</u>		
Features of Next House				90	
House type	94.4%		19.6%		
Price	60.0%		12.4%		
Investment potential	35.6%		7.4%		
Availability	17.8%		3.7%		
Good neighborhood	67.8%		14.1%		
Good location	53.3%		11.0%		
Inside of house	76.7%		15.9%		
Outdoor space	68.9%		14.3%		
Other	7.8%		1.6%		
	<u>482.3%</u>		<u>100.0%</u>		

<u>Income Means by Project</u>		<u>House Prices by Project</u>
Greentree	\$28,500	\$41,000
Forest Meadows	24,167	45,000
Kingswood Downs	29,722	37,000
Country Club	33,750	39,000
Springmont	26,750	43,000
Mariners Village	31,875	67,000
Lillooet	30,000	55,000
Champlain Villa	35,000	55,000
False Creek	40,000	82,000

expensive units (over \$100,000); if more expensive units had been included, differences in incomes would likely have been found.

Family size

There were differences in whether respondents had children ($p=.016$, sig.) and in the related measure of family size. Greentree Village and Lillooet respondents had the lowest number of families with children (only 20% of respondents) and family sizes ranged from 1.7 to 2.7 people/household.

<u>% of Respondents with Children</u>	
Greentree	20
Forest Meadows	70
Kingswood Downs	80
Country Club	60
Springmont	80
Mariners Village	70
Lillooet	20
Champlain Villa	70
False Creek	40

Kingswood Downs and Springmont residents had the highest number of families with children (80% of respondents had children) and family sizes ranged from 2.9-3.3 people/household. Knowing that the projects have different family types and different numbers of children may be useful, given the reports in the literature which relate satisfaction in townhouses to problems with children (Becker, 1974; Bell, 1974).

Residence time and plans to stay

How long people have lived in their house and how much longer they plan to stay are useful measures of their satisfaction with their townhouse. There were no differences between projects on how long people planned to stay (3.5 years on average), or on how long they had lived there (3 years average). Any differences in residence time were due only to project age.

Last residence

The housing backgrounds of respondents showed a number of differences depending on which project they lived in. It was found that people's last place of residence depended on the location of their townhouse project; more than half of the residents in each project had moved from within the same municipality. A number of respondents commented that they also preferred to stay in the same area when they moved the next time.

Last house type

There were significant differences between the projects in the kind of housing people had last lived in ($p=.051$, sig.). Greentree Village respondents had all moved from rented apartments, as compared to respondents from Mariners Village, Lillooet, and False Creek, 50 to 70% of whom had moved from their own single family house. The other projects form an intermediate group with people having moved from apartments and rented houses.

Houses lived in since childhood

There were also differences between the projects on the related question of what types of housing people had lived in since leaving home ($p=.002$, sig.). Although a majority of all respondents had grown up in single family houses, respondents from False Creek were most likely to have owned or rented only single family houses since childhood, while people from Greentree Village had lived primarily in rented apartments.

These findings will be used to test the hypothesis that a person's housing background will affect his satisfaction with some aspects of townhouse living. It is hypothesized that people who have lived in single family houses will be more critical of the size and privacy of the private outdoor space provided in the townhouse projects compared to people who have lived in apartments, for whom the townhouse should represent a substantial improvement in private outdoor space.

Reasons people moved from their last house

When people were asked why they moved from their last house, the most common reasons were wanting to own their home, wanting a bigger or better home, and a change in family size (see Table 5). People who moved in order to own their house were more likely to be living in Greentree Village, Forest Meadows, Country Club, or Springmont ($p=.011$, sig.). False Creek residents

% of Residents Who Moved in Order to Own

Greentree	80
Forest Meadows	70
Kingswood Downs	30
Country Club	70
Springmont	70
Mariners Village	40
Lillooet	30
Champlain Villa	60
False Creek	10

were least likely to cite ownership as their reason for leaving their last house, probably because the majority owned their last house. The finding that Greentree Village and other projects seem to attract people who are buying their first house is probably due to lower prices and, in the case of Forest Meadows, federal assistance to first homeowners (Assisted Home Ownership Program). One other project, Champlain Villa, was within the AHOP ceiling when it was built in 1971, but enough of the original residents had moved that this was not a reason given by people for moving there.

In a similar vein, False Creek was the only project where people said that one of the reasons they moved was to get a smaller house with less maintenance ($p=.016$, sig.). This is a common reason for people to prefer townhouse

% of Residents Who Moved to Get
a Smaller House with Less Maintenance

Greentree	0
Forest Meadows	0
Kingswood Downs	20
Country Club	10
Springmont	10
Mariners Village	20
Lillooet	30
Champlain Villa	10
False Creek	60

living. These results, with False Creek residents moving to get a house with less maintenance, in contrast to respondents from Greentree Village, Forest Meadows, Country Club, and Springmont, who moved in order to own their home, confirm a similar finding by Norcross (1973). He found that former owners moved to townhouses because of the low maintenance while renters cited reasons of price and ownership.

The other reasons people moved showed no differences among projects ($p=.223-.733$, not sig.).

Reasons for choosing the project

People were also asked why they chose the projects and units they were living in. Knowing something about a person's expectations can be valuable in interpreting their satisfaction and criticisms of the townhouse. The most frequently mentioned reason for choosing a townhouse project was the project's general appearance and there were differences between projects on whether people gave this reason ($p=.015$, sig.); Greentree Village respondents all said the general appearance was a reason they chose the project, and people from Champlain Villa were the least likely to cite this reason. This finding may

% of Residents Saying They Choose Their
Project for its General Appearance

Greentree	100
Forest Meadows	80
Kingswood Downs	60
Country Club	40
Springmont	90
Mariners Village	70
Lillooet	50
Champlain Villa	30
False Creek	50

be due to the unusual architecture of the section of Greentree that was sampled (see Plate 1) and people mentioned that their part of Greentree was the most attractive.

This finding may be similar to a report by Becker (1974) that people's satisfaction with their projects depended strongly on the general appearance and upkeep of the projects.

Two other common reasons for choosing the project, location close to job or transportation and specifically wanting a townhouse, were given equally by all project residents ($p=.677$ and $.376$, not sig.), but the size of the project and the project features were listed more by residents of some projects than others ($p=.052$ and $.004$, sig.). People preferred smaller projects (see Norcross, 1973; Bell, 1974) and residents of Forest Meadows and Country Club were the most likely to give the project size as a reason for their choice of projects. Country Club was the smallest project sampled with only 56 units,

	<u>% of Residents Saying They Chose Their Project for Its Size</u>	<u>Project Size in Units</u>
Greentree	0	76
Forest Meadows	40	134
Kingswood Downs	10	62
Country Club	40	56
Springmont	10	32
Mariners Village	20	50
Lillooet	20	65
Champlain Villa	0	43
False Creek	0	48

and Forest Meadows was one of the larger projects (136 units), but the land coverage was comparatively low because of the stacked form (see Plate 2) and there is no other development in the immediate area. Greentree Village, Champlain Villa, and False Creek are projects within large developments of several hundred units, and few residents of these projects said they chose them because of project size. These results confirm that people's perception of project size is not directly related to the actual number of units, but is influenced by site design, coverage, and the division of the larger projects into "neighborhoods" (Norcross, 1973; Bell and Constantinescu, 1974; Becker, 1974).

The other reason for choosing a townhouse project that was mentioned by residents in some projects more than others ($p=.004$, sig.) was the features in the project (such as pool, common areas, etc.). The people most likely to

% of Residents Saying They Chose Their
Project for Its Features

Greentree	60
Forest Meadows	50
Kingswood Downs	30
Country Club	10
Springmont	10
Mariners Village	50
Lillooet	20
Champlain Villa	10
False Creek	80

give this as a reason were from Greentree Village, Forest Meadows, Mariners Village, and False Creek. Features referred to include swimming pools and other recreational facilities, landscaping, and the project setting or location. This finding may be the same as findings reported in the literature that the general quality of the project "environment" is important to residents (see Norcross, 1973; Lansing, 1970).



Plate 1. The unusual architecture in Greentree Village.

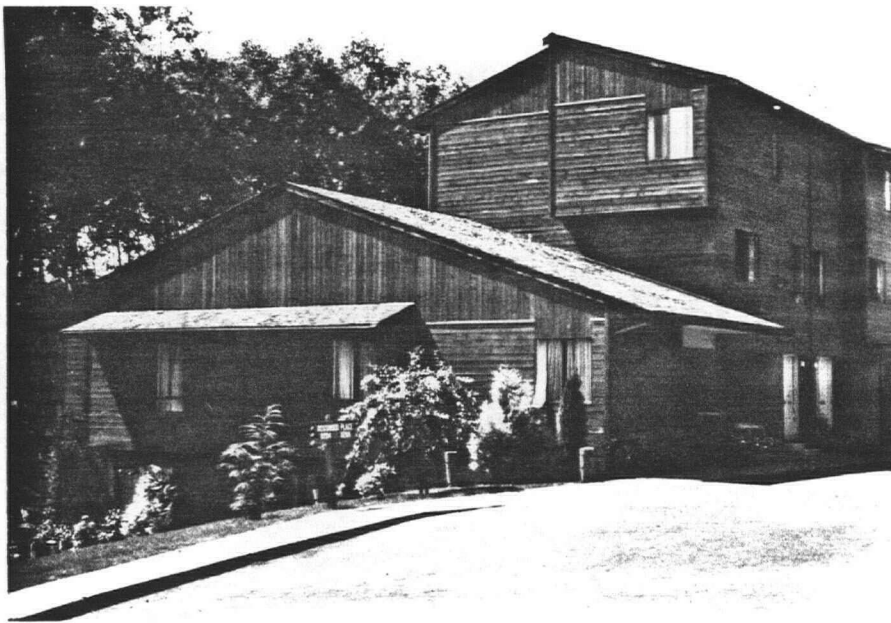


Plate 2. The stacked form of Forest Meadows allowed low land coverage.

Reasons for choosing the unit

The most common reasons given for choosing the townhouse unit, the inside features, the price, and the location within the project, were given equally by the residents of all projects ($p=.135$, $.129$, and $.549$, not sig.). The finding that private outdoor space is a less important reason for choosing a house has been reported before (Eadie, 1978), but it is important to keep in mind that many of these respondents would find an apartment with similar inside features unacceptable because of the lack of the private outdoor space provided in a townhouse.

Ideal housing type

Another measure of housing attitude that may affect a person's satisfaction with townhouse living is that person's ideal housing type. The resident who prefers living in a townhouse is more likely to be satisfied than the resident who wants to move to a single family house. The strong preference for single family housing reported by various authors (Michelson, 1968, 1969; Hinshaw and Allot, 1972; Sanoff and Sawhney, 1972; Cooper, 1975; Eadie, 1978) is confirmed in this study. A majority of the respondents (69.0%) said their ideal form of housing is the single family house on medium or large lot (see Appendix 1), but substantial preference for townhouses was also found; 22.2% of respondents said their ideal house was a townhouse. This finding confirms reports in the literature (Lansing and Hendricks, 1967; Lansing et al., 1970; Condominium Research Associates, 1970; Cooper, 1970; Burnaby Planning Department, 1974) which indicate that a significant number of townhouse residents are completely satisfied with townhouse living, and would only move to another townhouse. There were no differences among projects in residents' ideal housing type ($p=.068$, not sig.).

Reasons people will move from their townhouse

Respondents were asked why they might move from their townhouse. The most common reasons were to get a bigger or better house and to get a bigger yard. Respondents from all projects gave similar reasons ($p=.063-.994$, not sig.), so there were no particular aspects of any one project (such as bad neighbors or neighborhood, inconvenient location, small houses or yards) that made residents of that project want to leave. The overall response to the question was quite low, i.e. there were few reasons people wanted to move, and six respondents said nothing would make them move. Results of this type should always be qualified by the reminder that the most dissatisfied residents may have already moved.

Features of next house

When respondents were asked what they would look for in their next house, almost all (94.4%) said they would look for a particular type of house. Over half of these people (56.8%) said they would look for a single family house, almost a third (30.7%) would look for another townhouse, and the rest either for apartments or duplexes. The number of people who would prefer single family housing is still high, but is slightly lower than those who said it was their ideal type of housing. Some people explained that they really prefer single family, but in their next house they would have to be looking for something else.

Other than looking for a particular type of house, most people would look for the inside features of the house, the design or size of the yard, the neighborhood, the price, and the convenience of the location. There were no differences among projects on what features people would look for in their next house ($p=.100-.844$, not sig.).

Ideal tenure

The preference for ownership reported in the literature (Eadie, 1978) was also confirmed; 93.3% of respondents preferred to own their housing rather than rent and there were no differences among projects ($p=.599$, not sig.). Other studies report that older residents express a preference for renting (Bell, 1974), but this was not found ($p=.670$, not sig.). The inflation in housing and land costs in the Vancouver area may be responsible for the difference in findings.

4.3 RATINGS, ATTITUDES, USE AND PREFERENCES FOR PRIVATE OUTDOOR SPACE

Ratings and Attitudes

Project and Outdoor Space Rating

Four general measures of satisfaction were collected: project rating, house rating, overall outdoor space rating, and back yard rating (see Table 6). On one of these measures, the overall outdoor space rating, responses were different depending on which project people lived in ($p=.010$, sig.). Country Club received the lowest outdoor space rating ("so-so" to "fair"). The projects receiving high outdoor space ratings were Greentree, Springmont, Mariners Village, and Lillooet. This rating measure is very general and

Mean Outdoor Space Ratings (3=so-so, 4=fair, 5=good, 6=excellent)

Greentree	4.70
Forest Meadows	4.44
Kingswood Downs	4.38
Country Club	3.33
Springmont	5.00
Mariners Village	4.88
Lillooet	4.78
Champlain Villa	4.00
False Creek	4.40

TABLE 6. Ratings and preferences of 90 Residents of Nine Townhouse Projects

<u>Rating or Preference</u>	<u>Mean (or % Respondents)</u>	<u>% Responses</u>	<u>Standard Deviation</u>	<u>Number</u>	<u>Observed Range</u>	<u>Possible Range</u>
Project Rating	5.11		0.71	90	3.0-6.0	1.0-6.0
House Rating	4.79		0.87	90	3.0-6.0	1.0-6.0
Outdoor Space Rating	4.69		1.02	90	2.0-6.0	1.0-6.0
Back Yard Rating	4.63		1.05	90	2.0-6.0	1.0-6.0
Privacy of Back Yard	2.56		0.58	90	1.0-3.0	1.0-5.0
Fence Rating	5.01		0.78	90	3.0-6.0	1.0-6.0
Function of Back Fence				90		
Mark edges of property	0.0%					
Keep intruders out	15.6%					
Give privacy on sides	46.7%					
Give complete privacy	36.6%					
Other	1.1%					
	100.0%					
Back Yard Size Rating	2.49		0.66	90	1.0-3.0	1.0-5.0
Patio Size Rating	3.59		0.70	90	3.0-5.0	1.0-5.0
Patio Features				90		
Water	77.8%					
Gas	0.0%					
Electric outlet	72.2%					
Roof	22.2%					
Fence or screen	91.1%					
Planter boxes	16.7%					
Laundry line	2.2%					
Storage shed	18.9%					
	301.1%					
Can Do Without Some features				90		
Yes	2.2%					
No	97.8%					
	100.0%					
Want to Add Some Features				90		
Yes	57.8%					
No	42.2%					
	100.0%					
Which Features to Add				58		
Water	25.8%	17.4%				
Gas	1.7%	1.2%				
Electric outlet	27.6%	18.6%				
Roof	18.9%	12.8%				
Fence or screen	13.8%	9.3%				
Planter boxes	24.1%	16.3%				
Laundry line	18.9%	12.8%				
Storage shed	17.2%	11.6%				
	148.0%	100.0%				
Satisfied with Patio Surface				90		
Yes	81.1%					
No	18.9%					
	100.0%					
Present Connection from Unit to Patio				90		
Kitchen	2.2%					
Dining Room	10.0%					
Living Room	80.0%					
Other	7.8%					
	100.0%					

TABLE 6 (continued)

<u>Rating or Preference</u>	<u>Mean (or % Respondents)</u>	<u>% Responses</u>	<u>Standard Deviation</u>	<u>Number</u>	<u>Observed Range</u>	<u>Possible Range</u>
Want to Change Connection				90		
Yes	41.1%					
No	58.9%					
	<u>100.0%</u>					
Perferred Connection				90		
Kitchen	31.1%					
Dining room	6.7%					
Living room	46.7%					
Other	15.6%					
	<u>100.0%</u>					
Back Yard Treatment Beyond Patio				90		
Mostly grass	42.2%					
Some grass, some flower beds	21.1%					
A little grass, mostly flower beds	6.7%					
No grass	13.3%					
More paving and some grass	16.7%					
	<u>100.0%</u>					
Use of Back Yard				90		
Eating, cooking	85.6%	18.3%				
Sunbathing, sitting	94.4%	20.2%				
Growing flowers and vegetables	78.9%	16.9%				
Having friends over	78.9%	16.9%				
Children's play	34.4%	7.4%				
Working on messy projects	45.6%	9.7%				
Storage	30.0%	6.3%				
Drying laundry	15.6%	3.3%				
Other	4.4%	0.1%				
	<u>468.1%</u>	<u>100.0%</u>				
Present Orientation				90		
East	37.8%					
South	27.8%					
West	23.3%					
North	11.1%					
	<u>100.1%</u>					
Want to Change Orientation				90		
Yes	28.9%					
No	71.1%					
	<u>100.0%</u>					
Preferred Orientation				90		
East	32.3%					
South	43.3%					
West	18.9%					
North	2.2%					
Other	3.3%					
	<u>100.0%</u>					
Like to Garden				90		
Yes	79.0%					
No	21.0%					
	<u>100.0%</u>					
Have Grown Vegetables in Yard				90		
Yes	48.0%					
No	52.0%					
	<u>100.0%</u>					
Changes Made in Back Yard				90		
Yes	65.6%					
No	34.4%					
	<u>100.0%</u>					

TABLE 6 (continued)

<u>Rating or Preference</u>	<u>Mean (or % Respondents)</u>	<u>% Responses</u>	<u>Standard Deviation</u>	<u>Number</u>	<u>Observed Range</u>	<u>Possible Range</u>
Features of Ideal Back Yard				90		
Play equipment	27.8%	11.5%				
Vegetable garden	62.2%	25.8%				
Pond or fountain	17.8%	7.4%				
Fruit trees	52.2%	21.7%				
Benches	31.1%	12.9%				
Small greenhouse	42.2%	17.5%				
Other	7.8%	3.2%				
	<u>241.1%</u>	<u>100.0%</u>				
Importance of Outdoor Space				90		
Children's play	38.9%	8.1%				
Other family activities	75.6%	15.7%				
For a nice view	56.7%	11.7%				
To go outside and sit	81.1%	16.8%				
For a private or quiet place	81.1%	16.8%				
To grow flowers and vegetables	70.0%	14.5%				
For a piece of land	37.8%	7.8%				
For extra storage	24.4%	5.1%				
Other	5.6%	3.5%				
	<u>471.2%</u>	<u>100.0%</u>				
Have a Front Yard				90		
Yes	66.7%					
No	33.3%					
	<u>100.0%</u>					
Front Yard Rating	4.4		0.9	59	2.0-6.0	1.0-6.0
Front Yard Size Rating	2.5		0.7	59	1.0-3.0	1.0-5.0
Front Yard Privacy	3.3		0.6	59	3.0-5.0	1.0-5.0
Have a Front Fence				59		
Yes	45.8%					
No	54.2%					
	<u>100.0%</u>					
Want to Change the Front Fence				58		
Yes	29.3%					
No	70.7%					
	<u>100.0%</u>					
Function of Front Yard				59		
Attractive entrance	46.0%					
To separate house from street	31.8%					
For another private space to use	16.8%					
For extra storage	2.7%					
Other	2.7%					
	<u>100.0%</u>					
Have a Balcony				90		
Yes	31.0%					
No	69.0%					
	<u>100.0%</u>					
Balcony Rating	4.6		1.1	26	2.0-6.0	1.0-6.0
Balcony Size Rating	2.7		0.5	26	1.0-3.0	1.0-5.0
Want to Change Balcony Screen				26		
Yes	38.5%					
No	61.5%					
	<u>100.0%</u>					

TABLE 6 (continued)

<u>Rating or Preference</u>	<u>Mean (or % Respondents)</u>	<u>% Responses</u>	<u>Standard Deviation</u>	<u>Number</u>	<u>Observed Range</u>	<u>Possible Range</u>
Use of the Balcony				26		
Children's play	3.8%	2.7%				
Storage	23.1%	16.2%				
Eating, cooking	7.7%	5.5%				
Sunbathing, sitting	50.0%	35.1%				
Having friends over	3.8%	2.7%				
Working on messy projects	7.7%	5.4%				
Growing flowers & vegetables	42.3%	29.7%				
Other	3.8%	2.7%				
	142.2%	100.0%				
Does Project have Recreation Facilities				90		
Yes	55.6%					
No	44.4%					
	100.0%					
Use of Recreation Facilities				50		
Project has Recreation Facilities						
Yes	70.0%					
No	30.0%					
	100.0%					
Project does not have Recreation Facilities				40		
Yes	65.0%					
No	35.0%					
	100.0%					
Children's Noise a Problem				89		
Yes	14.6%					
No	77.5%					
Occasionally	7.9%					
	100.0%					
Monthly Maintenance Fee (\$)	44.17		13.91	90	30-75	
What Included in Fee (# items mentioned)	5.7		1.8	90	0-9	
Satisfied with Maintenance Work				90		
Yes	71.1%					
No	5.6%					
Ambivalent	23.3%					
	100.0%					
Satisfied with Project Rules				90		
Yes	84.4%					
No	2.2%					
Ambivalent	13.3%					
	100.0%					
Suggested Changes to Site Plan				90		
Yes	31.1%					
No	68.9%					
	100.0%					

probably includes project appearance, landscaping, "streetscape", and the private outdoor space. The other general rating measure (project rating) showed no differences among projects ($p=.072$, not sig.).

House Rating

The topic of townhouse interiors is beyond the scope of this study but this rating was collected because it is assumed to be a strong component of general satisfaction. The mean rating was "fair" to "good" and there were no differences among projects ($p=.511$, not sig.).

Back Yard Rating

The fourth general rating, the back yard rating, probably involves a number of issues, including size, orientation, fencing, plantings, privacy, and use. There were no differences among projects in the ratings given to the back yards ($p=.599$, not sig.), even though a substantial range of provisions and degrees of privacy was represented in the sample. This finding can be explained by the general nature of the rating; such a variety of issues were involved in people's ratings that any differences between projects could not be seen. The other possible explanation for the lack of project differences is the fact that people differ - even if everyone had the same house and yard, a consensus of preferences and attitudes would not be found.

Privacy of back yard

The first question on more specific aspects of the backyard asked people to rate the privacy of their back yards. Most people said the back yard was "about right" or that it "should be a little more private", although most people qualified their responses by saying things like "Since this is a townhouse ..." or "You can't get real privacy in a townhouse, but ...". If the ratings had been in reference to some standard, the mean would have been

lower. There were no differences among projects in the ratings given to backyard privacy ($p=.076$).

Fence rating

Fencing in the projects varied from solid side screens that extended only six to ten feet from the unit (Greentree Village and Forest Meadows) and side hedges (Lillooet), to complete low fences (Kingswood Downs and Springmont), and tall solid fences and hedges in the remaining projects (see plans in Appendix 4). Country Club had 8' solid hedging with a gate, False Creek had a combination of 4 to 6' sections of solid fence and lattice, Champlain Villa had a 6' solid fence on all three sides, and Mariners Village had 8 to 10' solid fences on the sides and tall lattice screens across the end. When people were asked to rate their fences, people with tall, solid fences or hedges gave them significantly higher ratings than those with low fences or side screens ($p=.011$, sig.). This finding seems to indicate that people prefer the more private fences.

Mean Fence Ratings (4=fair, 5=good)

Greentree	4.00
Kingswood Downs	4.33
Springmont	4.83
Country Club	4.70
Mariners Village	4.83
Lillooet	4.67
Champlain Villa	4.71
False Creek	4.80

Function of back fence and privacy of back yard

Another approach is to ask people what they think a back fence should do, just mark the edges of the property, keep intruders and pets out and children in, provide some privacy from neighbors on the sides but be open at the end, or be a solid wall to create a completely private space. Almost half the

respondents (46.7%) wanted privacy on the sides, and more than a third (36.6%) wanted complete privacy. This finding shows that many people prefer a degree of privacy not found in many townhouse projects and confirms reports in the literature (Willmott, 1962; Kuper, 1968; Sandvik et al., 1973). There were no differences among projects ($p=.247$, not sig.). The privacy ratings given in projects with partial screening of back yards should be lower than ratings in projects with solid high fences. This result was found; Greentree Village received the lowest privacy ratings for the back yards, and the projects receiving the highest ratings were Country Club (solid hedges), Mariners Village (tall solid fences and lattice), Lillooet (side hedges), and Champlain Villa (tall solid fences). The presence of Lillooet in the most private group is most likely due to the site design, which has many of the back yards on the perimeter of the project, so there is privacy from activity and noise. From the description of fencing at False Creek it might be expected that it would be rated as private. The fact that False Creek is not in the group of projects receiving high back yard privacy ratings is probably due to the use of lattice sections and open sections as screen across the end of the yard and also the impression of high density and activity in most areas of the project (see Plates 3 and 4).

Privacy in the back yard may be a combination of freedom from seeing other people in their yards and from them seeing in, the ability to restrict children, animals, and other people from coming to the yard, and quiet from the noise of children playing and other people's activities. People were asked specific questions about several aspects of privacy in the back yard.

Plate
3



Plate
4



Plates 3 and 4. The feeling of density inside the False Creek enclave.

Visual privacy of back yard

People were asked how private their back yard was to people seeing in. Most people said "not very private" or "somewhat private", and people in Greentree Village and Springmont were more likely than anyone else to say the backyards were "not private at all". People more likely to say their yards were "very private" lived in Mariners Village, Lillooet, and Champlain Villa, where the fences were tall and solid.

"People seeing in bothers me"

When asked how much they mind people being able to see into their back yards, people in all projects said "not much" or "not at all" ($p=.211$, not sig.). There was some feeling on the part of the interviewer that people were embarrassed about sounding antisocial, and that because of this, some people said people seeing them bothered them less than it actually did. People who do mind being seen are likely to rate the general back yard as poor ($r=.284$), as not private enough ($r=.523$), and the visual privacy of the back yard as poor ($r=.260$).

Concern about noise

There is some evidence in the literature (Willis, 1963) that some people are discouraged in the use of less private yards for fear of disturbing their neighbors with noise. On the other hand, Becker (1974) states that many people are not disturbed by noise and accept it as part of living in multiple housing. People in the study were "somewhat concerned" or "not very concerned" after quickly reassuring the interviewer that they didn't make any noise outside.

Problems in the back yard

People were also asked whether a number of problems existed in their back yards: noise from neighbors; traffic noise; people walking by too close; people seeing in from their houses and yards; and children and pets wandering in. The overall response was that there were few, if any, problems in the projects. Some of the suggested problems may have bothered people occasionally, but people were hesitant to attach the label of "problem" to something that may have been only a minor annoyance. The only problem that was mentioned with any frequency was pets wandering in. The high number of cats in the projects bothered many people because there was no way to keep them out of the yards. All the projects had these problems at about the same frequency (about 10% of respondents). One interesting difference that was found was that significantly more Greentree Village and Springmont respondents said people seeing in their back yards was a problem ($p=.021$, sig.). These two projects also received low ratings on the visual privacy of the back yard. Greentree Village had only short side screens and half the units interviewed faced an open lawn (see Plate 5) which people used as a shortcut. Springmont was one of the projects where the buildings faced directly onto more townhouses across the back yards, which all had balconies and the feeling was that people could look down into the Springmont yards.

People who thought people seeing into their back yard was a problem were more likely to rate the general privacy as poor ($r=-.339$) and the privacy to people seeing in as poor ($r=-.349$). They were also more likely to say that people seeing into the yard bothered them ($r=-.379$), although they were no more likely to want a solid fence than other residents. This last finding may seem to be contradictory, but there are characteristics of a completely

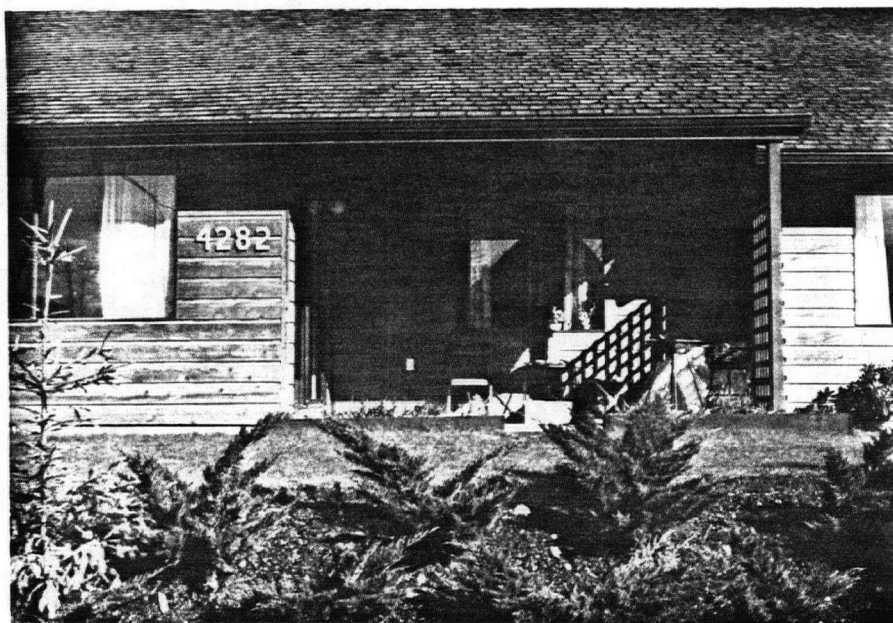


Plate 5. Lower units at Greentree had patios facing out onto an open lawn.

enclosed back yard other than visual privacy. There is a strong sense of enclosure is a small private yard which some people may not like and the opportunities for looking out of the yard are virtually eliminated. These characteristics might cause a person who dislikes being seen to still prefer more open fencing in the back yard, although it has been found that most people will trade the view for privacy (Byrom, 1970).

Features, Use and Preferences for the Back Yard

The interviewer asked people their preferences on a number of specific aspects of the back yard: size of patio and back yard; patio features and surface material; patio connection to the house; whether grass or paving was preferred in the back yard; and what the back yard was used for. Respondents were also asked what features would be in their ideal back yards, why it was important to have some private outdoor space, whether they liked to garden and what they had grown, whether they had made any changes in the back yard, and which direction they wanted their yard to face.

Back yard size rating

Most people said their back yards were "about right" or "a little too small" ($p=.152$, not sig.). Back yards ranged from about 200 sq. ft. to 500 sq. ft., with Greentree Village residents having the smallest and Springmont the largest (see Appendix 4).

When these results are compared to recommendations for the size of private outdoor space (Murray and Flies, 1970; Cooper, 1975; Ottawa, 1977), there is general agreement. The authors cited recommended yards of 200 to 400 square feet for families, and other studies report resident satisfaction with yards of about 400 square feet. Most people in this study were satisfied with the size of their yards if larger than 300 square feet.

Patio size rating

Patios in the nine projects ranged from no hard surface provided at all in Champlain Villa, to the back yards in False Creek and Mariners Village which were completely paved except for small planting areas. Patios in Greentree, Forest Meadows, and Kingswood Downs were rated as the smallest ("much too small" or "a little too small"), and False Creek patios were rated as the largest ("about right") ($p=.011$, sig.). When these ratings are compared to

Mean Patio Size Ratings
(3=about right, 4=a little too small, 5=much too small)

Greentree	3.70
Forest Meadows	3.70
Kingswood Downs	4.50
Country Club	3.50
Springmont	3.50
Mariners Village	3.40
Lillooet	3.40
Champlain Villa	3.40
False Creek	3.20

actual patio sizes ($r=.288$), Greentree and Kingswood Downs are among the smallest patios and are also enclosed by building walls and fences, which makes them more difficult to use (see Plates 6 and 7). Other patios of about the same size in Country Club and Springmont, the design allows activities to "spill off" the patio on several sides, and these patios are rated as larger than the enclosed ones of the same size. Forest Meadows patios were rated as too small, although the actual size was quite generous. This finding may be explained by the fact that since the back yards in Forest Meadows had no fencing except side screens, the patio was the only part of the yard which clearly belonged to the unit, and therefore, people tended to use the patio more than the rest of the yard (see Plates 8 and 9). This much use could make the patio seem too small. The False Creek patios, which were actually paved

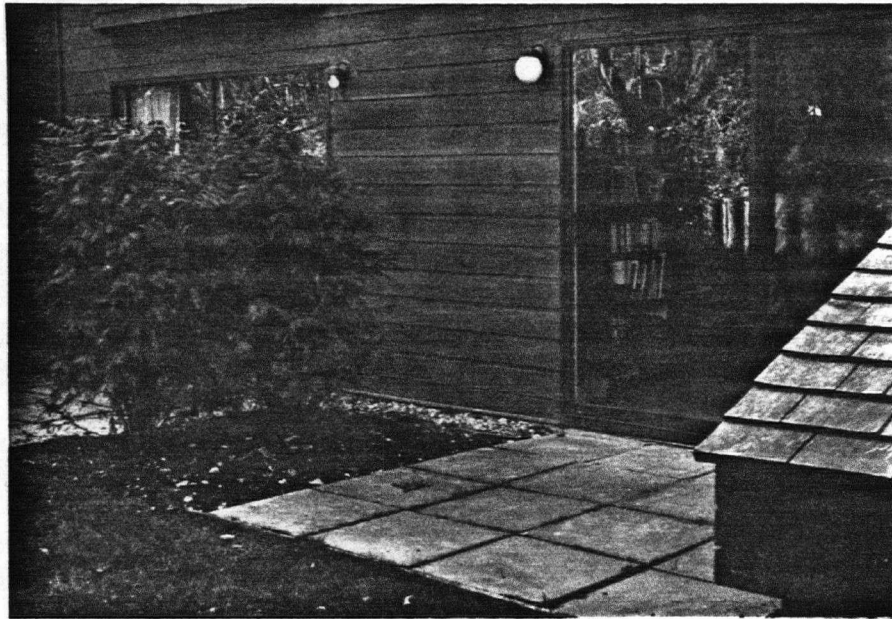


Plate 6. The upper unit patios at Greentree were considered too small by most residents.

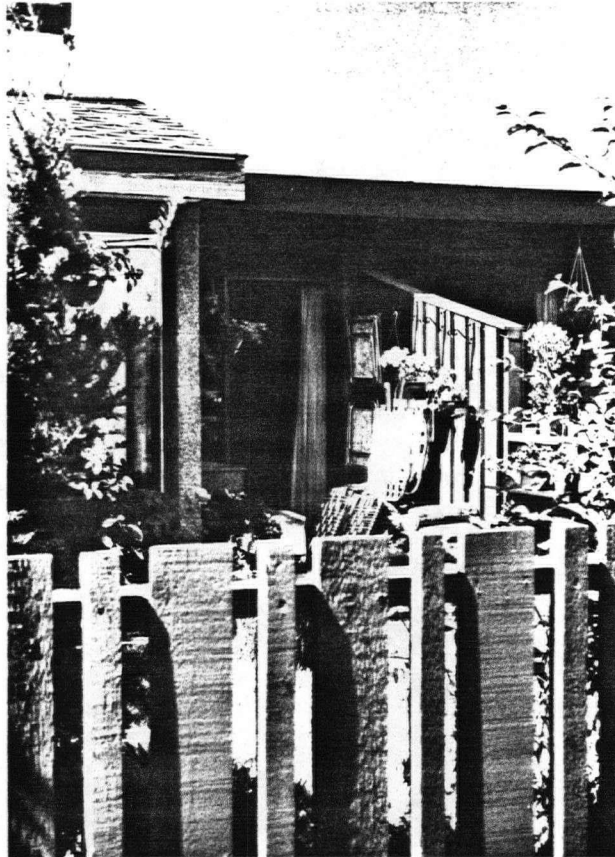


Plate 7. Patios at Kingswood Downs were small and were surrounded by building walls and fences.

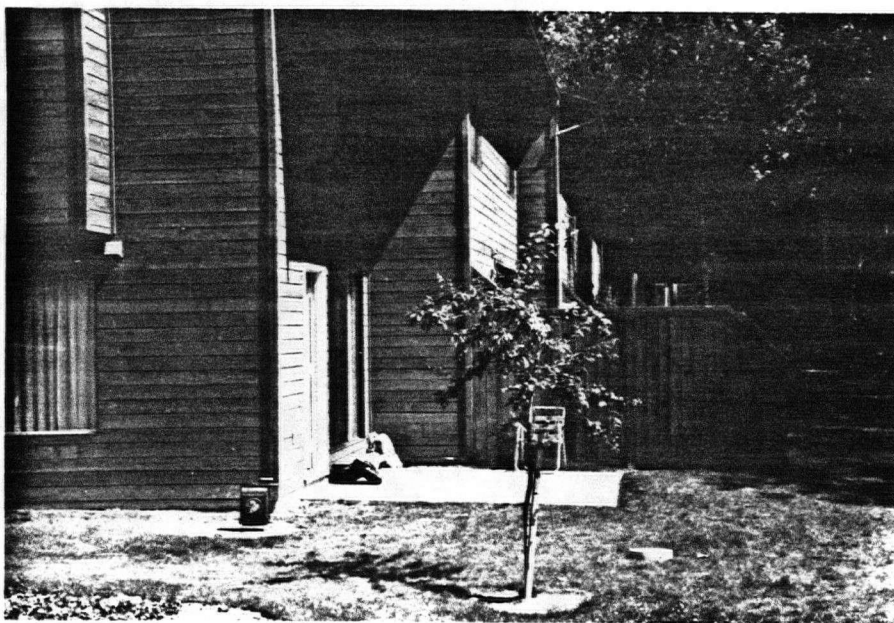


Plate 8

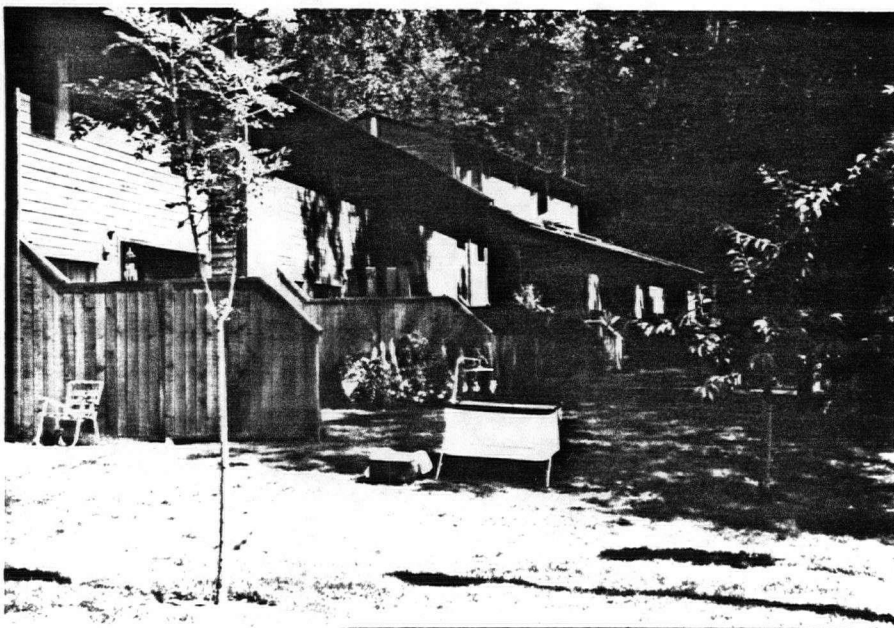


Plate 9

Plates 8 and 9. The back yards at Forest Meadows lack clear boundaries.

back yards, were the largest in the sample and residents said they were the right size ("about right").

These results seem to indicate that people prefer the patio to be as large as possible, or at least 10 x 10 feet, and that the patio should not be enclosed by walls and fences.

Patio features

Most projects had a water tap, an electric outlet, and some privacy screen on the back patio. The majority of people not only said they didn't have anything they could do without, over half wanted to add something to their patio (see Table 6). Popular requests were for electric outlets and water taps from those who didn't have them, and for planter boxes or more planting areas. Only a few people wanted their patios covered, which would make them much more useful in the rainy climate. In fact, most of the patios were protected for the first three or four feet by a roof overhang and the few units missing this overhang wanted some form of roof. This amount of cover, which allows people to step outside for a few minutes and also store some articles out of the rain, is evidently adequate for most respondents.

Patio surface material

Most projects had poured concrete patios and the majority of people were pleased with the concrete, saying it was easy to clean and looked good. A few people preferred brick or wood, but most people thought concrete was better for maintenance and rot resistance. Two projects had paving in a large part of the back yard; Mariners Village had an exposed aggregate paving in 4' modules, and False Creek had 6" square tiles laid in concrete. Several people in Mariners Village complained about the rough surface of the aggregate, saying it hurt their bare feet and was difficult for older people to walk on.

None of the False Creek residents wanted a different patio material and all ten said they were glad they didn't have concrete. The tile was praised as easy to clean and attractive.

The conclusion from these findings is that most people find concrete acceptable, but once they have a different surface that is just as easy to clean and as smooth to walk on, they no longer want concrete. Concrete is definitely less expensive than exposed aggregate or tile, and if respondents were given the choice of having concrete or paying extra for a different surface, the majority would probably chose concrete.

Connection between patio and house

The most common connection to the patio was through the living room of the unit, although some were through the dining area, the kitchen, or the second bedroom. Almost half of the respondents wanted to change their arrangement. Overall, the favored connection is through the living room, but a substantial number (almost a third) wanted the patio off the kitchen, which was rarely provided in the sampled townhouses. This preference for a connection through the kitchen has been reported before (Cooper, 1975a; Beck and Teasdale, 1977), and people said it would be more convenient for cooking outside, and cleaner, especially if the family had children. The most common reason people preferred to have the patio off the living room was to have more natural light in that room, and to have a view from the living room.

Treatment of back yard beyond patio

Most back yards had a 10 x 12 foot poured concrete patio next to the house and the rest of the space was grass with the borders in flower beds (see Appendix 4). This arrangement, or one with less grass and more planting area, was preferred by most people (87%) who had this kind of yard, and the rest

wanted no grass at all. Two projects, Mariners Village and False Creek, had paving in the back yards rather than grass, and these residents were the only ones who said they preferred not to have much grass ($p=.000$, sig.). No one wanted a yard with very much grass; 40% wanted no grass at all, 50% wanted paving and a little grass, and the rest wanted some paving with some grass, and some flower beds. These results indicate that many people might prefer a paved townhouse yard to one with a small lawn. The advantages of a hard surface include cleanliness, fast drainage, ease of maintenance, and year-round use.

Use of back yard and orientation

Townhouse residents use their back yards for sunbathing and just sitting, eating and cooking, growing flowers and vegetables, and when friends come over. These results confirm reports in the literature (Beck and Teasdale, 1977; GVRD, 1978; Vischer Skaburskis, 1980). All the projects reported the same use of back yards ($p=.175-.733$, not sig.), although yards which faced north were not used as much because of the lack of sunshine. Of the townhouses sampled, 38% faced east, 28% faced south, 23% faced west, and 11% faced north. Some people would like to change their orientation and the overall preference was for south (43.3%), east (32.3%) or west (18.9%) facing back yards.

Gardening and growing vegetables

The majority of respondents said they like to garden (or "putter" in the yard) and almost half had grown vegetables in their yard at least one season. The most common vegetables grown were tomatoes, lettuce, and chives, but everything from strawberries to potatoes had been tried. Most residents also grew flowers, especially in the front yard.

Changes to the back yard

Almost two-thirds of the respondents had made some changes in their yards. Most had added shrubs, flowers, or bulbs, but a number had reseeded grass, built fences and wood decks, poured larger concrete patios, put up storage sheds, and made other alterations.

Features of ideal back yard

When people were asked what features they wanted in their ideal back yard, most people were thinking of a much larger yard than the one with their townhouse and there was no attempt made to have people be practical. The most popular features were space for a vegetable garden (62.2%), fruit trees (52.5%), a small greenhouse (42.2%), and benches (31.1%). Eleven people said they wanted none of these things and were perfectly content with their townhouse yard as it was (see Table 6). The finding that most people want space for a vegetable garden does not necessarily mean townhouse projects should provide more garden space. Most of the people growing flowers and vegetables in containers or small plots were accepting this limited arrangement as part of townhouse living. The impression gained was that the majority were doing just as much gardening as they wanted to.

Importance of outdoor space

People were asked why it was important to them that they have some outdoor space of their own. Most people thought outdoor space was important for a private and quiet place outside the house (81.1%), for a place to go outside and sit for a few minutes (81.1%), for family activities like eating and cooking (75.6%), for growing flowers and vegetables (70.0%), and for a nice view from inside the house (56.7%).

Front Yards and Balconies

Front yards

Two-thirds of the respondents also had a space at the front of their unit that they could use. These front areas ranged from the large fenced yards of some Greentree units and the smaller private spaces in Mariners Village, to the more typical grass areas between carports in Kingswood Downs, Country Club, Springmont, Lillooet, and Champlain Villa (see Plates 10 and 11).

People who were asked to rate their front yards gave them ratings of "fair" or "good". The fact that the larger, more private front yards did not receive significantly higher ratings ($p=.821$, not sig.) is probably due to the lack of a reference standard. Each person evaluates his yard by his own criteria, so that ratings can only be used as the respondent's satisfaction with his yard, and not as a comparison between projects.

The size of the front yards was rated as "a little too small" or "about right", again with no differences between the types of yards ($p=.192$, not sig.). The privacy of front yards was rated "fair". Only half of the front yards had any fencing, and other than the screens in the larger private yards, most fences were low border hedges or fences. Most people with the latter type of fencing saw no need for any different type, or for any fence at all. The fact that most people are satisfied with the size and privacy of the front yard implies that few people want to use these spaces as another yard. Even with the small size of their back yards, townhouse owners are content to let the front space, which is quite substantial in most projects, be public or semi-public space similar to front yards in conventional suburban residential neighborhoods. Most people used the front yard for growing flowers and occasional sitting out.



Plate 10. The large front patios at Greentree Village.



Plate 11. The more typical front treatment at Country Club.

When people were asked what they thought a townhouse front yard should be for, the majority thought it was to provide an attractive entrance and to separate the house from the sidewalk or street, and less than a fifth thought the front should be another private outdoor space for the resident's use. This finding confirms reports in the literature (Cooper, 1967; Byrom, 1972).

Balconies

Twenty-six units had balconies, most of which were three or four feet deep and 10 to 15 feet long. The balconies were rated "fair" or "good", and "a little too small" or "about right". The screening on the balconies was acceptable to most people, unless the top railing blocked the view from inside, as at False Creek. In general, the balconies were used very little; only for occasional sitting, growing flowers, and storage. Most balconies were located off the master bedroom and were not as convenient to use as the yard below. Many people commented that the balconies were used so little that they were completely unnecessary.

General Site Information

Five of the nine projects had swimming pools and some also had saunas and meeting rooms. Most of the residents used the pools in their projects, and most people who didn't have pools said they would use them. Most projects also had areas set aside for children's play and most respondents with children said that their children played there often. Children's noise was not a major problem in any of the projects; only about one-fourth of the residents said the noise of children playing ever bothered them. This finding, in contrast to reports in the literature (Norcross, 1973; Sandvik et al., 1973), may be due to the relatively low numbers of children in most of the sampled projects.

Monthly fees for maintenance averaged \$44 and people were fairly well-informed when asked what the fee paid for. Most people knew it included maintenance of the building exterior, lighting and heating of common areas, and a fee to the management company, as well as landscape maintenance, fire insurance, and cleaning of common areas. When asked if they were satisfied with the work and how much it cost, the majority said yes, some were ambivalent, and only a few said no. Most people were evaluating the landscaping and general cleaning; ambivalent replies came from people who thought the work was probably acceptable, but they thought it cost too much.

Respondents were asked about the rules in their projects regarding changes to the houses and yards. The majority were satisfied having rules; commenting that this kept up the appearance of the development. Only a few people were dissatisfied or ambivalent, and some mentioned that the enforcement of the rules was inconsistent.

The majority of people had no criticism of their project site plan. Half of the suggested improvements were concerned with parking arrangements (amount, access, or wanted covered parking) and the others had to do with the safety of project streets, or visitors having difficulty finding their address. These are common complaints from townhouse owners (Norcross, 1973; Cooper, 1975; Beck and Teasdale, 1977).

4.4 CAN RATINGS BE PREDICTED BY DEMOGRAPHIC CHARACTERISTICS, HOUSING BACKGROUND, AND PREFERENCES?

Introduction

The purpose of techniques like factor analysis and cluster analysis is to allow the researcher to condense a large number of variables into groups of

closely related variables. These groups of variables can be combined into composite variables, or scales, which are then used in procedures such as regression analysis to gain some insight into the relationships between the variable groups.

In this study, the variables were first divided into four groups based on the type of information they represented: demographic characteristics; housing background; ratings; or preferences. These groups were formed a priori before any factor analysis was done because one of the major goals of the study is to predict a person's ratings from his demographic characteristics, housing background, and preferences.

The four variable groups are:

Demographic characteristics - age, sex, income, education, have children, ages of children, family size

Housing background - last house type, last tenure, last private outdoor space, have lived in townhouse before, childhood house types, other houses since childhood, ideal house type, ideal tenure, residence time, plans to stay

Ratings - project rating, general outdoor space rating, back yard size rating, visual privacy of back yard, fence rating, function of back fence, patio size rating, back yard problems, satisfaction with maintenance work.

Preferences - gardening, orientation, attitude toward visual privacy, patio features, patio surface, patio connection, use of back yard, ideal back yard features, reasons outdoor space is important, reasons moved from last house, reasons chose project, reasons chose unit, reasons will move, features of next house, changes made to back yard, suggested changes to site plan, satisfaction with strata rules.

Of the original 199 variables, 100 were factored. The 99 variables omitted from the factoring were either irrelevant (general project information such as price, age, and patio sizes), issues which were eliminated for the sake of simplicity (front and balcony information), or the "other" options on a number of variables.

Demographic Scales

Factor analysis performed on the nine demographic variables produced three factors which account for 65% of the variance (see Table 7). Since each factor is defined by correlations (or loadings) with all the variables factored, the first step in constructing scales was to sort the variables so that each variable appeared in only one grouping.

When the variables have been sorted into groups based on the factor loadings, the scale is constructed by a weighted linear combination of the variables in the group. For example, grouping 1, which will be called "Family Size", consists of four variables, have children, family size, age of oldest child, and age of youngest child. (For the equations used to calculate the scale scores, see Appendix 5.)

The scores on Family Size (see Table 8) range from 1.0 to a high score of 14.4, which is a respondent with a family of four and children 20 and 24 years old. The mean score of 5.9 probably represents a family of 3 with a child 3.6 years old.

The second grouping of demographic variables includes the variables income, age, education-males, and education-females, and will be called "Young, Well-educated Respondents with High Incomes - Yes or No". The mean score is 13.8, which might describe a 40 year old respondent earning \$30,000 a year with both adults having some college or technical school.

The third grouping of demographic variables is reduced to a single variable, Sex.

These three scales, Family Size, Young, Well-educated Respondents with High Income - Yes or No, and Sex will be used in the analysis as predictors of the ratings given on a number of aspects of townhouse living. By using these

TABLE 7. Demographic Factor Loadings

	<u>FACTOR 1</u>	<u>FACTOR 2</u>	<u>FACTOR 3</u>
Have children	<u>0.878</u>	0.005	-0.058
Oldest child	<u>0.708</u>	-0.447	-0.090
Youngest child	<u>0.714</u>	0.126	0.101
Family size	<u>0.860</u>	0.223	-0.028
Age	-0.060	<u>-0.658</u>	-0.028
Income	0.030	<u>0.649</u>	-0.371
Education-females	-0.007	<u>0.738</u>	0.060
Sex	0.090	0.044	<u>0.911</u>
Education-males	0.305	0.527	-0.530
% of variance explained	30.2%	22.4%	12.9%

Notes: Loadings are the Pearson's correlation between the variables and each factor. Major loadings are underlined.

TABLE 8. Summary Statistics for Demographic Scales

<u>Scale Name</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Range</u>
Family Size	5.85	3.98	1.0-14.37
Young, Well-Educated Respondents with High Incomes	13.76	26.44	-58.0-88.0
Sex	1.64	0.48	1.0-2.0

scales instead of the original nine variables, the analysis is simplified and made more efficient. Evidence that these combinations of variables are meaningful comes from the results of Reliability tests on the first two scales (the Sex scale consists of only one variable and so is not tested). The results (see Table 9) indicate that the scales are composed of variables with high intercorrelations.

Housing Background Scales

When the 10 housing background variables were factored, five factors resulted which account for 70% of the variance of the variables (see Table 10).

The first housing background scale called "Past Apartment Renters, Plan to Stay - Yes or No", consists of the three variables: last housing type, last tenure, and plans to stay. The scale label "Past Apartment Renters, Plan to Stay", describes the hypothetical respondent with the highest score on the scale, 11.0 (respondent rented an "other" house and plans to stay in the townhouse five years or more). The opposite end of the scale is a respondent with a score of 1.2, which means he last owned a single family house and plans to stay in the townhouse a year or less (see Table 11). The mean score of 4.7 probably represents the respondent who last rented an apartment in a low-rise building and plans to stay in his townhouse for about 3 years.

The second housing background scale is called "Wide Experience in Childhood Housing, Lived in Townhouse Before - Yes or No", and consists of the two variables, childhood housing type and lived in townhouse before.

The scale label describes the hypothetical respondent with the maximum score of 2.0, who grew up in rented apartments or houses and who has lived in a townhouse before. The minimum score is 0.2, which describes the respondent who grew up in single family housing and has never lived in a townhouse before

TABLE 9. Reliability Coefficients of Scales

<u>Scale</u>	<u>Std. Alpha</u>
Family Size	0.855
Young Well-educated Respondents with High Incomes	0.612
Sex	SVS
Past Apartment Renters, Plan to Stay	0.622
Wide Experience in Childhood Housing, Lived in Townhouse Before	0.540
Had Large Yard, Now Want to Rent Non-single Family	0.359
Non-single Family Housing Since Childhood	SVS
Long-time Residents	SVS
General Ratings	0.837
Privacy Ratings	0.604
Good Fences Make Good Neighbors	0.359
Investment Value of Housing is Important	0.443
Outdoor Space is Important for Children's Play	0.689
Gardeners	0.661
Moving Down to a Townhouse	0.534
Seeking a Better House	0.637
Want Better Neighbors and Neighborhood	0.642
Outdoor Space is Important for Storage and as Land	0.528
Family Use of the Back Yard	0.600
Use Patio and Want to Change Connection	0.337

SVS - Single variable scale

TABLE 10. Housing Background Factor Loadings

	<u>FACTOR 1</u>	<u>FACTOR 2</u>	<u>FACTOR 3</u>	<u>FACTOR 4</u>	<u>FACTOR 5</u>
Last house type	<u>0.855</u>	-0.098	-0.006	-0.072	-0.139
Last tenure	<u>-0.864</u>	0.026	0.022	0.123	-0.223
Childhood housing type	-0.010	<u>0.914</u>	0.029	-0.075	0.140
Lived in townhouse before	-0.219	<u>0.602</u>	0.030	0.502	-0.301
Last private outdoor space	0.206	0.222	<u>0.666</u>	-0.385	-0.141
Ideal housing type	-0.158	-0.000	<u>0.707</u>	0.214	0.145
Other houses since childhood	-0.092	0.022	0.055	<u>0.838</u>	0.070
Residence time	0.023	0.025	0.052	0.052	<u>0.919</u>
Plans to stay	0.392	0.285	-0.397	0.047	<u>-0.139</u>
Ideal tenure	-0.053	0.076	-0.483	-0.390	0.374
% of variance explained	21.3%	13.8%	13.0%	11.9%	10.0%

Notes: Loadings are the Pearson's correlation between the variables and each factor. Major loadings are underlined.

TABLE 11. Summary Statistics for Housing Background Scales

<u>Scale Name</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Observed Range</u>	<u>Possible Range</u>
Past Apartment Renters, Plan to Stay	4.71	1.51	1.2-7.2	1.2-11.0
Wide Experience in Childhood Housing, Lived in Townhouse Before	0.51	0.52	0.2-1.8	0.2-2.0
Had Large Yard, Now Want to Rent Non-single Family Housing	-0.02	0.53	-0.8-1.8	-0.8-2.2
Non-single Family Housing Since Childhood	3.07	1.11	0.0-5.0	0.0-5.0
Long-time Residents	3.70	2.61	0.3-9.9	0.3-9.9

this one. The mean scale score of 0.5 represents respondents who grew up in single family houses and rented houses and apartments, and who have never lived in a townhouse before.

The third housing background scale is called "Had a Large Yard and Now Want to Rent Non-single Family Housing - Yes or No". It is composed of the three variables, last private outdoor space, ideal housing type, and ideal tenure.

As in the previous two scales, the label "Had a Large Yard and Now Want to Rent Non-single Family Housing - Yes or No" describes the hypothetical respondent with a maximum score of 2.2 (had a large yard and now wants to rent an apartment or some other kind of housing). The opposite end of the scale is the respondent with the score -0.8, who last had a small balcony and wants to own a single family house. The mean score was 0.0, which probably represents someone who last had a small balcony and now wants to own a townhouse or a single family house.

The fourth housing background scale is called "Non-Single Family Housing Since Childhood - Yes or No" and consists of one variable, housing since childhood.

The scale label describes the respondent who has lived in rented apartments or houses, or some other kind of housing since leaving home (a score of 4.0 or 5.0), and the respondent who has moved from his parents' home to the townhouse is at the opposite end of the scale (a score of 0.0). The mean score is 3.1, which means that most people lived in single family houses and rented apartments before moving to the townhouse.

The last housing background scale consists of the single variable, residence time, and is called "Long-time Residents - Yes or No".

Residence time ranges from a minimum of 3 months (score 0.3) to over 8 years (score 9.9), and the mean score is 3.7, which represents 37 months or just over 3 years.

These five scales will now take the place of the ten housing background variables in attempts to predict a respondent's ratings on townhouse life. Results of Reliability tests (see Table 9) show that the first two scales, "Past Apartment Renters, Plan to Stay" and "Wide Experience in Childhood Housing, Lived in Townhouse Before" are fairly strong groupings, but the third "Had a Large Yard and Now Want to Rent Non-single Family Housing" is not as strong. The weaker scale and the single-variable scales are included in the analysis, and the results obtained with these scales will be interpreted with care.

A number of hypotheses can be tested by using the five housing background scales as predictors of the ratings and preferences received on various aspects of townhouse living. The general assumption that a person's housing background will affect his expectations and evaluation of the townhouse can be examined by posing several questions: Do first owners (or past apartment renters) rate the townhouse open space and privacy more generously than people who have owned their own single family house? Do people who have lived in townhouses before rate their projects and units higher than people who are in their first townhouse? Are long-time residents more satisfied than new residents?

Rating Scales

The fifteen rating variables were factored to produce six factors which account for 68% of the variance of the fifteen variables (see Table 12). The

TABLE 12. Rating Factor Loadings

<u>Variable</u>	<u>FACTOR 1</u>	<u>FACTOR 2</u>	<u>FACTOR 3</u>	<u>FACTOR 4</u>	<u>FACTOR 5</u>	<u>FACTOR 6</u>
Project rating	<u>0.567</u>	-0.166	-0.471	0.009	-0.137	-0.130
Outdoor space rating	<u>0.913</u>	0.045	-0.086	-0.010	-0.132	-0.006
Back yard rating	<u>0.902</u>	0.190	0.059	0.049	-0.096	0.053
Back yard size rating	<u>0.762</u>	0.250	-0.181	0.051	-0.074	0.056
Privacy of back yard	0.180	<u>0.690</u>	-0.286	0.149	0.061	0.036
Visual privacy of back yard	0.069	<u>0.717</u>	-0.097	-0.038	-0.273	0.251
People seeing in the yard a problem	-0.117	<u>-0.706</u>	-0.007	0.225	0.051	0.274
Neighbor's noise a problem	-0.159	-0.155	<u>0.806</u>	0.179	0.097	0.201
Back fence rating	0.059	0.235	<u>-0.645</u>	0.368	-0.021	0.147
Satisfied with maintenance work	0.097	-0.026	0.028	<u>0.872</u>	-0.140	-0.129
Traffic noise a problem	-0.110	-0.163	-0.014	0.098	<u>0.799</u>	0.177
Patio size rating	-0.206	0.043	0.224	-0.220	<u>0.687</u>	-0.181
Back fence function	0.067	-0.034	0.117	-0.080	0.028	<u>0.857</u>
Children and pets coming in a problem	0.094	0.042	0.160	-0.421	-0.300	-0.306
People walking by too close a problem	-0.069	-0.518	-0.030	-0.416	-0.063	0.305
% of variance explained	24.8%	11.2%	9.7%	8.1%	7.2%	9.0%

Notes: Loadings are the Pearson's correlation between the variables and each factor. Major loadings are underlined.

first three factors were strong factors (two or more variables with $r=.7$) but the last three were weaker and some of the variable groupings made little sense, e.g. traffic noise is a problem and the patio is too small (factor 5). Cluster Analysis was performed on the same variables to attempt to clarify the variable groups. The results from clustering confirmed factor groupings 1, removed one variable (people seeing in) from grouping 2 and put it in a new grouping with variables from factor groupings 3, 4, and 5. Two variables were not combined until the last step (back fence rating and satisfaction with maintenance work) and were omitted from subsequent analysis.

As a result of combining the results from factor analysis and cluster analysis, three rating scales were produced from thirteen of the original fifteen variables (see Table 13). Reliability tests confirm that the first two scales are strong variable combinations, but that the third should be used with qualification (see Table 9).

The first rating scale consists of the four variables, project rating, outdoor space rating, back yard rating, and back yard size rating, and is called "General Ratings".

General Rating scores range from 0.8, which represents the hypothetical respondent who rates everything as "very poor" or "much too small", to 4.8, which represents someone giving the highest possible ratings to all four questions (see Table 14). The mean score is 3.4, which could describe the respondent who gives one "fair" rating, two "good" ratings, and says the back yard is "about right".

The second rating scale is called "Privacy Ratings" and includes the variables, back yard privacy rating and back yard visual privacy rating. The lowest score possible is 0.4, which is a respondent who says the back yard

TABLE 13. Final Rating Scales

<u>Scale Label</u>	<u>Variables in Scale</u>
General Ratings	Project rating Outdoor space rating Back yard rating Back yard size rating
Privacy Ratings	Privacy of back yard Visual privacy of back yard
Good Fences Make Good Neighbors	Back yard problems (5) Patio size rating Back fence function

TABLE 14. Summary Statistics for Rating Scales

<u>Scale Name</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Observed Range</u>	<u>Possible Range</u>
General Ratings	3.38	0.58	1.8-4.2	0.8-4.6
Privacy Ratings	1.06	0.25	0.4-1.4	0.4-2.0
Good Fences Make Good Neighbors	2.69	1.38	-1.6-7.2	-2.0-7.8

"should be much more private" and is "not private at all" to people seeing in, and the highest score is 1.8, which would be a respondent who thinks the back yard "should be much less private" and is "very private" to people seeing in. The mean score is 1.1, which probably represents the respondent who says the back yard privacy is "about right" and that it is "not very private" to people seeing in.

The last rating scale is called "Good Fences Make Good Neighbors - Yes or No" and consists of the following variables: function of back fence, patio size rating, and the five back yard problems, noise from neighbors, noise from traffic, people walking by too close, people seeing in the back yard, and children and pets coming in.

The scale label, "Good Fences Make Good Neighbors" describes the hypothetical respondent with the highest possible score of 7.8, who thinks a fence should be a solid wall, the patio is much too big, and noise from neighbors and traffic, and people walking by and seeing in bothers him, but children and pets coming in don't. The other end of the scale is the hypothetical respondent with a score of -2.0, who wants a fence only to mark the edges of his property, thinks the patio is too small, and has no problems except children and pets coming in. The mean score is 2.7, which probably describes the respondent who wants his fence to give privacy on the sides, thinks the patio is a little too small, and says there are no problems.

This last rating scale describes satisfaction with the social aspects of townhouse living: neighbors noise, privacy from intrusion both physical and visual, and problems with children and pets.

These three rating scales, General Ratings, Privacy Ratings, and Good Fences Make Good Neighbors, represent the information that the analysis will

attempt to predict from the demographic, housing background, and preference scales. For example, are small families and single people more satisfied with townhouse living than people with large families, as measured by their General Rating scores and Good Fences-Good Neighbors scores? This kind of information can help designers understand what kinds of people are living in townhouses and what people expect from the private outdoor space provided with their townhouses.

Preference Scales

The last variables factored were the 66 preference variables. Factor analysis produced 23 factors which accounted for 75% of the variance, but, as with the factoring of the ratings, many of the factor groupings were unclear or groups with only one strong variable. Cluster Analysis was performed on the 66 variables plus seven variables (reasons projects were chosen were inadvertently omitted from the factoring) in an attempt to clarify and reduce the number of groupings. Cluster analysis (see Table 15) confirmed or clarified nine factors as major variable clusters and the other factors were either confirmed as minor, single-variable clusters or split up between more logical clusters of variables. Of the 73 variables included in the initial factor analysis and cluster analysis, 41 variables are included in the final clusters, and 32 have been omitted from subsequent analysis. The nine clusters that result from the combination of factor analysis and cluster analysis are confirmed as well-related groups of variables by the results of Reliability tests (see Table 9).

The first preference scale is called "Investment Value of Housing is Important - Yes or No" and consists of the following six variables: the unit was chosen because it was available and because of its investment potential;

TABLE 15. Preference Cluster Results

<u>Cluster label</u>	<u>Variables in cluster</u>	<u>Steps before cluster formed</u>	<u>Factor number</u>
Importance of Housing Value	Unit chosen because available	5	2
	Next house should be available		2
	Unit chosen for investment		2
	The next house should be a good investment		2
	The next house should have a good price		2
	The next house should be in a good neighborhood		2
Outdoor Space Important for Children's Play	Back yard used for children's play	7	3
	Outdoor space important for children's play		3
	Ideal back yard should have play equipment		3
	Unit was chosen for its outdoor space		9
	Project was chosen for general appearance		Not factored
	Project was chosen for good neighborhood		Not factored
Gardeners	Back yard used for messy projects	4	19
	Like to garden		4
	Back yard used for flowers and vegetables		4
	Outdoor space is important for growing flowers and vegetables		4
	Ideal back yard should have vegetable garden		4
	Ideal back yard should have fruit trees		4
Moving Down to a Townhouse	Moved to get smaller house	4	5
	Moved to get less expensive house		5
	Project chosen because wanted a townhouse		Not factored
	Will move to get smaller house		15
Seeking a Better House	Will move to get bigger yard	5	6
	Will move to get bigger house		7
	Outdoor space is important for a view from the house		1
	Next house should have certain inside features		2
	Next house should have certain outdoor space features		2
Want Better Neighbors, Neighborhood	Criticisms of project site plan	3	22
	Will move to get better neighbors		10
	Will move to get better neighborhood		10
Outdoor Space Important for Storage and as Land	Use back yard for storage	2	9
	Outdoor space important for extra storage		9
	Outdoor space important as land to own		4
Family Use of Back Yard	Outdoor space important for family activities	1	6
	Back yard used for eating, cooking		6
Use Patio and Want to Change Connection	Back yard used for sunbathing, sitting	1	16
	Want to change patio connection		Not factored

features of the next house should include price; investment potential and availability; but not good neighborhood.

The scale label describes someone with a maximum score of 4.0; the minimum is -1.0, and the mean score, 1.1, probably describes a respondent who chose his unit for its investment potential rather than availability and whose next house must have the right price and a good neighborhood, but investment value is going to be less important (see Table 16).

The second preference scale, called "Outdoor Space is Important for Children's Play - Yes or No", is constructed from five variables: outdoor space is important for safe children's play; the ideal back yard would have space for play equipment; the back yard is used for children's play; the project was chosen for its general appearance; and the unit because of its private outdoor space.

The scale label describes the respondent with the maximum score of 5.0 and the minimum score is 0.0. The mean score, 2.0, describes respondents who said "yes" to two questions and "no" to the other three.

The third scale, "Gardeners - Yes or No", consists of the following five variables: the back yard is used for flowers and vegetables; outdoor space is important for growing flowers and vegetables; the respondent likes to garden; and the ideal yard should have a vegetable garden and fruit trees. Gardeners are people with a maximum score of 5.0 and the opposite end of the scale is a score of 0.0. The mean score is 3.4, which means most people answered "yes" to between three and four items on the scale.

The fourth preference scale is called "Moving Down to a Townhouse - Yes or No" and consists of the four variables: moved to get a less expensive house and a smaller house with less maintenance, the project was chosen because

TABLE 16. Summary Statistics for Reference Scales

<u>Scale Name</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Observed Range</u>	<u>Possible Range</u>
Importance of Housing Value	1.13	1.42	-1.0-4.0	-1.0-4.0
Outdoor Space Important for Children's Play	2.04	1.60	0.0-5.0	0.0-5.0
Gardeners	3.42	1.47	0.0-5.0	0.0-5.0
Moving Down to a Townhouse	0.67	0.89	0.0-4.0	0.0-4.0
Seeking a Better House	2.81	1.52	0.0-5.0	0.0-5.0
Want Better Neighbors, Neighborhood	0.13	0.43	0.0-2.0	0.0-2.0
Outdoor Space Important for Storage and as Land	0.92	0.99	0.0-3.0	0.0-3.0
Family Use of Back Yard	1.61	0.66	0.0-2.0	0.0-2.0
Use Patio and Want to Change Connection	1.36	0.59	0.0-2.0	0.0-2.0

respondent was looking specifically for a townhouse, and will move again to get a smaller house. A respondent who is "Moving Down to a Townhouse" has the maximum score of 4.0, and his opposite, a score of 0.0. The mean score, 0.7, represents the typical respondent who said "yes" to only one question (or less).

The fifth preference scale, "Seeking a Better House - Yes or No", is composed of five variables: will move to get a bigger yard and a bigger or better house; important features of the next house are the inside and the design or size of the yard; and outdoor space is important for a nice view from inside the house. The maximum score (someone seeking a better house) is 5.0 and the minimum is 0.0. The mean score, 2.8, probably represents the respondent who will move to get a bigger house but not a bigger yard, and who will look at both the inside of the next house and its yard.

The sixth preference scale is called "Want Better Neighbors and Neighborhood - Yes or No", and consists of the two variables, will move to get better neighbors and to get better neighborhood.

The scale label describes the respondent with the maximum score of 2.0, and the minimum score is 0.0. The mean score, 0.1, describes the typical respondent who would not move for either of those reasons.

The seventh scale, "Outdoor Space is Important for Storage and as Land - Yes or No", is constructed from three variables: the back yard is used for storage, and outdoor space is important for extra storage and as a piece of land to own. The maximum score on this scale is 2.0, the minimum is 0.0, and the mean score, 0.9, describes the respondent who probably thinks outdoor space is important as a piece of land, but who doesn't use the back yard for storage or think storage is an important aspect of having outdoor space.

The eighth preference scale is called "Family Use of the Back Yard" and consists of two variables, the back yard is used for eating and cooking, and outdoor space is important for family activities. Scores range from a maximum of 2.0 to a minimum of 0.0, with mean score of 1.6 indicating that most respondents said "yes" to at least one question.

The last preference scale "Use Patio and Want to Change Connection - Yes or No", is constructed from the two variables, use the back yard (and patio) for sunbathing and sitting, and want to change the connection between the patio and the house. The maximum score is 2.0, the minimum is 0.0, and the mean score is 1.4, which indicates that most people said "yes" to at least one question.

These nine preference scales describe residents' preferences for most aspects of townhouse living, from gardening and children's play, to the importance of housing values and the townhouse as a low-maintenance housing choice. One goal of the analysis is to use this preference information to predict a person's satisfaction with townhouses. For instance, do gardeners rate townhouse outdoor space any higher or lower than non-gardeners? Do people who think outdoor space is important for children's play rate townhouses differently than other people?

Results of Regressions Using Scales

One of the major hypotheses of this study was that a person's demographic characteristics, housing background, and preferences for private outdoor space would affect his ratings on various aspects of townhouse living in a predictable fashion. Scale construction has produced three rating scales, General Ratings, Privacy Ratings, and Good Fences Make Good Neighbors.

The first scale, General Ratings, represents a respondent's evaluation of the project, the project outdoor space, and his back yard. These general ratings reflect a person's overall satisfaction with his project and its appearance and maintenance, as well as the adequacy of his private outdoor space. The Privacy Ratings scale represents a resident's evaluation of the privacy of his back yard and includes a general privacy rating and a more specific rating of visual privacy. This separation of general satisfaction and satisfaction with privacy into two distinct scales by the factor analysis and cluster analysis confirms that different issues are involved in the two sets of ratings. There is some overlap between the two scales as measured by the Pearson correlation between them (see Table 17), and the direction of the association is positive. The resident who is satisfied with his project in general is also likely to be satisfied with the privacy of his yard.

The third scale, Good Fences Make Good Neighbors, reflects a person's evaluation of his project on a number of social problems that may exist: problems of noise from traffic and people, and problems of adults, children, and pets intruding on private space either by seeing in or by intruding physically. The rating also includes a person's desire for a completely unfenced yard or one with a solid wall all the way around. The person who has

TABLE 17. Pearson Correlations Between the Three Rating Scales

	<u>General Ratings</u>	<u>Privacy Ratings</u>	<u>Good Fences Make Good Neighbors</u>
General Ratings	1.000	0.278	-0.204
Privacy Ratings	0.278	1.000	-0.259
Good Fences Make Good Neighbors	-0.204	-0.259	1.000

the highest possible score on this scale sees many of these social problems in his project and wants a solid wall around his yard also tends to rate the project in general and the privacy of his back yard lower than other residents ($r = -.259$ and $-.204$).

Relating a respondent's scores on these three rating scales to his demographic characteristics, housing background, and preferences is done with regression analysis. In order to test which type of information is most closely related to a person's ratings, separate regressions are performed. For example, general ratings are regressed on the demographic scales, general ratings are also regressed on the housing background scales, and finally, general ratings are regressed on the preference scales. To determine which individual scales (regardless of whether demographic, housing background, or preference) best predict general ratings, another regression is performed using all the scales at once. These regressions are performed for the three rating scales beginning with General Ratings.

Predictors of General Ratings

Results of Separate Regressions with Demographic, Housing Background, and Preference Scales

The results in Table 18 show that the preference scales accounted for 22% of the variance in General Ratings ($R^2 = .218$) and that the regression is significant at $p = .05$ with six scales in the equation and at $p = .10$ with all scales entered. The regressions with the demographic and housing background scales were not significant at $p = .05$ or $.10$ and accounted for only 1.5% ($R = .015$) and 7.3% ($R^2 = .073$) of the variance in General Ratings, respectively.

TABLE 18. Results of Separate Regressions on General Ratings with Demographic, Housing Background, and Preference Scales

Regression with Demographic Scales

	r^a	R^2	F^b	F_{CRIT}^c
Family Size	-0.088	0.008	0.686	253.00
Young, Well-educated Respondents with High Incomes	-0.083	0.013	0.578	19.48
Sex	-0.036	<u>0.015</u>	0.440	8.57
TOTAL		0.015		

Regression with Housing Background Scales

Had a Large Yard and Now Want to Rent Non-single Family Housing	0.163	0.027	2.408	253.00
Long-time Residents	-0.128	0.040	1.827	19.48
Past Apartment Renters, Plan to Stay	0.127	0.058	1.762	8.57
Non-single Family Housing Since Childhood	-0.125	0.070	1.591	5.68
Wide Experience in Childhood Housing, Lived in Townhouse Before	0.123	<u>0.073</u>	1.320	4.42
TOTAL		0.073		

Regression with Preference Scales

Outdoor Space Important for Children's Play	0.274	0.075	7.132	253.00
Seeking a Better House	-0.175	0.162	8.411	19.48
Use Patio and Want to Change Connection	-0.170	0.190	6.710	8.57
Moving Down to a Townhouse	0.126	0.202	5.392	5.68
Family Use of Back Yard	-0.086	0.216	4.618	4.42
Importance of Housing Value	-0.052	0.217	3.841	3.72
<hr/>				
Outdoor Space Important for Storage and as Land	0.026	0.218	3.257	3.29
Want Better Neighbors, Neighborhood Gardeners	-0.082	0.218	2.818	3.00
	-0.122	<u>0.218</u>	d	2.77
TOTAL		0.218		

^aSimple r (Pearson's r)

^bF value for regression equation

^cF value which is significant at a prob. of 0.05 and for the correct d.f.

^dF value not computed because increase in F is less than 0.01

^eRegression equation including the scales above the line is significant at $p=.05$

The preference scales which were significant predictors of General Ratings (at $p=.05$) are scales which describe a resident's attitudes toward his housing and his family's use of the back yard. If he thought outdoor space is important for children's play, if he has moved to the townhouse to get a smaller or less expensive house and is not looking for a bigger house, his general ratings tended to be higher than other residents'. The importance of parents' satisfaction with housing projects as good places for their children to play has been reported by Becker (1974) and Bell and Constantinescu (1974). People who were "moving down to a townhouse" may tend to be more satisfied than people living in townhouses for other reasons because they chose a townhouse over other forms of housing.

Why were preferences better predictors of General Ratings than demographics and housing background? One explanation for this finding could be that a person's stated preferences were a more precise type of information than the more general demographic characteristics and housing background. The finding indicates that a range of degrees of satisfaction would be found on any aspect of townhouse outdoor space which could not be accounted for by demographic and housing background information, but that a person's preferences for outdoor space were the best clues to how he would evaluate his townhouse. Most authors who have done these comparisons reported the same finding; that there were no systematic relationships between demographic and socioeconomic characteristics and general satisfaction ratings (Condominium Research Associates, 1970; Bell, 1974; CMHC, 1974; Gatt, 1978), although Sandvik (1973) found that a person's satisfaction with his housing tended to increase with higher income and job status.

Although the housing background scales have little value for predicting General Ratings, information can still be gained from an examination of the regression of the housing background scales against General Ratings. Although the associations are weak, the best predictor was the scale "Had a Large Yard and Now Want to Rent Non-single Family Housing". People who had high scores on this scale were somewhat more likely to give high ratings to the project and its outdoor space. Long-time residents, on the other hand, were less likely to have high General Ratings scores, which indicates that new residents gave higher ratings than people who have lived in the projects longer.

People who have moved from rented apartments and planned to stay in their townhouses were also somewhat more likely to give the projects higher ratings than people who have come from single family homes of their own and did not plan to stay very long. The two weakest housing background scales are "Non-single Family Housing Since Childhood" and "Wide Experience in Childhood Housing and Lived in Townhouses Before". People who have lived in a variety of houses since leaving home are only slightly more likely to give lower General Ratings, and people who have lived only in single family houses tend to rate the project and outdoor space slightly higher.

People who have lived in townhouses before, and grew up in different kinds of houses, are somewhat more likely to give the projects high General Ratings than the people who grew up in single family housing and have never lived in a townhouse.

Some authors have reported that housing background has some influence on the evaluation of present housing and others report finding no relationship. Condominium Research Associates (1970) and CMHC (1974) found that past housing type and tenure had little or no effect on the evaluation of the unit or the

project, while Willmott (1964), Department of the Environment (1971), Sanoff (1975), and Gatt (1978) reported that satisfaction was affected by housing experience. This contradiction may be explained by the purely qualitative nature of the latter group of findings; many authors expected that housing background affects satisfaction with housing, but when the analysis was done by Condominium Research Associates (1970) and CMHC (1974) no systematic relationships were found.

Results from Regression on General Ratings with All Scales

Table 19 shows the results of the regression of General Ratings on all scales. This regression allows us to see which scales, regardless of which group, can be entered to create a significant equation to predict General Ratings. The combined scales accounted for 26% of the variance in General Ratings ($R^2=.263$) and the equation with 11 scales entered was significant at $p=.05$ and with 14 scales at $p=.10$. The regression equation significant at $p=.05$ contained all the preference scales found to be significant predictors of General Ratings when the scale groups were regressed separately, and added four housing background scales and one demographic scale, which were not significant predictors before. Taken as a group, the scales which best predicted General Ratings describe a resident's expectations and attitudes concerning his townhouse. People who had higher General Ratings wanted a townhouse because of the low maintenance, they had lived in houses with large lots and now prefer some other type of housing, they had lived in townhouses before, and, although they hadn't lived in this townhouse very long, they planned to stay for a long time. People with high General Ratings also thought children's play was an important function of outdoor space although they had smaller families than other residents, and they were less concerned about their housing being an investment.

TABLE 19. Results of the Regression on General Ratings with All Scales

	r^a	R^2	F_b	F_{CRIT}^c
Outdoor Space Important for Children's Play	0.274	0.075	7.132	253.00
Seeking a Better House	-0.175	0.162	8.411	19.48
Use Patio and Want to Change Connection	-0.170	0.190	6.710	8.57
Had a Large Yard and Now Want to Rent	0.163	0.202	5.500	5.68
Non-single Family Housing				
Moving Down to a Townhouse	0.126	0.216	4.731	4.42
Family Use of Back Yard	-0.086	0.217	4.182	3.72
Long-time Residents	-0.123	0.218	3.724	3.29
Wide Experience in Childhood Housing, Lived in Townhouse Before	0.103	0.218	3.291	3.00
Family Size	-0.088	0.237	3.032	2.77
Importance of Housing Value	-0.052	0.237	2.766	2.61
Past Apartment Renters, Plan to Stay	0.127	0.245	2.500	2.47
<hr/>				
Young, Well-educated Respondents with High Incomes	-0.083	0.250	2.273	2.36
Non-single Family Housing Since Childhood	-0.125	0.252	2.080	2.28
Outdoor Space Important for Storage and as Land	0.026	0.261	1.913	2.21
Want Better Neighbors, Neighborhood	-0.082	0.262	1.764	2.15
Sex	-0.036	0.263	d	2.09
Gardeners	-0.122	<u>0.263</u>	d	2.04

^aSimple r (Pearson's r)^bF value for regression equation^cF value which is significant at a prob. of 0.05 and for the correct d.f.^dF value not computed because increase in F is less than 0.01^eRegression equation including the scales above the line is significant at $p=.05$

Predictors of Privacy Ratings

Results of Separate Regressions on Privacy Ratings with Demographic, Housing Background, and Preference Scales

The results in Table 20 show that the demographic scales accounted for only 2% of the variance in Privacy Ratings ($R^2=.002$), the housing background scales accounted for 9% ($R^2=.090$), and the preference scales accounted for 16% ($R^2=.160$). None of these regressions were significant at $p=.05$ or $.10$. It was not hypothesized that demographic characteristics would relate to Privacy Ratings, but it was expected that a person's housing background would influence his ratings of townhouse privacy. People who had lived only in single family housing were expected to be much more critical of the privacy in the townhouse yards than people who had been renting apartments. The association of the two scales "Had a Large Yard and Now Want to Rent Non-Single Family Housing" and "Past Apartment Renters, Plan to Stay" with Privacy Ratings are very weak ($r=-.141$ and $.135$), although the direction of association confirms the expected relationships.

The conclusion from these findings is that privacy preferences are not dependent on a person's housing background, demographic characteristics, or preferences, and that other factors such as personality and temperament are probably involved.

Results from Regression on Privacy Ratings with All Scales

In Table 21 the results from the regression of all scales on Privacy Ratings show that combining demographic and housing background scales with the preference scales, a regression equation of 10 scales is significant at $p=.05$ and an equation of 13 scales is significant at $p=.10$. The scales which are significant at $p=.05$ concern a resident's attitudes toward housing as well as

TABLE 20. Results of Separate Regressions on Privacy Ratings with Demographic, Housing Background, and Preference Scales

Regression with Demographic Scales

	r^a	R^2	F^b	F_{CRIT}^c
Sex	-0.008	0.001	0.061	253.00
Family Size	0.026	0.001	0.056	19.48
Young, Well-educated Respondents with High Incomes	-0.022	<u>0.002</u>	0.042	8.57
TOTAL		0.002		

Regression with Housing Background Scales

Long-time Residents	0.197	0.039	3.563	253.00
Had Large Yard, Now Want to Rent Non-single Family Housing	-0.141	0.055	2.550	19.48
Non-single Family Housing Since Childhood	-0.136	0.074	2.305	8.57
Past Apartment Renters, Plan to Stay	0.135	0.087	2.029	5.56
Wide Experience in Childhood Housing, Lived in Townhouse Before	-0.063	<u>0.090</u>	1.656	4.42
TOTAL		0.090		

Regression with Preference Scales

Importance of Housing Value	-0.231	0.054	4.970	253.00
Moving Down to a Townhouse	0.203	0.080	3.775	19.48
Use Patio and Want to Change Connection	-0.163	0.102	3.246	8.57
Outdoor Space Important for Children's Play	0.044	0.121	2.930	5.56
Family Use of Back Yard	-0.156	0.141	2.757	4.42
Outdoor Space Important for Storage and as Land	-0.136	0.151	2.467	3.72
Seeking Better House	-0.189	0.159	2.221	3.29
Want Better Neighbors, Neighborhood	-0.055	0.160	1.927	3.00
Gardeners	-0.168	<u>0.160</u>	1.695	2.77
TOTAL		0.160		

^aSimple r (Pearson's r)

^bF value for regression equation

^cF value which is significant at a prob. of 0.05 and for the correct d.f.

TABLE 21. Results of the Regression on Privacy Ratings with All Scales

	r^a	R^2	F_b	F_{CRIT}^c
Importance of Housing Value	-0.231	0.054	4.970	253.00
Long-time Residents	0.197	0.080	3.975	19.48
Moving Down to a Townhouse	0.203	0.102	3.823	8.57
Use Patio and Want to Change Connection	-0.163	0.121	3.772	5.68
Outdoor Space Important for Children's Play	0.044	0.141	3.744	4.42
Had a Large Yard and Now Want to Rent Non-single Family Housing	-0.142	0.151	3.313	3.72
Seeking a Better House	-0.189	0.160	3.109	3.29
Young, Well-educated Respondents with High Incomes	-0.021	0.160	3.057	3.00
Family Use of Back Yard	-0.156	0.160	2.882	2.77
Sex	-0.007	0.203	2.620	2.61
<hr/>				
Past Apartment Renters, Plan to Stay	0.135	0.223	2.384	2.47
Non-single Family Housing since Childhood	-0.136	0.224	2.192	2.36
Outdoor Space Important for Storage and as Land	-0.136	0.225	2.019	2.28
Family Size	0.026	0.251	1.853	2.21
Want Better Neighbors, Neighborhood	0.005	0.254	1.709	2.15
Wide Experience in Childhood Housing, Lived in Townhouse Before	-0.006	0.257	1.582	2.09
Gardeners	-0.168	<u>0.258</u>	d	2.04

^aSimple r (Pearson's r)^bF value for regression equation^cF value which is significant at a prob. of 0.05 and for the correct d.f.^dF value not computed because increase in F is less than 0.01^eRegression equation including the scales above the line is significant at $p=.05$

how long he had lived in the townhouse, whether he had lived in a house with a large yard before the townhouse, and information about his age, income, education, and sex.

There are two possible reasons why residents who had lived in the townhouse longer gave the privacy of their yards higher ratings. People who have stayed in their townhouses longer are people who have chosen to stay and may be more satisfied with privacy than newer residents, some of whom may not stay very long. Even though none of the housing background scales were significant when regressed on Privacy Ratings as a group, the scale "Had a Large Yard and Now Want to Rent Non-single Family Housing" was in the significant regression equation when all scales were combined. The finding that people who had moved from a house with a large yard rated the privacy of their townhouse back yards lower than people who had moved from apartments or other housing with little or no private outdoor space is evidence that people's housing backgrounds do influence their expectations for private outdoor space.

The inclusion of the two demographic scales in the significant equation indicates that younger people with high educational levels and high incomes tend to be more critical of townhouse privacy, and that women are slightly more critical than men.

The preferences of residents which contributed to the regression equation were attitudes toward housing value, whether respondents were "moving down" to the townhouse or were "seeking a better house", and whether they considered the family's and children's use of the back yard important. As in the prediction of General Ratings, people who thought the investment value of housing was important were likely to give lower Privacy Ratings than other residents, and people who were moving to a townhouse because of the low

maintenance were also more likely to give their back yards high Privacy Ratings. People moving to townhouses for this reason were making a fairly informed decision about some of the advantages of townhouse living and were also probably aware of the relative lack of privacy they could expect in their townhouse yards.

Predictors of "Good Fences Make Good Neighbors"

Results from Separate Regressions with Demographic, Housing Background, and Preference Scales

Table 22 shows that the demographic scales only explained 4% of the variance in Good Fences Make Good Neighbors ($R^2=.041$), the housing background scales explained 5% ($R^2=.051$), and the preference scales accounted for 19% ($R^2=.191$). None of these regression equations were significant at $p=.05$, although at $p=.10$, the preference equation with eight scales was significant.

Results from Regression on "Good Fences Make Good Neighbors" with All Scales

The results of the regression on "Good Fences Make Good Neighbors" with all scales are shown in Table 23. None of these equations were significant at $p=.05$, although at $p=.10$, the equation with ten scales was significant. Three scales appear in this equation which have not had any value in predicting the other rating scales, "Want Better Neighbors and Neighborhood", "Gardeners", and "Outdoor Space is Important as Storage and as Land". The other scales in the equation have appeared in one or both of the other combined regression equations and describe a respondent's attitude toward his housing.

The fact that three new scales appeared in the equation which predicted Good Fences Make Good Neighbors emphasized the distinct differences between

TABLE 22. Results of Separate Regressions on "Good Fences Make Good Neighbors" with Demographic, Housing Background, and Preference Scales

Regression with Demographic Scales	r ^a	R ²	F ^b	FCRIT ^c
Young, Well-educated Respondents with High Incomes	0.200	0.040	3.646	253.00
Sex	0.000	0.041	1.849	19.48
Family Size	0.023	<u>0.041</u>	d	8.57
TOTAL		0.041		
Regression with Housing Background Scales				
Had a Large Yard and Now Want to Rent Non-single Family Housing	-0.157	0.025	2.228	253.00
Non-single Family Housing Since Childhood	0.153	0.042	1.918	19.48
Past Apartment Renters, Plan to Stay	-0.109	0.050	1.502	8.57
Long-time Residents	0.016	0.051	1.136	5.68
Wide Experience in Childhood Housing, Lived in Townhouse Before	-0.037	0.051	d	4.42
Regression with Preference Scales				
Want Better Neighbors, Neighborhood Gardeners	0.203	0.041	3.775	253.00
Seeking Better House	-0.149	0.073	3.433	19.48
Outdoor Space Important for Children's Play	0.190	0.118	3.823	8.57
Use Patio and Want to Change Connection	-0.098	0.142	3.509	5.68
Outdoor Space Important for Storage and as Land	0.117	0.162	3.242	4.42
Moving Down to a Townhouse	0.058	0.175	2.930	3.72
Family Use of Back Yard	-0.064	0.182	2.609	3.29
Importance of Housing Value	0.074	0.190	2.358	3.00
	-0.024	0.191	2.098	2.77

^aSimple r (Pearson's r)

^bF value for regression equation

^cF value which is significant at a prob. of 0.05 and for the correct d.f.

^dF value not computed because increase in F is less than 0.01

TABLE 23. Results of the Regression on "Good Fences Make Good Neighbors" with All Scales

	r^a	R^2	F_b	F_{CRIT}^c
Want Better Neighbors, Neighborhood	0.203	0.041	3.775	253.00
Young, Well-educated Respondents with High Incomes	0.199	0.073	3.830	19.48
Gardeners	-0.149	0.118	3.935	8.57
Outdoor Space Important for Storage and as Land	0.058	0.142	3.559	5.68
Outdoor Space Important for Children's Play	-0.098	0.162	3.685	4.42
Had a Large Yard and Now Want to Rent Non-single Family Housing	-0.157	0.175	3.374	3.72
Seeking a Better House	0.190	0.182	3.008	3.29
Use Patio and Want to Change Connection	0.117	0.189	2.745	3.00
Moving Down to a Townhouse	-0.064	0.191	2.484	2.77
Past Apartment Renters, Plan to Stay	-0.109	0.196	2.241	2.61
Non-single Family Housing Since Childhood	0.153	0.201	2.027	2.47
Long-time Residents	0.016	0.203	1.847	2.36
Importance of Housing Value	-0.024	0.203	1.689	2.28
Family Use of Back Yard	0.074	0.223	1.554	2.21
Family Size	0.023	0.225	1.436	2.15
Sex	0.000	0.226	1.331	2.09
Wide Experience in Childhood Housing, Lived in Townhouse Before	-0.037	0.226	1.236	2.04
TOTAL		0.226		

^aSimple r (Pearson's r)^b F value for regression equation^c F value which is significant at a prob. of 0.05 and for the correct d.f.

the three rating scales. Good Fences Make Good Neighbors reflected a resident's attitudes toward his neighbors and intrusions on his privacy, while the other two rating scales were more general measures of his satisfaction with the project and the privacy in his back yard. The scale "Want Better Neighbors and Neighborhood" reflected a resident's satisfaction with the social aspects of his project. The people who said they would move to get better neighbors or a better neighborhood also have high scores on "Good Fences Make Good Neighbors". People who are gardeners tended to have low scores on the last rating scale which may confirm reports that people using their yards for more active hobbies are more satisfied with townhouse yards (Willis, 1963; Gatt, 1979).

SUMMARY

Each of the three rating scales, General Ratings, Privacy Ratings, and "Good Fences Make Good Neighbors", was predicted by a regression equation significant at $p=.05$ made up of preference, housing background, and demographic scales. General Ratings was the only scale which could be predicted from one of the scale groups alone (preferences). The scales included in the three significant regression equations were different, especially the scales predicting "Good Fences Make Good Neighbors". In general, information useful for predicting a resident's ratings included why he was living in his townhouse, his attitudes toward his house's investment value, whether he thought outdoor space was important for family use and children's play, what kind of housing he had lived in, and his age, income, education, and length of residence.

5.0 RECOMMENDATIONS FOR DESIGN

The value of a designer conducting a survey of this type is that the data can be translated into recommendations and suggestions for other designers. This crucial step has to be left out in studies conducted by social scientists, and designers are rarely qualified to interpret the results of these social science studies themselves.

A number of recommendations for townhouse private outdoor space design, site design, and management are presented here. This information should be of interest to landscape architects, planners, and builders or developers working in multiple housing.

5.1 PRIVATE OUTDOOR SPACE DESIGN

Size of Yards and Patios

The majority of people seemed to be satisfied with yards over 300 square feet. With unit frontages ranging from 16 to 20 feet, this means the yards should have a depth of 15 or 20 feet. Patios should be at least 10 by 10 feet and should not be tucked into a building setback which limits the use of the space. People in townhouses used the patios for a wide range of activities and there is some support for laying paving in a large portion of the yard. People who had a paved yard are content to be without lawn, although those with conventional yards said they want grass. One issue concerning many of the features studied is how to provide for the range of preferences found among residents. Proposing that a variety of treatments be installed by the developer is no solution; people buy houses for reasons of price and inside features, and the design of the yard is not usually a factor in their decision.

The best system may be one where a basic yard is provided and owners are informed about possible improvements and recommended materials. For example, the patio should be constructed of two foot square pavers set in concrete, which people could extend by laying more of the same pavers in sand. The paver system is recommended because it is inexpensive and can easily be added to by the home owner.

Fencing

The same type of modular system should be used for fencing. The wide range of privacy preferences found in this study make it obvious that a more flexible fencing system would probably please many residents. Yards should be fenced on all three sides. People want fencing to keep people off their grass and to make boundaries clear even if they don't want it for privacy. The tall (6') solid screens usually provided between units should be built; these screens make the patios private from the neighbors next door. Instead of stopping there, as many builders do, the fencing should be continued. Fencing six feet high on the sides and three feet high across the end is recommended.

The best solution to providing a satisfactory fencing system is to build the fences so they can easily be altered by the residents. If the frame of the fences (posts and rails) is designed to accept changeable panels built in six or eight foot modules, residents could substitute solid sections for sections of lattice, for instance. The higher side fence should be mostly solid sections with one lattice section toward the end, and the three foot high end fence should be all lattice sections. People could then substitute solid sections to make a solid three-foot-high fence, or add sections to make the end fence six feet high. These modules could be traded among the residents from a stock provided by the builder when the fences are constructed, or simple plans could be provided so residents could construct their own.

The main virtue of flexible paving and fencing systems like the ones described is that residents can change them to suit their needs. The inflexibility of condominium rules regarding changes to fencing is in contrast to the rules about interior alterations, where owners can do anything they want unless structural changes are involved. People should have the same freedom to change their outdoor living spaces as long as the general appearance of the project is safeguarded. The simplest way to insure that there is a common design element underlying the variety of fences, for example, is to build it in: provide the basic framework of the fences and build the panels so that they all look the same.

Lawns

Recommending that all yards be fenced will also make maintenance of the common areas easier. In the sample projects which had open yards, the maintenance crews cut the lawns. Mowing these innumerable small lawns is time-consuming and inefficient and some residents were uncertain about their freedom to plant shrubs and flowers in the back yards. In the projects with enclosed yards, the residents maintained a lawn if they wanted one, and quite a few had either reduced the area of lawn or had done away with it altogether.

The recommendation for yard treatment is that all yards should be provided with small areas of lawn and sizeable planting areas (see Figure 3). The lawn can be expanded or eliminated and replaced by a vegetable garden, shrubs, or paving, according to the preference of the residents. The small lawn would also reduce the aggravation of people with north-facing yards trying to maintain lawn in an unending competition with the moss. There should also be room for owners to install small storage sheds if the builders have not provided them.

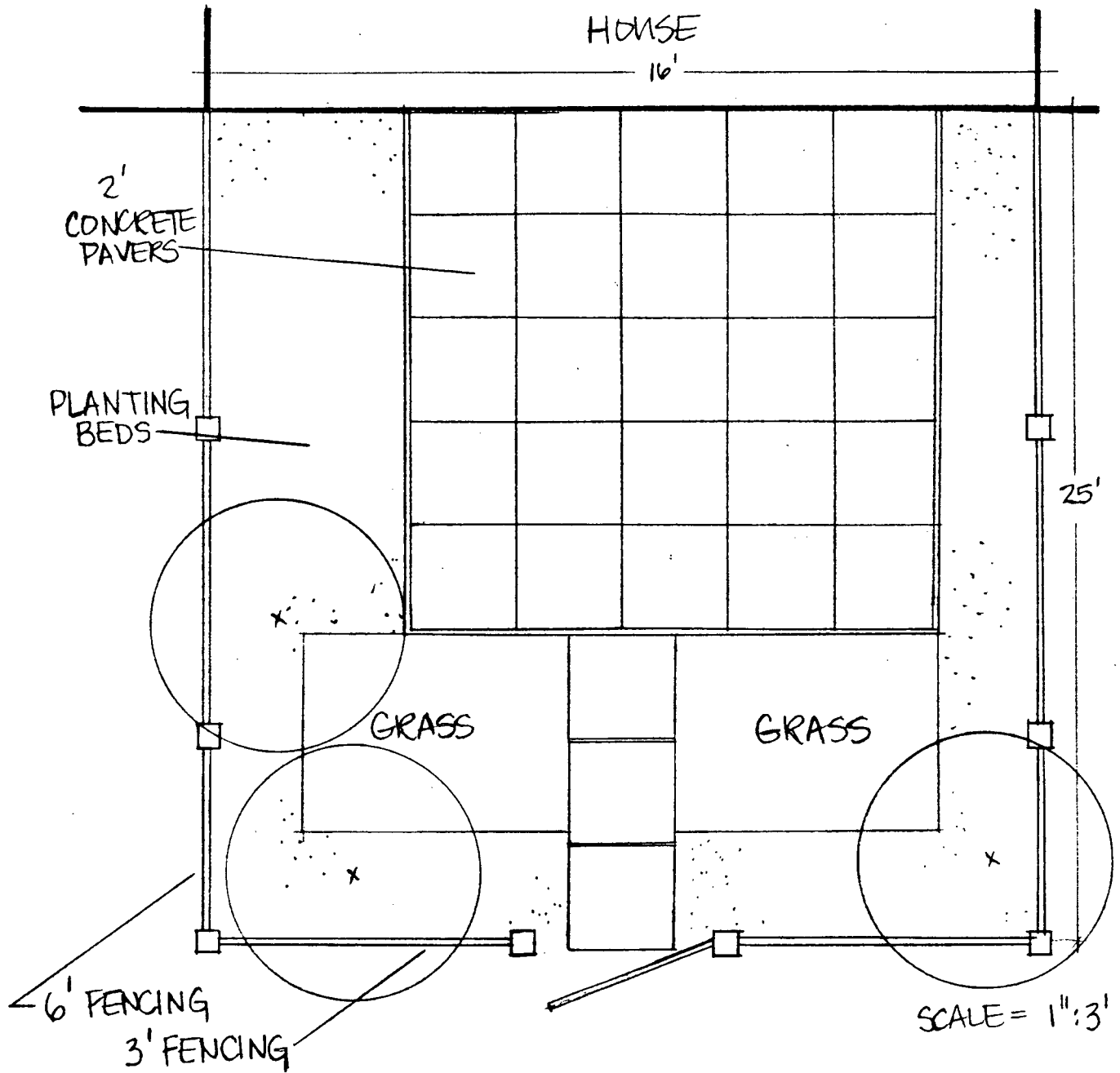


Figure 3. Recommended Yard Treatment.

Trees and Shrubs

A basic structure of trees and shrubs should also be provided. The positive effect of generous landscaping on the general appearance and privacy of townhouse projects is illustrated in Plates 12 and 13. Even small yards should have at least one tree and if the right species are chosen and planted far enough from the buildings there will be no problems with trees growing too large. Enough evergreen and deciduous shrubs should be planted to insure that the person who doesn't want to garden can still have an attractive yard.

Connection to the Unit

The practice of placing the living room of townhouses along the full length of the back wall created some cleaning problems with traffic from the back yards, especially for families with children. One solution would be to create a covered area on the patio which could function as a back porch. A number of residents would have preferred that their kitchen was adjacent to the patio rather than their living room to make cleaning easier and to make cooking outside more convenient.

Front Yards

In most townhouse projects the space at the front of units was semi-public and more for looking at than using; this was acceptable to most residents. Better landscaping with shrubs as well as trees would do much to improve the general appearance of some projects. The effort people spent growing flowers in the front yards indicated their interest in the appearance of the front yards.

Some townhouses had a small private front space (see Plate 14) rather than the more typical open area of lawn. These spaces were of value for providing excellent privacy for the inside of the unit, and for improving the appearance



Plate 12. The benefit of generous landscaping at Lillooet.

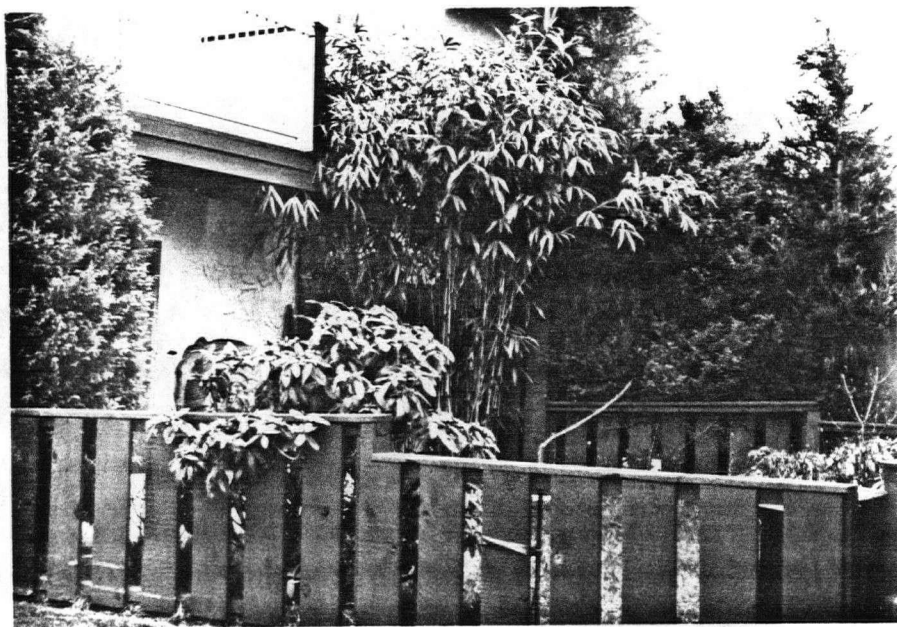


Plate 13. Landscaping enhances privacy at Springmont.

of the carport areas because of the extra storage space provided. In general, these semi-private front spaces were no substitute for a private back yard, unless they were separated from the street and parked cars, as at Greentree Village (see Plate 15).

Balconies

The finding that most balconies in townhouses were unused and little appreciated was due primarily to their location off upstairs bedrooms. In projects like Lillooet where the living rooms in some units were on upper floors, the balconies off these rooms were very popular. The minimum depth for a usable balcony is about five feet; otherwise, sitting comfortably on a chair is almost impossible. Balcony railings should be solid enough to provide some privacy and safety for children, but where there is a view, the top railing should not be thick enough to block the view from inside.

Since the major use of balconies seemed to be growing flowers, railings should be provided which allow people to hang pots and flower boxes. Planter boxes built into the railing can be attractive where the balconies face a street or courtyard, but can create problems if there is a view. These planter box-railings are best planted with annuals rather than vines and shrubs unless they will receive water from rainfall; dead or dying plants look worse than none at all.

Roof Decks

One sample project (False Creek) had roof decks on some units (see Plate 16). These decks were little used because of wind and the lack of shade. If roof decks are provided, they should be at least partially protected.

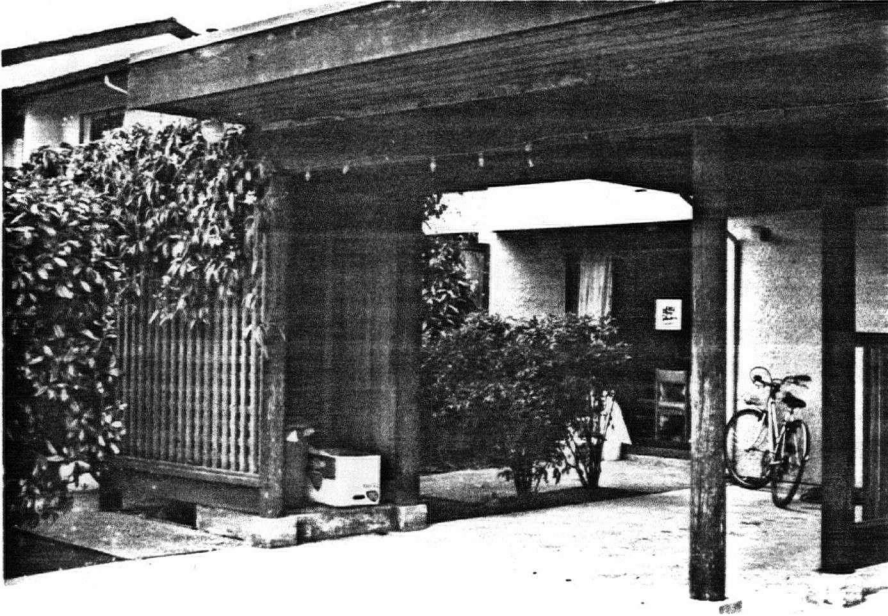


Plate 14. Small, private front patios at Mariners Village.

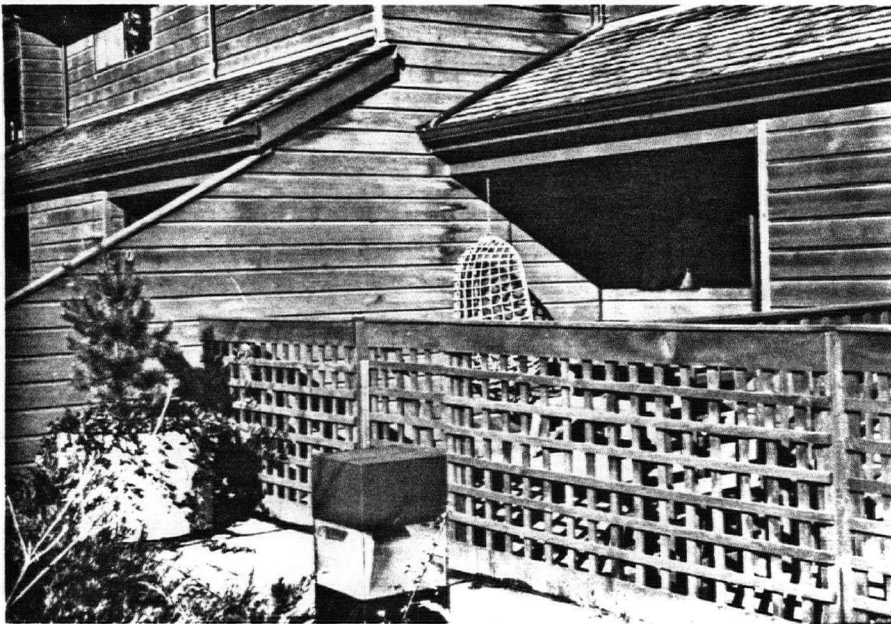


Plate 15. Front patios at Greentree are removed from the street.



Plate 16. Some False Creek roof decks were little used because of exposure to sun and wind.

5.2 SITE DESIGN

Children's Play

There were few complaints about noise from children's play in the projects sampled. Play areas should always be located between rows of units, if possible, to reduce noise problems. Sand boxes and sand pits should always be covered, if provided at all, because of problems with cats.

Children's play in project streets and parking areas was a worry for some residents. It should be recognized by now that children over the age of six or so prefer to play in a central location with a hard surface. Parking lots and streets fit children's criteria perfectly. It is probably wiser for designers to anticipate this play rather than to ignore it or try to prevent it. Court arrangements are probably the safest and long, narrow streets with parking on the side are probably the least safe. Speed bumps can help slow traffic but this is a makeshift solution.

Parking

The general conclusion about parking is that each unit should have parking space for two cars. One should be at the front door of the unit, preferably covered, and the other a short distance away. The problem of preventing townhouse projects from looking like parking lots has been admirably solved at Mariners Village. The court arrangement with a central, well-landscaped parking island is attractive, serves as a visual buffer, and the road design tends to slow down traffic.

Swimming Pools

Swimming pools were used and appreciated by the residents who have them. Most people without pools said they would use one, but the critical question of whether they would pay more to get a pool was not asked. There can be

problems with management and noise, and the location of the pool within the project is important. The best solution in large projects is to locate the pool in a common area between sections or "neighborhoods". In small projects, landscaping can help fit the pool in with its surroundings and can act as a noise buffer.

5.3 MANAGEMENT

There was a general lack of interest and information on the part of residents regarding the strata councils. Few long-term residents attended the annual meetings and both new and old residents were quite ill-informed about council rules regulating changes to yards and fences. If the councils were to distribute a summary of what can and cannot be done together with a description of acceptable fences, screen doors, etc., there would probably be less discomfort with the rules, less resentment about council decisions, and better communication between some residents and councils.

The fact that most people knew a number of the items covered by their monthly maintenance fee did nothing to counter their impression that the landscape maintenance was too expensive. This impression, whether true or not, caused bad feelings among residents about the quality of the maintenance. Again, better communication between the management, council, and residents would eliminate some of the misunderstandings and encourage discussion of alternative maintenance systems. For example, one of the smaller projects (Springmont) had recently fired its management company and residents were managing the project and doing the landscape maintenance on a communal basis. This might be a reasonable option for many of the smaller projects, although any project larger than 50 units or so may find the management company earns its fee.

6.0 SUMMARY

This chapter summarizes and discuss some of the more important findings reported throughout the study.

6.1 WHO ARE TOWNHOUSE OWNERS?

The study found that a broad range of people own townhouses in the Vancouver area. The average respondent was over 40 years old and had a household income of about \$30,000 a year. The study included young singles, young married couples, families of all ages, older couples, and older single people. Therefore, the common market wisdom that townhouses are only for first owners and "empty nesters" was not supported by this study. There were substantial numbers of first owners but there were also people of all ages who had moved from their own single family houses.

6.2 ARE THERE ANY DIFFERENCES BETWEEN TOWNHOUSE PROJECTS WHICH AFFECT OWNERS' SATISFACTION?

A variety of private outdoor space treatments were represented in the sample, ranging from the paved, private yards in Mariners Village to the small open patios at Greentree Village. A number of conclusions can be drawn from residents' evaluations of their yards:

1. Yards of about 300 square feet were satisfactory to most residents. Completely enclosed yards seem smaller.
2. Patios less than 10 x 10" were too small, especially if they were built into a recess in the building. If activities spill off the patio onto grass areas, the patios seemed larger.
3. Concrete patios were satisfactory, but tile or exposed aggregate was better.
4. Those who had a small lawn wouldn't dream of being without one, but those with paving preferred the paving. Having no grass sounds bleak, but once people have a paved yard, the convenience and low maintenance are popular.

5. Most people like to garden or "putter" in their yards and most are content with the small plots and an assortment of containers.
6. Some people want a degree of privacy not usually available in townhouses, but a significant number are quite satisfied.
7. The taller and more solid the fence, the better many people like it. Hedges are preferred to fences. There should be fencing all around the yard.
8. Children playing bothers few residents but cats in yards bothers almost everyone.
9. The best way to satisfy the range of preferences is to let people change their fences and yards.

6.3 CAN A PERSON'S RATINGS OF HIS YARD AND TOWNHOUSE PROJECT BE PREDICTED FROM HIS DEMOGRAPHIC CHARACTERISTICS, HOUSING BACKGROUND, OR PREFERENCES?

General Ratings, Privacy Ratings, and "Good Fences Make Good Neighbors" were all predicted successfully. Between 20 and 26% of the variance in ratings was accounted for.

1. Preference information was the most useful for predicting a respondent's ratings. People who gave higher General Ratings and Privacy Ratings moved to the townhouse to get a smaller house with less maintenance, did not think of housing as an investment, and thought the back yard was important for children's play.
2. A respondent's housing background affected his ratings on the project and his outdoor space (General Ratings) and the privacy of his yard (Privacy Ratings). People who had lived in houses with large yards gave lower privacy ratings than people who had lived in apartments.
3. Demographic characteristics were the least useful for predicting ratings, although younger respondents with higher educations and incomes gave lower General and Privacy Ratings. Women were also more critical of privacy than men.

6.4 UTILITY OF FINDINGS

The utility of the findings reported here can be illustrated by a series of recommendations to the groups involved in designing and managing townhouse outdoor space. Landscape architects are often hired to produce site plans and landscaping plans for townhouse projects, and much of the information in this

study will prove useful to them. Planners usually write the guidelines which set standards for acceptable project design. The inclusion of the recommendations presented here could improve the quality of the private outdoor spaces. The groups which manage townhouse projects include professional management firms and the strata councils elected by residents, as well as groups responsible for cooperative and rental townhouse projects. The findings in this study have several implications for project management. Last, some advice is extended to prospective townhouse buyers.

Landscape Architects

One of the most important general findings of the study was that although the design of the private outdoor space is not a factor in a person's decision to buy a townhouse, the general appearance and landscaping of the project are important factors. Ample plantings of trees and shrub masses in scale with the housing, functional and attractive open spaces, well-designed parking and roadways, and good signage and furniture detail are features which residents and prospective buyers appreciate. Some of these features are expensive and only the more expensive projects may have all the design features the landscape architect would like to include, but better design in the moderately-priced projects can ensure that expensive plant material is used to its best effect.

Townhouse yards can be as small as 15x20 feet as long as the paved area is functional. Patios are used extensively and need to be large enough to accommodate garden furniture, a barbecue, and some storage. Patios should be at least 10x10 feet and there is evidence that many people would like yards with no grass at all. People were satisfied with the concrete patios in most projects, although the more expensive tile or exposed aggregate patios were popular with residents who had them.

It is critical that privacy fencing be provided on at least two sides of the yard. Few people demanded complete privacy, but most people wanted fencing to control access to their yard. Fencing is expensive but it is crucial to the quality of the private outdoor spaces. If yards are not completely enclosed, pedestrian access to the rear yard areas should be limited.

Gardening on a small scale was popular among the townhouse owners interviewed. Small planting areas should be provided for flowers and vegetables, and where decks are built, large planters should be included.

Planners

The findings in this study indicate that the recommendations for the size of yards in multiple housing (about 400 square feet) are acceptable. Patio size may be just as important as the size of the yard because patios are used so often. Patios should be a minimum of 10x10 feet and larger if set back into a building recess.

Guidelines for fencing should set some standards for the "solidity" of the fence and not just state a minimum height. If fences are meant to establish real privacy then they must be built so people can't see through them. This may seem obvious, but much of the fencing provided in townhouse projects does little to establish privacy.

Standards for road design should allow for children playing in project streets. Cul-de-sacs and court arrangements are safer than linear layouts.

Management

The results from the interviews indicate that townhouse management could be improved by better communication with residents and more flexibility in allowing alterations to yards and fences. Recommendations include the distribution of project rules and regulations to residents as soon as they

move in. A description of acceptable fence designs and materials, for example, would inform people of the alternatives available. Better communication about budget matters would prevent some misunderstandings about the costs of landscape maintenance and other services. More small projects might want to explore the option of self-management.

Prospective Townhouse Owners

People who have never lived in a townhouse may not realize how important the design of the open space and private outdoor space are in townhouse projects. Features to look for include privacy in the back yard, pedestrian patterns along front or back property lines, places children play, busy streets or project parking areas on the bedroom side of the unit, and orientation to the sun at the front and back of the unit. Recognizing that features outside the house can be as important as the inside can help prospective buyers anticipate what living in the townhouse project will be like.

6.5 FURTHER RESEARCH

Several interesting side issues have been raised in the course of the study and some suggestions can be made for further study.

1. Asking people how much they would pay for a suggested improvement may be more useful than unqualified statements of preference. Many of the features discussed in this study are expensive and builders and developers need to know if consumers will accept higher prices to get pools, more fencing, or aggregate paving, for example. Trade-off questions which ask people to choose between alternatives with realistic consequences (such as cost) collect useful, practical information.
2. Resident satisfaction with townhouse projects may be affected by project management. A comparison of cooperative townhouse projects with condominium projects like the ones in this study could demonstrate the importance of communication and resident involvement in project management.

3. Residents of townhouse projects may be interested in a landscape advice service. Information about growing annuals, vegetables, lawns, shrubs, and trees could be tailored to the exposure and soil conditions of project yards. This service could be provided by an interested resident with help from a landscape architect or a nurseryman.
4. What is the best balance between communal open space and private space? Questions could be asked about the amount, function, and use of open space in townhouse projects and the interface between communal and private space.

Bibliography

- Battles, Robert A.M. (1976) Townhouses in Single Family Areas: Analysis of Public Attitudes Towards Increasing Density, M.A. Thesis in Community & Regional Planning, U.B.C.
- Beck, Robert J. and P. Teasdale (1977) User-Generated Program for Low-Rise Multiple Dwelling Housing - Summary of a Research Report, University of Montreal.
- Becker, Franklin (1974) Design for Living: The Resident's View of Multi-Family Housing, Center for Urban Development Research, Cornell University, Ithaca, N.Y.
- Bell and Constantinescu (1974) The Housing Game - A Survey of Consumer Preferences in Medium-Density Housing in the Greater Vancouver Region, United Way of Vancouver.
- Broady, Maurice (1966) "Social Theory in Architectural Design", Arena, 81 (Jan. 1966), pp. 149-154.
- Burnaby Planning Dept. (1974) Multiple Housing Questionnaire, Burnaby, B.C..
- Byrom, Connie (1970) "Privacy and Courtyard Housing", The Architect's Journal, Jan. 14, 1970, p. 101.
- Byrom, J.B. (1972) Shared Open Space in Scottish Private Enterprise Housing, Architecture Research Unit, Department of Architecture, University of Edinburgh.
- Calgary, City of, Planning Dept. (1970) Multi-Residential Standards (Draft), Calgary, Alberta.
- Chermayeff, Serge and Christopher Alexander (1963) Community and Privacy - Toward a New Architecture of Humanism, Doubleday, New York.
- Central Mortgage and Housing Corporation, Architecture and Planning Division (1974) User Study of Private Open Spaces in a Courtyard Housing Project, Working Paper #10, Ottawa.
- Central Mortgage and Housing Corporation (1977) Site Planning Criteria, Ottawa.
- Condominium Research Associates (1970) National Survey of Condominium Owners.
- Cooper, Clare (1967) "Fenced Backyard - unfenced frontyard - enclosed front porch", Journal of Housing (1967), 24:5, pp. 268-274.
- _____ (1970) Resident Attitudes Toward the Environment at St. Francis Square, S.F.: A Summary of the Initial Findings, Working Paper #126 Institute of Urban & Regional Development, University of California at Berkeley.

- _____ (1971) "St. Francis Square: Attitudes of Its Residents",
AIA Journal (Dec. 1971) 56:22-27.
- _____ (1975) Easter Hill Village: Some Social Implications of Design,
The Free Press, N.Y.
- Department of the Environment (1971) New Housing - A Cleared Area. A Study of
St. Mary's, Oldham, HMSO, Design Bulletin No. 22, London.
- Eadie, Graeme (1978) "Condominium Owner's and Tenants' Profiles" in Hamilton
(ed.), Condominiums: A Decade of Experience in British Columbia, B.C.
Real Estate Association, Vancouver, B.C., pp. 75-104.
- Gatt, Carmel (1978) Privacy in Private Outdoor Spaces in Multifamily Housing
Projects, M. of Architecture Thesis, U.B.C.
- Ganchat, U. P. (1978) Parameters for High Density Urban Housing: The
Suburban Metaphor, Harvard Publication Series in Architecture, Cambridge,
Mass.
- Gilmour, Andrew, et al. (1970) Low-Rise High Density Housing Study,
University of Edinburgh, Architecture Research Unit.
- Griffin, Mary E. (1974) "Mount Hope Courts: A Social-Physical Evaluation",
Proceedings of Northeast Undergraduate Conference on Environment and
Behavior, Vogt, Jay W. (ed.), University of Mass, Amherst, Mass., p. 33-49.
- GVRD Planning Department (1974) Background Paper: Compact Residential
Communities in the GVRD, Vancouver, B.C.
- _____ Planning Department (1977a) Survey of Resident Attitudes: Bookside
Townhouse Development, (Port Moody, B.C.), Vancouver, B.C.
- _____ Planning Department (1977b) Survey of Resident Attitudes: Lynn Valley
Coop Townhouse Development, Vancouver, B.C..
- _____ Planning Department (1977c) Survey of Resident Attitudes: Greentree
Village Phase 1 Townhouses, Vancouver, B.C.
- _____ Planning Department (1978) Summary Survey of Resident Attitudes:
Edgewater Park duplexes, Vancouver, B.C..
- Halkett, Ian P.B. (1978) "The Recreational Use of Private Gardens", Journal of
Leisure Research 10:1 (13-20).
- Hall, Edward T. (1966) The Hidden Dimension, Doubleday, Garden City, New York.
- Harding, Michele, Kerry Wasserman and Andrew Zdanowicz (1975) User Study:
Zero lot line Concept prepared for Ministry of Housing, Ontario Housing
Corporation.
- Hinshaw, Mark and Kathryn Allott (1972) "Environmental Preferences of Future
Housing Consumers", JAIP (Mar. 1972), pp. 102-107.

- Kaiser, Edward J., S. Weiss, R. Burby and T. Donnelly (1970) Neighborhood Environment and Residential Satisfaction: A Survey of the Occupants and Neighborhoods of 166 Single Family Homes in Greensboro, North Carolina, Center for Urban and Regional Studies, University of North Carolina at Chapel Hill.
- Katz, Robert D. (1963) Intensity of Development and Livability of Multi-Family Housing Projects: Design Qualities of European and American Housing Projects, Technical Study TS 7.14, U.S. Gov't Printing Office, Wash, D.C.
- _____ (1966) Design of the Housing Site - A Critique of American Practice, distributed by Small Homes Council-Building Research Council, U. of Illinois, Urbana, Ill.
- Kiff, Janet (1974) Space Outside the Dwelling Unit: A Review of Selected Canadian Housing User Studies, Working Paper #7, CMHC Architecture and Planning Professional Standards and Service Group, Ottawa.
- _____ (1975) A Review of Municipal and CMHC Requirement for Space About Residential Buildings, Working Paper #9, CMHC Architecture and Planning Professional Standards and Service Group, Ottawa.
- Knight, Robert L. and Mark D. Menchik (1974) Residential Environmental Attitudes and Preferences: Report of a Questionnaire Survey, Institute for Environmental Studies, University of Wisconsin, Madison, Wisconsin.
- Koenig, John Franklin (1975) Alternative Forms of Housing, Real Estate Board of Greater Vancouver, Vancouver, B.C..
- Kuper, Barbara (1968) Privacy and Private Housing, Building Design Partnership.
- Lansing, John B. and G. Hendricks (1967) Living Patterns and Attitudes in the Detroit Region, Technical Report, Detroit Metropolitan Area Regional Planning Commission, Detroit, Michigan.
- Lansing, John B., Robert W. Marans and Robert B. Zehner (1970) Planned Residential Environments, Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, Michigan.
- Lynch, Kevin (1960) The Image of the City, MIT Press, Cambridge, Mass.
- Mann, Thorbjørn (1972) "The Role of Research in the Development of Performance Standards" in W.J. Mitchell (ed.), Environmental Design: Research and Practice, Proceedings of the Third Annual Conference of the Environmental Design and Research Association, University of California at Los Angeles.
- Marshall, Nancy J. (1970) "Environmental Components of Orientations Toward Privacy", Proceedings of the 2nd Annual Environmental Design Research Association Conference, Archea, L. and C. Eastman, eds., Pittsburgh: Carnegie Mellon University, pp. 316-319.

Michelson, William (1968) "Most People Don't Want What Architects Want", Transaction, 5:37-43.

____ (1969) Analytic Sampling for Design Information: A Survey of Housing Experience, Research Paper #21, Centre for Urban and Community Studies, University of Toronto.

Ministry of Housing and Local Government (1967) "Housing at Coventry: A User Reaction Study", Official Architecture and Planning.

____ (1969a) Family Houses at West Ham, Design Bulletin #15, HMSO, London.

____ (1969b) The Family at Home, Design Bulletin #17, HMSO, London.

Murray, James and Henry Fliess (1970) Family Housing - A Study of Horizontal Multiple Housing Techniques for the Canadian Housing and Design Council.

Newman, Oscar (1972) Defensible Space - Crime Prevention Through Urban Design, Macmillan, New York.

Norcross, Carl (1973) Townhouses and Condominiums: Residents' Likes and Dislikes, Institute Special Report, Washington, D.C.: Urban Land Institute.

North Vancouver, City of (1976) Open Space Criteria for Low and Medium Density Comprehensive Residential Developments, North Vancouver, B.C.

Ottawa, City of, Planning Branch (1977) Residential Design Guidelines (Draft) Ottawa, Ontario.

Pavlich, Dennis J. (1978) "The Strata Titles Act" in Hamilton (ed.) Condominiums: A Decade of Experience in B.C., B.C. Real Estate Association, Vancouver, B.C., pp. 33-73.

Perin, Constance (1977) Everything in Its Place: Social Order and Land Use in America, Princeton University Press.

Proshansky, H., W. Ittelson and L. Rivlin (1970) "Freedom of Choice and Behavior in a Physical Setting" in Proshansky et al. (eds.) Environmental Psychology, Holt, Reinhart and Winston.

Proshansky, Harold M. (1974) "Environmental Psychology and the Design Professions" in Lang et al. (eds), Designing for Human Behavior, pp. 72-80.

Rapoport, A. (1969) House Form and Culture, Prentice-Hall, Englewood Cliffs, N.J.

Saile, David G., et al. (1971) Activities and Attitudes of Public Housing Residents: Rockford, Illinois, Committee on Housing Research and Development, University of Illinois at Urbana-Champaign.

- Sandvik, Gloria J., Barbara B. Shellenbarger and Margaret M. Steveson (1973) Resident Evaluation of Four Planned Unit Developments: Eugene, Oregon, A Report presented to the Eugene Planning Department, Eugene, Oregon.
- Sanoff, H. and M. Sawhney (1972) "Residential Livability: A Study of User Attitudes Toward Their Residential Environment" in W.J. Mitchell (ed.) Environmental Design: Research and Practice, Proceedings of the Third Annual Conference of the Environmental Design and Research Association, University of California at Los Angeles.
- Shankland and Cox Assoc. (1967) "Front and Back: Problems of the Threshold", The Architects' Journal, Nov. 22, 1967, pp. 1307-1312.
- Sommer, Robert (1969) Personal Space - The Behavioral Basis of Design, Prentice-Hall, Englewood Cliffs, N.J.
- _____ (1972) Design Awareness, Rinehart Press, Corte Madera, California.
- University of Michigan Survey Research Center (1970) Interviewers' Manual, revised edition, University of Michigan, Ann Arbor.
- Vischer Skaburskis Planners (1980a) False Creek, Area 6, Phase 1: Post-Occupancy Evaluation, Volume 1: Executive Summary, prepared for CMHC, Vancouver, B.C.
- _____ (1980b) False Creek, Area 6, Phase 1: Post-Occupancy Evaluation, Volume 2: Final Report, prepared for CHMC, Vancouver, B.C.
- Walkey/Olson Architects (1976) Privacy in Compact Housing, prepared for the GVRD Planning Department, Vancouver, B.C.
- Whyte, William H. (1964) Cluster Development, American Conservation Association, New York.
- Willis, Margaret (1963) "Designing for Privacy", Architects Journal 137 pp. 1137-1141, 1181-1187, 1231-1236.
- Willmott, P. (1962) "Housing density and town design in a new town", Town Planning Review 33:2 (July 1962), pp. 115-27.
- Zeisel, John (1975) Sociology and Architectural Design, Russell Sage Foundation.
- Zeisel, John and Mary E. Griffin (1975) Charlesview Housing: A Diagnostic Evaluation, Architecture Research Office, Graduate School of Design, Harvard University.

APPENDIX 1

QUESTIONNAIRE AND RESPONSES

Introduction

Hello. My name is Barbara Greig and I'm a graduate student at UBC. I'm conducting a townhouse study and this complex was chosen for interviews. First, can I ask you 2 quick questions?

1. Do you rent or own this unit? rent own
2. How long have you lived here? less than 3 mo. more than 3 mo.

Rejection statement: I'm only speaking to people who (1) own their unit
(2) have lived here more than 3 months, so I won't
need to speak with you. Thank you anyway. Goodbye.

I'm a student of landscape architecture and I'm studying the private gardens that are built with townhouses. I'm asking people what they like and what they don't like, what they'd like to change, etc. so we can learn how to design these gardens better.

The interview takes about 25 minutes and all information will be confidential. Can we do the interview now? yes no or shall I come back later?

1. In general, how would you rate this project?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Very poor	0	0.0
Poor	0	0.0
So-so	3	3.3
Fair	9	10.0
Good	53	58.9
Excellent	25	27.8
	<u>90</u>	<u>100.0</u>

2. How would you rate the inside of your house?

Very poor	0	0.0
Poor	0	0.0
So-so	10	11.1
Fair	15	16.7
Good	49	54.4
Excellent	16	17.8
	<u>90</u>	<u>100.0</u>

3. How would you rate your outdoor space?

Very poor	0	0.0
Poor	5	5.6
So-so	7	7.8
Fair	14	15.6
Good	49	54.4
Excellent	15	16.7
	<u>90</u>	<u>100.0</u>

4. In general, how would you rate your back yard?

Very poor	0	0.0
Poor	6	6.7
So-so	6	6.7
Fair	18	20.0
Good	45	50.0
Excellent	15	16.7
	<u>90</u>	<u>100.0</u>

5. As far as the size goes, is it:

Much too small	8	8.9
A little too small	30	33.3
About right	52	57.8
A little too big	0	0.0
Much too big	0	0.0
	<u>90</u>	<u>100.0</u>

6. Do you have a fence?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Yes	72	80.0
No	18	20.0
	90	100.0

7. If yes, would you say it is:

Very poor	0	0.0
Poor	0	0.0
So-so	3	3.3
Fair	12	13.3
Good	38	42.2
Excellent	19	21.1
	72	100.0

8. What do you think a back fence should do?

Mark the edges of my property and nothing else	0	0.0
Keep intruders and pets out or make a safe place for children	14	15.6
Give privacy from the neighbors on the sides but open at the end	42	46.7
Act as a solid wall to make a completely private space	33	36.6
Other	1	1.1
	90	100.0

9. Would you say your back yard should be:

Much more private	4	4.4
A little more private	32	35.6
Just as it is	54	60.0
A little less private	0	0.0
Much less private	0	0.0
	90	100.0

10. Which of these things, if any, are problems here?

<u>Problem</u>	<u>Frequency of "Yes" responses</u>	<u>% Respondents</u>	<u>% "Yes" Responses</u>
Noise from neighbors	9	10.0	11.8
Noise from traffic	12	13.3	15.8
People walking by too close	10	11.1	13.2
People seeing in from their houses and yards	13	14.4	17.1
Children and pets wandering in	23	25.6	30.3
Other	9	10.0	11.8
	76	84.4	100.0

11. How private is your yard from people seeing in?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Not private at all	11	12.2
Not very private	16	17.8
Somewhat private	48	53.3
Very private	<u>15</u>	<u>16.7</u>
	90	100.0

12. How much does this bother you?

A lot	4	4.4
Some	22	24.4
Not much	28	31.1
Not at all	<u>36</u>	<u>40.0</u>
	90	100.0

13. Are you concerned about your family making too much noise outside?

Not concerned at all	13	14.4
Not very concerned	13	14.4
Somewhat concerned	48	53.3
Very concerned	<u>16</u>	<u>17.8</u>
	90	100.0

14. Does anyone in your family like to garden?

Yes	71	78.9
No	<u>19</u>	<u>21.1</u>
	90	100.0

15. Have you grown vegetables in this yard?

Yes	43	47.8
No	<u>47</u>	<u>52.2</u>
	90	100.0

16. Is the size of your patio:

Much too big	0	0.0
A little too big	0	0.0
About right	48	53.3
A little too small	31	34.4
Much too small	<u>11</u>	<u>12.2</u>
	90	100.0

17. Are you satisfied with the patio being (material) or would you rather have something else?

Satisfied	73	81.1
Not satisfied	<u>17</u>	<u>18.9</u>
	90	100.0

18. What do you have on your patio?

<u>Feature</u>	<u>Frequency of "Yes" responses</u>	<u>% respondents</u>
Water tap	70	77.8
Gas	0	0.0
Electricity	65	72.2
Some form of roof	20	22.2
Fence or screen	82	91.1
Planter boxes	15	16.7
Laundry line	2	2.2
Storage shed	17	18.9
	<u>271</u>	<u>301.1</u>

19. Would you like to add any of these things?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Yes	52	57.8
No	38	42.2
	<u>90</u>	<u>100.0</u>

20. Which would you like to add?

<u>Feature</u>	<u>Frequency of "Yes" responses</u>	<u>% respondents</u>
Water tap	15	16.7
Gas	1	1.1
Electricity	16	11.1
Some form of roof	11	8.9
Fence or screen	8	2.2
Planter boxes	14	5.6
Laundry line	11	8.9
Storage shed	10	4.4
	<u>86</u>	<u>58.9</u>

21. Is there anything you have that you could just as well do without?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Yes	2	2.2
No	88	97.8
	<u>90</u>	<u>100.0</u>

22. Your way to the patio now goes through the (room) .

Kitchen	2	2.2
Dining room	9	10.0
Living room	72	80.0
Other	7	7.8
	<u>90</u>	<u>100.0</u>

23. Would you rather it went through another room like the dining room or kitchen?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Yes	37	41.1
No	53	58.9
	<u>90</u>	<u>100.0</u>

24. Which would you prefer?

Kitchen	25	67.6
Dining room	2	5.4
Living room	1	2.7
Other	9	24.3
	<u>37</u>	<u>100.0</u>

25. Beyond the patio, would you like to have:

Much less space	0	0.0
A little less space	0	0.0
Just as it is	56	62.2
A little more space	26	28.9
Much more space	8	8.9
	<u>90</u>	<u>100.0</u>

26. If you could have that amount of space would you want it in:

Mostly grass with small shrub or flower beds	38	42.2
Some grass and some shrub and flower beds	19	21.1
A little grass and mostly shrub and flower beds	6	6.7
No grass	12	13.3
More paving and some grass	15	16.7
	<u>90</u>	<u>100.0</u>

27. Which of these things would you like to have in your ideal back yard?

<u>Feature</u>	<u>Frequency of "Yes" responses</u>	<u>% Respondents</u>	<u>% "Yes" Responses</u>
Area for play equipment	25	27.8	11.5
Space for a vegetable garden	56	62.2	25.8
Pond or fountain	16	17.8	7.4
Fruit trees	47	52.2	21.7
Benches	28	31.1	12.9
Small greenhouse	38	42.2	17.5
Other	7	7.8	3.2
	<u>217</u>	<u>241.1</u>	<u>100.0</u>

28. What does your family use the back yard for?

<u>Activity</u>	<u>Frequency of "Yes" responses</u>	<u>% Respondents</u>	<u>% "Yes" Responses</u>
Eating, cooking	77	85.6	18.3
Sunbathing, just sitting	85	94.4	20.2
Growing flowers or vegetables	71	78.9	16.9
Having friends over	71	78.9	16.9
Children's play	31	34.4	7.4
Working on messy projects	41	45.6	9.7
Storage	27	30.0	6.4
Drying laundry	14	15.6	3.3
Other	4	4.4	0.9
	<u>421</u>	<u>467.7</u>	<u>100.0</u>

29. Why do you think it's important to have some outdoor space of your own?

<u>Reason</u>	<u>Frequency of "Yes" responses</u>	<u>% Respondents</u>	<u>% "Yes" Responses</u>
Safe children's play	35	38.9	8.3
For other family activities (eating, cooking, sitting, etc.)	68	75.6	12.0
For a nice view from inside	51	56.7	12.0
For some place to go outside and sit for a few minutes	73	81.1	17.2
For a private or quiet place outside my house	73	81.1	17.2
To grow flowers and vegetables	63	70.0	14.9
For a piece of land that I own	34	37.8	8.0
For extra storage space	22	24.4	5.2
Other	5	5.6	1.2
	<u>424</u>	<u>472.0</u>	<u>100.0</u>

30. When do you get sun in the back yard (which direction does your back yard face)?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
East	34	37.8
South	25	27.8
West	21	23.3
North	10	11.1
	<u>90</u>	<u>100.0</u>

31. Would you prefer to face another way?

Yes	24	26.7
No	64	71.1
Ambivalent	2	2.2
	<u>90</u>	<u>100.0</u>

32. Which way would you prefer to face?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
East	3	11.5
South	17	65.4
West	3	11.5
North	0	7.7
Other	3	3.9
	<u>26</u>	<u>100.0</u>

33. Do you have a private space in front?

Yes	60	66.7
No	30	33.3
	<u>90</u>	<u>100.0</u>

34. Do you have a balcony?

Yes	27	31.0
No	60	69.0
	<u>87*</u>	<u>100.0</u>

(* 3 missing cases)

35. Overall, how would you rate your front area?

Very poor	0	0.0
Poor	3	5.1
So-so	7	11.9
Fair	15	25.4
Good	29	49.1
Excellent	5	8.5
	<u>59*</u>	<u>100.0</u>

(* 1 missing case)

36. Overall, how would you rate your front balcony?

Very poor	0	0.0
Poor	1	3.9
So-so	3	11.5
Fair	7	26.9
Good	9	34.6
Excellent	6	23.1
	<u>26*</u>	<u>100.0</u>

(* 1 missing case)

37. As far as the size of the front goes, is it:

Much too small	6	10.2
A little too small	15	25.4
About right	38	64.4
A little too big	0	0.0
Much too big	0	0.0
	<u>59</u>	<u>100.0</u>

38. As far as the size of the balcony goes, is it:

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Much too small	1	3.8
A little too small	6	23.1
About right	19	73.1
A little too big	0	0.0
Much too big	0	0.0
	<u>26</u>	<u>100.0</u>

39. Is there any fence or screening in the front yard?

Yes	27	45.8
No	32	54.2
	<u>59</u>	<u>100.0</u>

40. Would you change it in any way?

Yes	17	29.3
No	41	70.7
	<u>58</u>	<u>100.0</u>

41. Would you change the balcony screening in any way?

Yes	10	38.5
No	16	61.5
	<u>26</u>	<u>100.0</u>

42. What do you think a front area should be for?

<u>Function</u>	<u>Frequency of "Yes" responses</u>	<u>% "Yes" Respondents</u>	<u>Responses</u>
Attractive entrance	52	88.1	46.0
To separate the front entry from the sidewalk or street	36	61.0	31.8
Another private area to sit out in, for eating, children's play, etc.	19	32.2	16.8
Storage	3	5.1	2.7
Other	3	5.1	2.7
	<u>113</u>	<u>191.5</u>	<u>100.0</u>

43. Would you say your front area should be:

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Much less private	0	0.0
A little less private	0	0.0
As is	44	74.6
A little more private	12	20.3
Much more private	3	5.1
	<u>59</u>	<u>100.0</u>

44. Would you say your balcony should be:

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Much less private	0	0.0
A little less private	0	0.0
As is	20	76.9
A little more private	4	15.4
Much more private	2	7.7
	<u>26</u>	<u>100.0</u>

45. What does your family use the front area for?

<u>Use</u>	<u>Frequency of "Yes" responses</u>	<u>% Respondents</u>	<u>% "Yes" Responses</u>
Children's play	12	20.3	11.0
Storage	6	10.2	5.5
Eating, cooking	12	20.3	11.0
Sunbathing, just sitting	22	37.3	20.2
Having friends over	9	15.2	8.2
Working on messy projects	6	10.2	5.5
Growing flowers and vegetables	38	64.4	34.9
Other	4	6.8	3.7
	<u>109</u>	<u>174.7</u>	<u>100.0</u>

46. What does your family use the balcony for?

Children's play	1	3.8	2.7
Storage	6	23.1	16.2
Eating, cooking	2	7.7	5.5
Sunbathing, just sitting	13	50.0	35.1
Having friends over	1	3.8	2.7
Working on messy projects	2	7.7	5.4
Growing flowers and vegetables	11	42.3	29.7
Other	1	3.8	2.7
	<u>37</u>	<u>142.2</u>	<u>100.0</u>

47. Does this project have a place for children to play?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Yes	59	66.3
No	30	33.7
	<u>89*</u>	<u>100.0</u>

(* 1 missing case)

48. How often do your children play there?

Never	1	7.7
Some	3	23.1
Often	9	69.2
	<u>13</u>	<u>100.0</u>

49. Does the noise from children playing ever bother you?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Yes	13	14.6
No	69	77.5
Occasionally	7	7.9
	<u>89</u>	<u>100.0</u>

50. Is there any common area for adults?

Yes	50	55.6
No	40	44.4
	<u>90</u>	<u>100.0</u>

51. Do you use it?

Project has recreational facilities

Use	35	70.0
Don't use	15	30.0
	<u>50</u>	<u>100.0</u>

Project has no recreational facilities

Would use	26	65.0
Would not use	14	35.0
	<u>40</u>	<u>100.0</u>

52. I see that the house here are (describe site plan). Would you like to change this in any way?

Yes	28	31.1
No	62	68.9
	<u>90</u>	<u>100.0</u>

53. How much is the fee for maintenance here?

No answer	3	3.3
\$30-39	38	42.2
\$40-49	18	20.0
\$50-59	20	22.2
\$60-69	9	10.0
\$70-79	2	2.2
	<u>90</u>	<u>100.0</u>

54. What does that include?

<u>Number of Items Mentioned</u>	<u>Frequency</u>	<u>% Respondents</u>
0	1	1.1
2	2	2.2
3	3	3.3
4	21	23.3
5	17	18.9
6	20	22.2
7	7	7.8
8	12	13.3
9	7	7.8
	<u>90</u>	<u>100.0</u>

55. Are you satisfied with the work and how much it costs?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Yes	64	71.1
No	5	5.6
Ambivalent	<u>21</u>	<u>23.3</u>
	<u>90</u>	<u>100.0</u>

56. What rules do you have here about changing your house and garden? Are you satisfied with these rules? Do you think these rules are a good idea?

No	2	2.2
Yes	76	84.4
Ambivalent	<u>12</u>	<u>13.3</u>
	<u>90</u>	<u>100.0</u>

57. Have you changed anything outside since you moved in?

Yes	59	65.6
No	<u>31</u>	<u>34.4</u>
	<u>90</u>	<u>100.0</u>

58. If money was no object, what kind of housing would you choose?

	<u>Frequency</u>	<u>% Respondents for each housing type</u>	<u>% Total respondents</u>
<u>Single family</u>			69.0
With land in the country	17	27.4	
On a large lot in the suburbs	22	35.5	
On a medium-sized lot in the city	20	32.3	
On a large lot in the city	2	3.2	
On a small lot in the suburbs	<u>1</u>	<u>1.6</u>	
	<u>62</u>	<u>100.0</u>	

	<u>Frequency</u>	<u>% Respondents for each housing type</u>	<u>% Total respondents</u>
<u>Duplex</u>			2.2
In the suburbs	1	50.0	
In the city	<u>1</u>	<u>50.0</u>	
	2	100.0	
<u>Townhouse</u>			22.2
In the city	5	25.0	
In the suburbs	2	10.0	
In a small project	2	10.0	
In a large project in the suburbs	3	15.0	
In a small project in the suburbs	5	25.0	
In a small project in the city	<u>3</u>	<u>15.0</u>	
	20	100.0	
<u>Apartment</u>			3.3
Low rise	1	33.0	
High rise	<u>2</u>	<u>67.0</u>	
	3	100.0	
<u>Other</u>	3		3.3
TOTAL	90		100.0

59. Would you want to rent or own?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Own	84	93.3
Rent	4	4.4
Ambivalent	<u>2</u>	<u>2.2</u>
	90	100.0

60. Where was the last place you lived?

Vancouver	36	40.0
Burnaby	13	14.4
Richmond	12	13.5
North Vancouver, West Vancouver	9	10.0
Other Lower Mainland	11	12.2
Other B.C.	2	2.2
Other	<u>7</u>	<u>7.7</u>
	90	100.0

61. What kind of house was that?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Single family home	33	36.7
Duplex or triplex	8	8.9
Townhouse	5	5.6
Low rise apartment	31	34.4
High rise apartment	10	11.1
Other	3	3.3
	<u>90</u>	<u>100.0</u>

62. Did you own or rent?

Own	28	31.1
Rent	61	67.8
Lived with parents	1	1.1
	<u>90</u>	<u>100.0</u>

63. Did you have a private yard there? or a balcony? Was it large or small?

None	9	10.0
Small balcony	12	13.3
Medium balcony	8	8.9
Large balcony	7	7.8
Small yard	9	10.0
Medium yard	13	14.4
Large yard	32	35.6
	<u>90</u>	<u>100.0</u>

64. Have you ever lived in a townhouse before?

Yes	22	24.4
No	68	75.6
	<u>90</u>	<u>100.0</u>

65. What kind of houses did you grow up in?

Single family	75	83.2
Single family and townhouse	5	5.6
Single family and rented house or apartment	5	5.6
Rented apartment and/or house	5	5.6
	<u>90</u>	<u>100.0</u>

66. What kinds of houses have you lived in since then?

None	1	1.1
Single family	10	11.2
Single family and townhouse	3	3.3
Single family and rented house or apartment	37	41.1
Rented apartment and/or house	36	40.0
Other	3	3.3
	<u>90</u>	<u>100.0</u>

67. Why did you decide to move out of your last house?

<u>Reason</u>	<u>Frequency of "Yes" responses</u>	<u>% Respondents</u>	<u>% of "Yes" Responses</u>
Changed job	7	7.8	3.7
Change in family size	20	22.2	10.6
Wanted to own or establish equity	46	51.1	24.5
Wanted better neighborhood	13	14.4	6.9
Wanted location closer to job or transportation	13	14.4	6.9
Wanted house with yard	14	15.6	7.5
Wanted bigger or better house	27	30.0	14.4
Wanted smaller house with less maintenance	16	17.8	8.5
Wanted less expensive house	4	4.4	2.1
Other	28	31.1	14.9
	<u>188</u>	<u>157.8</u>	<u>100.0</u>

68. Why did you choose this house?

Reasons to do with project

General appearance of project	57	63.3	25.2
Size of project - large or small	14	15.6	6.3
Location - close to job or transportation	49	54.4	21.7
Good neighborhood	36	40.0	15.9
Project features (underground parking, play facilities, pool, etc.)	32	35.6	14.1
Wanted a townhouse	33	36.7	14.6
Other	5	5.6	2.2
	<u>226</u>	<u>251.2</u>	<u>100.0</u>

Reasons to do with unit

Availability	36	40.0	12.8
Price	62	68.9	22.1
Potential for investment	26	28.9	9.3
Inside of house - size and arrangement of rooms	63	70.0	22.4
Outdoor space - design or size of yard, patio, etc.	36	40.0	12.8
Good location within project	57	63.3	20.3
Other	1	1.1	0.3
	<u>281</u>	<u>312.2</u>	<u>100.0</u>

69. How long do you plan to stay?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Less than 1 year	15	16.7
1-2 years	10	11.1
2-5 years	32	35.6
More than 5 years	32	35.6
Other	1	1.1
	<u>90</u>	<u>100.0</u>

70. Why will you move?

<u>Reason</u>	<u>Frequency of "Yes" responses</u>	<u>% Respondents</u>	<u>% of "Yes" Responses</u>
Change in job or retirement	21	23.3	12.9
Change in family size	20	22.2	12.3
Want better neighborhood	7	7.8	4.3
Want better neighbors	5	5.6	3.1
Want location closer to job or transportation	8	8.9	4.9
Want bigger or better yard	30	33.3	18.4
Wanter bigger or better house	43	47.8	26.4
Want smaller house	7	7.8	4.3
Want less expensive house	2	2.2	1.1
Other	20	22.2	12.3
	<u>163</u>	<u>147.8</u>	<u>100.0</u>

71. What will you look for in your next home?

<u>Feature</u>	<u>Frequency of "Yes" responses</u>	<u>% Respondents</u>	<u>% of "Yes" Responses</u>
Particular type of house (single family, duplex, townhouse, etc.)	85	94.4	19.6
Price	54	60.0	12.4
Potential for investment	32	35.6	7.4
Availability	16	17.8	3.7
Good neighborhood	61	67.8	14.1
Good location close to job or transportation	48	53.3	11.0
Inside of house - size or arrangement of rooms	69	76.7	15.9
Design or size of lot/yard	62	68.9	14.3
Other	7	7.8	1.6
	<u>434</u>	<u>482.3</u>	<u>100.0</u>

72. Do you have any children?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Yes	52	57.7
No	38	42.2
	<u>90</u>	<u>100.0</u>

73. Age of oldest child

<u>Age</u>	<u>Frequency</u>	<u>% of Older Children</u>
1	4	7.7
2	3	5.8
3	4	7.7
4	1	1.9
5	3	5.8
6	1	1.9
8	3	5.8
9	4	7.7
11	2	3.8
12	2	3.8
13	5	9.6
14	1	1.9
15	1	1.9
16	1	1.9
17	2	3.8
18	2	3.8
19	3	5.8
20	2	3.8
21	2	3.8
22	2	3.8
23	1	1.9
24	3	5.8
	<u>52</u>	<u>100.0</u>

74. Age of youngest child

<u>Age</u>	<u>Frequency</u>	<u>% of Younger Children</u>
1	4	17.4
3	1	4.3
4	3	13.0
5	1	4.3
7	4	17.4
8	3	13.0
9	1	4.3
11	2	8.7
16	1	4.3
17	1	4.3
19	1	4.3
20	1	4.3
	<u>23</u>	<u>100.0</u>

75. So how many people live here?

<u>Total</u>	<u>Frequency</u>	<u>% Respondents</u>
1	10	11.1
2	30	33.3
3	25	27.9
4	22	24.4
5	2	2.2
6	1	1.1
	<u>90</u>	<u>100.0</u>

76. How old are you?

<u>Age</u>	<u>Frequency</u>	<u>% Respondents</u>
20-24	4	4.4
25-29	9	10.0
30-34	26	28.9
35-39	10	11.1
40-44	9	10.0
45-49	9	10.0
50-54	6	6.7
55-59	6	6.7
60-64	6	6.7
65-69	4	4.4
70-74	0	0.0
75-79	1	1.1
	<u>90</u>	<u>100.0</u>

77. Which category describes your annual household income before taxes?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
Less than \$10,000	3	3.3
\$10-15,000	11	12.2
\$15-20,000	10	11.1
\$20-25,000	14	15.6
\$25-30,000	19	21.1
\$30-50,000	24	26.7
\$50-80,000	5	5.6
More than \$80,000	1	1.1
No answer	3	3.3
	<u>90</u>	<u>100.0</u>

78. Which category describes your education?

<u>Response</u>	<u>Frequency</u>	<u>% Respondents</u>
<u>Males</u>		
Grade 8	7	14.4
Some high school	5	5.6
Finished high school	11	12.2
Some vocational or technical school	7	7.8
Finished vocational or technical school	14	15.6
Some college	15	16.7
Finished college	11	12.2
Some post graduate work	2	2.2
Finished post graduate work	<u>12</u>	<u>13.3</u>
	83	100.0
<u>Females</u>		
Grade 8	5	8.9
Some high school	6	6.7
Finished high school	25	27.8
Some vocational or technical school	5	5.6
Finished vocational or technical school	7	7.8
Some college	15	16.7
Finished college	13	14.4
Some post graduate work	5	5.6
Finished post graduate work	<u>6</u>	<u>6.7</u>
	83	100.0

78. Sex of respondent

Male	32	35.6
Female	<u>58</u>	<u>64.4</u>
	90	100.0

1979 B.C. Assessment Authority Valuation of Units (in thousands of dollars)

\$37	10	11.1
39	10	11.1
41	10	11.1
43	10	11.1
45	10	11.1
55	20	22.2
65	5	5.6
67	10	11.1
100	<u>5</u>	<u>5.6</u>
	90	100.0

Age of Project (in months)

<u>Age</u>	<u>Frequency</u>	<u>% Respondents</u>
24	10	11.1
40	10	11.1
48	10	11.1
60	20	22.2
84	10	11.1
96	10	11.1
97	10	11.1
99+	10	11.1
	<u>90</u>	<u>100.0</u>

Size of Patio in Square Feet

0	3	3.3
32	1	1.1
60	10	11.1
64	10	11.1
72	21	23.3
144	21	23.3
200	12	13.3
225	2	2.2
300	10	11.1
	<u>90</u>	<u>100.0</u>

Residence Time (in months)

3-6	13	14.5
6-12	4	4.4
12-24	22	24.4
24-36	17	19.0
36-48	10	11.1
48-60	13	14.5
60-72	1	1.1
72-84	3	3.3
84-96	4	4.4
96+	3	3.3
	<u>90</u>	<u>100.0</u>

APPENDIX 2

LETTER AND SUMMARY OF RESULTS SENT TO RESPONDENTS

Yards and Patios

Most people were quite satisfied with the size of their yards. Patios were frequently rated as too small. The size recommended for patios is at least 10x10 feet, with no walls or fences enclosing the sides of the patio. Patios which are surrounded by grass on at least two sides are easier to use because activities can "spill off" onto the grass.

Privacy

People differed in their preferences for privacy in their back yards, and the yards studied ranged from open ones with very little privacy to yards with high fencing all around. The recommendation made was that fences should be built so people can easily change them to make them more or less private.

Noise, Children, and Pets

Noise was not a problem in most projects unless there was a busy road near the houses. Few people were bothered by the noise of children playing in the projects. Complaints about cats coming in the yards were common in several projects.

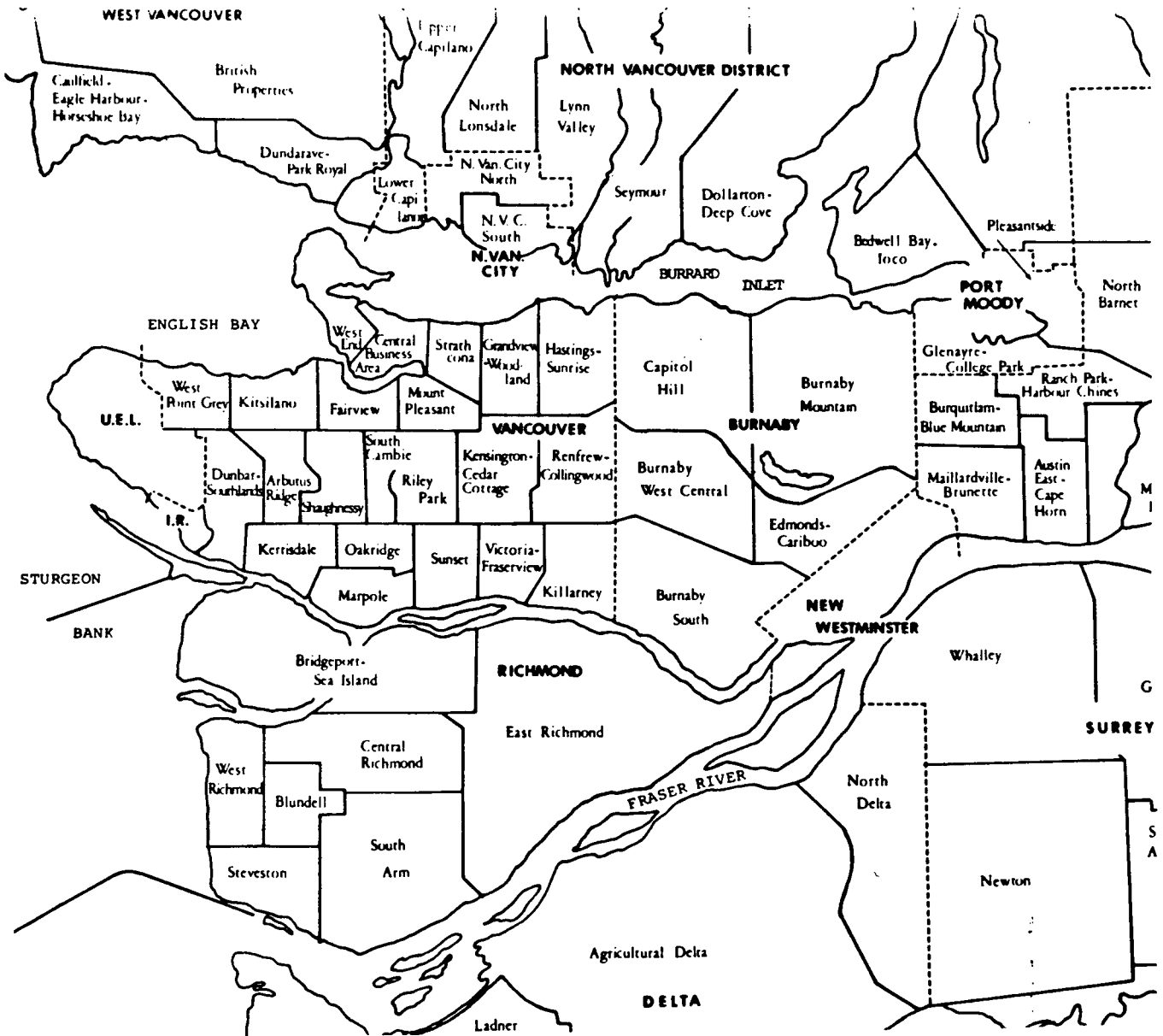
Management

Most residents were satisfied with the rules and fees of their project. Most people knew several of the things their monthly fee paid for and most thought the landscape maintenance was done well. The recommendation made was that strata councils should distribute a summary of the rules about changing fences and yards and describing the kind of fences that could be put up, so that all residents would know what was allowed.

APPENDIX 3

TOWNHOUSES IN FOUR MUNICIPALITIES

This list represents all occupied townhouses in the four municipalities in August 1979. A number of projects have been built since that time, especially in Vancouver. The Vancouver listings are organized by local neighborhood planning areas for convenience (see map next page).



Neighborhood Areas of Lower Mainland Municipalities

TOWNHOUSES IN FOUR MUNICIPALITIES

<u>Included in Sample^a</u>	<u>Number from Sampling Frame^b</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure^c</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
<u>VANCOUVER</u>						
<u>West End</u>						
		1-4/1509 Harwood St.	4	Strata (VR 152)	pre-1974	\$58,000
		English Bay Village Davie at Denman	10	Strata	1979	\$125,-155,000
		610 Jervis St.	9	rental	pre-1974	
		917 W. Beach St.	19	rental	pre-1974	
<u>Strathcona</u>						
		168-176 Powell St.	17	rental	pre-1974	
		616-620 E. Georgia St.	3	Strata (VR 317)	1976	\$45,500
		730 Union St.	7	coop	1975	\$59,000
		831-835 Union St.	3	Strata (VR 303)	1976	\$6,800
		833-837 Prior St.	3	Strata (VR 302)	1976	\$45,000
		811-815 Prior St.	3	Strata (VR 301)	1976	\$6,800
		701-705 Union St.	3	Strata (VR 319)	1976	\$6,800
		546-554 Union St.	5	Strata (VR 418)	1977	\$48,000
		402-480 Keefer St.	6	rental	pre-1974	
		517 E. Union St.	6	rental	pre-1974	
		721 Keefer St.	12	rental	pre-1974	
		816-834 Hawks St.	9	rental	pre-1974	
		800-816 Hawks St.	7	rental	pre-1974	
		730-734 Union St.	8	Strata (VR 356)	1974	\$6,100
		652 Keefer St.	3	Strata (VR 328)	1976	\$45,500
		532, 536 E. Prior St.	6	rental	pre-1974	
		100 Semlin Dr.	12	rental	1977	
<u>Grandview-Woodland</u>						
		150 Semlin Dr.	12	rental	1977	
		200 Semlin Dr.	12	rental	1977	

^aAn asterisk appears in this column if the project was one of the nine chosen for the sample

^bThe number arbitrarily assigned to projects in the sampling frame.
Ineligible projects have no number

^cStrata title ownership, rental, or coop. If strata title, the Land Registry Office Strata Plan number is given in parentheses.

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
		1350-1360 Franklin St.	4	rental	pre-1974	
		208-222 N. Garden St.	7	rental	pre-1974	
		2100-2116 Eton St.	4	rental	pre-1974	
		2165 Oxford St.	8	rental	pre-1974	
		115-127 S. Garden St.	5	rental	pre-1974	
		105-135 N. Templeton St.	5	rental	pre-1974	
		102-118 S. Victoria St.	5	rental	pre-1974	
		1934 Triumph St.	14	rental	pre-1974	
		2034-2036 E. Triumph St.	5	rental	pre-1974	
		105-117 S. Lakewood Dr.	4	rental	pre-1974	
		2198 Triumph St.	5	rental	pre-1974	
		2280 E. Triumph St.	4	rental	pre-1974	
		137 Garden St.	3	rental	pre-1974	
		2080-2090 E. Pender St.	8	rental	pre-1974	
		2066 E. Triumph St.	4	rental	pre-1974	
		1624 E. Georgia St.	4	rental	pre-1974	
		1055-1095 S. Victoria St.	3	rental	pre-1974	
		1892-1896 E. Napier St.	5	rental	pre-1974	
		1505-1523 Charles St.	4	rental	pre-1974	
		1208-1210 S. Salisbury St.	5	rental	pre-1974	
		1555 Woodland St.	32	rental	pre-1974	
		1906 E. Grant St.	8	rental	pre-1974	
		1908-1942 Woodland Dr.	4	rental	pre-1974	
		2008-2014 Victoria Dr.	4	rental	pre-1974	
<u>Hastings-Sunrise</u>						
		26 N. Garden St.	5	rental	pre-1974	
		2550 Adanac St.	125	coop (Adanac Coop)	1977	
<u>Renfrew-Collingwood</u>						
		5512 Tyne St.	29	rental	1979	
<u>Killarney</u>						
		5702-5798 Rupert St.	36	rental	pre-1974	
	1	3150-3180 E. 58th	104	Strata (VR 111)	1974	\$55-66,000
		3240-3280 E. 58th	140	rental	pre-1974	
		3350 E. 54th	100	rental	pre-1974	

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
	2	3405-3477 E. 49th	150	Strata (VR 53)	pre-1974	\$40,000
*		3672 E. 49th and 6600-6900 Arlington St.	110	Strata	1972	
		3550-3650 E. 49th	132	coop (Decosmos Village)		
		6655-6696 Arlington St.	8	rental	1975	
		6705-6805 Arlington St.	14	Strata (VR 234)	1975	\$55,000
		7100 Champlain Cres.	150	coop (Kanata)	1975	
		3220 Rosemont Dr.	22	Strata (VR 228)	1975	\$60,000
		3300 Rosemont Dr.	16	Strata (VR 213)	1975	\$58,000
		Champlain Heights Enclave 18	66	coop (La Petite Maison)	1979	
		Champlain Heights Enclave 19	105	rental	1976	
<u>Victoria-Fraserview</u>						
		2550 Waverly St.	180	rental	pre-1974	
<u>Kensington-Cedar Cottage</u>						
		719 E. 31st	28	rental	1978	
<u>Sunset</u>						
		6265 Knight	132	rental	pre-1974	
		805-997 E. 52nd	22	rental	pre-1974	
		1003-1089 E. 52nd	32	rental	pre-1974	
<u>Riley Park</u>						
		219-225 E. 21st	4	rental	pre-1974	
10		460 W. 16th	31	Strata (VR 449)	1977	\$46,000
		430 W. 16th	30	rental	1976	
<u>Mount Pleasant</u>						
		2811 Alberta St.	4	rental	pre-1974	
		2880-2882 Manitoba St.	4	rental	pre-1974	
		301 W. 15th	6	rental	pre-1974	
		2932-2942 Sophia St.	6	rental	pre-1974	
		2832-2854 St. George St.	6	rental	pre-1974	
		589-593 E. 13th	4	rental	pre-1974	
		3080-3096 Alberta St.	8	Strata (VR 546)	1974	\$40-50,000
<u>Fairview</u>						
		1129-1149 and 1159-1175 W. 8th	20	Strata (VR 332)	1974	\$69,000

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
		1541-1551 W. 12th	4	Strata (VR 416)	1974	\$60,000
		1002-1018 W. 10th	12	rental	pre-1974	
		941 W. 13th	14	rental	1976	
		2888 W. Heather St.	7	Strata (VR 340)	1976	\$70-80,000
		525 W. 14th	4	rental	1974	
		1163-1177 W. 7th	6	Strata (VR 531)	1978	\$90,000
		838-848 W. 7th	6	rental	1978	
		1063 W. 7th	8	Strata (VR 544)	1978	\$44-100,000
		1132-1136 W. 7th	3	rental	1979	
	4	1181-1199 W. 7th	20	Strata (VR 447)	1979	\$100,000
		995 W. 7th	15	rental	1978	
		1024 W. 7th	6	rental	1978	
		870 W. 7th	66	rental	1978	
		1135-1155 W. 7th	19	Strata (VR 491)	1978	\$70-115,000
		False Creek - Enclave 3 Pcl. 4	56	coop (Creek Village Coop)	1976	
		False Creek - Enclave 2 Pcl. 2	46	rental (Bertha O'Clarke Soc.)	1976	
		False Creek - Enclave 5	88	coop (False Creek Coop)	1978	
		False Creek - Enclave 6	82	coop (False Creek Coop)	1978	
*	5	Spruce Neighborhood (Enclave 7, Pcl. 17)	48	Strata (VR 514)	1978	\$31-92,000
		False Creek - Enclave 1 Pcl. 11	61	rental (Kiwanis)	1976	
	6	False Creek - Enclave 1 Pcl. 11	37	Strata	1976	\$80,000
	7	Heather Neighborhood (Enclave 4)	48	Strata	1976	\$75,000
		False Creek - Enclave 7 Pcl. 8	50	coop (University Building Society)	1976	
		False Creek - Enclave 8	101	rental (Nether- lands Assoc.)	1976	
<u>South Cambie</u>						
		3239 Heather St.	4	rental	pre-1974	
<u>Shaughnessy</u>						
		1320 W. 15th	9	rental	pre-1974	

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
<u>Oakridge</u>						
		6409-6429 Oak St.	4	Strata (VR 49)	1974	\$80,000
<u>Marpole</u>						
		445 SW Marine Dr.	70	rental	1974	
		8107-8167 Cambie St. and 510-522 W. 65th	16	Strata (VR 175)	1974	\$40-50,000
		6618-6630 Turnberry Cres., 402-434 Greensboro Pl, and 320-340 Wethersfield Dr.	42	Strata (VR 478)	1978	\$117-193,000
		7142-7178 Neal St., 7117-7123 Tisdall St., 7069-7091 Cambie St., and 7226-7298 Ash Cres.	34	rental	1974	
<u>Kerrisdale</u>						
		2225-2245 W. 43rd	3	rental	pre-1974	
<u>Arbutus Ridge</u>						
		4351-4449 Arbutus St., 2106-2138 Nanton St., and 4304-4450 Yew St.	40	Strata (VR 452)	1977	\$100,000
		2350 W. 39th	41	rental	pre-1974	
		2180 W. 38th	4	rental	pre-1974	
		2893 W. 41st	19	Strata (VR 441)	1977	\$60-89,500
		4350 Valley Dr.	21	Strata (VR 474)	1974	\$128-140,000
8		2202-2297 McBain St.	34	Strata (VR 120)	1974	\$76-115,700
		2100-2199 McMullen St.	19	Strata (VR 146)	1974	\$100,000
9		2258-2294 W. King Edward St., 4005-4154 Vine, and 3950-4042 Yew	37	Strata	1978	\$76-115,000
		3907-4097 Arbutus, 3909-4099 Springtree Dr., and 3901-4195 Parkway Dr.	75	rental	1978	
<u>Dunbar-Southlands</u>						
		4100 Salish St.	75	rental	1974	
<u>West Point Grey</u>						
		1701-1721 Wallace St.	20	coop (Penta Coop)	1978	
		3890 W. Pt. Grey Rd.	15	coop (Dunbar Village)	1979	
		1305 Maple St.	4	rental	1979	
<u>Kitsilano</u>						
		1333-1363 Chesnut St.	6	Strata (VR 366)	1976	\$79,000

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
		1080 Maple St.	8	coop (Sam Greer Coop)		
		3800 W. 2nd	36	rental	1979	
		1870-1890 Bayswater St.	4	Strata (VR 476)	1977	\$121-138,700
		1820 Bayswater St.	12	Strata (VR 409)	pre-1974	\$26-57,000
		2766-2788 W. 1st and 1710-1718 McDonald St.	10	Strata (VR 199)	1978	\$73-105,600
		2720 W. 2nd	5	rental	1979	
		2565-2595 W. Pt. Grey Rd.	5	rental	pre-1974	
		2417-2449 W. Pt. Grey Rd.	8	Strata (VR 489)	1974	\$45,000
		1555-1593 Larch St.	6	rental	pre-1974	
		3551-3567 W. 4th	10	rental	pre-1974	
		3415-3425 W. 4th	9	rental	pre-1974	
		1969-1999 Waterloo	4	rental	pre-1974	
		1960-1990 Waterloo	9	rental	pre-1974	
		3325-3347 W. 4th	12	rental	pre-1974	
		3235-3273 W. 4th	14	rental	pre-1974	
		3135-3179 W. 4th	14	rental	pre-1974	
		3139-3153 W. Pt. Grey Rd.	7	rental	pre-1974	
		3270, 3250 W. 4th	12	rental	pre-1974	
		2304-2316 W. 8th	7	rental	1975	
		2138-2150 W. 6th	4	rental	1977	
		2963-3069 W. 4th	46	rental	pre-1974	
		3028-3068 W. 4th	36	rental	pre-1974	
		2874-2880 W. 4th	6	rental	pre-1974	
		2010-2040 Larch St.	4	rental	pre-1974	
		2280-2294 W. 3rd	14	rental	pre-1974	
		2268-2278 W. 3rd	6	rental	pre-1974	
		2293-2295 W. 6th	6	rental	pre-1974	
		2510-2560 Larch St.	6	rental	pre-1974	
		2396-2398 W. Broadway St.	8	rental	pre-1974	
		1999 W. 8th	5	rental	1977	
		1981-1999 W. 10th	12	rental	pre-1974	
		1905 W. 8th	5	rental	1978	
		2431-2439 Vine St.	8	rental	1979	
		1605-1617 Maple St.	6	rental	pre-1974	

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
<u>University Endowment Lands</u>						
		5500-5600 Kings Rd, Alison Road., and Toronto Road	47	rental	pre-1974	
RICHMOND						
		6071 Azure Rd.	50	rental	1964	
		6251-6291 Minoru Blvd.	24	rental	1960	
		8660 Westminster Hwy.	66	rental	1979	
11		8501-8583 Citation Dr. and 6501-6541 Pimlico Way	63	Strata (NW 559)	1975	\$55-56,700
		6831 Cooney Rd.	7	rental	1978	
12		7491 No. 1 Road and 3900 Moresby Rd.	68	Strata (NW 243)	1974	\$44-47,000
13		3581 Blundell St.	63	Strata (NW 505)	1975	\$50-51,000
		7300 Ledway Rd.	33	Strata (NW 875)	1976	\$56,700
		7251 Langton St.	66	rental	1975	
		8220-8280 No. 2 Road and 6200 Blundell St.	66	rental	1975	
		6600 Lucas Rd.	98	Strata (NW 628)	1976	\$121-126,000
14		6871 Francis Rd. and 6880 Lucas Road	96	Strata (NW 807)	1976	\$57, 63,600
15		9240-9500 Glenacres Dr. and 9280, 9460 Glenallen Dr.	79	Strata (NW 28)	1970	\$30-46,000
16		9650-9800 Glenacres Dr.	151	Strata (NW 12)	1969	\$44,100
17		811 Saunders Rd.	96	Strata (NW 269)	1974	\$74-84,000
18		11160 Kingsgrove Ave.	52	Strata	1979	
*		9331 No. 5 Rd. and 11751 King Rd.	62	Strata (NW 227)	1973	\$40-50,000
20		11711-11791 King Rd. and 9371 No. 5 Rd.	50	Strata (NW 371)	1974	\$34-41,000
21		9111 No. 5 Rd.	63	Strata (NW 433)	1975	\$49,800
22		11602-11778 Kingsbridge	80	Strata (NW 644)	1976	
23		10011-10111 Swinton Cres.	89	Strata (NW 30)	1970	\$43-52,600
24		10751-10771 Mortfield Rd.	30	Strata	1971	\$50,800
25		10680-10980 Ryan Rd. and 9030 Ryan Cres.	56	Strata (NW 16)	1969	\$38-41,500
26		8411-8491 Ryan Rd.	46	Strata (NW 24)	1969	\$46,900
27		8040 Rosewell and 10900 No. 3 Road	20	Strata (NW 5)	1969	\$48,000
28		8311 Steveston Hwy.	20	Strata (NW 9)	1969	\$48,000

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
	29	10391 No. 3 Road and 10220 Dunoon Dr.	87	Strata (NW 976)		\$63-65,000
	30	4900 Francis Rd.	93	Strata (NW 578)	1975	\$53-58,000
		4700 Francis Rd.	65	rental		
	31	3031 Williams Rd.	208	Strata (NW 438)	1972	\$42-53,900
	32	10200 4th Ave.	110	Strata (NW 51)	1970	\$35-40,000
	33	10900-10960 Springmont Dr.	30	Strata (NW 69)	1970	\$42,800
*	34	10800-10840 Springmont Dr.	32	Strata (NW 60)	1971	\$43,700
	35	3051-3251 Springfield Dr.	62	Strata (NW 152)	1972	\$43,600
	36	11291 7th Ave.	55	Strata (NW 280)	1973	\$65-70,000
*	37	11391 7th Ave.	50	Strata (NW 279)	1973	
	38	11391 7th Ave.	24	Strata (NW 330)	1973	
	39	11491 7th Ave.	91	Strata (NW 947)	1974	\$44,800
		4120 Steveston Hwy.	12	Strata (NW 914)	1977	\$52-59,000
		4151 Regent St.	80	rental	1976	
		4340 Steveston Hwy.	70	coop (Klahanie Coop)	1975	
		4800 Trimaran	50	rental	1976	
	40	4460 Garry St.	28	Strata (NW 153)	1973	\$47,100
	41	11451-11651 Kingfisher Dr.	58	Strata (NW 76)	1972	\$55,200
	42	11711 Kingfisher Dr.	72	Strata (NW 150)	1973	\$66,800
BURNABY						
		5116 Smith Ave.	58	rental	1964	
		5706 Irwin St.	20	rental	1969	
		7121 4th Ave.	90	rental	1970	
		7460-7478 13th Ave.	15	Strata (NW 210)	1974	\$47-48,000
	43	4651-4695 Garden Grove Dr., 4679-4799 Fernglen Pl., 4770-4865 Fernglen Dr., and 4703-4765 Fernglen Ct.	73	Strata (NW 194)	1973	\$45-52,000
	44	4555-4591 Garden Grove Dr., 4701-4733 Elmgrove Pl., and 4511-4597 Elmgrove Dr.	40	Strata (NW 208)	1974	\$45-51,900
	45	3903-3963 Garden Grove Dr., 4706-4784 Laurelwood, 4704-4794 Willowdale, and 4701-4792 Cedarglen	72	Strata (NW 310)	1975	\$45-55,000
	46	4703-4794 Driftwood, 4201-4282 Birchwood Cres., and 4701-4713 Birchwood Pl.	62	Strata (NW 440)	1975	\$45-55,000

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
*	47	4102-4396 Garden Grove Dr.	76	Strata (NW 603)	1975	\$39-44,000
	48	7303-7393 Montecito Dr.	93	Strata (NW 136)	1975	\$42,900
	49	7304-7328 Goleta Pl. and 1801-1948 Goleta Dr.	61	Strata (NW 128)	1973	\$40-49,900
	50	7301-7386 Coronado Dr.	68	Strata (NW 86)	1973	\$40-50,000
	51	7301-7398 Capistrano Dr.	75	Strata (NW 90)	1973	\$50,000
	52	3202-3377 Ganymede Dr., 8902-8950 Ganymede Pl., and 8901-8962 Orion Pl.	196	Strata (NW 58)	1971	\$31-34,500
	53	8902-8948 Centaurus Circle, 3201-3031 Centaurus Dr., 3017-3057 Carina Pl., 9001-9033 Lyra Pl., and 9002-9048 Altair Pl.	130	Strata (NW 39)	1971	\$40-49,000
	54	8902-8948 Centaurus Circle, 3001-3018 Vegas Ct., and 3001-3016 Carina Pl.	49	Strata (NW 65)	1971	\$40-45,700
	55	8804-8862 Centaurus Circle, 2863-2899 Corona Dr., 8924-8970 Corona Pl., and 2829-2899 Neptune Cres.	87	Strata (NW 97)	1973	\$39-49,000
	56	2947-2991 Mira Pl. and 2966-2995 Corona Dr.	67	Strata (NW 65)	1973	\$44-49,000
		8686-8688 Centaurus Circle, 9125-9138 Capella Dr., and 9143-9155 Saturna Dr.	220	rental	1976	
		8750 Centaurus Circle	102	coop (Norman Bethune Coop)	1975	
		8851-8951 Horne St.	67	rental	1974	
	57	3802-3944 Pentland Ct., and 9125-9165 Wiltshire Pl.	31	Strata (NW 311)	1975	\$57-61,000
	58	9061 Horne St.	73	Strata (NW 300)	1976	\$44-56,000
		9080-9180 Halston Ct., 9085-9296 Gildwood Dr., and 9215-9380 Sandlewood Cres.	216	rental	1976	
	59	9908 Millburn Ct., 9852 Millbrook Ln., 9801 Belfriar Dr., and 4101 Bridgewater Cres.	106	Strata (NW 655)	1976	\$50-60,000
*	60	8202-8292 Elkwood Pl., 8320-8370 Aspenwood Pl., 8206-8284 Amberwood, 8204-8266 Rosswood, and 8310-8386 Vinewood	134	Strata (NW 963)	1977	\$38-46,900
	61	6702-6762 Kneale Pl.	31	Strata (NW 64)	1972	\$42-45,000
		2666-2692 Kingsford Ave.	14	Strata (NW 938)	1977	\$56-57,000

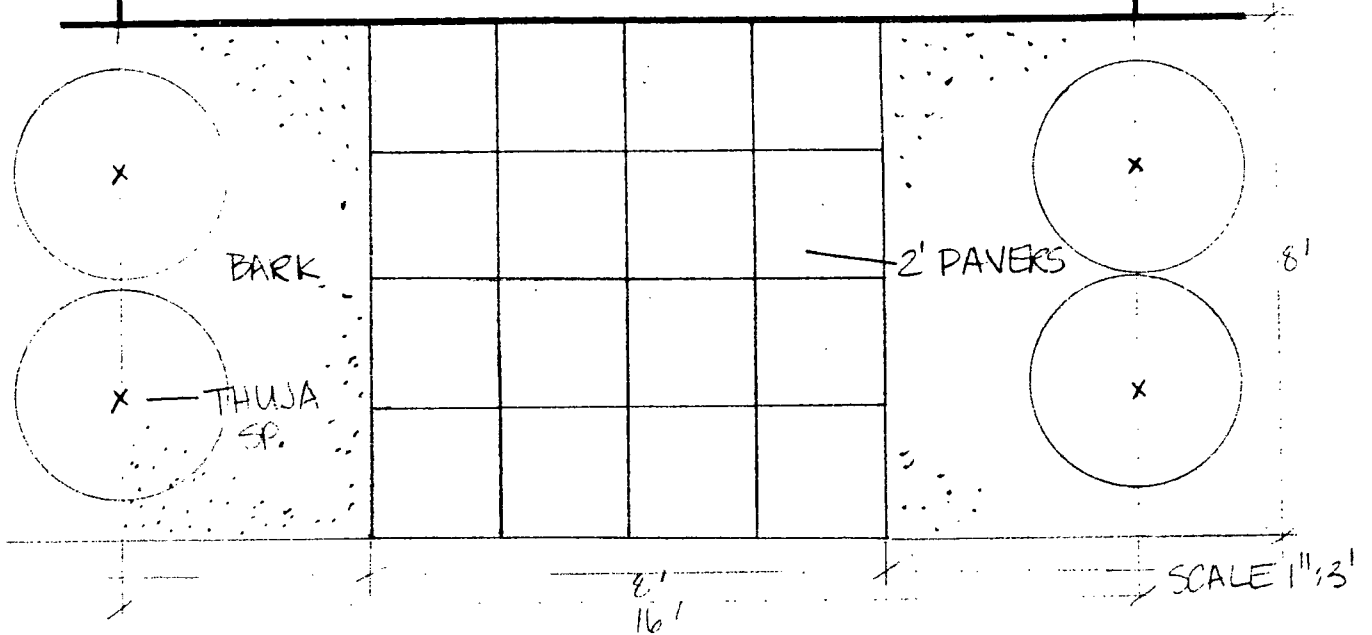
<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure+</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
		2620-2698 Moorcroft, 6858 Beechcliffe, and 6871-6899 Bromley Ct.	40	Strata (NW 468)	1976	\$55-56,000
62		2701-2777 Ellerslie Ave., and 2604-2696 Tretheway Dr.	44	Strata (NW 728)	1977	\$42-47,000
		2701 Bainbridge	28	rental	1978	
		2780 Bainbridge	76	rental	1978	
		7302-7364 Dunvegan Ct.	32	rental	1977	
63		2007-2053 Holdom Ave., and 5560-5658 Broadway	54	Strata (NW 27)	1970	\$26-37,000
64		5502-5548 Broadway	24	Strata (NW 48)	1971	\$39,000
		5330 Broadway	28	Strata (NW 218)	1974	\$46,500
65		2004-2090 Springer Ave.	27	Strata (NW 806)	1972	\$45-50,000
		5740 Canada Way	60	Strata	1979	
NORTH VANCOUVER DISTRICT (INCLUDING N. VAN. CITY)						
		3730-3736 Edgemont Blvd.	4	rental	1955	
		3750 Edgemont Terrace	52	rental	1964	
		3501-3497 Capilano Rd.	35	rental	1965	
		3300 Capilano Rd.	28	rental	1966	
		2871-2935 Capilano Rd.	9	rental	1971	
		751-755 W. Queens St.	3	Strata (VR 218)	1975	\$70,000
		701 W. Queens St.	5	Strata (VR 43)	1972	\$61,600
		Westview Terrace	114	rental		
		555 W. 28th	133	coop		
		251 W. 14th	22	rental		
		202-204 W. 4th	5	Strata (VR 550)	1979	\$74,000
		177 W. 6th	3	Strata	1974	\$53,000
		117-125 W. 6th	5	rental	1976	
		1535 St. George's	7	rental		
		220 E. 11th	23	rental		
		108 W. Windsor and 3201-3263 Lonsdale	12	Strata (VR 573)	1978	\$54-63,000
		150 E. Queens St.	5	rental	1963	
		3701-3817 Princess Ave.	57	rental	1972	
66		821-877 Hendecourt, 812-889 Frederick, and 3352-3381 William	82	Strata (VR 391)	1975	\$89-100,000

<u>Included in Sample</u>	<u>Number from Sampling Frame</u>	<u>Address</u>	<u>Number of Units</u>	<u>Tenure</u>	<u>Date Built</u>	<u>1979 BCAA Valuation</u>
	67	2601-2645 Fromme Rd.	22	Strata (VR 596)	1979	\$71-75,000
		2516 Fromme Rd.	65	coop (Lynn Valley Coop)	1976	
	68	1271-1293 Emery Pl. and 2301-2395 Mountain Hwy.	60	Strata (VR 13)	1970	\$50-53,000
		1285-1289 E. 27th	3	rental	1971	
		1861-1939 Rufus Dr.	21	rental		
	69	1515-1556 McNair Dr.	31	Strata (VR 102)	1973	\$53-54,900
	70	4675-4699 Hoskins Rd.	75	Strata (VR 17)	1971	\$50-52,000
	71	1090-1254 Premier	100	Strata (VR 10)	1970	\$42-47,000
	72	801-955 Lillooet Rd.	78	Strata (VR 5)	1969	\$47,200
	73	961-1207 Lillooet Rd.	123	Strata (VR 126)	1973	\$40-52,000
*	74	960-1008 Lillooet Rd.	65	Strata (VR 44)	1972	\$53-58,000
	75	1804-2090 Purcell Way	95	Strata (VR 329)	1970	\$39-60,000
		251-329 Seymour River Pl.	65	rental	1971	
		2131 Dollarton Hwy., 251-291 Riverside Dr., and 252-290 Seymour River Pl.	39	rental		
		2125-2135 Munster Ave.	6	rental	1969	
		2160-2166 Dollarton Hwy.	4	rental	1968	
	76	4001 Mt. Seymour Parkway	86	Strata (VR 46)	1972	\$61-63,500
		1142-1196 Deep Cove Rd.	10	Strata (VR 23)	1971	\$47,800
	77	2026-2042 Deep Cove Cres.	22	Strata (VR 14)	1970	\$46,200

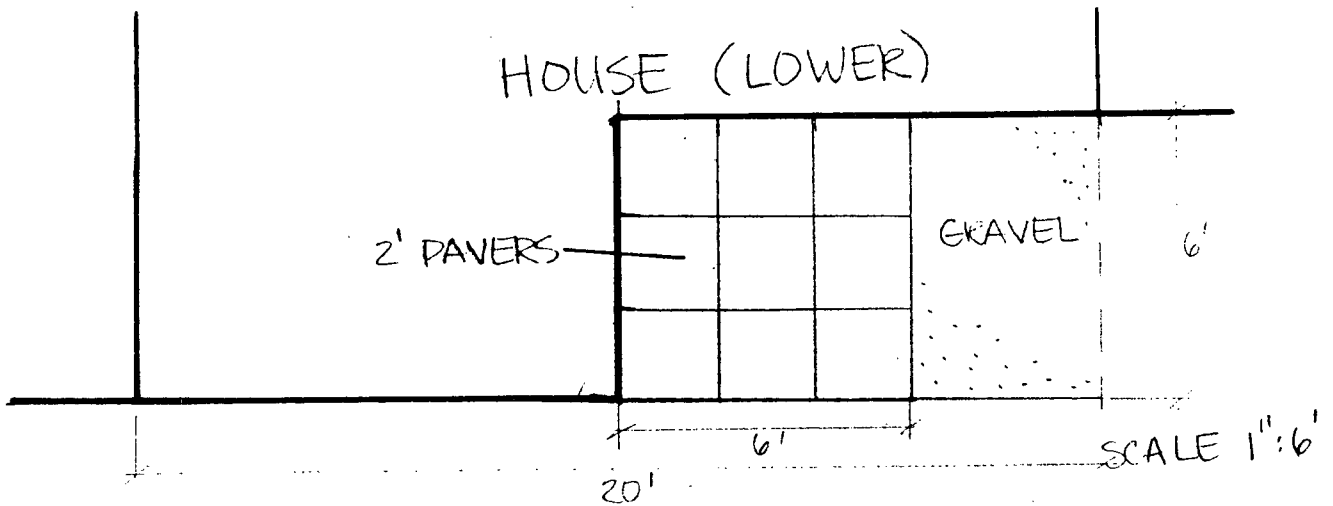
APPENDIX 4

PLANS OF PRIVATE OUTDOOR SPACE IN SAMPLE PROJECTS

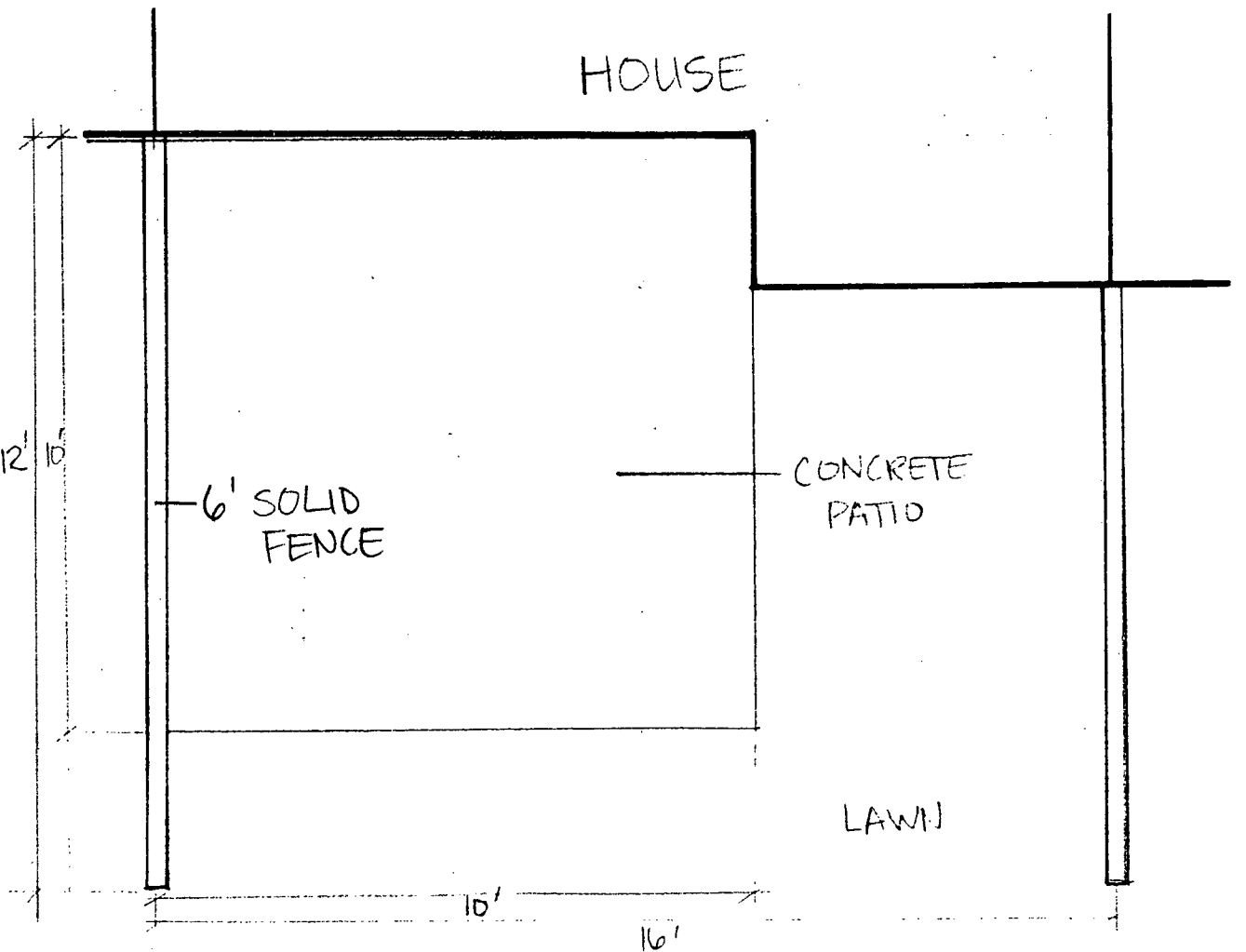
HOUSE (UPPER)



HOUSE (LOWER)

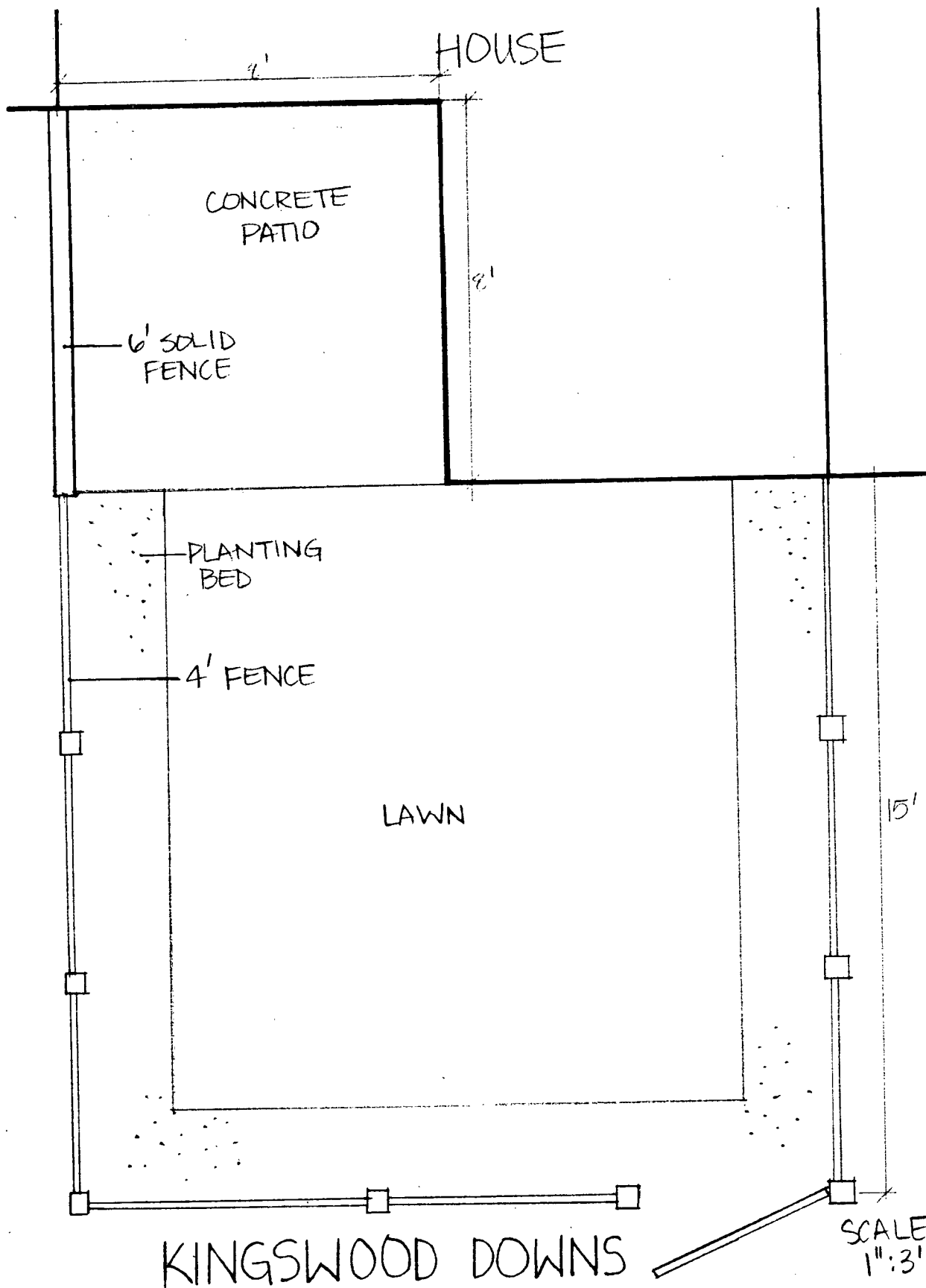


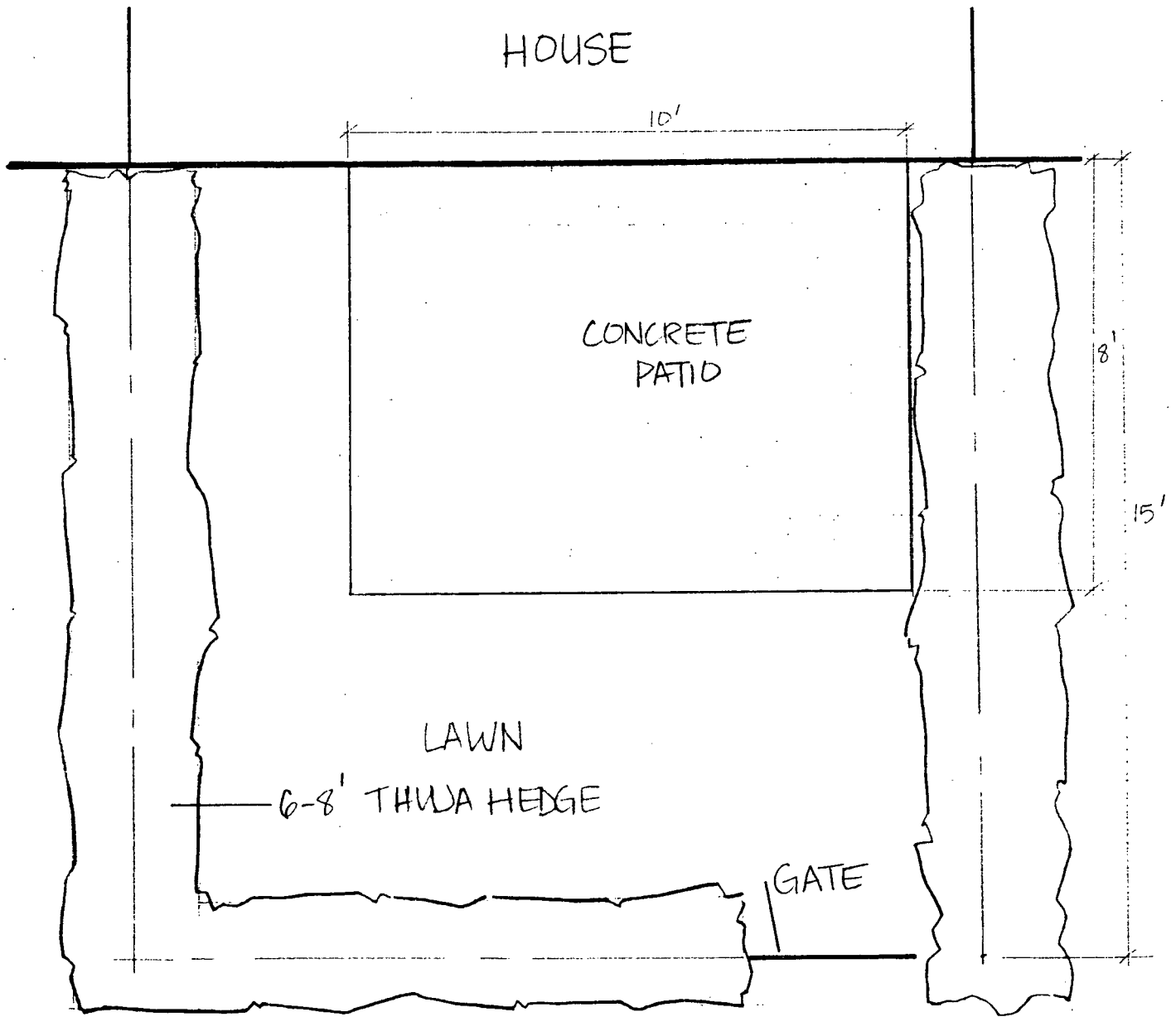
GREENTREE VILLAGE



SCALE 1"=3'

FOREST MEADOWS





SCALE 1"=3'

COUNTRY CLUB

HOUSE

16'

8'

CONCRETE
PATIO

6' SOLID
FENCE

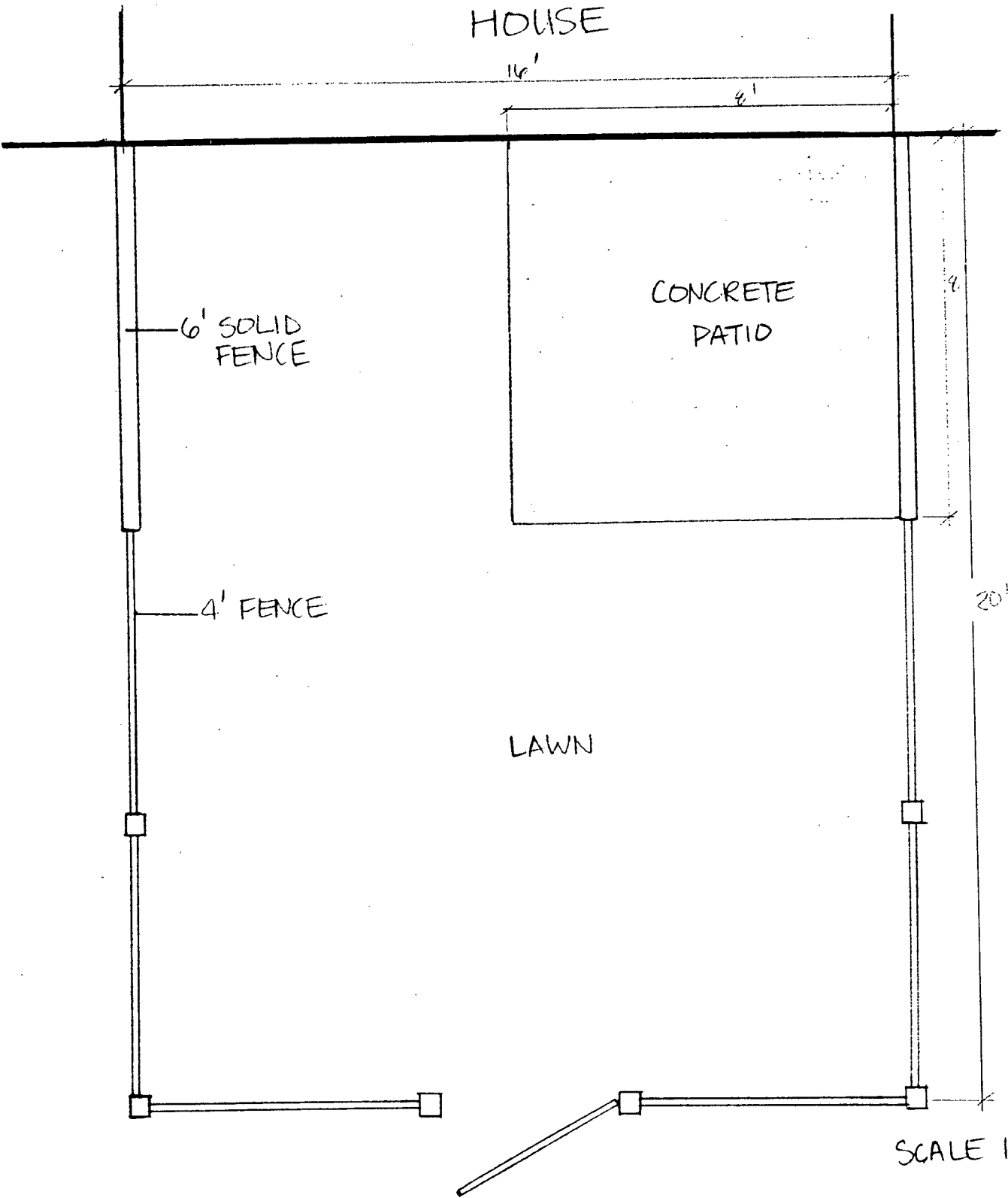
4' FENCE

20'

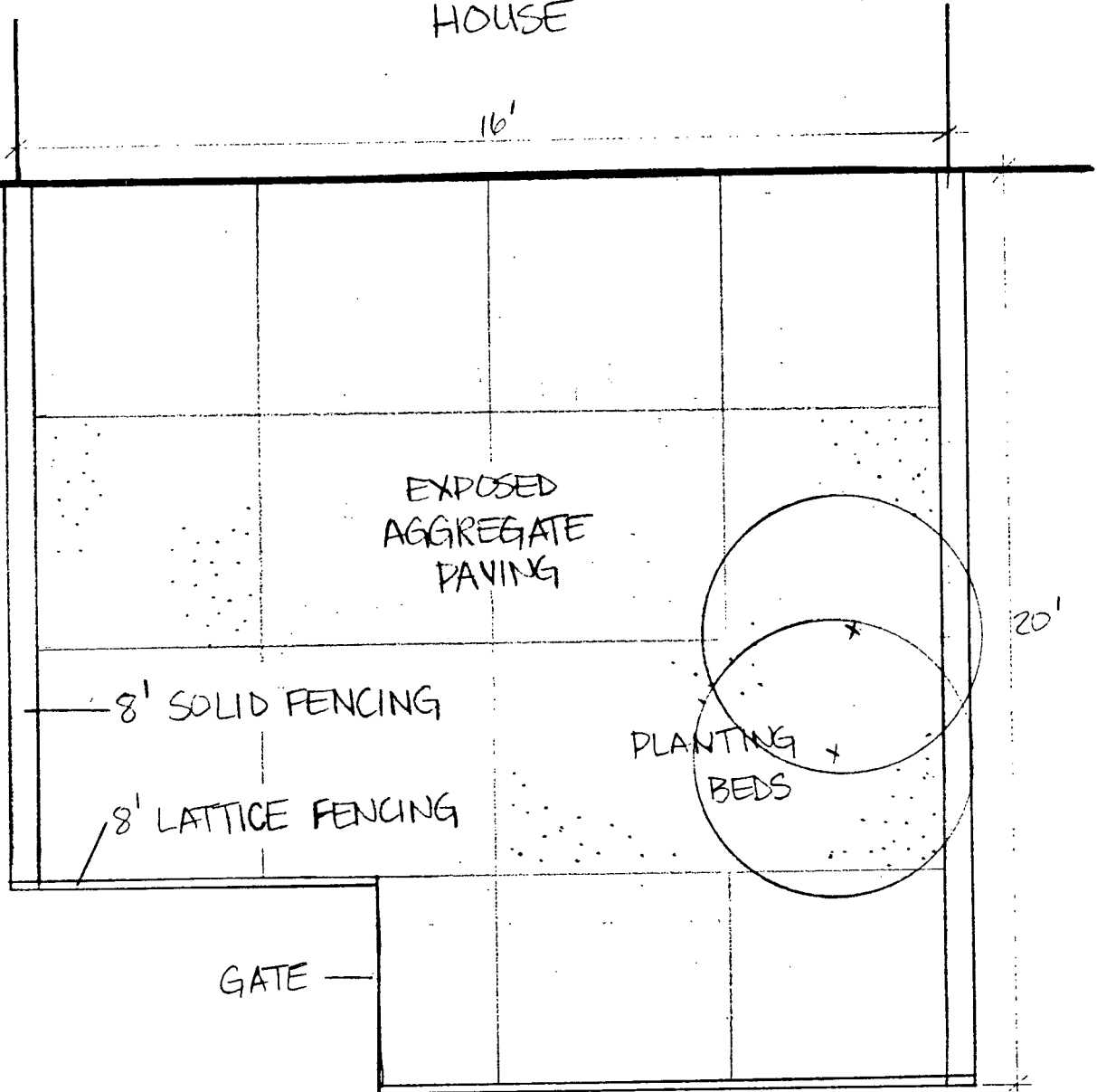
LAWN

SCALE 1"=3'

SPRINGMONT



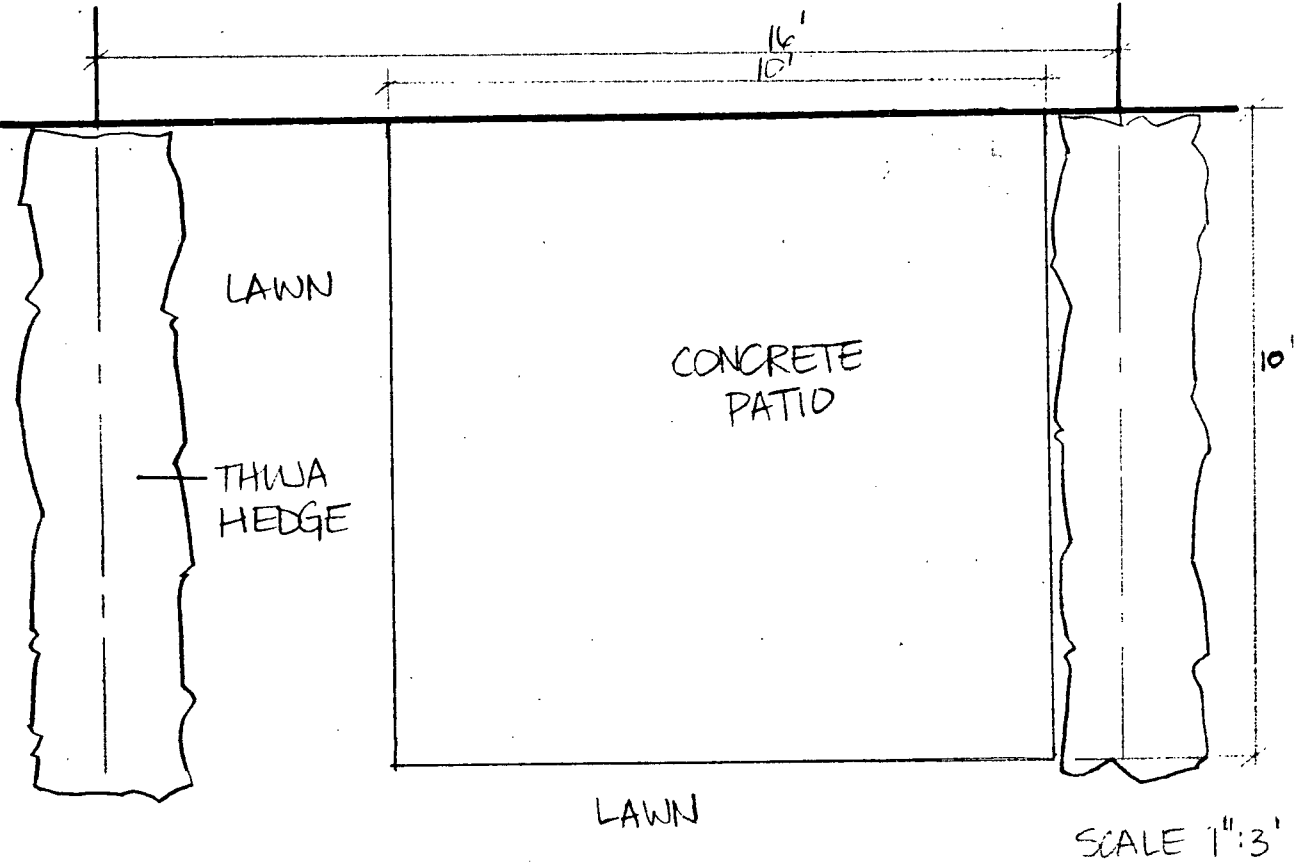
HOUSE



SCALE 1"=3'

MARINERS VILLAGE

HOUSE



LILLOOET

HOUSE

16'

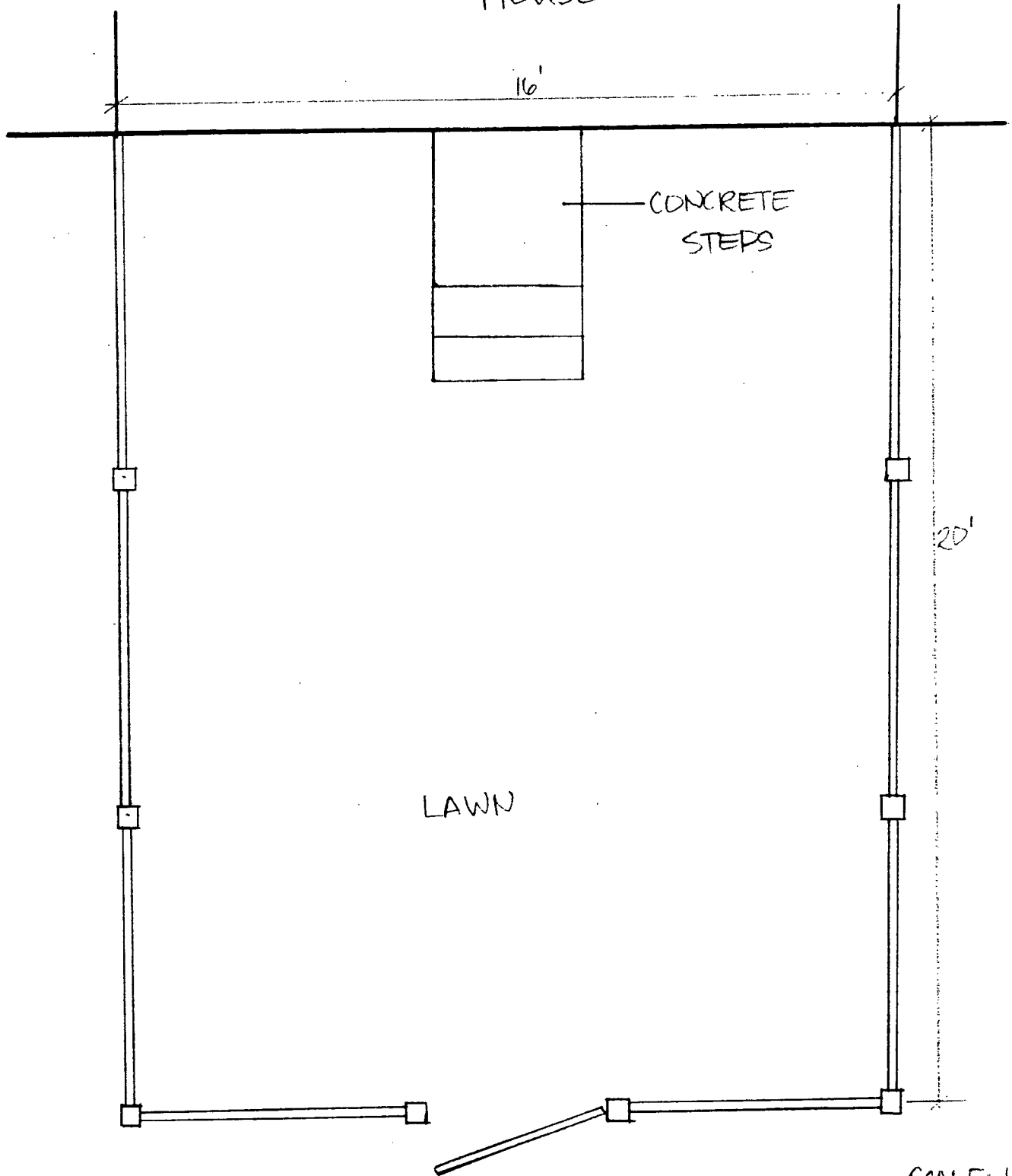
CONCRETE
STEPS

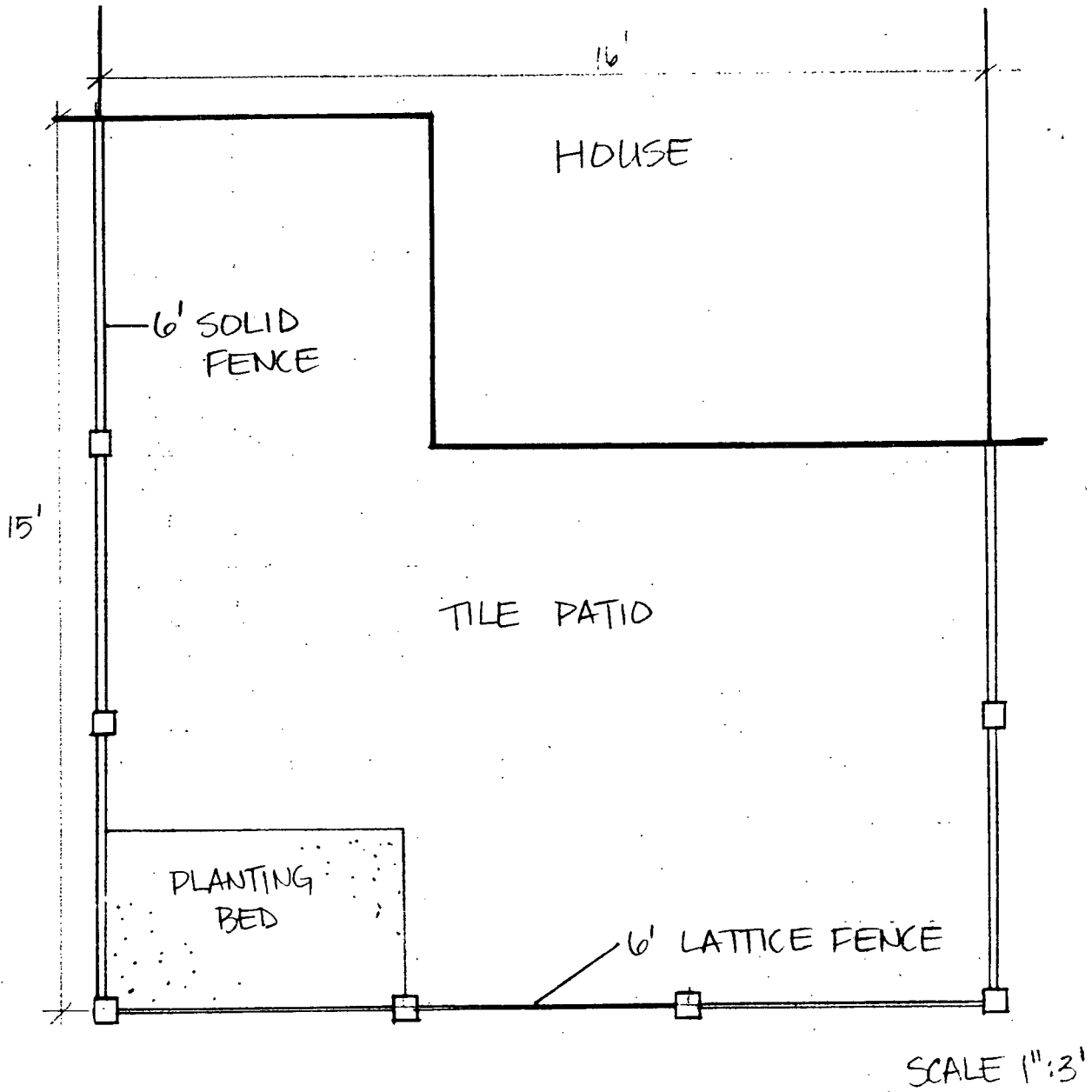
20'

LAWN

SCALE 1"=3'

CHAMPLAIN VILLA





FALSE CREEK

APPENDIX 5

EQUATIONS USED TO COMPUTE SCALE SCORES

Scale Name

Equation

Demographic Scales

Family Size	Score = have children + family size + (age of oldest child) ^{1/2} + (age of youngest child) ^{1/2}
Young, Well-educated Respondents with High Incomes	Score = income - age + education (males) + education (females)
Sex	Score = sex

Housing Background Scales

Past Apartment Renters, Plan to Stay	Score = last housing type/5 + last tenure/5 + plans to stay/10
Wide Experience in Childhood Housing, Lived in Townhouse Before	Score = childhood housing type/5 + lived in townhouse before
Had a Large Yard and Now Want to Rent Non-single Family Housing	Score = last private outdoor space/5 + ideal housing type/5 - ideal tenure
Non-single Family Housing Since Childhood	Score = housing since childhood
Residence Time	Score = residence time/10

Rating Scales

General Ratings	Score = project rating/5 + outdoor space rating/5 + back yard rating/5 + back yard size rating/5
Privacy Ratings	Score = back yard privacy rating/5 + back yard visual privacy rating/5
Good Fences Make Good Neighbors	Score = function of back fence - patio size rating/5 + neighbors' noise + traffic noise + people walking by too close + people seeing in the back yard - children and pets coming in

Preference Scales

Importance of Housing Value	Score = unit chosen because available + unit chosen because of investment potential + features of next house include price + features of next house include investment potential - features of next house include good neighborhood
-----------------------------	---

Outdoor Space Important for Children's Play	Score = outdoor space important for children's play + ideal back yard has play equipment + back yard is used for children's play + project chosen for general appearance + unit chosen for outdoor space
Gardeners	Score = grow flowers and vegetables in the back yard + outdoor space is important for growing flowers and vegetables + likes to garden + ideal yard should have space for a vegetable garden + ideal yard should have fruit trees
Moving Down to a Townhouse	Score = moved to get less expensive house + moved to get smaller house with less maintenance + were looking for a townhouse project + will move to get a smaller house
Seeking Better House	Score = will move to get bigger yard + will move to get bigger or better house + inside of next house is important + yard of next house is important + outdoor space is important for a nice view from inside
Want Better Neighbors, Neighborhood	Score = will move to get better neighbors + will move to get better neighborhood
Outdoor Space Important for Storage and as Land	Score = back yard used for storage + outdoor space is important for storage + outdoor space is important as land
Family Use of Back Yard	Score = back yard used for eating and cooking + outdoor space is important for family activities
Use Patio and Want to Change Connection	Score = use the back yard for sunbathing and sitting + want to change the patio connection