DEPARTMENT OF GEOGRAPHY DISCUSSION PAPER SERIES

SINGLE FAMILY HOUSE EXPANSION

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by

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DISCUSSION PAPER NO. 18

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INTRODUCTION TO THE DISCUSSION PAPER

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1. The purpose of this study was to gather information on the phenomenon and process of single family house expansion. The work was initiated essentially as a problem setting exercise, recognizing that there are fundamental issues involved at various levels of enquiry. On the one hand lies the fundamental human endeavour of creating shelter. This is not absent at the household level whether the society be styled as primitive, developing or developed. On the other hand, at the social level, one recognizes that individual households in modern societies (such as that in which the present study was undertaken) are not entirely free to create shelter in any way they please. Public regulations control certain aspects of building, enforce standards, and so protect the public interest in applying a level of knowledge which would otherwise be unattainable by the 'average' individual. Inspections of buildings reinforce this control. In conjunction with this there has emerged, perhaps increasingly during this century, the practice of manufacturing standardized materials and unit parts or assemblages which themselves must meet the regulations governing the quality of materials. Regulations regarding site, location, materials and design are pervasive. In all this there is a persistent

interrelationship between the individual household and the frameworks of social control: the desires and efforts of households to create home environments most suited to their needs, and most desirable as expressions of their personalities, must be achieved within the limits of material design, shapes, dimensions and permit control, while, simultaneously, the manufacture of materials is continually modified to provide for the greatest possible freedom of building expression. To cite this interrelationship is not to ignore the control exerted by the costs of design and construction. Indeed, it is around the factor of cost that many of the decisions regarding what is possible, as against desirable in a house expansion project,are made.

2. Changes in the quantity of housing in Canada are monitored on a regular basis and serve as a guide to certain decisions in both government and industry circles. This same information is also widely used in scholarly works on housing and urban development in general. Most of it refers only to fully self-contained housing units, whether single or multiple family, or co-operative, or whether owned or rented. But it is common knowledge, at least in the Vancouver area, that the availability of rooms and spaces organized as self-contained units within existing houses is an important source of living accommodation, whether such spaces be styled, in deference to zoning regulations, as in-law suites or illegal suites.

The social and economic patterns of such accommodation have been of considerable interest and study. What seems to have been ignored

in our understanding of these developments is the study of the physical changes to housing units in order that such accommodation might be provided. This comment would not apply to the well publicized areas of gentrification, or to areas under pressure of transition which are zoned to allow extensive modification and apartment development within houses originally built for single families. It refers rather to that class of conversion/modification/addition activities which are continually in process throughout single family housing districts, changes which do not necessarily lead directly to separate household space within existing houses but which may represent construction which eventually could contribute to such housing by sub-division. There is thus a focus here on what might be termed the 'leading edge' of the transition zone; but it is a focus which cannot be confined to a geographical area set at a certain distance in relation to the central business district, for its principal locational attribute is diffuseness. Another formulation of the notion would thus lead away from the ecological vocabulary to suggest that the process of house expansion proceeds throughout the single family districts, whether recent or well established, and represents a change in society's ability to provide and so to consume heated space. From the standpoint of the individual it would represent an increase in the "use value" of the house and, simultaneously, would represent an investment in equity to be realized in "exchange value" at the time of some future transaction.

3. The apparent oversight in studying changes in this range of construction activity is understandable, for many of the projects are of comparatively minor scale and so are not obvious candidates for enquiry. Further, many conversions and sub-divisions of houses have been carried out without municipal permits. Where known, conversions lacking permits might be tolerated, at least temporarily, either because the municipal authorities are unable to keep abreast of such developments or because of the housing service potentially provided in tight housing markets. The implicit suggestion here is that data must be obtained not only from official sources but also in the field. In the present study, the three sample municipalities are reputed to keep a tight control over such construction, and certainly the available cases to study were so numerous that only a ten percent sample could be considered. On the basis of the understanding gained, however, one might suggest that the quantities of space added to houses in the study area, in aggregate, would be, if anything, slightly understated. But they are, without modification, still sufficiently startling to be of interest to those concerned with the supply and cost of housing.

4. Probably the most important determinant of whether or not a householder will go to the trouble and expense of expanding the house is the presence of children. As children are born and grow, so the household requires more space both to provide for the privacy of children, especially as they enter the high school years, and for the greater amount of communal space to accommodate the larger spatial

demands of family activity. Other determinants, as shown in this study, are perhaps secondary, such as the need to provide shelter for grandparents or other relatives, or the desire to speculate in the housing market and so to increase wealth. Certainly it is widely assumed that the latter desire is paramount with most people, and it is easy to find households which move in, fix up, and move out. But the evidence of the present study indicates that those who expand their houses, as distinct from renovating them, do so because there is some good reason, other than speculation, to do so; for the average number of years of tenure in the premises before expansion is twelve, a period of time which suggests considerable community stability among those who engage in this activity. Further, some 56 percent, or just over half of the respondents in the present study suggested that they did not consider moving to be a good alternative to expansion in order to procure more space. This may be in part a function of the present comparative costs between expanding and moving, a comparison which can tip the balance in favour of the former in many cases. But this would not be the whole story, for the period of study covered is six years, from 1975 through 1981, and 1982 for one of the municipalities, during which time there were fluctuations in the housing market. There are other motives for expansion as an alternative to moving, such as the preservation of neighbourhood ties of all sorts--staying with the same school and trusted neighbours for example, or the unthinkable move from the area in which the householder has been raised. While recognizing this, however, it

is also to be noted that virtually all those expanding their houses are not unaware of the potential gain to be had in the eventual resale of their expanded houses, a gain which is free of capital gains tax. Various motives are thus at work, but my initial idea that the increase in the value of the property would turn out to be the most important determinant in the expansion decision was significantly modified during the course of the present enquiry.

5. Just as the expansion decision seems to have its major impetus in the needs of the family pressure on space, so this seems in turn to be rooted in a deep urge concerning the need for space. The physical quantity of space required for living certainly varies from country to country, from region to region, from society to society, perhaps from class to class, and from culture to culture. It also seems to vary from generation to generation within one place, at least in this society, and the common expectation seems to be that a family now needs more space than it would have done, in similar socio-economic circumstances, a generation ago. The coal-fired furnace of forty years ago required a large central space in the basement for its correct positioning, and also required a considerable circumference around itself to provide for the upward and away branching of the ducts for the convection feeding of heat to the house above. Further, the coal bin was space-consuming, and dust from it generally made the basement a dirty place. So it was largely given over to storage and perhaps workshop uses. With changing heating technology, however, and the elimination of coal and cinder dust,

it was possible to convert the basement into acceptable and even pleasant living space. Thus the basement "rec room" became common, often to be filled up with furniture for a second "sitting area," or with such space consumptive equipment as ping pong tables and television sets. In time some of these pieces of equipment, and the space to accommodate them, became more or less required for, and expected of, the average family. In houses which did not have basements suitable for conversion, space for these activities would thus have to be added. At the same time the privacy of individuals within the family seems to have become an issue requiring attention, resulting in greater luxuries and timing flexibility in the use of facilities, such as en suite bathrooms would suggest. But the greatest spur to the addition of private space has been the perceived need for extra bedrooms. Thus many children now would expect to have a room of their own, and their parents would expect to have to provide it, whereas, when young, these same parents may well have shared a bedroom right up until the time of leaving home.

These two suggested developments, of the extension within the home of communal space and private space, perhaps illustrate the spatial expression of a generally higher and perhaps constantly improving standard of living in this century. Although the rate of increase in the internal space of houses may vary in the short term, such as over a decade, in response to tax incentives or the particular pattern of cohort development in the population, it would also be well to keep in mind that there may be an historical momentum which is of longer duration, which is more difficult to document, but which might also be fundamentally urgent in

the understanding of these changes. I refer here as an example to the hard won 'parlour' of the working man's house of the last century; is the post World War II 'family room' not a part of that trend to be able to command more space for the keeping of company while allowing privacy to continue to be available elsewhere in the house? And is the increased number of bedrooms, and perhaps their increased size, not a spatial accommodation to the possession of more goods, larger and more toys in the case of small children, the need for a desk and study space for older children, vanity tables and dressing areas for adults? And where does one keep all that sports equipment, and the now numerous household appliances? In short, how does the geography of housing relate not only to basic needs of the population but also to what has been called the revolution of rising expectations?

6. There are paradoxes. If the revolution of rising expectations is partly responsible for the increased need for space, and thus is partly responsible for the actual creation of additional space, it might be suggested that the uses of additional space would become more specialized. This would represent a qualitative change as well as a quantitative one. But house space seems to be increased in proportionate ways both functionally and spatially. To judge from the results of the present study the purposes for which space is needed does not noticeably diversify; more space seems to be added merely for existing purposes, a purely quantitative increase. The resolution to this seeming paradox may lie in the number of 'uncommitted' purposes. The most popular extra

room designation is the bedroom, but this masks the possibility that a bedroom can easily be changed to a study or other purpose. While site visits and questionnaires did not reveal any switching of bedrooms to other uses, and so inspired confidence that permit designations were accurate, one knows on other grounds that such changes of use do occur; but the amount of such shifting of room uses may not in aggregate be important.

7. What might well prove worthwhile to watch for in future, however, is the emergence, or re-emergence, of revenue generating working space within the home. While reference has been made above to study and desk space, this could probably be argued to be most important in the homes of professional and business people with executive or business ownership responsibilities. (Reference has already been made to the need for high school and university students living at home to have a place to study. But such space does not directly contribute to the generation of revenue.) Recent indications seem to suggest, however, that the home is increasingly becoming a centre for work. The garment industry was recently reported by the CBC to be relying substantially on home-based female labour; there are other more varied instances of women working out of the home in tasks which would require some form of office space and telephone--such work as bookkeeping for small businesses, travel agency work, or pre-school and day-care supervision. And does the advent of the micro computer and word processor herald the need for specialized space to be devoted to its storage and use as the television set could be argued to have done a generation ago?

This phenomenon of home-based work is not necessarily confined to women, for 'flex-hours' have been accepted to a degree in the workplace and some men have been able to arrange both to avoid the delays of the rush hour traffic (and so save time in their days) and to preserve for their own some of the best of the daytime hours. Some of this time may well be devoted to revenue generating activities--or at least to savings on expenditures by doing property maintenance chores. Or if not generating actual funds, the time may be spent in hobbies and sports the equipment for which requires housing. Just as increases in wages have sometimes been suggested to be needed to complement increased leisure time, because part of the leisure time is passed in spending money, so it might be suggested that increased leisure time requires additional household space to cope with and 'house' the repercussions of more home-based activity.

The journey to work has been a continual planning and traffic engineering headache in recent decades, so there may well be sympathy from official sources for home-based work developments. But one must remember that the reduction of one spatial problem, largely accommodated in infrastructural terms in the public sphere, may involve the transfer of the cost of the infrastructure to private households. If a garment worker no longer rides the bus or subway to work, or drives a car on a public road or freeway, she must provide the space and organizational skills within the home itself to be able to generate income. And there would also be the concomitant loss of workplace companionship. The geography of household space changes may well be one of the more sensitive indicators of the changing nature of social and labour relations.

8. To approach the question of the geography of household space changes, two postulates are presented in schematic form. The first, House Spaces by Purpose and Form, attempts to match the forms of space to the purposes for which the space is needed. The basic distinction centres on communal and private space, and two levels or scales of consideration are indicated as between A. and B.

The second is presented as a stage diagram in which there is a spatial progression from a very simple open area houseplan, analogous to a cabin (A). There is some specialization of space, but barriers exist only as furnishings in the main room, or as walls to segregate toilet space. Storage space, shown here as separate, would not necessarily be divided from the main room by a wall and door. Through the succeeding stages space is progressively subdivided to separate physically its specialized uses. The analogy for D might be a modern, suburban, small (two bedroom) bungalow. Although not carried to a stage of great elaboration here, and so to possible specializations such as music or sewing or dark rooms, the lack of functional diversity shown is consistent with the main findings of the present study. Perhaps these two schemes may serve as useful starting points in further enquiry into the spatial arrangements of the single family household.

9. In conclusion, the following are suggested as spheres of enquiry which, if sub-divided as questions, might initiate or guide further research directions.

a) The morphogenesis of the single family house is a sensitive indicator of the changing ways of life of a large proportion of the population.

HOUSE SPACES BY PURPOSE AND FORM

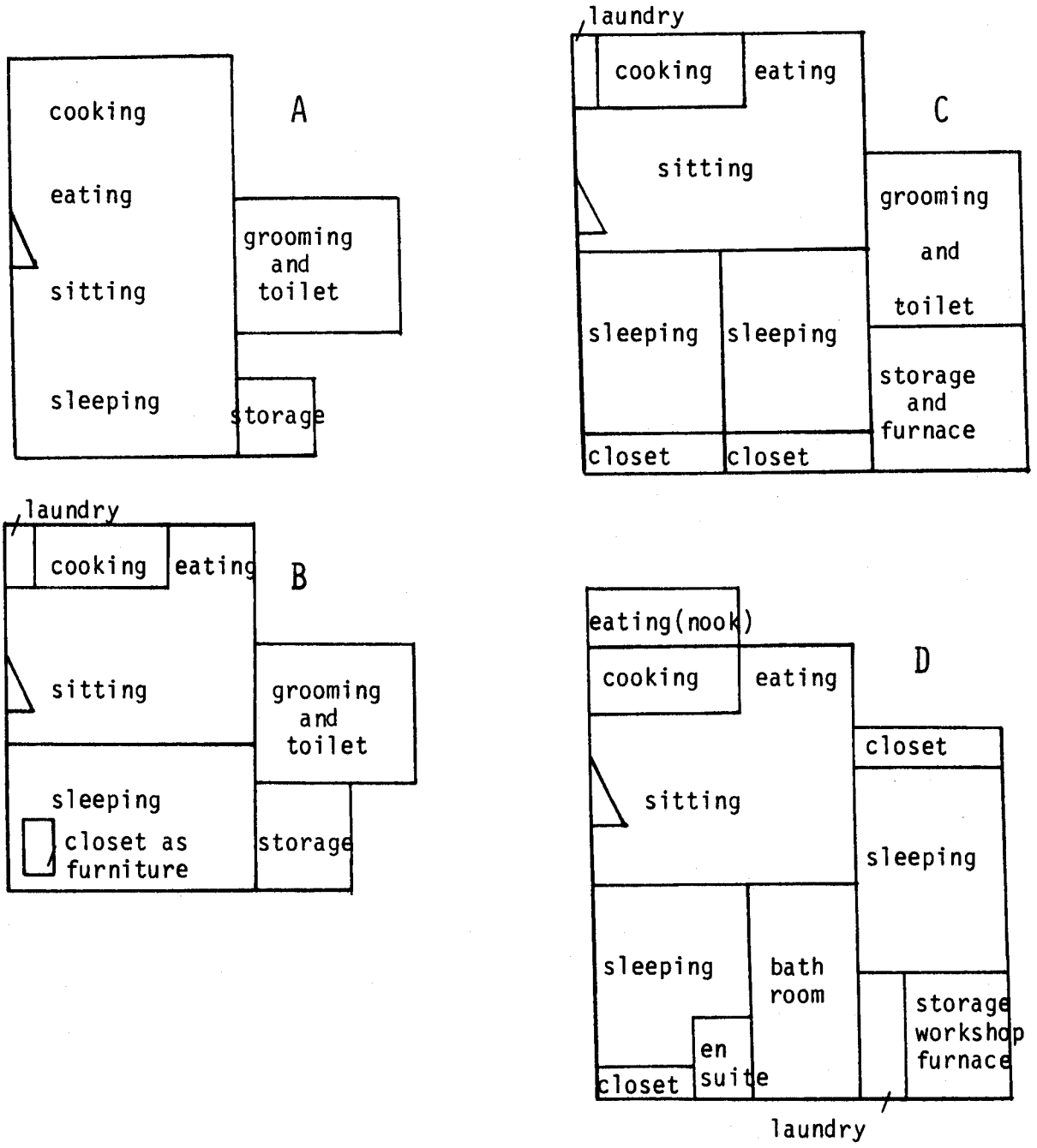
A. General Purpose of Space	General Form	Specific Forms
Shelter	Heated enclosure.	Roof, walls, entrances.
Communal Activity	Open area; unrestricted access; unconfined visually and acoustically.	Open area enclosed only at outer limits. Space may be articulated to indicate use changes without being closed off. So functions may be specialized.
Privacy	Enclosure with restricted access; visually and acoustically cut off.	Walls and doors.

There may be some areas of the house space which do not neatly fit the communal or privacy categories. These might include workshop or laundry areas, kitchens and offices, which might be defined better in terms of which members of the family or household are dominantly concerned and responsible for these areas, without the areas becoming a preserve of privacy.

B. Purpose of Space: Sub-Types		
Communal Activity	*for cooking and eating	kitchen and dining areas
	*for formal socializing	living room, drawing room, parlour
	*for informal socializing	family room, den, TV room, games room, sauna
	*for adults *for children	further sub-types possible
Privacy	*for sleeping	bedroom
	*for toilet and grooming	bathroom, en suite
	*office work	separate room, desk in family room or bedroom
	*workshop	tools storage and use area
	*laundry	laundry area
	*games	games room or area

THE DIFFERENTIATION OF HOUSEHOLD SPACE

A POSSIBLE MODEL



b) The point of development when an expansion decision is taken, and carried out, represents a moment of change which can be documented and studied to throw light not only on the change itself but also on preceding and post-expansion housing circumstances.

c) While the construction of new housing is of greatest interest to the construction industry, and is watched carefully for the contribution it makes to the general economy, persistent expansion activity contributes in a minor but cumulative way to the expansion of living space, to the consumption of construction materials, to the employment of labour, and to the demand for furnishings and energy for space heating.

d) At the level of house expansion, rather than house construction, individual householders are much involved in performing the physical tasks of the construction, as well as being involved in the decisions regarding design and materials purchase. The degree of such activity would suggest, at least in British Columbia, or more generally in areas dominated by wood frame construction, that continuing activity in construction at a 'handyman' or amateur level, is a continuing pastime and so a major element in the 'way of life.' Both spouses are usually involved although there may be some differentiation of tasks by sexual stereotyping.

e) Households engaged in expansion are motivated primarily by the need for more space ("use value"), although they are cognizant of the long term financial benefit of the increase in equity the expansion represents ("exchange value").

f) Whether houses undergoing expansion can be related to the traditional ecological models of urban expansion and space specialization remains an open question. Smith and McCann found some relationship to be apparent in Edmonton, but at the more focussed smaller scale in the present study there is no evidence to suggest an easy or obvious linkage. One direction of such a link might lie in the suggestion of the present study that some households are (perhaps even self-consciously) 'gearing up' their houses in anticipation of a zoning change which, responding to demands for land use or land use intensity changes, could 'initiate' a zone of transition. In such a case, expanded houses might be ready for easy conversion to apartments.

g) The participation of individuals in their own expansion projects, along with hired labour, professional designers, and the use of pre-manufactured materials, suggests that this activity is a point of entry into what would amount to folklore studies of modern society.

h) The focus on spatial change provides a firmer footing for the study of the long term than would the study of expansions in market or financial terms. A square foot is always a square foot, but a dollar is not always a dollar. Thus the longer term undercurrents of social change or stability might be revealed in less spectacular but more realistic ways by the discussion of space than by the discussion centred on house value.

SINGLE FAMILY HOUSE EXPANSION

Final Report

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Report to Canada Mortgage
and Housing Corporation

June 1983

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SINGLE FAMILY HOUSE EXPANSION

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June 1983

ABSTRACT

This project was undertaken as an enquiry into the phenomenon and process of single family house expansion. The study area comprised the three municipalities of Vancouver's north shore, namely the City of North Vancouver and the District Municipalities of North Vancouver and West Vancouver.

During the last decade there has been a continuing pattern of construction activity designed to add rooms and spaces to existing houses. Some of this activity may be intended to provide needed space, and some to provide a way of increasing equity. Whatever the motive, the level of activity has not been inconsiderable, and it seemed that such a study could contribute to our understanding of the developing urban and suburban areas of Canada.

The general approach taken was to study a ten percent sample of house expansions and from this to lay out this activity in terms of morphological and social characteristics. The former included data on the actual rooms and spaces built, the quantities of area these involved, and the forms taken by the space as a new part of the shape of the house. The latter included data on the uses for which the space was intended and certain social and behavioural characteristics of the population engaged in house expansion.

The period studied was 1975 to 1980 inclusive, a period of considerable activity in the housing market in general. Records in the municipal halls provided the data for morphological characteristics. These data were principally derived from architectural or builders' plans of proposed expansions.

The following lists some of the main findings. Quantities are extrapolated from sample data.

a) expansions are more commonly built on the rear sides of houses than on either the fronts or sides.

b) About 5,200 rooms were added over the six years of the study period, and some 1,500 rooms were extended.

c) Space was added to the upstairs, main living floor, and basement in approximate proportions of 2, 4, and 1 respectively.

d) The mean expansion was 466 square feet, this being virtually the same for all three municipalities. The medians vary, however, from 240 square feet in the City of North Vancouver, through 280 in West Vancouver, to 309 in North Vancouver District.

e) The mean post-expansion house size is 2,353 square feet.

f) The main uses of expanded rooms are, in order of frequency of occurrence, bedrooms, family rooms, bathrooms, and public rooms.

g) Households expanding their houses average 3.9 persons, and the mean number of children is 1.52. The largest proportion (45 percent) of children are in elementary school at the time of expansion, while pre-schoolers account for 30 percent. Parents are in their early to mid forties.

h) Household tenure before expansion averages 12 years, and the time taken to plan and execute an expansion is about 31 months. Virtually all householders take an active part in the work, both physically and organizationally, and most expansions are perceived to be on budget.

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TABLE OF CONTENTS

TABLE OF CONTENTS CONT'D. Page

TABLE OF CONTENTS CONT'D.

LIST OF TABLES

LIST OF FIGURES

LIST OF ILLUSTRATIONS

LIST OF APPENDICES

SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

1. This study was undertaken to explore the question of additions to single family dwellings.

2. An attempt was made to discover the amount and types of such building, over a six year study period, 1975-80 inclusive, in three municipalities. These were the City of North Vancouver and the two District Municipalities of North and West Vancouver which, jointly, comprise the north shore of greater Vancouver. A preliminary study, referring only to the two Districts, was submitted to CMHC in 1982. The present study includes the City in addition, and thus makes possible the presentation of findings referring to all three municipalities and to the north shore as a whole. The present study is also devoted to exploring social and behavioural aspects of the processes of house expansion.

3. Expansion areas were measured from architects' and builders' drawings, as submitted for approval by municipal authorities. These were complemented by measurements of pre-expansion house areas, areas of addition by level (floor), that is basement, main level and upstairs, and these were considered cross-sectionally for the municipalities. Further, building expressions, termed architectural complements, the physical results of expansion, were studied. Room uses or functions were noted.

4. Two hundred and fifty-four cases were selected at random from the building permits filed in the municipalities, these representing a ten percent sample of all permits issued for additions.

5. Social data were derived principally from a mailed questionnaire survey, the most important areas of information sought having reference to family and household characteristics, household tenure and neighbhourhood, and decisions made with regard to the expansion project. Almost 100 usable questionnaires were returned, representing about a 50 percent rate of return. Interviews

assisted in gaining further understanding of the social side of the house expansion process.

6. Specific findings, in the order of sections presented in the report, are listed below:

a) Aspect

The factor of exposure does not appear to be a strong determinant of how additional space is enclosed. It is important, of course, in how sundecks, patios and windows may be placed. But the locations of enclosed additions do not in aggregate show strong tendencies to be clustered in relation to points of the compass. In this study it would appear that the shape of the property, set-back regulations, the need for space to allow for some internal pattern of circulation to be expanded, and the nature of the pre-existing house would be stronger determinants of the directions in which houses are expanded. Informal observation, however, of more recent (post 1980) upstairs additions suggests that this factor is increasing in importance.

b) Orientation

The orientation of additions refers to the side of the houses on which additions were built. These were designated as front entry side, sides, and rear entry side. The rear entry side was the most commonly built on (41 percent), the front entry side was the least (28 percent), with the sides being slightly higher (31 percent). Municipal variations show some departures from these north shore aggregate figures, however, the City emphasizing the rear (51 percent) and to a considerable degree avoiding the front entry side (21 percent), whereas West Vancouver emphasized the front more than either of the North Vancouvers (39 percent) and tied with North Vancouver District with 39 percent of building on the rear.

The relationship between Aspect and Orientation was explored through a cross tabulation of frequencies of addition by aspect and orientation. Both cardinal and diagonal points of the compass were considered as aspect measures. There is for the north shore a slight emphasis on southerly and westerly aspects, and a preponderance of rear entry side additions regardless of aspect. The emphases on the south and west tend to be greatest in West Vancouver.

c) Rooms Added And Extended

The accompanying table lists the principal factual findings of the morphological analysis by municipality and for the north shore as a whole. These findings refer to the 1975-80 period and, where totals are given, are derived by extrapolation from the 10 percent sample studied.

Some 5,200 rooms were added to existing houses over the six year period, and nearly 1,500 existing rooms were extended. The greatest emphasis on adding rooms was in the District of North Vancouver (48 percent of the north shore total) while the greatest emphasis on extending rooms was in West Vancouver (52 percent). But North Vancouver City had the highest ratio of rooms added to extended (5.7). Some 2.7 rooms are added per project, while about 1.7 existing rooms are extended. About 15 percent of all projects involve both adding and extending existing rooms.

d) Expansion By Level

Areas of expansion were differentiated by floor level. The main living level of houses was where most expansion occurred, there being some 688,500 square feet of space added. This is almost exactly twice the amount added to the upstairs level, and four times the amount added to basement levels. The City of North Vancouver experienced a much greater emphasis on the vertical distribution of additions, however, in that main floor and upstairs additional areas have an almost one to one ratio, and the main floor expansions were only

SINGLE FAMILY HOUSE EXPANSION: SUMMARY CHARACTERISTICS

	NS	NVC	NVD	WV
Rooms Added (%)	5,200	800(15)	2,510(48)	1,890(36)
Rooms Extended	1,470	140(10)	570(39)	770(52)
Ratio Added/Extended	3.5	5.7	4.4	2.5
Places Adding Rooms	2,010(81)	260(80)	1,060(86)	690(69)
Places Extending Rooms	890(36)	90(25)	370(30)	430(41)
Mean Rooms Added Per Place	2.6	2.6	2.4	2.7
Mean Rooms Extended Per Place	1.7	1.4	1.5	1.8
Places Adding And Extending Rooms	380(15)	30(8)	210(17)	140(14)
Expansion By Level (square feet)	1,196,760	161,320	573,820	461,620
3 Upstairs	338,650	62,440	118,070	158,140
2 Main floor	688,500	64,280	359,720	264,500
1 Basement	169,610	34,600	96,030	38,980
Area Added (Total Sq. ft.)	1,196,760	161,320	573,820	461,620
Mean Area Added/Year	199,450	26,890	95,640	76,930
Mean Pre-Expansion Area/Place	1,881	1,686	1,836	1,992
Mean Post-Expansion Area/Place	2,353	2,154	2,302	2,472
Mean Expansion Per Place	466	468	463	462
Median Expansion Per Place	300	240	309	280
Ratios Addition Areas To Pre-Expansion Areas	.312	.282	.319	.313
Total Pre-Expansion House Equivalents	636	96	313	232
Mean Annual Addition of House Equivalents	106	16	52	35

twice those of the basements. The greatest amount of upstairs space, in absolute terms, was built in West Vancouver while its basement expansions were only about one-seventh the amount built on its main floors. North Vancouver District holds an intermediate position in terms of the internal proportionate distribution of additional space.

e) Areas of Additions

The mean expansion per house was almost identical in all three municipalities, that for the north shore being 466 square feet. But the typical cases, as expressed by median values, differentiate the municipalities with the smallest value, 240 square feet, for North Vancouver City and the largest, 309 square feet, for North Vancouver District. The north shore median was 300 square feet and that for West Vancouver was 280 square feet. The total area added across the north shore was nearly 1,200,000 square feet, this being added at an average annual rate of almost 200,000 square feet.

f) Pre-expansion Areas of Dwellings

The mean pre-expansion house size was 1,881 square feet. The smallest houses being expanded were in North Vancouver City, just under 1,700 square feet, while the largest were in West Vancouver, just under 2,000 square feet. The median size for the north shore, at 1,833 square feet, was close to the mean value.

g) Areas Of Enlarged Dwellings

The mean post-expansion house size was 2,353 square feet. The municipal averages ranged from 2,154 square feet for North Vancouver City, through 2,302 square feet for North Vancouver District, to 2,472 square feet for West Vancouver. The north shore median was 2,212 square feet while North Vancouver District and West Vancouver had identical medians of 2,228 square feet. The mean size of expanded house across the north shore increased by 18 percent but ranged from a

low of 7.8 percent in North Vancouver District through 23 percent in the City, to 30.8 percent in West Vancouver.

h) Ratios Of Addition Areas To Pre-expansion Dwelling Areas

The mean proportionate increase of space is some 31 percent for the north shore and for the two district municipalities. It is slightly less, at 28 percent, for the City of North Vancouver. Median values are less, however, ranging between about 12 percent in the City and 19 percent in North Vancouver District.

i) Spatial Distributional Characteristics

Throughout the study comparisons are drawn among the three municipalities. This makes the study more useful because it presents the results in a way that is of direct interest to municipal authorities and those who must interact with those authorities. But the spatial 'mesh' of municipalities as reference areas is crude and irregular and, from a social geographical standpoint, it is desirable to have a finer break-down. This is accomplished here by standardizing the data collection over the area as described in the report. The isopleths which are then interpolated describe the spatial variability of the phenomena. Four such maps were created. These pick out certain underlying urban spatial structures, the most dominant of which is a 'band' of housing age, area and expansion characteristics around the lower Capilano River, linking the two major districts or core areas of earlier settlement, namely the City of North Vancouver and lower West Vancouver (Ambleside and Hollyburn areas). Spatial variations occur in a more or less regular alternating sequence of 'ridges' of intense and light expansion activity as one progresses in any direction away from this central core around the lower Capilano.

j) Rooms And Spaces By Activity Complexes

A 'functional classification' of newly added space was developed, and the relative emphases on these spaces analyzed by frequencies of occurrence. The

most important category of expansion by function is the Bedroom Group (30 percent of all additions) followed by Family Rooms for General Activity (15 percent), Bathroom Group (13 percent) and Public Room Group (12 percent). The Bathroom Group in many instances is related to the Bedroom Group, owing to their proximity in hallways or as en suites. This may be expressed in proportionate terms, that for every two bedrooms added a bathroom is also added. Comments are made in the report on the nature and meanings of hallway, kitchen and utility area expansions. There is marked municipal variation in the frequencies of many functional types of additions, but general uniformity across the north shore in the frequency of kitchen enlargements.

k) Building Or Architectural Complements

An eight part typology of building (or architectural) complements was developed in order to allow generalization of the many forms of addition. The building complement is defined as the physical addition which is built in order to effect an expansion of living space. Two closely related types predominate: a simple 'wing, with three outside walls' and 'rooms attached, with three outside walls'. The category 'enclosure of previously defined space' ranks third, and is taken to be important because it represents the situation in which outdoor living space, already in existence, is enclosed for indoor space.

The largest projects, by area, occur with the least frequency. Nine percent of projects increased their space by 90 percent or more. Forty-five percent of projects increased their space by between 10 and 50 percent.

l) Case Studies: City Of North Vancouver

Case histories of eight single family properties were developed. These incorporate more than the question of expansions, and provide a picture of the whole development of the properties. Several general trends were identified, these having some application across the whole north shore.

a) Additions were not uncommonly built soon after the initial construction of the house. For example, a garage or carport might be built within two years.

b) Additions may be planned in stages, and thus the house may 'evolve' according to a scheme, and as time and finances permit.

c) Existing outdoor living space is frequently a target for enclosure as the extra addition.

d) If outdoor living space is sacrificed to indoor living space, further outdoor space is frequently constructed to compensate for the loss.

e) Some properties seem to go through long periods of evolution before reaching a 'climax' phase of development. This evolution may be 'independent' of homeowner in that all the occupants seem to engage in property development activity during their respective tenures.

m) Family and Household

About one-half of all households on the north shore comprise two to three persons. Further, one-half of all families have between one and two children, and a large proportion (39 per cent) of families have no children living at home. These are suburban municipalities characterized by small numbers of children. The constant building activity thus suggests a constantly rising per capita consumption of living space.

Households expanding their dwellings have a mean number of 3.9 members. The evidence points to the conclusion that expansion activity occurs principally in 'traditional' nuclear families. Some observations are made concerning possible modifications to this pattern.

The mean number of children per expansion household is 1.52, and there was some excess of boys over girls in responding households. Thirty per cent of the children were pre-schoolers at the time of expansion, while 45 per cent, the largest proportion, were of elementary school age.

House expansion is an activity of the forties. The average age for the family man engaged in adding on space is 45 years and his wife averages 42 years. Eighty-nine percent of respondents indicated that their children had individual bedrooms; 57 percent had always enjoyed separate bedrooms.

n) Household Tenure And Neighbourhood

The mean number of years of household tenure before expanding the house is 12 years. Thus there is considerable stability among households choosing to expand. Further stability is indicated in that, of the moves that were made in order to locate in the present house, 31 percent were from within the present municipality, and 49 percent of all moves were within the north shore. The journey-to-work, overwhelmingly to downtown Vancouver, is of minor importance as a determinant of location within the north shore, the principal determinants being house cost, neighbourhood satisfaction, and house quality, in that order. Fifty-six percent of expansion households did not consider moving to be an alternative to expanding. Perceived neighbourhoods vary greatly in size, and their size is not apparently directly related to expansion decisions; neighbourhood character, however, quite probably is related to expansion decisions.

o) Expansion Decisions And Project

The time spent planning an expansion project is about 18 months, with some variation among municipalities. Professionals are much involved in the designs of expansions, with architects being more frequently employed in West Vancouver than in either of the North Vancouver municipalities. But it would seem that there is a high standard of design being observed in general.

Virtually all homeowners take some part in the expansion activity. Sixty-three percent are involved in skilled and finishing work. In many cases they act as helpers to the trades, and as project managers and trades co-ordinators.

The average length of time spent on the expansion work is 13 months,

although this is usually patterned by an initial burst of activity, a peaking, and a long tapering off period. The householder is typically more involved physically at the finishing stages. About four-fifths of respondents claimed that the project was on budget.

Overall, it is concluded that expansion activity is satisfying in spatial, economic and behavioural terms to the households which choose to increase their indoor living space.

(p) As an expression of average spatial equivalence, the amount of expansion activity on the north shore, based on pre-expansion house sizes, may represent the addition of 636 new houses. Further, this would represent an average annual increment of 106 new houses.

INTRODUCTION

INTRODUCTION

The purpose of this report is to present the data, analyses and findings of an enquiry into expansions of single family dwellings.

Data collection was carried out in the three municipalities which jointly comprise the 'north shore' of Greater Vancouver. These are the City of North Vancouver, the historic core of the region, and the two District Municipalities of North Vancouver and West Vancouver. These municipalities are dominated by single family residences, although in recent years multiple unit residential blocks have become much more prominent, most especially in the lower City. But the north shore as a whole may be described as largely suburban in character.

The background which gave rise to the study was the observation, made in the field, that there has been in recent years much 'incidental' construction in these municipalities, construction which yields increased living space to existing households by expanding the premises of their principal dwellings. No doubt the value of the expanded houses has increased to a worthwhile degree as well. When projected, the amount of such activity was thought to be of a degree and importance not formerly highlighted in the literature on housing or urban development. Yet in the construction process labour is employed, designers are contracted for, and building materials are purchased in quantity. Exactly what is the contribution, then, made by housing additions, to housing itself, to the standard of living of the individuals involved and to the community, and to the settlement patterns of the urban and suburban areas? What "user needs" are being met by the expansion of SFD's? And how does this activity and its results fit our understanding of the development of urban structure?

These general questions were the starting point for this enquiry. The purpose of the enquiry was, therefore, to explore the subject of SFD expansion

with a view to obtaining some measure of its importance in the local urban and suburban structure, and from this perhaps to infer its wider importance for Canadian cities. Further, the purpose was to try to characterize what expansions occur and what they might mean to the way of life of the community.

Two general approaches were identified in order to develop the enquiry: morphological and behavioural. A preliminary study was conducted in 1982 in the two Districts, following only a morphological approach. The present study goes further in that the City is incorporated and the materials of the earlier study have been reworked and integrated with the new morphological data from the City in order to provide north shore wide results. Thus results here are consistently framed for four geographical units, that is the three municipalities and for the north shore taken as a whole. Throughout the discussion a comparative approach among the municipalities is taken, for this provides perspectives which have meaning in the area inasmuch as the municipalities are communities and also are units of jurisdiction and approval of building practices. It is hoped that the results, couched in comparative terms, will thus be of assistance to those at the municipal level who are concerned with these matters.

The behavioural approach was pursued through a mailed questionnaire survey, by follow-up interviews, and by discussions held with a variety of individuals whose interest was both professional and personal. The questionnaire survey was the principal source of information and, as it was collected systematically, provides the principal focus of discussion here. The interviews, often lengthy, have informed the writing here, but are not be set out in the same systematic way as a cross-sectional survey. Thus the methods are complementary, and it is felt that a fairly complete representation of the social and behavioural side of house expansions has been presented.

The principal data sources for the morphological changes were the records of the municipal building departments. The forms of organization vary as among jurisdictions, but the structure of available data is similar. The records consulted included, most importantly, the lists of building permits and the architectural or builders plans submitted for approval. There is no real public control over cosmetic design, rather the emphasis in the approval process is entirely on structural features of the building and on questions of conformity with by-laws. Thus the homeowner who wishes to expand a house has a fairly free hand to select the 'look' as well as the functional space that is wanted, and thus the landscapes of these communities suggest an almost unfettered record of desire in their social geographies.

To focus on expansions is to suggest by implication that single family dwellings are getting larger. They are. But there are trends which modify this simple statement. The simple case here is of a typically modest house being expanded. But both large and small houses also undergo expansion. Another process at work, and currently quite visible in the landscape, is the complete replacement of small houses by quite large ones. This demolition-replacement process is not the issue here, but is a not unrelated matter for it too provides increased indoor living space in situ. This has become a matter of public concern in the vocabulary of "bulkiness" in West Vancouver, and in several municipalities throughout the region the same discussion has been joined in terms of the development of small lots; resolutions seem to be largely in terms of floor-space ratios, and height and side yard restrictions. The issue has not progressed to a stage to be appropriately dealt with here, however, but might become more important in the future. The counter trend to expansion is the much publicized work on creating small houses as part of the thrust to "affordable housing". Significantly, one of the important claims for the desirability of a new form

of small house developed by the industry (HUDAC) in the past year was that the house was easily expandable. Thus one concludes that the desire for more space remains and must be catered for, even when reductions are being suggested by demonstration. (Appendix 2)

The quality of records, and thus of data, is in general of a high standard. Plans which are accepted for approval vary in quality from houseowner plans to those of the professional architect. But all must contain the essentials of dimensions, relation to existing building, and so on. Thus only a few plans drawn in the sample had to be rejected. Where this did occur, the next place on the list was selected, as discussed below.

The years selected for study were 1975 through 1980. These limits were necessary, for records after 1980 were still current and so not available in West Vancouver at the time of data collection, and it was felt that six years was plenty to handle when the scope of the job was surveyed. To go back to the early 1970's would be desirable perhaps, but would involve a more complex approach to the question of the building cycle. To go back beyond 1971 is impossible in North Vancouver District, for records from before that time do not exist. It was possible, for the City, to come forward to the end of 1982 but, because the 1980 date is the overall cut-off time, data for the City are presented both at the 1980 cut-off and at 1982.

The amount of building activity relevant to this study is considerable, as Table 1 shows. The municipalities have slight differences in the ways that these figures are compiled, and so the comparability of these data is not exact. But the general patterns are clear. The categories which include "additions" account for 52 percent and 45 percent of all building permits issued in North Vancouver District and West Vancouver respectively. This figure is much less for the City, at 12 percent, but it is still an activity to be reckoned with

TABLE 1 BUILDING PERMITS ISSUED 1975-1982:

CITY OF NORTH VANCOUVER

	Number "Add. & Alt."	Total	% of Total
1975	17	305	6
1976	32	321	10
1977	20	410	5
1978	18	308	6
1979	69	447	15
1980(sub-total)	96 (252)	471 (2262)	20 (11)
1981	56	287	20
1982(not including Dec.)	35	255	14
Total	343	2804	12

	Value ($'000s) "Add. & Alt."	Total	%
1975	178.5	15,847.9	1
1976	374.1	20,296.6	2
1977	256.1	49,183.5	0.5
1978	242.0	40,234.6	0.6
1979	438.0	27,851.6	2
1980(sub-total)	716.2 (2204.9)	48,914.9 (202,329.1)	1.5 (1.1)
1981	929.4	37,027.7	2.5
1982(not including Dec.)	444.0	29,908.7	1.5
Total	3578.3	269,265.5	1.3

TABLE 1 BUILDING PERMITS ISSUED, 1975 - 80; Numbers and estimated values

North Vancouver District

	Number			Value ($'000s)		
	"Misc"	Total	%	"Misc"	Total	%
1975	533	968	55	3018	43111	7
1976	550	947	58	2644	22159	12
1977	533	940	57	2931	22092	13
1978	445	875	51	2717	27508	10
1979	456	962	47	3256	27813	12
1980	442	1022	43	4453	44688	10
Total	2959	5714	52	19019	187371	10

West Vancouver

	Number					
	"Add & Alt"	Tot	%	"Add& Alt"	Total	%
1975	248	444	56	2217	16378	14
1976	295	508	58	2927	17751	17
1977	239	514	47	2443	20943	12
1978	208	497	42	1963	21247	9
1979	238	619	39	3580	22452	16
1980	274	753	36	4776	44920	11
Total	1502	3335	45	17906	143691	13

there, with over 300 permits being issued.

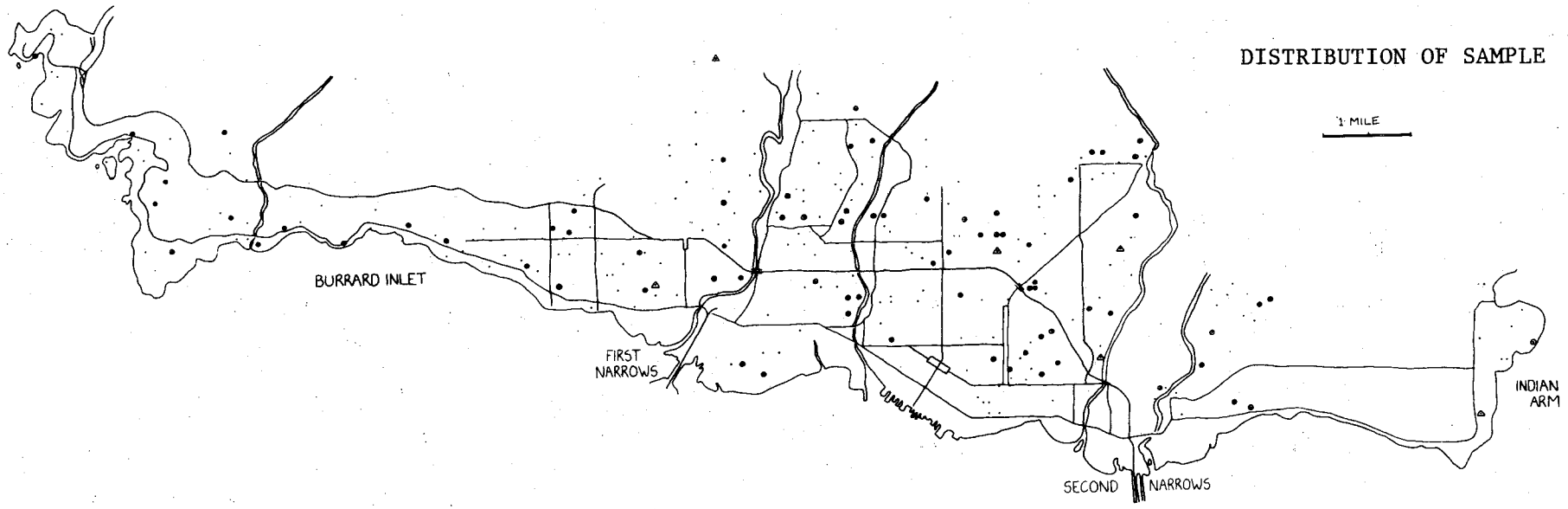
The sample selection proceeded by inspection of all permits, the listing of those for additions into a Basic List, and the random selection of a 10 percent sample from that list. This resulted in a total sample of 254 cases, as shown in Table 2. The geographical distribution of the sample is shown in Figure 1, along with a map showing the basic features for orientation, that is the rivers and major thoroughfares. The Distribution of Sample map also shows (by closed symbols around dot locations) locations of questionnaire respondents, the main observation being that there is a 'good scatter' of these across the whole area. (The total returns, as discussed in the report, provide for almost a five percent sample of the whole Basic List.)

Basic data sources having been assembled, information was recorded on standardized forms for analysis. The morphological categories chosen were:

* aspect - with respect to degrees of compass
* orientation - with respect to the front entrance
* room function - the intended use of new space
* rooms added - the number of rooms added
* rooms expanded - the number of pre-existing rooms expanded by removing walls and opening to newly built space
* building or architectural complement - the physical form of the addition
* house levels - the number of levels, basement through upstairs, including split levels, on which expansions or additions were built
* expansion by level - the amount of space added to each level
* areas of additions - the total amount added
* areas of pre-expansion dwellings - including all levels
* areas of newly expanded dwellings - pre-expansion areas plus additions
* ratios of additions to pre-expansion areas - given as a ratio to three decimal places, or one place in a percentage reading

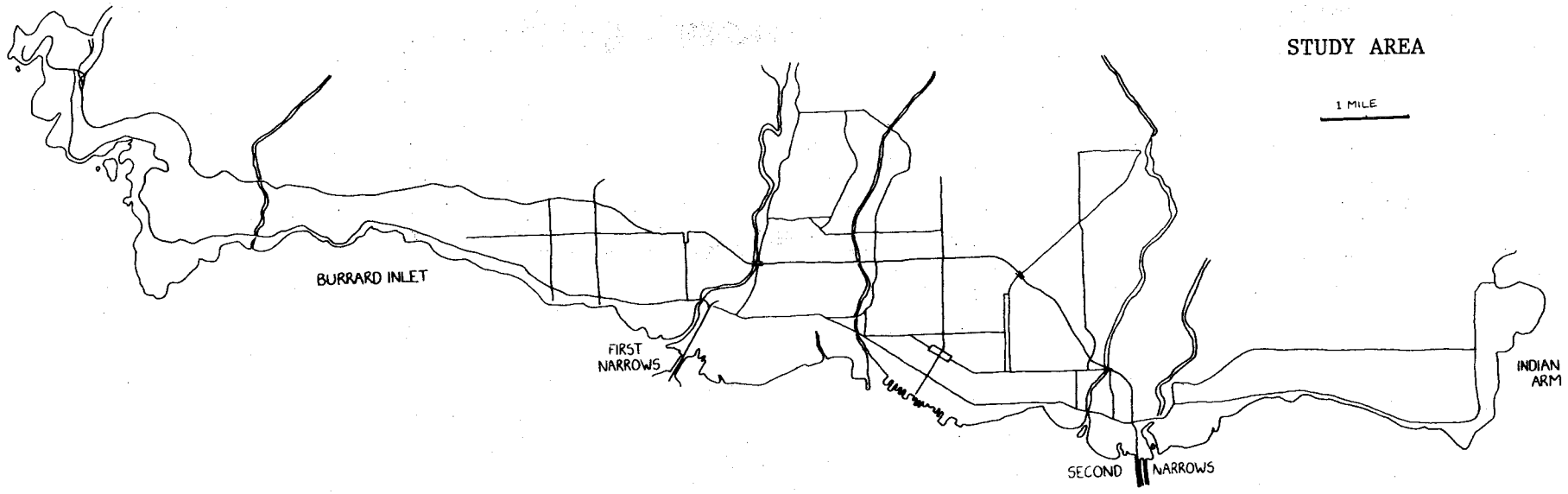
Table 2 DERIVATION OF SAMPLE

	Basic List	10% Sample
North Vancouver City	400	40
North Vancouver District	1,239	124
West Vancouver	923	90
Total		254



VANCOUVER'S NORTH SHORE

Figure 1



All area measurements were made and recorded in square feet, following the unit of measure used in all records consulted. This practice was continued throughout this report, and analyses are discussed in terms of the listed categories.

Data on the social and behavioural aspects are organized here under the categories given in the questionnaire, that is, family and household characteristics, household tenure and neighbourhood, and expansion decisions and project. For the City of North Vancouver it was possible to develop a selection of case studies, and these are presented in Part III. These demonstrate the important point that expansions to houses are often only events in a longer term property development.

PART I

MORPHOLOGICAL CHARACTERISTICS

ASPECT

Data on the aspects of expansions are summarized in tabular and diagrammatic form in Figure 2. It was not always possible to tell from the drawings the direction of expansion, because not all drawings included north points. But in a good majority of cases it was possible to know and so to record the direction. Some houses had more than one component to their expansions, on different sides of the house, and in such cases more than one entry was made for that house. In other cases, notably for basements and full second storeys, all directions were implied but no particular direction was clearly intended in the expansion. No notation could be made in such cases.

Given the amount of informal talk about views among north shore residents, and a political confrontation in West Vancouver (in 1982) over the question of trees which block views, one might expect that aspect would be an important consideration in the design of expansions. Further, as one tours the north shore by car, one is impressed by sundecks on the south sides of houses, and by other features relating to aspect on these mountainsides, which are themselves south-facing. Inspection of the collected data yields, however, only limited support for the notion of the importance of aspect. I am now of the opinion that the limitations inhere in the quality of present data and that aspect requires additional and different data in order to show its importance. Perhaps this will become apparent in the following discussion.

On the north shore as a whole it is just as common to build an addition on the north side of a house (27 percent) as it is to build on the south side (28 percent) and, similarly, to build on the east-side (22 percent) is almost as common as it is to build on the west (24 percent). (Figure 2) Again there is virtually no distinction between values of diagonal point directions, the west having only the slightest edge in frequency of building with 26 percent

FIGURE 2

ASPECT: NORTH SHORE

	N	NE	E	SE	S	SW	W	NW	
N =	42	22	24	25	41	25	30	25	N = 234
% =	18	9	10	11	18	10	13	10	% = 99
(a) N (cardinal points)	89		71		91		80		N = 331
% "	27		22		28		24		% = 101
(b) N (diagonal points)		88		90		96		97	N = 371
% "		24		24		26		26	% = 100

(a) totals for three adjacent values centred on cardinal points

(b) totals for three adjacent values centred on diagonal points

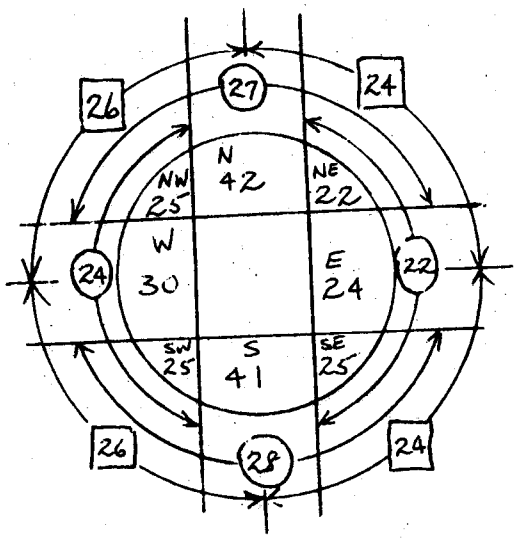


FIGURE 2

ASPECT: CITY OF NORTH VANCOUVER

	N	NE	E	SE	S	SW	W	NW	
N =	9	3	9	1	13	3	3	4	N = 45
% =	20	6	20	2	29	6	6	9	% = 98
(a) N =	16		28		37		21		N = 102
% =	16		28		36		21		% = 101
(b) N =		21		23		19		16	N = 79
% =		27		29		24		20	% = 100

(a) totals for three adjacent values centred on cardinal points

(b) totals for three adjacent values centred on diagonal points

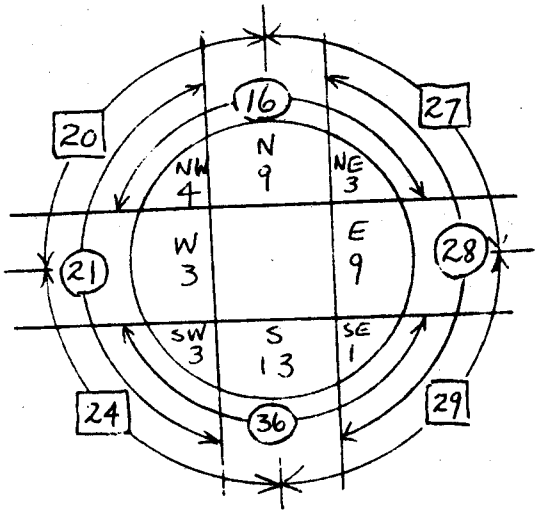


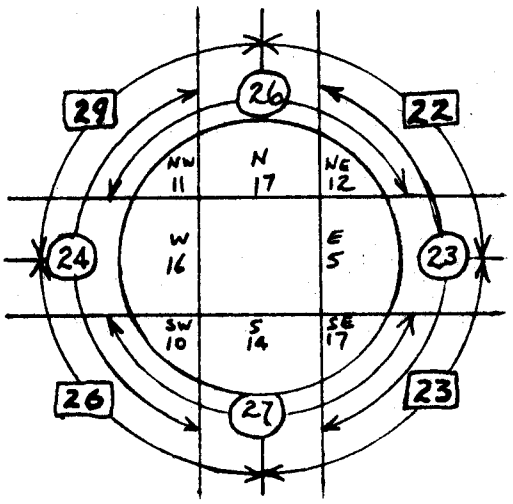
Figure 2 ASPECT

North Vancouver District

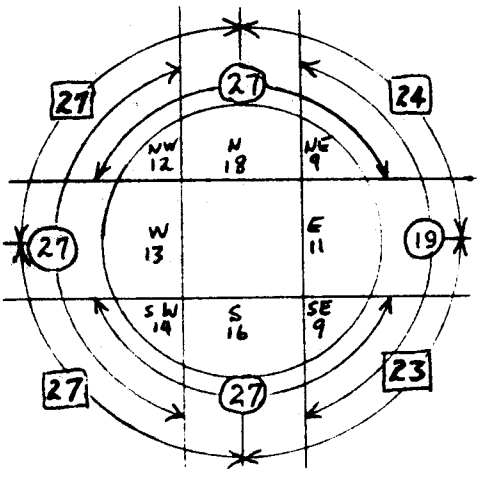
	N	NE	E	SE	S	SW	W	NW	
N=	16	11	5	16	13	9	15	10	N= 95
%=	17	12	5	17	14	10	16	11	
N=	37		32		38		34		N= 141
%=	26		23		27		24		
N=		34		36		40		44	N= 154
%=		22		23		26		29	

West Vancouver

	N	NE	E	SE	S	SW	W	NW	
N=	17	8	10	8	15	13	12	11	N=94
%=	18	9	11	9	16	14	13	12	
N=	36		26		36		36		N=134
%=	27		19		27		27		
N=		38		36		43		43	N=160
%=		24		23		27		27	



North Vancouver



West Vancouver

each for north-west and south-west while north-east and south-east each have values of 24 percent.

Turning to the more restricted case of the City of North Vancouver, however, the greatest directional frequency is 36 percent on the south side. This contrasts with the case of the north side at 16 percent, and is greater than either the west or east sides with 21 percent and 28 percent respectively. Further, the south-east at 29 percent and the north-east at 27 percent are larger than the values for the south-west at 24 percent or the north-west at 20 percent percent. But do these constitute an important trend?

Field observation suggests that the trend is less a reflection of aspect considerations than of property dimensions. If the exploitation of a resource is conceived as a problem of doing what is possible, and if the basic property and building envelope are the space resources available, then in the City it is probably true to say that what is more generally possible is the exploitation of back yard space for the extension of buildings. Most north-facing houses have not been built forward. No doubt there is an element of sun-seeking in that if the back of the house faces south, south-east, or south-west, an extension in any of those directions, angled correctly and fitted with appropriate windows, would provide a way of taking advantage both of exposure and view. But the basic determination of direction, at least at ground level, is often the lot size and shape. Lot sizes and house placements on many south-facing properties, those whose backyards lie on the north sides of the houses, make such sun-seeking much more difficult to achieve architecturally unless resort is made to building at a higher level, a point that will be developed by example below.

In order to explore further the relationship between aspect and property, cross tabulation of data were made to relate aspect to orientation with respect

to the front entry side. (Table 3) Cell frequencies* refer to the number of additions which occurred on a particular side as measured both by the points of the compass and by orientation. Thus referring to cardinal points, 11 out of 15 cases occurring on the north sides were built on the rear sides of their houses. In fact 32 cases, or 64 percent, of these in the City were built on the rear. Almost as great a proportion, 57 percent, were built on the rear if aspect is regarded in relation to compass diagonal points.

*It should be noted that cell frequencies do not equate to frequencies given in Figure 2 for the reason that data for both aspect and orientation are needed here for each addition and there are a number of cases for which both are not available.

TABLE 3 FREQUENCIES OF ADDITION BY ASPECT (Points of Compass) and BY ORIENTATION (with respect to front entrance): NORTH SHORE

Cardinal Points

	N	E	S	W	T	%
1	15	14	29	23	81	28
2	18	18	15	22	73	25
3	39	26	35	36	136	47
T	72	58	79	81	290	
%	25	20	27	28		100

Diagonal Points

	NE	SE	SW	NW	T	%
1	11	24	29	16	80	26
2	21	16	24	22	83	27
3	35	31	36	44	146	47
T	67	71	89	82	309	
%	22	23	29	27		101/100

1 - front entry side

2 - sides of house

3 - rear entry side

TABLE 3 FREQUENCIES OF ADDITION BY ASPECT (Points of Compass) AND BY ORIENTATION (with respect to front entrance): CITY OF NORTH VANCOUVER

Cardinal Points

	N	E	S	W	T	%
1	1	2	4	2	9	18
2	3	3	2	1	9	18
3	11	6	7	8	32	64
	15	11	13	11	50	
	30	22	26	22		100

Diagonal Points

	NE	SE	SW	NW	T	%
1	1	5	4	1	11	18
2	5	4	3	3	15	25
3	10	7	8	9	34	57
	16	16	15	13	60	
	27	27	25	22		101/100

1 - front entry side

2 - sides of house

3 - rear entry side

TABLE 3 FREQUENCIES OF ADDITION BY ASPECT (Points of Compass) AND BY ORIENTATION (with respect to front entrance): DISTRICT OF NORTH VANCOUVER

Cardinal Points

	N	E	S	W	T	%
1	7	5	9	9	30	25
2	11	9	7	10	37	31
3	13	10	16	15	54	45
T	31	24	32	34	121	
%	26	20	27	28		101

Diagonal Points

	NE	SE	SW	NW	T	%
1	3	7	8	9	27	23
2	10	5	10	10	35	30
3	10	11	16	17	54	47
T	23	23	34	36	116	
%	20	20	29	31		100

1 - front entry side

2 - sides of house

3 - rear entry side

TABLE 3 FREQUENCIES OF ADDITION BY ASPECT (Points of Compass) AND BY ORIENTATION (with respect to front entrance): DISTRICT OF WEST VANCOUVER

Cardinal Points

	N	E	S	W	T	%
1	7	7	16	12	42	35
2	4	6	6	11	27	23
3	15	10	12	13	50	42
T	26	23	34	36	119	
%	22	19	29	30		100

Diagonal Points

	NE	SE	SW	NW	T	%
1	7	12	17	6	42	32
2	6	7	11	9	33	25
3	15	13	12	18	58	44
T	28	32	40	33	133	
%	21	24	30	25		100/101

1 - front entry side

2 - sides of house

3 - rear entry side

The addition of data from the City has not materially altered the results obtained earlier for the two Districts. Similar tables which crosstabulate aspect and orientation were constructed for the Districts, and for the north shore taken as a whole. These show that there is some tendency, especially in West Vancouver, for the south and west aspect to be favoured, and that, except for north-west and east, the emphasis in orientation is on the front and rear sides but not on the sides. These emphases are not borne out strongly for the north shore as a whole, however, and so the relationship between aspect and orientation remains obscure.

Two further points may be made. Some house expansions make use of aspect by building up to a higher level on the side away from the sun and view. This literally allows for sun trapping and views, perhaps across one's own garden and then to the distance, but results here in a statistical opposite to that which may be expected. But the two cases in Figure 3 illustrate the point clearly. The basic idea in each case is that the 'wings' of the house are outstretched as though to embrace the sun and view, both to the south-west. But in both cases (only one of which occurs in the sample in this study) the actual additions were built on the east side and in the one case the largest portion of the addition is on the north side.

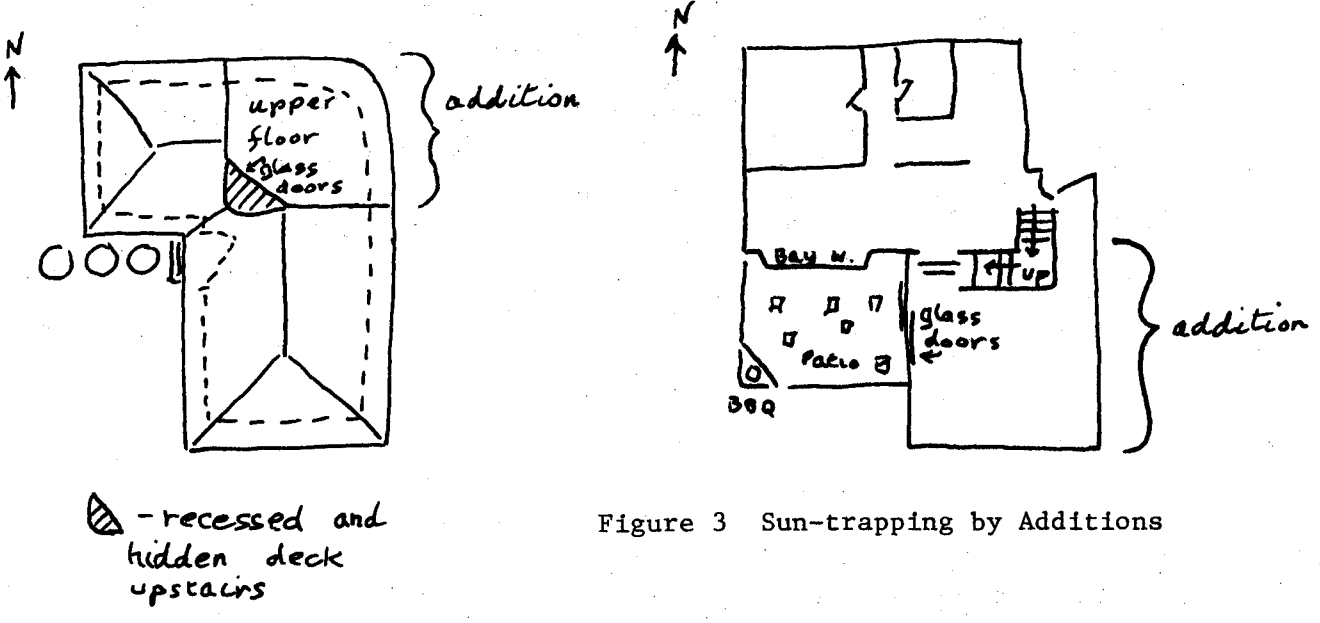


Figure 3 Sun-trapping by Additions

Inspection of the data presented in table 3 suggests that there is enough correspondence of direction of building to points of the compass for aspect to be considered an important factor, even if not gauged successfully here. But the question has been raised during interviews and, although individuals cannot themselves quantify the importance of aspect (view, suntrap), they often assert its importance in their appreciation of their properties. This appreciation has not only an aesthetic dimension but also one of equity as it seems to be commonly held that a fine view may well be worth several thousand dollars in house re-sale value. To investigate the importance and nature of aspect further, however, would require attention to additional types of data which could usefully include the questions of outdoor living space and seasonal time budgets. These in turn imply life style research and questions of design. "When you stare at a pool 365 days a year but swim in it only 150, good looks should be one of your top ... design considerations." (Caption in article "Pleasures of the Pool", Western Living, B.C. edition, May 1983).

ORIENTATION (with respect to front, sides and rear)

Table 4 indicates the patterns of expansions in relation to the sides of the houses on which they occur. In the last section, on aspect, data for orientations were included in an attempt to understand some of the relations between aspect and orientation, but the present discussion is confined to the latter, referring to the sides of the houses on which additions have been built.

Data here are substantially complete but there are cases for which only partial drawings were submitted to building departments and from which drawings front and rear entrances were omitted. This problem obtains more in the District of North Vancouver than in either of the other municipalities, but even in the District it is not a major problem. Some data are not applicable, as in the cases of full basement or storey additions and, in some cases, where there is more than one component to an expansion project, more than one entry has been made in the tables here.

For the north shore, taken as a whole, the rear was the most common side on which an addition was built. (41 percent) This was followed by the sides (31 percent), and the front entry side was the least common (28 percent). Reference has already been made in the discussion of aspect to the question of lot sizes and shapes and, because these vary across the north shore it is useful to consider the municipalities comparatively. The City experienced additions being placed on the rear sides to the extent of 51 percent, or fully half the cases, this being well above the 39 percent of cases noted for each of the two Districts. Further, the City's frequency of building on the fronts is the lowest, being 21 percent of all cases, whereas the equivalent proportion for North Vancouver District is 25 percent and for West Vancouver it is 39 percent. In the City virtually four-fifths of the

TABLE 4 ORIENTATION OF EXPANSIONS: NORTH SHORE

	1	2	3	
1975	13	19	25	
1976	9	11	10	1 - front entry side
1977	10	13	15	
1978	16	18	21	2 - sides
1979	15	10	19	3 - rear entry sides
1980	14	14	22	
1981	2	1	2	
1982	0	2	3	
Sub total to 1980				
	77	85	112	N = 274
	28	31	41	% = 100
Total including '81 and '82 for NV City	79	88	117	N - 284
	28	31	41	% = 100

Note: Data for 1981 and 1982 pertain only to the City of North Vancouver.

TABLE 4 ORIENTATION OF EXPANSIONS: CITY OF NORTH VANCOUVER

	1	2	3	
1975	3	2	5	
1976	2	0	1	
1977	0	2	1	
1978	1	5	4	
1979	2	1	4	
1980	1	2	7	
1981	2	1	2	
1982	0	2	3	
Total	11	15	27	N = 53
%	21	28	51	100

1 - front entry side

2 - sides

3 - rear entry side

TABLE 4 ORIENTATION OF EXPANSIONS

North Vancouver District				West Vancouver				
1	2	3		1	2	3		
4	13	15		6	4	5	1975	
3	6	4		4	5	5	1976	
6	11	6		4	0	8	1977	
7	8	14		8	5	3	1978	
6	6	8		7	3	7	1979	
11	10	11		1(2)	1(2)	2(4)	1980	(6 months)
37	54	58	149	30	18	30	78	Total
25	36	39	100	39	23	39	101	Percentages

1 - front entry side

2 - sides

3 - rear entry side

Note: Bracketed figures represent extrapolations to 12 months, used for north shore totals.

additions, and in the District fully three-quarters were not built on the fronts of houses, and so clearly there is some pattern of avoidance here which does not occur in West Vancouver where 40 percent of additions occur on the fronts. This contrast might even be stronger than the figures suggest, for in some cases in central West Vancouver the fronts of the houses are sufficiently close to the set-back limits of the property that to build forward would produce only small additional space. In this respect the parallel is with the small properties of lower North Vancouver City.

There is another consideration which has arisen in interviews which may assist here. Some people, on buying a house, are attracted by its look from the street and so are reluctant to alter the appearance if space can be created in some other direction. The integrity of the facade is important it would seem, as is illustrated in North Vancouver City Case Study No. 3 in which a new facade was constructed to cover over the piece-meal nature of several expansions. This point might not take precedence in an expansion decision, however, if there is some really dramatic gain to be made in the amount and quality of space. An example (below) in West Vancouver illustrates this in that a pleasant family room and garage were built forward from the house, on the downslope south side, and are very prominant features of the appearance of the house when one looks up at it from the street. But, apart from the enclosed spaces, what has also been gained is a huge deck on the south side of the house, a deck entered from double doors off the living room upstairs, an exit point also within four or five steps from the kitchen. From inside one feels automatically drawn to this exit to the deck and view, and the outdoor space has added immensely to the character of the house and to the quality of its public (room) space. Thus, in this instance, the sacrifice of the facade was made with clear benefits resulting from the change.

This cross-sectional discussion of the orientations of additions clearly shows that a number of considerations are taken into account in deciding on the direction of expansion. Those mentioned here relate primarily to site characteristics, and these are very important. But their significance obviously varies from case to case and probably also varies from area to area. But in summary they would include slope, directions of lines of sight, appearance from the street, and property shapes and sizes. The equity value of these is not lost on homeowners, and thus these characteristics in some way are also a measure of what amounts to a test of the market, performed in aggregate by all homeowners acting collectively in expanding their premises. The space economy of the household is not independent of its site and, by extension, the housing market is itself not independent of site characteristics.

What has not been cited here is the detailed consideration given to internal spaces in the house, and how the functions of the household are spatially distributed throughout the dwelling. Analysis of this is crucial to any understanding of the expansion process and phenomenon, for it relates directly to the use value of the property. But discussion of this is better deferred to the section on room functions.

ROOMS ADDED AND EXTENDED

North Shore

Table 5 lists the data pertaining to the addition of new rooms and the extension of pre-existing rooms. Only those data referring to the 1975-80 period, inclusively, will be referred to here. During that period 520 rooms were added to the houses constituting the sample and, by extrapolation, some 5,200 rooms were added across the north shore. This activity occurred at an average annual rate of between 860 and 870 rooms. Similarly, by extrapolation, some 1,470 pre-existing rooms were extended at an average annual rate of about 245 rooms. Some 380 places both added new and extended pre-existing rooms, these projects comprising about 15 percent of the cases. Most projects were designed to add new rooms (81.4 percent - see column bii), but some 890, or more than one in three, also extended rooms (36.0 percent - columneii). The mean number of rooms added per project was 2.6 while 1.7 rooms were extended per project on average.

Data for the City of North Vancouver were available through the end of 1982 but, for comparative discussion, only those referring to the end of 1980 will be remarked here. Data for 1981 and 1982 are, however, presented in Table 5 and in Figure 4

Eighty rooms were added to the sample in the City during the six years ending in 1980, and thus about 800 rooms were added throughout the study period. These were divided among about 260 projects, or 79 percent of the total number of projects. On average just over three rooms were added, and this figure is considerably higher than are the comparable figures for either the District (2.4) or West Vancouver (2.7). Against this comparison, however, must be set the fact that the mean number of rooms added (1.4) is marginally lower than it was for the District (1.5) but certainly lower than either the

TABLE 5 ROOMS ADDED AND EXTENDED: NORTH SHORE

	Total Rooms Added	Places Adding Rooms		Mean No. of Rooms Added per place	Total rooms extended	Places Extending Rooms		Mean No. of Rooms Extended per place	Places adding and extending rooms	
		No.	%			No.	%		No.	%
	a	i	b ii	c	d	i	e ii	f	i	g ii
1975	80	34	70.8	2.4	26	18	37.5	1.4	7	14.6
N = 48										
1976	81	29	87.9	2.8	14	7	21.2	2.0	3	9.1
N = 33										
1977	80	29	74.4	2.8	27	15	38.5	1.8	5	12.8
N = 39										
1978	91	34	75.6	2.7	27	17	37.8	1.6	6	13.3
N = 45										
1979	76	36	83.7	2.1	14	13	30.2	1.1	6	14.0
N = 43										
1980	112	39	100.0	2.9	39	19	48.7	2.1	11	28.2
N = 39										
1981	8	3	100.0	2.7	0	0	0.0	0.0	0	0.0
N = 3										
1982	5	3	75.0	1.7	1	1	25.0	1.0	0	0.0
N = 4										
N(75-80) =247	520	201	81.4	2.6	147	89	36.0	1.7	38	15.4
$\bar{X}$/yr.(75-80) =41.2	86.7	32.2			24.5	14.8			6.3	

a) Data for 1981 and 1982 are only for the City of North Vancouver

b) Other notes as on Tables showing data for North Vancouver District and for West Vancouver.

TABLE 5 ROOMS ADDED & EXTENDED: NORTH VANCOUVER CITY

	Total rooms added	Places adding rooms		Mean no. of rooms added per place	Total rooms extended	Places extending rooms		Mean no. of rooms extended per place		Places adding & extending rooms
		No.	%			No.	%		No.	%
	a	i b	ii	c	d	i e	ii	f	i g	ii
1975	7	4	57.1	1.8	3	3	42.9	1	1	14.3
N = 7										
1976	17	5	100	3.4	0	0	0	0	0	0
N = 5										
1977	1	1	33.3	1	4	2	66.7	2	0	0
N = 3										
1978	27	6	75	4.5	5	3	37.5	1.7	1	12.5
N = 8										
1979	11	5	100	2.2	1	1	20	1	1	20
N = 5										
1980	16.5	5	100	3.3	0	0	0	0	0	0
N = 5										
1981	8	3	100	2.7	0	0	0	0	0	0
N = 3										
1982	5	3	75	1.7	1	1	25	1	0	0
N = 4										
N = 40	92.5	32	80%	2.6	14	10	25%	1.4	3	7.5%
$\bar{X}$ = 5	11.6	4			1.8	1.3			.38	
Sub-total 1975-80										
N = 33	80	26	79	3.1	13	9	27.3	1.4		9
X = 5.5	13.3	4.3			2.2	1.5			.5	

TABLE 5 ROOMS ADDED AND EXTENDED: NORTH VANCOUVER DISTRICT

	Total rooms added (a)	No. Places adding rooms (b) i	% (b) ii	Mean no. of rooms added per place (c)	Total rooms extended (d)	No. Places extending rooms (e) i	% (e) ii	Mean no. of rooms extended per place (f)	No. Places adding & extending rooms (g) i	% (g) ii
1975 N=24	37	16	66.7	2.3	15	10	41.7	1.5	4	16.7
1976 N=15	33	15	100.0	2.2	5	3	20.0	1.7	3	20.0
1977 N=20* (N=19)	59	20	100.0	3.0	7	2	10.5	3.5**	2	10.0
1978 N=22	32	17	77.3	1.9	13	9	40.9	1.4	4	18.2
1979 N=19	31	16	84.2	1.9	6	6	31.6	1.0	3	15.8
1980 N=24	59	22	91.7	2.7	11	7	29.2	1.6	5	20.8
N=124	251	106	85.5	2.4	57	37	29.8	1.5	21	16.9
$\bar{X}$=20.7	41.8	17.7			9.5	6.2			3.5	

Notes: A. Column letter designations correspond to those identifying trend lines in Figure 4.

B. Column eii = ei/N x 100 Column c = a/bi x 100
Column bii = bi/N x 100 Column f = d/ei x 100
Column gii = gi/N x 100

C. *In 1977 one project consisted of house raising and the installation of a full basement, with no addition to lot coverage. No room details were specified. So this project is included in N for rooms added but not for rooms extended. Thus N is 20 and 19.

**The figure 3.5 is not a good reflection of the general activity in that one project alone extended six rooms and one extended only one room, for a total of seven room extensions in two projects.

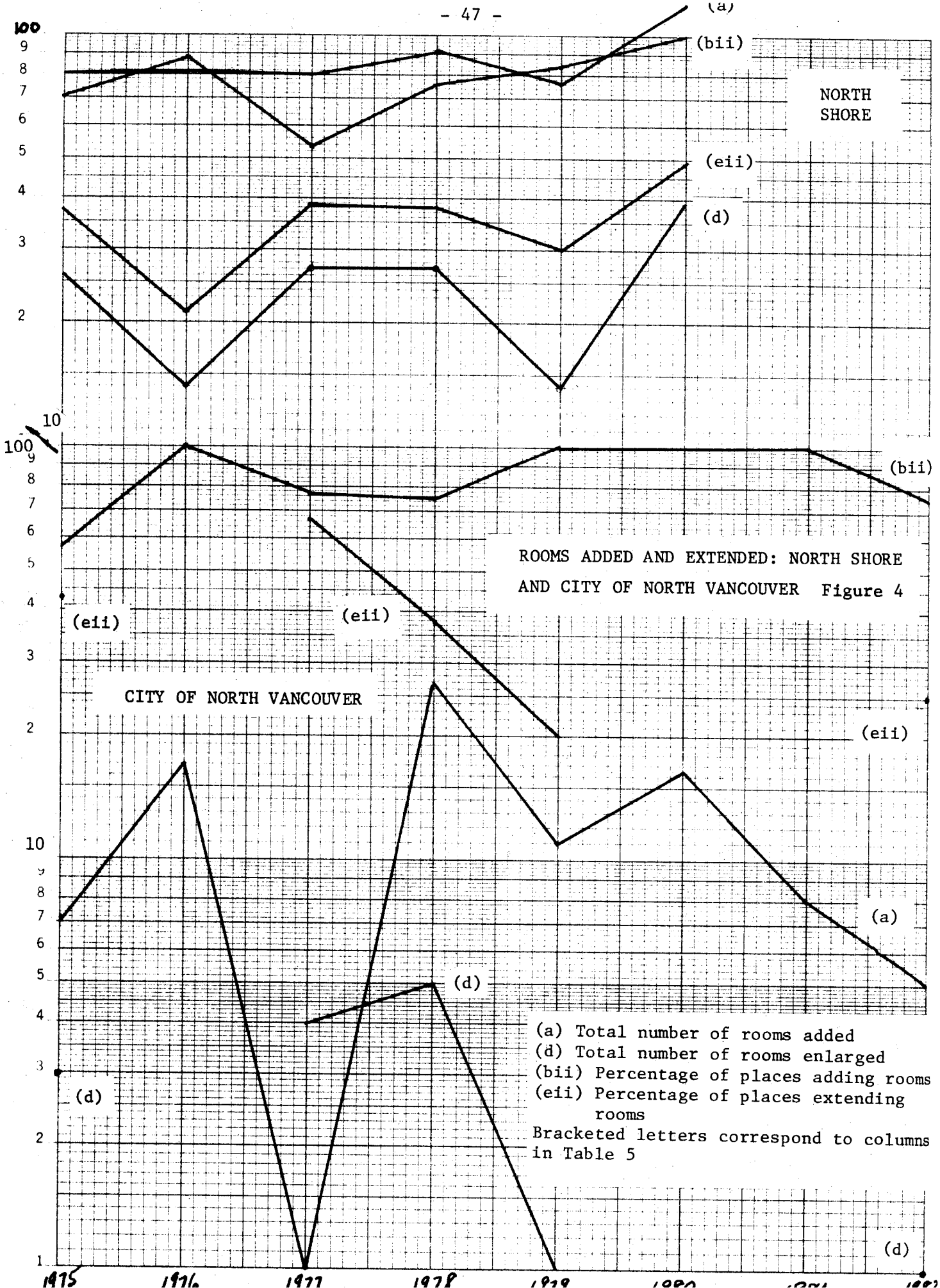
TABLE 5 ROOMS ADDED AND EXTENDED: WEST VANCOUVER

	Total rooms added	No. Places adding rooms	%	Mean no. of rooms added per place	Total rooms extended	No. Places extending rooms	%	Mean no. of rooms extended per place	No. Places adding & extending rooms	%
	a	b i	ii	c	d	e i	ii	f	g i	ii
1975 N=17	36	14	82.4	2.6	8	5	29.4	1.6	2	11.8
1976 N=13	31	9	69.2	3.4	9	4	30.8	2.3	0	--
1977 N=16	20	8	50.0	2.5	16	11	68.8	1.5	3	18.8
1978 N=15	32	11	73.3	2.9	9	5	33.3	1.8	1	6.7
1979 N=19	34	15	79.0	2.3	7	6	31.6	1.2	2	10.5
1980 N=10	18	6	60.0	3.0	14	6	60.0	2.3	3	30.0
N=20	36	12	60.0	3.0	28	12	60.0	2.3	6	30.0
N=90	171	63	69.0	2.7	63	37	41.1	1.7	11	13.2
$\bar{X}$=15	28.5	10.5			10.5	6.2			1.8	
N=100	189	69	69.0	2.7	77	43	43.0	1.8	14	14.0
$\bar{X}$=16.7	31.5	11.5			12.8	7.2			2.3	

Notes: A. Column letter designations correspond to those identifying trend lines in Figure 4.

B. Column eii = ei/N x 100 Column c = a/bi x 100
Column bii = bi/N x 100 Column f = d/ei x 100
Column gii = gi/N x 100

C. For 1980 the second row of figures are extrapolations from half year data to full year. Similarly, the second summary row is based on 1980 data which has been extrapolated, in addition to results from all other years shown



ROOMS ADDED AND EXTENDED: NORTH SHORE AND CITY OF NORTH VANCOUVER **Figure 4**

(a) Total number of rooms added
(d) Total number of rooms enlarged
(bii) Percentage of places adding rooms
(eii) Percentage of places extending rooms
Bracketed letters correspond to columns in Table 5

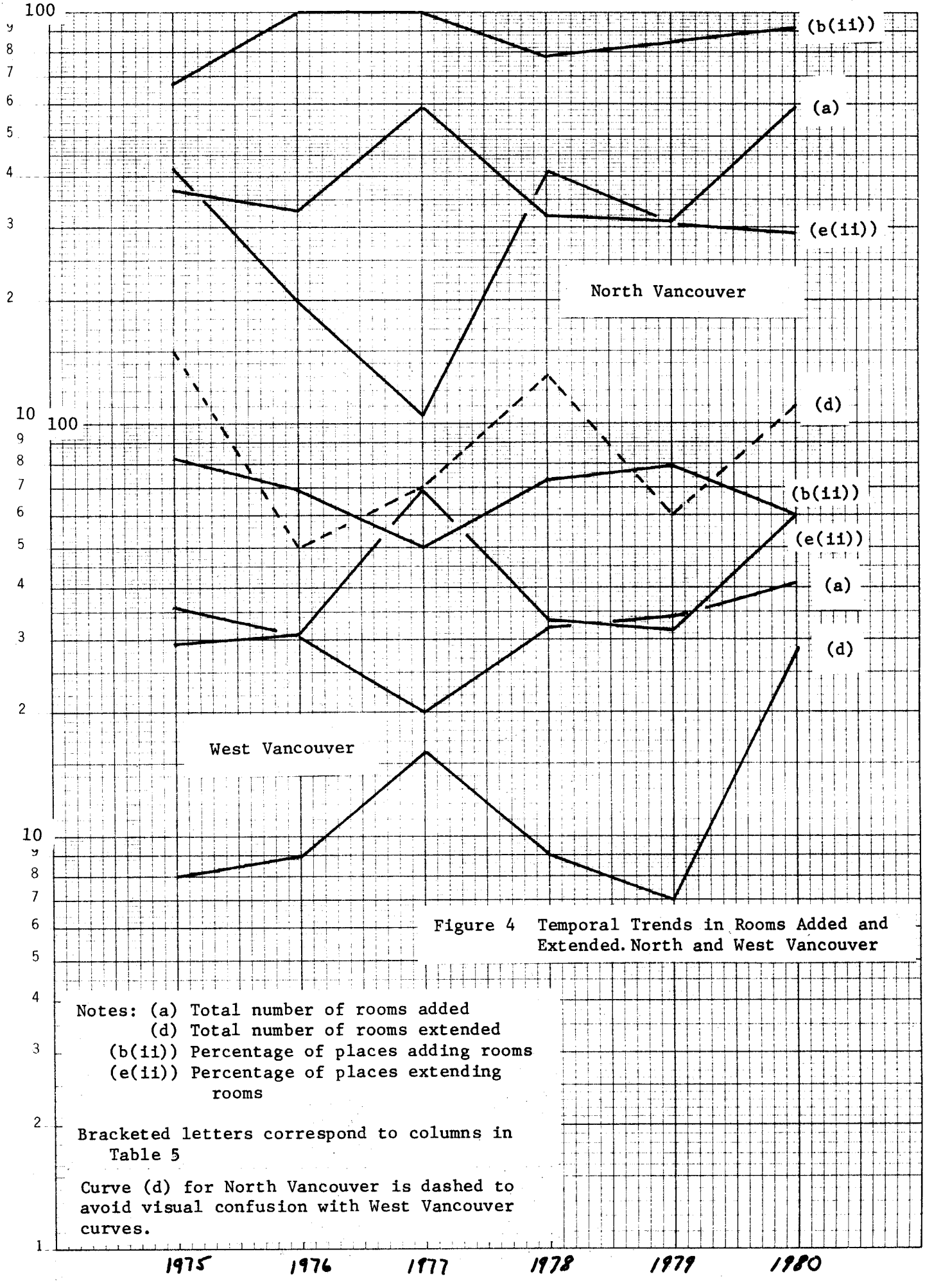


Figure 4 Temporal Trends in Rooms Added and Extended. North and West Vancouver

Notes: (a) Total number of rooms added
(d) Total number of rooms extended
(b(ii)) Percentage of places adding rooms
(e(ii)) Percentage of places extending rooms

Bracketed letters correspond to columns in Table 5

Curve (d) for North Vancouver is dashed to avoid visual confusion with West Vancouver curves.

West Vancouver figure at 1.8 or the total north shore figure at 1.7. The total for West Vancouver, 770 rooms extended, comprises slightly more than one half of all room extensions on the north shore, and so has the controlling weight in setting the north shore mean.

Some 130 rooms were extended over some 90 separate projects (column d and ei), about 27 percent (9/33 x 100) of the cases. The mean number of rooms extended (1.4) is modest compared with West Vancouver's figure of 1.7, but this must also be seen against the relatively high mean figure of 3.1 rooms added, the highest municipal average. There are several contributing explanations here. One is that there are fewer houses in the City than in either of the Districts which conform to the modern open plan of layout, the average age of houses in the City being greater (Figure 9). In such a circumstance to add a room, or more than one, is a simpler structural matter than it is to extend rooms, for to accomplish the latter would require special adaptations, in particular beam installations over newly opened passage ways. These jobs are messy and expensive and also involve a commitment to a whole new design concept of layout in the house. Of course there are instances of such extensive transformation, but in the average case the structural integrity of the house would appear to have a determining effect on the form of additions, and it is perhaps easier to add rather than to modify. To some degree the opposite is the case in West Vancouver where the idea of the "west coast" style in open area plans has strong expression. In open plan houses, almost by definition, an expansion will involve extending an existing room. Further, in some cases the open beam work is regarded as a feature. Thus, rather than being an obstacle, such work becomes an incentive to create attractive open areas. Even older houses not built on an open plan may perforce be modified to imitate the stylistic lead of the

open plan concept if the householders are aware of and have resources to pursue such options. Somewhere between these two 'extremes' as sketched lies the middling situation of North Vancouver District, an area vast in extent and sharing characteristics of both extreme types. A more refined classification of actual work carried out in each case would be required in order to be able to show expansion projects along a gradient, but it is suggested that the general idea of a gradient of house types, from one with a predominance of closed in spaces to the opposite, that is complete open area space, is a useful concept to anchor ideas about the continuing evolution of house forms.

The cases of North Vancouver District and West Vancouver have already been reported in the first phase of this project, but in the new context of results for the whole north shore some ofthe findings for the two Districts may be reiterated. By extrapolation, it may be calculated that about 2,500 new rooms were added in North Vancouver and about 570 pre-existing rooms were extended, the former involving some 86 percent of projects as against some 30 percent for the latter. These proportions decline in West Vancouver to 69 and 43 percent respectively, although there is still a clear emphasis there on additions rather than extensions. The implication of this is strong throughout the north shore, that for most householders what is needed or desired is simply more space, space which can if necessary be specialized space. This specialization may mean flexibility rather than function only, that is, the flexibility to switch space from an office to a bedroom for example. But such uses might well be incompatible with other uses of an open area room, and so merely to extend a room would not necessarily provide suitable extra space. In each project there would thus be a trade-off between the idea of adding rooms and that of extending rooms.

Where an emphasis on extending pre-existing rooms is found, as is the case to a greater extent in West Vancouver, houses in general are more capacious. The mean pre-expansion size of houses in North Vancouver District was 1,836 square feet, while in West Vancouver it was 1,992, as will be discussed below.

The mean additions are virtually the same at just over 460 square feet, although the North Vancouver District median of 309 is about 10 percent greater than the median of 280 square feet for West Vancouver. Further, West Vancouver cases add an average 2.7 rooms per project to 2.4 for North Vancouver District and extend 1.7 rooms to 1.5 respectively. Thus the additions themselves on both counts add to the slightly more luxurious spatial existence in West Vancouver, for in these cases there is the joint emphasis on the flexibility of function for the closed off space of rooms with doors, and the extra elbow room of expanded existing rooms. This discussion will continue in the sections to follow on the areas involved in additions.

Temporal trends are shown for all three municipalities, and for the north shore, in Figure 4. Because these trends are shown on semi-log paper the smaller numbers of cases in the individual municipalities show up more dramatically as rates of change. This is particularly the case for the City. But the more important focus is perhaps on the aggregate picture of the north shore and there it may be seen that the rate of addition of new rooms was remarkably constant from 1975 through 1977 (line (a)), rising a little in 1978 only to fall back in 1979 and then to rise at its steepest rate during the six year study period to 1980. In contrast, the percentage of places adding rooms showed the greatest annual variation before 1978, and then the line straightened out between 1978 and 1980. These trends conform in time

to the heady speculative impulses felt in the housing market in the latter years of the study period. The urge to keep the value of the house in reasonable proportion with the value of the property is undoubtedly a factor underlying both the considerable increase in the number of rooms and also in the steady increase in the percentage of places adding rooms between 1978 and 1980.

In some contrast the curves for rooms extended and the percentage of places extending rooms run largely parallel to each other. About the same level of activity may be seen for 1975, 1977 and 1978, with drops in 1976 and 1979 followed by strong recoveries. Again, the relation between the levels of this activity and the behaviour of the housing market would seem to be close. But a further point which may be cited here, and which is important throughout this study as an undercurrent, is the protection from capital gains tax offered by investment in materials and labour in one's principal residence.

EXPANSION BY LEVEL

The analysis by level constitutes an approach in which expansions by basement, main living floor and upstairs are considered separately and cross-sectionally. On the accompanying tables and figures the codes used are:

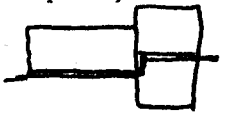
Level 1 - basement; Level 2 - main living floor; Level 3 - upstairs.

Certain problems of interpretation were encountered in gathering the data. The 'basement' of some houses can be at or below ground level. The common "Vancouver Special" house, a 'mass-produced' house which encloses a relatively large living space at modest cost, generally has an above-ground basement. This is quite suitable in the flatter areas of metropolitan Vancouver. On the north shore this form is modified somewhat because sloping terrain is so pervasive that some excavation is almost always required. This implies that a basement exists on the damper upslope side, even if on the downslope side the lowest level opens at ground level. One not infrequently gets the feeling in looking at certain houses that the existence of a basement depends on which side of a house is being considered! In fact, the West Vancouver by-law distinguishes a basement from a cellar by its less proportionate depth under ground, thus allowing for increased window space in the upper parts of the basement walls. One suspects that cellars, the deeper excavations, may predominate in older houses once heated by coal furnaces connected to the house upstairs by a sprouting of convection-feed hot air ducts slanting upwards and away.

Such a morphological approach to basement definition has its advantages, but in a time when basements are used for living space, and forced air heat passes along ducts rectangular in cross-section and neatly tucked between

the joists, the basement clearly has a different nature to what it had a generation or two ago. So, in this study, an open mind was kept from a functional (behavioural) standpoint, and the uses of space helped to define levels in problem cases.

The main living level was taken to be the key to the whole designation of levels in the house. This level, that is Level 2, contained the main living areas. These were defined to include living room, kitchen, eating areas, and (generally) the principal entrance to the house. The upstairs, Level 3, presented no general problem in its identification. The basement generally included laundry and utility areas, but did not preclude bedrooms, family rooms, offices and so on. In the case of split levels, generally Levels 1 and 2 were recognized, Level 2 being designated to include the living room at the half level, and bedroom areas in the upper level above the basement. There is commonly no basement, only crawl space, under the living room of a split level. Thus, in diagrammatic form:



In cases where the house is constructed on a concrete pad or over crawl space, and is all on one level, the house was recorded as Level 2 only.

The main living level is where most house expansions occur (Table 6). Between 55 and 60 percent of the additions, as measured by area for the north shore, take place on this level and, overall, this represents some 688,500 square feet for the six years ending in 1980. Between one-quarter and one-third (28.3 percent) of the total area added was to level 3, that is upstairs, while just over 14 percent was added to the first living level. The area added to level 2 was just over twice the amount added to level 3 and almost exactly four times the amount added to level 1. This latter also represents the ratio between the number of cases between levels 2 and 3,

TABLE 6 EXPANSION BY LEVEL: NORTH SHORE
(square feet)

		LEVELS 3	2	1	Totals all levels
1975	Total	5,768	11,895	2,322	19,985
	Mean	360.5	305.0	464.4	
	N	16	39	5	
% diff. in total		-7.8	-2.2	-11.3	
% diff. in mean		+84.4	+37.5	-26.1	
1976	Total	5,318	12,159	2,059	19,536
	Mean	664.8	419.3	343.2	
	N	8	29	6	
% diff. in total		-29.5	-4.0	+62.1	
% diff. in mean		-29.5	-13.0	+21.6	
1977	Total	3,747	11,676	3,337	18,760
	Mean	468.4	364.9	417.3	
	N	8	32	8	
% diff. in total		+78.8	-12.7	+19.9	
% diff. in mean		+19.2	-28.4	26.2	
1978	Total	6,699	10,195	4,001	20,895
	Mean	558.3	261.4	307.8	
	N	12	39	13	
% diff. in total		-53.3	-10.0	-40.0	
% diff. in mean		-30.0	+10.0	-35.0	
1979	Total	3,127	9,196	2,401	14,724
	Mean	390.9	287.4	200.1	
	N	8	32	12	
% diff. in total		+194.4	+49.3	+15.5	
% diff. in mean		+ 30.8	+22.5	+57.8	
1980	Total	9,206	13,729	2,841	25,776
	Mean	511.4	352.0	315.7	
	N	18	39	9	
All Years	Totals	33,865(28.3)	68,850(57.5)	16,961(14.2)	119,676
	Mean/year	5,644.2	11,475.0	2,826.8	
	Mean/project	483.8	327.9	320.0	
	N	70	210	53	
	Mean projects/ year	11.7	35.0	8.8	

TABLE 6 EXPANSION BY LEVEL: CITY OF NORTH VANCOUVER
(square feet)

		LEVELS 3	2	1	Total
1975	Total	258	843	575	1,676
	Mean	258	210.8	287.5	
	N	1	4	2	
% diff. in total		+579.9	-5.6	-22.1	
% diff. in mean		+239.9	-5.6	+55.8	
1976	Total	1,754	796	448	2,998
	Mean	877	199	448	
	N	2	4	1	
% diff. in total		-86.3	-49.7		
% diff. in mean		-72.6	+0.5		
1977	Total	240	400	-	640
	Mean	240	200	-	
	N	1	2	-	
% diff. in total		+1,021.3	+391		
% diff. in mean		+273.8	+22.8		
1978	Total	2,691	1,964	666	5,321
	Mean	897	245.5	222	
	N	3	8	3	
% diff. in total			-52.2	+4.1	
% diff. in mean			-0.44	+4.1	
1979	Total	-	939	693	1,632
	Mean	-	234.8	231	
	N	-	4	3	
% diff. in total			+58.3	+55.6	
% diff. in mean			+58.2	+55.6	
1980	Total	1,301	1,486	1,078	3,865
	Mean	1,301	371.5	359.3	
	N	1	4	3	
% diff. in total			-5.9		
% diff. in mean			+25.5		
1981	Total	-	1,399	-	1,399
	Mean	-	466.3	-	
	N	-	3	-	
% diff. in total			-29.9		
% diff. in mean			-47.5		

		3	2	1	Total
1982	Total	224	980	-	1,204
	Mean	224	245	-	
	N	1	4	-	
Sub total 1975-80		6,244(38.7%) of total	6,428(39.9)	3,460 (21.5)	16,132
Mean/year		1,040.7	1,071.3	432.5	
Mean/project		780.5	247.2	288.3	
N		8	26	12	
Mean/projects/year		1.3	4.3	1.5	
All years	Total	6,468(34.5%)	8,807(47%)	3,460(18.5%)	18,735
	Mean/yr.	808.5	1,100.9	432.5	
	Mean/project	718.7	266.9	288.3	
	N	9	33	12	
	Mean projects/yr.	1.1	4.1	1.5	

TABLE 6 EXPANSION BY LEVEL: NORTH VANCOUVER DISTRICT
(square feet)

		LEVELS 3	2	1	Totals all levels
1975	Total	1551	7658	1747	10,956
	Mean	310.2	333.0	582.3	
	N	5	23	3	
% diff. in total		+25.3	-21.5	-68.0	
% diff. in mean		+109.0	-29.0	-76.3	
1976	Total	1944	6014	552	8,510
	Mean	648.0	429.6	138.0	
	N	3	14	4	
% diff. in total		+53.6	+7.4	+34.5	
% diff. in mean		- 7.9	-11.5	+34.5	
1977	Total	2985	6461	2456	11,902
	Mean	597	380.1	614	
	N	5	17	4	
%diff. in total		-65.1	-12.0	-24.6	
% diff. in mean		-41.8	-25.2	-24.5	
1978	Total	1042	5687	1851	8,580
	Mean	347.3	284.4	463.8	
	N	3	20	4	
% diff. in total		-8.6	-36.4	-33.3	
% diff. in mean		-8.6	- 9.1	-55.7	
1979	Total	952	3617	1234	5,803
	Mean	317.3	258.4	205.7	
	N	3	14	6	
% diff. in total		+250.1	+80.7	+42.9	
% diff. in total		+110.1	+20.4	+42.8	
1980	Total	3333	6535	1763	11,631
	Mean	666.6	311.2	293.8	
	N	5	21	6	
All years	Total	11807 (20.6% of tot)	35972 (62.7% of tot)	9603 (16.7 % of tot)	57,382
	Mean/yr	1967.8	5995.3	1600.5	
	Mean/ project	492.0	330.0	355.7	
	N	24	109	27	
	Mean projects/yr	4	18.3	4.5	

TABLE 6 EXPANSION BY LEVEL; WEST VANCOUVER
(square feet)

		LEVELS 3	2	1	Totals all levels
1975	Total	3959	3394	-	7,353
	Mean	395.9	282.8	-	
	N	10	12	-	
	% diff. in total	-59.1	+57.6	-	+9.2
	% diff. in mean	+36.4	+72.0	-	
1976	Total	1620	5349	1059	8,028
	Mean	540	486.3	1059	
	N	3	11	1	
	% diff. in total	-67.8	-10.0	-16.8	-22.6
	% diff. in mean	-51.7	-23.8	-79.2	
1977	Total	522	4815	881	6,218
	Mean	261	370.4	220.3	
	N	2	13	4	
	%diff. in total	+468.2	-47.2	+68.4	+12.5
	% diff. in mean	+ 89.4	-37.6	+12.3	
1978	Total	2966	2544	1484	6,994
	Mean	494.3	231.3	247.3	
	N	6	11	6	
	% diff. in total	-26.7	+82.4	-68.1	+ 4.2
	% diff. in mean	-12.0	+43.3	-36.1	
1979	Total	2175	4640	474	7,289
	Mean	435	331.4	158	
	N	5	14	3	
	%diff. in total	+110.2	+25.1	-	+41.0
	% diff. in mean	-12.4	+25.1	-	
1980	Total	4572	5708	-	10,280
	Mean	381	407.7	-	
	N	12	14	-	
	Total	15814(34.3 % of tot)	26450 (57.3% of tot)	3898 (8.4% of tot)	46,162
	Mean/yr	2635.7	4408.3	-	
	Mean/ project	416.2	352.7	-	
	N	38	75	-	
	Mean projects/ year	6.3	12.5	-	

Figure 5
EXPANSION BY LEVEL: NORTH SHORE AND CITY OF NORTH VANCOUVER (TOTALS ONLY)

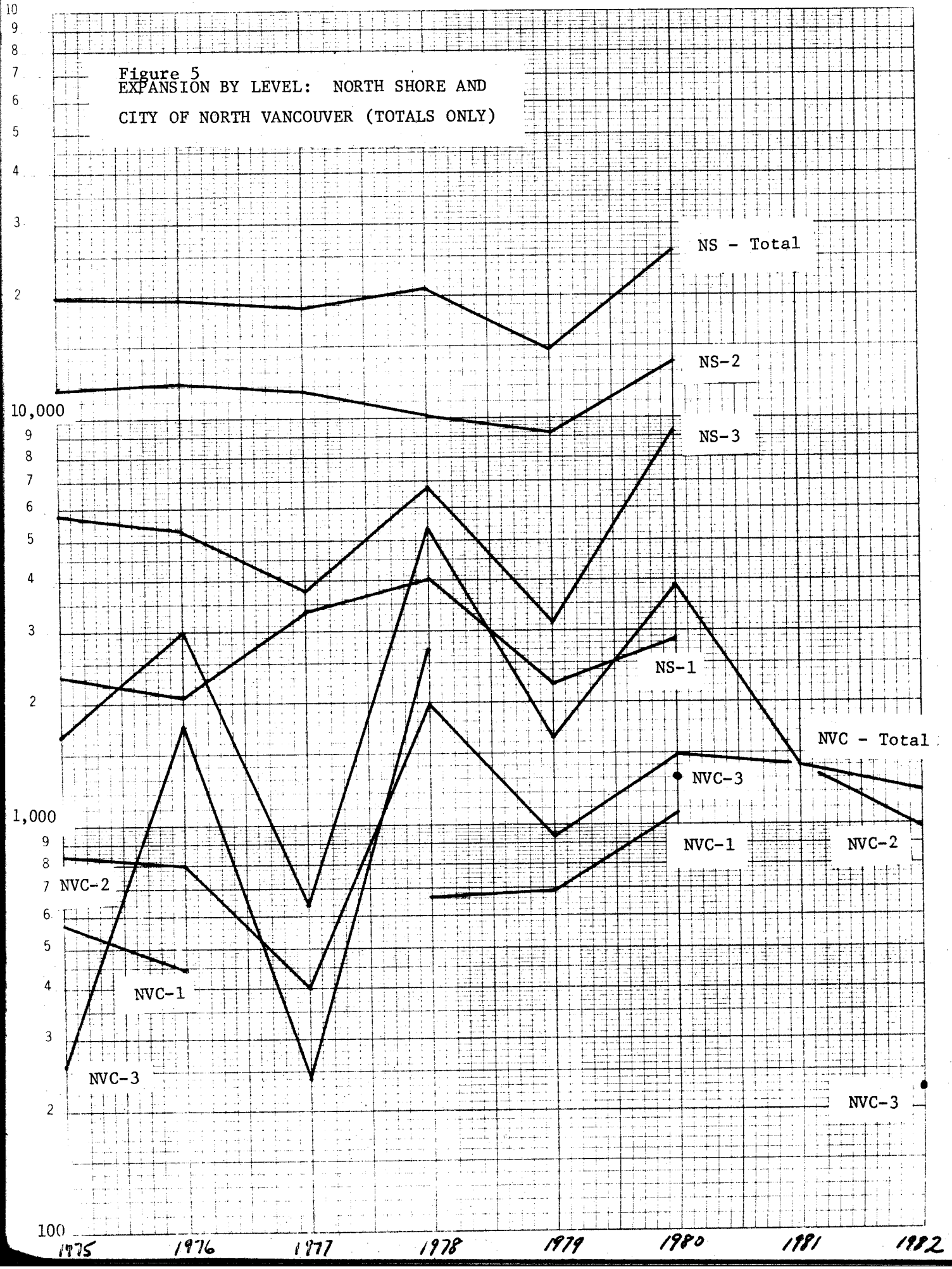


Figure 5
EXPANSION BY LEVEL: NORTH SHORE AND
CITY OF NORTH VANCOUVER (MEANS ONLY)

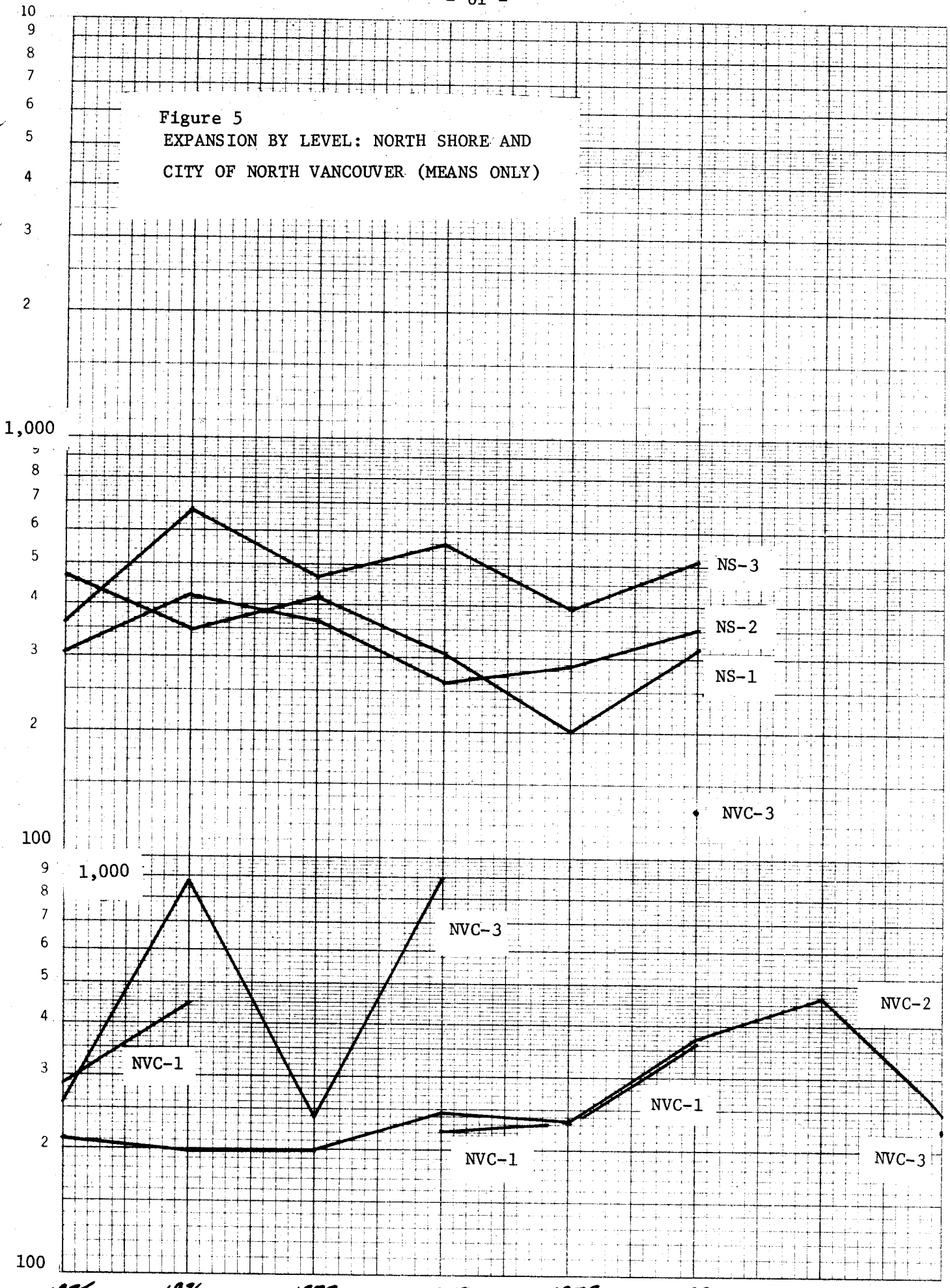
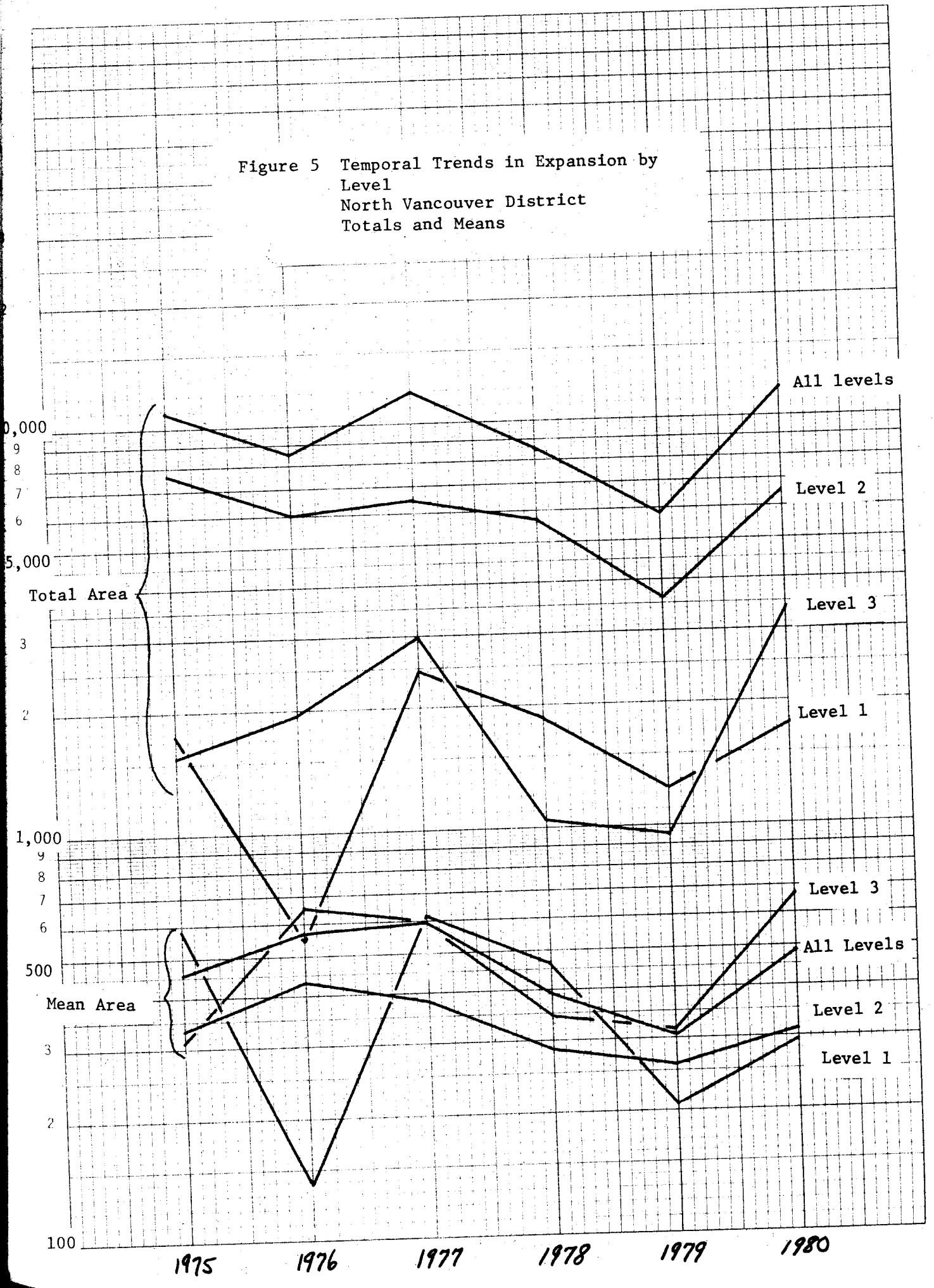


Figure 5 Temporal Trends in Expansion by Level
North Vancouver District
Totals and Means



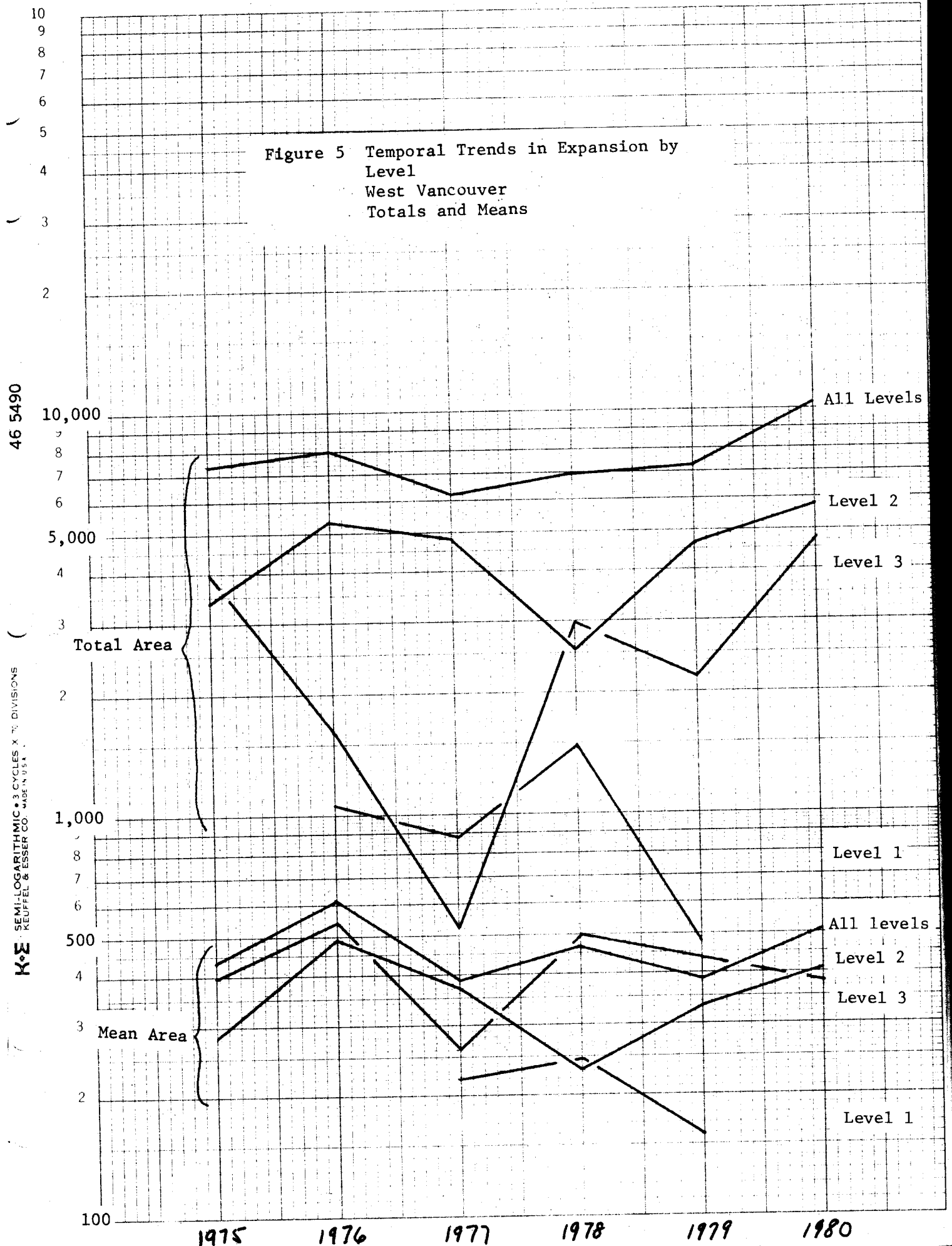


Figure 5 Temporal Trends in Expansion by Level
West Vancouver
Totals and Means

(4 x 53 = 212; N = 210 for level 2) but there are three times as many level 2 projects as there are level 3. Thus those carried out at level 3 represent major additions, fewer projects accounting for more space, and indeed the mean project at about 484 square feet is considerably larger than the mean of level 2 (328 square feet) and level 1 (320 square feet).

In the City the principal quantities of additional area were on the main living level, but some major projects in which extra floors were added gives the City a larger proportion of additional area at levels 1 and 3, (38.7 and 21.5 percent respectively) than is the case for the north shore. At the sub-total level the proportions in levels 2 and 3 are virtually the same but, if one extends the observation to include 1981 and 1982, then the preference for level 3 drops, as it does for level 1, and the preference for level 2 expansions rises correspondingly. The frequency of project is less in the City, however, and so the variability of its data is greater than the more reliable and steady trends for the north shore as a whole.

North Vancouver District and West Vancouver also both conform to the pattern of having the greatest proportions of expansion at the main living level, West Vancouver's proportion (57.3 percent) being almost precisely the same as that for the north shore (57.5 percent). But that is where the similarity ends, however, for the proportion added on level 3 is higher than for the north shore taken as a whole (34.3 to 28.3 percent), and that for level 1 is considerably lower (8.4 to 14.2 percent). Just the opposite tendencies as compared with the north shore 'norms' may be noted for North Vancouver District.

The comparative emphasis on level 3 work in West Vancouver is even more pronounced when the numbers of projects are considered. Thirty-eight projects there compare with 24 in North Vancouver District, but when compared with

the numbers of level 2 projects on a proportinate basis, the level 3 projects in West Vancouver account for 30 percent of the 127 total for all levels whereas they account in North Vancouver District for only 15 percent of its total of 160.

Level 1 additions are a little more important than are those of Level 3 in both the North Vancouvers, but especially in the City. In West Vancouver they are relatively unimportant at 11 percent of the total of 127 cases. Thus the overall picture emerges as one in which expanding on the main living level is the predominant process, but the municipalities are again clearly differentiated by preference for other levels for expansion, preference being measured by the number of cases. North Vancouver City has the highest rate of level 1 expansion (over 20 percent), the second highest rate of level 2 expansion (54 percent), and the lowest rate of level 3 expansion. West Vancouver has the highest rate of level 3 expansion and the lowest rate for level 1, while North Vancouver District has the highest rate of level 2 expansion, fully 68 percent of the cases being at that level. These relationships do not appear so strongly if total area figures rather than cases are considered, in particular the preference for level 3 rises for the City. This does not, however, negate the general differentiation among the three municipalities, for in the North Vancouver City data there are two exceptionally large level 3 expansions which inflate the 1975-80 sub-total. The total to 1982 shows a decline to 34.5 percent, a figure more in keeping with the general pattern, and almost identical with that for West Vancouver.

Temporal trends in additions by level are shown both in Table 6, there by percentage differences from year to year, and in Figure 5. In the latter the line tracing the trends for levels may be compared with the totals for each municipality and for the north shore as a whole. These latter are

perhaps the most important. The trend is remarkably consistent to 1978 for the north shore total, after which it dips sharply in 1979 and then rises steeply to 1980 when the total exceeded any previous year. Level 2 is the most consistent level during these years, the main variation in the overall total being due to fluctuations in Levels 1 and 3. In general these latter two levels rise and fall in the same years, but the directions of their lines were opposed between 1976 and 1977. This is a pattern also found for North Vancouver District although the low point for Level 3 in West Vancouver, in 1977, followed two years of steep decline.

Although the total expansion areas by level would appear to be holding their own, it is interesting to note that there would appear to be a general drift down in the size of the mean expansion areas by level across the whole north shore. Here again the trends for level 2 would appear to be the most steady, there being only two inflection points with direction reversals out of a possible four within the six years, as against three such points for level 1 and a full complement of four for level 3. This pattern suggests confirmation of the point that projects involving level 2 are the most consistent and popular because they are easy. To work on a basement, or to add space upstairs, can involve greater expense, more complex construction, professional labour, and certainly greater household upheaval. So long as the lot can accommodate horizontal expansion of the main living level, or perhaps a deck enclosure, this level would appear to offer the most practical and economical possibilities for adding extra space.

AREAS OF ADDITIONS

Each different form of measurement of house expansions yields another perspective on the issue. Room additions and extensions are very important in this respect, and have already been discussed. They have implications for questions leading to the segregation and integration of types of space in the lives of people, and thus of the community's social space characteristics. They also permitted suggestions as to possible relationships between building form, age of buildings, current design trends and costs. The issue in the present section, however, is that of area alone: how much space is added, as measured in a standardized unit, here the square foot? What are the quantities involved and what are the implications of the quantitative changes? This section is also closely related to discussions in the following two sections, those on the pre-expansion areas of houses and on the post-expansion sizes.

Table 7 presents the data relating to areas of additions for the sample. By extrapolation it may be seen that almost 1,200,000 square feet of space were added across the north shore during the six years. The distribution of this space, by municpality, shows that, as might be expected, the largest amount and proportion was built in North Vancouver District, 573,820 square feet and 48 percent respectively. West Vancouver, with 461,600 square feet comprises 38.6 percent of the total while the City, with 161,320 square feet makes up only 13.5 percent. Given that the City had 19.4 percent of the north shore's occupied single family dwellings in 1971, and still had 17 percent in 1981, this proportion of space added further shows that the City's residential living space in single family homes is dropping in proportion to the whole north shore at a more rapid rate than would be the case if its rate of space accumulation in this house form were keeping pace. It should be emphasized that this point is not merely one which can be understood as the

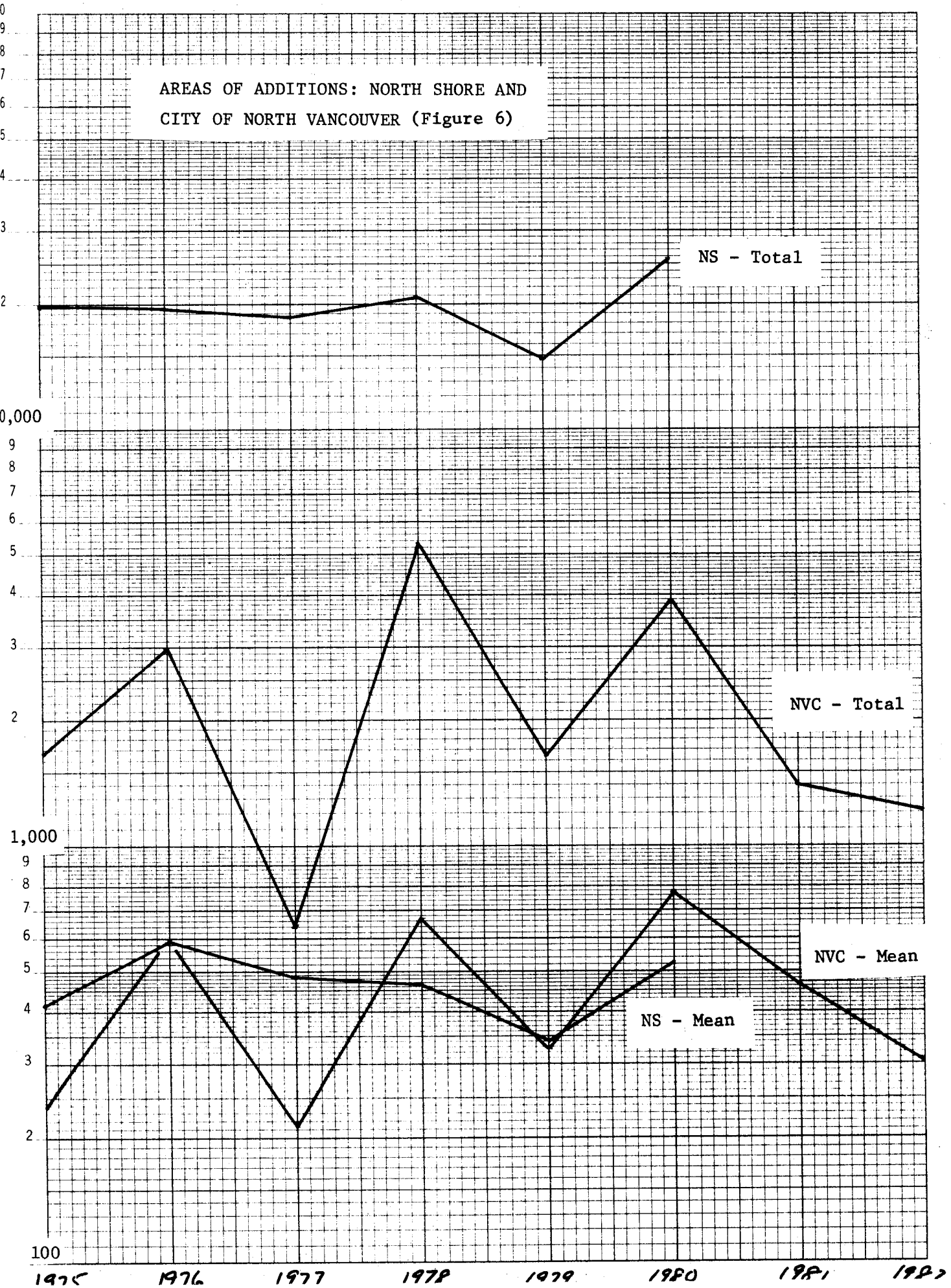
TABLE 7 AREAS OF ADDITIONS:

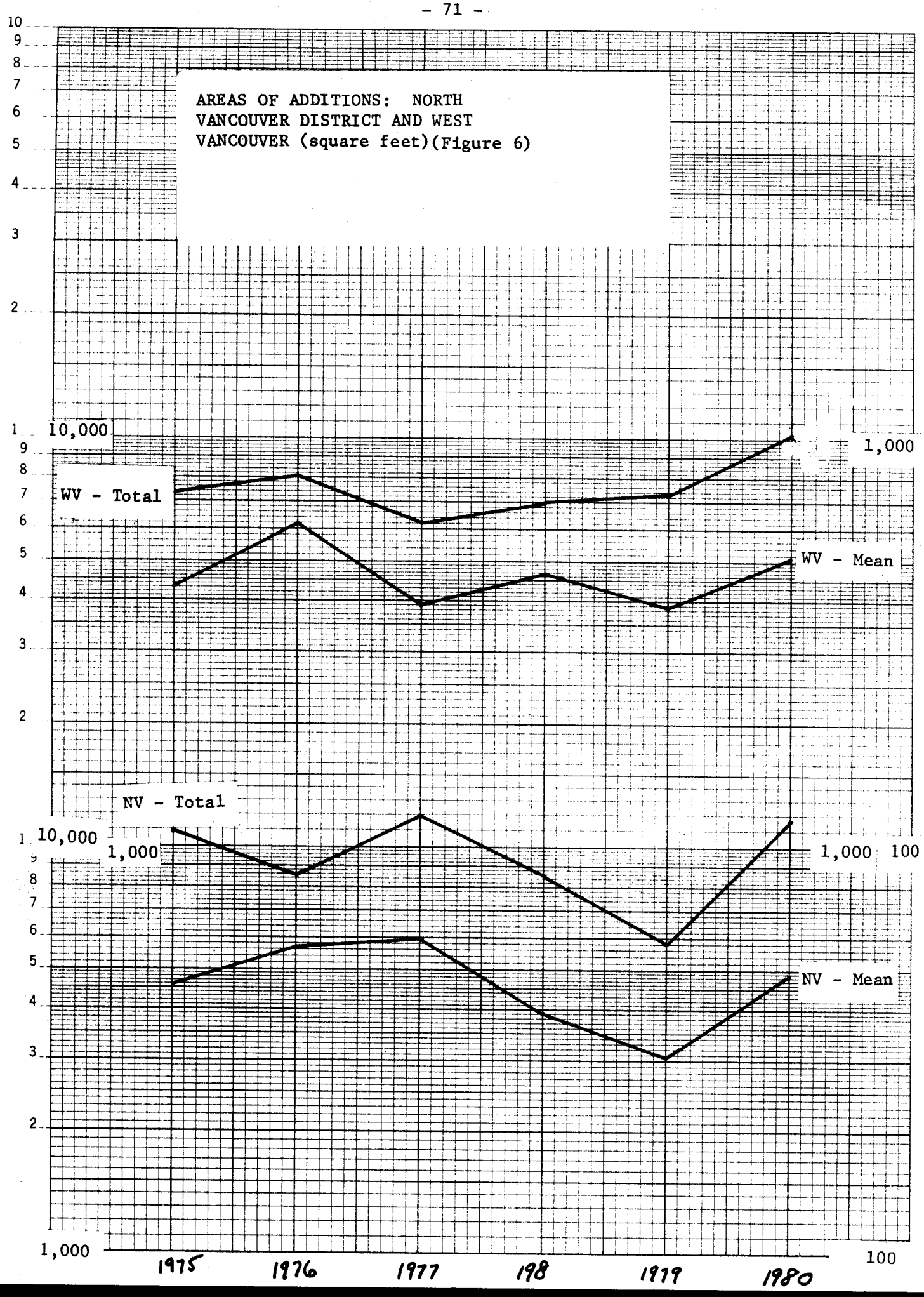
TABLE 7 AREAS OF ADDITIONS:
(square feet)

	North Shore				City of North Vancouver			
	Total	Mean	Range	Quartiles	Total	Mean	Range	Quartiles
1975 N=48	19,985	416.4	40-1,476		1975 N=7 1,676	239.4	40-479	
% diff	-2.1	+42.2			% diff. +78.9	+150.5		
1976 N=33	19,536	592.0	88-2,152		1976 N=5 2,998	599.6	88-1,856	
% diff.	-4.0	-18.8			% diff. -78.7	-64.4		
1977 N=39	18,760	481.0	17-1,450		1977 N=3 640	213.3	80-320	
% diff.	+11.4	-3.5			% diff. +731.4	+211.8		
1978 N=45	20,893	464.3	16-1,752		1978 N=8 5,321	665.1	106-1,752	
% diff.	-29.5	-26.3			% diff. -69.3	-50.9		
1979 N=43	14,724	342.4	16-1,313		1979 N=5 1,632	326.4	96-761	
% diff.	+75.1	+53.6			% diff. +136.8	136.8		
1980 N=49	25,776	526.0	80-2,213		1980 N=5 3,865	773	80-2,213	
N=257	119,674	465.7	16-2,213	161 300 644	% diff. -63.8	-39.7		
Mean/yr. N=42.8	19,945.7				1981 N=3 1,399	466.3	109-1,100	
				S_k = 0.85	% diff. -13.9	-35.4		
					1982 N=4 1,204	301	78-718	
					Sub total (1975-80) N=33 16,132	488.9	40-2,213	
					Mean/Year 2,688.7			
					N=40 18,735	468.4	40-2,213	100 240 579
					Mean/yr. 2,132.4			
								S_k = 0.83

TABLE 7 AREAS OF ADDITIONS
(square feet)

	North Vancouver District						West Vancouver					
	Total	Mean	Range	Quartiles			Total	Mean	Range	Quartiles		
1975 N=24	10956	456.5	72-1288				7353	432.5	56-1476			
% diff	-22.3	+24.3					+9.2	+42.8				
1976 N=15	8510	567.3	144-976				8028	617.5	140-2152			
% diff	+39.9	+4.9					-22.6	-37.1				
1977 N=20	11902	595.1	133-1208				6218	388.6	17-1450			
% diff	-31.8	-38.0					+12.5	+19.9				
1978 N=22	8580	390.0	26-1209				6992	466.1	16-1357			
%diff	-32.4	-21.7					+4.2	-17.7				
1979 N=19	5803	305.4	66-1269				7289	383.6	16-1313			
% diff	+100.4	+58.7					+41.0	+34.0				
1980 N=24	11631	484.6	73-1658				10280	514.0	120-1225			
N=124	57382	462.8	26-1658	205	309	639	N=100	46160	461.6	16-2152	139	280	578
Mean/yr	9563.7						Mean/yr	7693.3				
				S_K=1.04							S_K=0.72	


AREAS OF ADDITIONS: NORTH SHORE AND CITY OF NORTH VANCOUVER (Figure 6)
NS - Total
NVC - Total
NVC - Mean
NS - Mean
1,000
100
1975
1976
1977
1978
1979
1980
1981
1982


AREAS OF ADDITIONS: NORTH VANCOUVER DISTRICT AND WEST VANCOUVER (square feet)(Figure 6)
WV - Total
WV - Mean
NV - Total
NV - Mean
10,000
1,000
100
1975
1976
1977
198
1979
1980

flip side of the knowledge that the rates of apartment construction, household and population trends can be seen to be on the increase; rather, these figures relate only to trends within the single family housing stock itself. Thus we may reiterate the point that smaller additions characterize the City, and that these in turn may be expected to be conditioned by smaller buildings as starting points in the expansion process, and by smaller lots which condition the possible extent of additions. These trends combined are expressive of classic inner city developments, on the one hand, where an expectation might exist for housing to be allowed to run down; the pace of demolition of houses, and the rate of apartment construction, certainly would not deny the reality of such a classic inner city process. But, on the other hand, perhaps urban decay can only be partly imputed here, for one must recall that lots in the City are on average smaller than they are in the Districts and, as remarked in Case Study 3. perhaps what is happening is that there is a phase of property development reaching a completion stage in the City, one which may or may not represent impending demolition and 'densification' by land use change to apartments or other forms of use. After all, the appearance of houses in the City is not by any means uniformly one of 'blight'.

To give some illustration of the magnitude of the overall expansion process during the study period, however, an approximate figure for a per house addition may be calculated. According to the Census there were 27,910 single family dwellings ("occupied single detached private dwellings" in the language of the Census) in 1971, and 33,550 in 1981. (Table 8). The figure 30,730 was derived, by interpolation, for 1976. The average addition for all north shore single family dwellings may this be said to be 38.9 square feet, if all such dwellings are assumed to be involved. This represents a space 6.24 feet square, or 7 feet by 5 feet 6 inches. Of course not all houses

Table 8 DISTRIBUTION OF ADDITIONAL SPACE (square feet) IN RELATION TO DISTRIBUTION OF SINGLE FAMILY DWELLINGS

	NS	NVC	NVD	WV
Additional Space	1,196,740	161,320(13.5)	573,820(48.0)	461,600(38.6)
Single Family Dwelling				
1971	27,910	5,410(19.4)	13,810(49.5)	8,690(31.1)
1976	30,730	5,563(18.1)	16,038(52.2)	9,130(29.7)
1981	33,550	5,715(17.0)	18,265(54.4)	9,570(28.5)

Notes:

1. Data for 1976 are by interpolation from Census data.
2. Data for additional space are original here, as extrapolated from the sample studied.
3. Bracketed numbers represent percentages.
4. See Appendix, Socio-demographic profile, Part IV.

were or would be affected by expansions, and at any given time they would be a minority. But the scope of expansion is sufficient in area terms that one way of expressing the magnitude of expansion activity would be to say that it is equivalent to the addition of a 7 foot by 5½ foot space to each and every house on the north shore.

Another effective way of illustrating the magnitude of activity would be to express the additional space in terms of house equivalents. If the additional area added be divided by the north shore pre-expansion mean house size of 1,880 square feet, then it may be seen that the extra space accumulated in six years is the equivalent of 636 new houses, these in turn representing an annual rate of accumulation of about 106 new house equivalents. This is sufficient space to represent a sub-division of about five or six blocks annually in the urban fabric.

The case of West Vancouver provides another illustration of the theme that investment in the single family dwelling there has been the greatest of the three municipalities. With 38.6 percent of the total added area, it may be seen that this space was spread over about 30 percent of the north shore occupied private dwellings (31.1 percent in 1971, 28.5 percent in 1981. See Socio-demographic Profile). North Vancouver District occupies an intermediate position between West Vancouver and the City, as shown by the fact that its added area, 48 percent of the north shore total, is spread across just over 50 percent of the single family dwellings. (49.5 percent in 1971, 54.4 percent in 1981). Its rate of addition does not keep pace with its rate of increase of single family dwellings, but the rates are close and certainly they run ahead of what is found for the City. Thus, overall, the District may be seen to be the municipality of the most active increase in new single family houses, and it also leads in the absolute quantity of space accumulation by expansion.

But West Vancouver leads in space accumulation if measured by proportionate space added per dwelling, while the City is below both these municipalities in both quantity and proportion per dwelling. This directs attention to the mean and median values of additions and it may be seen that while the means are virtually the same in all three municipalities, the medians are quite different, being 309 square feet for the District of North Vancouver, and 280 and 240 square feet for West Vancouver and the City respectively. These may be seen against the north shore median of 300 square feet.

The areas of the most active apartment construction, that is the Lower City and central lower West Vancouver, both occur in municipalities showing signs of slowing down in their rates of single family dwelling increase. But they are differentiated in that, for whatever reasons, much less proportionate investment is going into the expansion of single family dwellings in the City than is the case in West Vancouver. In North Vancouver District the two rates are also not identical but they are not far apart; if there is a trend it would seem to be that newer houses are being added at a faster rate than are additions. This is perhaps not surprising, for newer houses in the years of this study would tend to be of larger dimensions than older houses, and this municipality, of the three north shore municipalities, has experienced the greatest recent construction. Thus there might be a little less need, from the viewpoint of use value, for additions to be made.

Temporal trends show little variation between 1975 and 1978, but drop fairly sharply in 1979 before rising to the highest level of the study period in 1980. This rise corresponds with the hectic real estate market of the 1979-80 period, a period when some homeowners were trying hard to upgrade their houses in order to sell them for an unusually high capital gains tax free profit on the turnover, or, more prosaically but realistically attempting to

keep the building and lot in a reasonably consistent relation of comparative assessed value.

Temporal trends of means display a basic parallel with the totals although mixed signs occur in 1976 for North Vancouver District. Overall, however, one is more impressed by the consistency of the rates of increase, year by year, than by great variation. An interesting question arises, though, as to whether the annual rates of increase of additions are keeping pace, considering that every year there are more single family dwellings in the total housing stock. Given that the stock is always increasing, it would seem that additions, as a proportion of total living space, may be declining somewhat except in West Vancouver.

PRE-EXPANSION AREAS OF DWELLINGS

Pre-expansion dwellings are the bases for additions. Their form, suitability for addition, size and character must all be considered in expansion projects. Data presented in Table 9 show the totals for each year, and for all six years of the study period, but attention is focussed here on the mean values. For the north shore the mean house size before expansion was approximately 1,880 square feet. It is important to note that this does not necessarily represent the mean size of all single family dwellings on the north shore, but only those dwellings which were expanded. The mean size varied municipally from 1,731 square feet for the City, through 1,836 for North Vancouver District to 1,992 square feet for West Vancouver.

It may be noted that these municipal mean values are closer to the medians than were the means of additions to their medians. These median values are 1,640 square feet for the City, 1,813 for the District, and 1,922 for West Vancouver, the overall north shore median being 1,833 square feet. The ranges vary widely from a low of 520 square feet in North Vancouver District to a high of 5,844 square feet for a house in West Vancouver. But this range, with the larger being approximately eleven times the smaller value, raises the question of possible extremes. There is a lower limit beyond which a house can scarcely be said to exist. The dimensions of a house of 520 square feet would only be some 23 feet square, a size perhaps better described as a cabin rather than a house. The low value found in the City, 663 square feet, and that in West Vancouver, 686 square feet, both represent dimensions of about 26 feet square. This is probably more typical as such a size can be divided into four rooms each 13 feet square and, at least theoretically, this would provide a basic room size and separation of rooms sufficient in a traditional house of four rooms for a small household unit. If the bathroom and kitchen were smaller,

TABLE 9 PRE-EXPANSION AREAS OF DWELLINGS:

	North Shore				City of North Vancouver			
	Total	Mean	Range	Quartiles	Total	Mean	Range	Quartiles
1975 N=47	83,834	1,783.7	541-3,036		1975 12,162 N=7	1,737.4	1,344-2,232	
% diff.	-30.7	+1.8			% diff. -12.8	+22.1		
1976 N=32	58,082	1,815.1	793-3,616		1976 10,610 N=5	2,122	1,496-2,862	
% diff.	+24.0	+1.8			% diff. -43.0	-5.0		
1977 N=39	72,040	1,847.2	869-5,844		1977 6,049 N=3	2,016.3	1,545-2,840	
% diff.	+10.6	-4.1			% diff. +118.2	-18.2		
1978 N=45	79,683	1,770.7	743-3,340		1978 13,197 N=8	1,649.6	945-2,324	
% diff.	+5.4	+12.9			% diff. -52.4	-23.8		
1979 N=42	83,980	1,999.5	530-3,805		1979 6,286 N=5	1,257.2	663-2,258	
% diff.	+10.2	+2.8			% diff. +40.5	+32.6		
1980 N=45	92,510	2,055.8	520-3,156		1980 8,832 N=5	1,666.4	1,248-2,138	
					% diff. -49.1	-10.1		
N=250	470,129	1,880.5	520-5,844	1301 1833 2324 S_k = -0.08	1981 4,497 N=3	1,499	681-1,910	
					% diff. +40.2	+5.1		
					1982 6,303 N=4	1,575.8	854-2,728	
					N=40 67,936	1,685.9	663-2,862	1296 1640 2118 S_k = 0.33
					Sub Total ('75-'80)			
					N=33 57,136	1,731.4		

TABLE 9 PRE-EXPANSION AREAS OF DWELLINGS
(square feet)

	North Vancouver District				West Vancouver				
	Total	Mean	Range	Quartiles		Total	Mean	Range	Quartiles
1975 N=24	44030	1834.6	541-3036		1975 N=16	27642	1727.6	793-2875	
% diff	-40.2	- 4.3			% diff	-23.6	+ 1.9		
1976 N=15	26344	1756.3	1043-3008		1976 N=12	21128	1760.7	793-3616	
% diff	+16.8	-12.4			% diff	+66.8	+25.1		
1977 N=20	30758	1537.9	869-2212		1977 N=16	35233	2202.1	1147-5844	
% diff	+28.6	+16.9			% diff	-23.5	-18.4		
1978 N=22	39545	1797.5	743-3280		1978 N=15	26941	1796.1	845-3340	
% diff	-.004	+15.4			% diff	+42.2	+18.5		
1979 N=19	39398	2073.6	919-3805		1979 N=18	38296	2127.6	686-3566	
% diff	+20.9	-4.3			% diff	-5.9	+5.9		
1980 N=24	47638	1984.9	520-2722		1980 N=16	36040	2252.5	1332-3156	
N=124	227713	1836.4	520-3805	1301 1813 2371 Sk = 0.10	N=93	185280	1992.3	686-5844	1309 1922 2395 Sk = 0.26

storage and closet space could also be squeezed in. But a place only 23 feet square might well represent a two room rather than four room house. One may note here that there is a building heritage of cabins on the north shore, from beach cottages to cabins high on the mountainside. Many of these have now been swept away but careful observation will still yield a small harvest of places scattered along the whole study area, places now often much modified by additions and renovations over the years.

But what is an upper size limit for a house? Provided that property dimensions and by-laws permit it, and given the financial resources, there is nothing to stop large houses from being made larger. In the case of the 5,844 square foot pre-expansion size house, the addition built on it was 1,450 square feet, for a new enlarged total of 7,294 square feet, the high end of the range for enlarged houses in this study. The addition itself is quite acceptable in size as a modest house, and in fact the addition is more than twice the size of the smallest places being expanded, whether pre or post expansion! It is also an addition of some 25 percent of its original house size.

Perhaps, given these extremes, it is surprising that the distributions are not more skewed than they are, and this focusses attention on the dispersion of the distribution rather than simply on the range. Thus the first and third quartiles are perhaps much more revealing of the real tendencies of house sizes before expansion. In this one sees the much more typical cases of about 1300 square feet for the first quartile, an approximate value which holds for the north shore and for each of its constituent municipalities. Further, one also notesthat the third quartile only varies from just over 2,100 square feet in the City to just under 2,400 square feet in West Vancouver. North Vancouver District, at 2,371 square feet is close to the value for

West Vancouver, and the overall north shore third quartile, at 2,324 square feet, represents a house size which is very common in the area.

The general trend of the mean values over time on the whole north shore is upward, with some exceptions. In 1978 the north shore mean dropped about 4 percent to 1,771 square feet, but 'recovered' strongly in the following year. Each of the municipalities experienced ups and downs, but by no means did these occur in the same patterns. For example, to continue with the 1977-78 period, both the City and West Vancouver experienced 18 percent drops in the mean size of house being expanded while North Vancouver District experienced a 17 percent increase. But the ranges, also to be noted for these years, point out that the means are influenced by the more extreme values and thus it is to the overall trend rather than the individual year changes that attention must be directed. Perhaps new house construction, for single dwellings, is to return to the practice of building smaller homes so that they may be afforded, but the basic building trends we are dealing with here are those of the post-war generation of houses in which the size generally increased. What is important from the viewpoint of the present study is that the average size of house overall will increase over time because of the present process being described, that is single family house expansion. This statement must of course be modified by the caveat "other things being equal", but, given that, it has merit.

The issue of affordability has been much discussed in public in recent months, and for several years it has been a major issue in Vancouver. During the past winter it was dramatized by the construction industry in the HUDAC demonstration home constructed on West Georgia Street in downtown Vancouver. Advertisements concerning this house noted that it was designed to be economical to build and maintain but that it could easily be expanded. This appears

good from a structural point of view, but elsewhere in advertisements it is noted that the low costs associated with buying such a home are in part dependent on the house's being built on a small lot, one "assumed" to cost $25,000.00. One wonders whether expansion would be possible on a small lot, given by-law restrictions. But expansion would probably be desireable, for, as finally discovered on page H6 of the Special Classified Advertising Feature, published by the Vancouver Sun on February 5, 1983, the house is only 650 square feet, although it is claimed to "feel larger" than this measure would suggest because of its "space stretching design". (See Appendix 2)

The figure of 650 square feet takes on significance in this study, for it is not too different from the value of the low end of the range for West Vancouver and for the City and represents a space equivalent of 25.5 feet square, a space in this calculation which makes no pretense of feeling larger! It is, nevertheless, some four times the size of the historic B.C. Mills Design A house, as highlighted from the 1905 catalogue by the Urban Reader*. (See Appendix 4) This prefab featured a single room, 11 feet 10 inches square, in the Settlers' Series of designs. There is an implication here that, once settled, one might wish to move to or expand into, something a little bit larger. This is much the same sentiment as the advertised point by HUDAC that their new Triple "A" home is designed specifically with the possibility of expansion in mind. Clearly this latter is a contemporary 'pioneering prefab'! The basic HUDAC house is quadruple the size of the B.C. Mills basic, and that would seem to represent a measure of the increase in the standard of living - in spatial not financial terms - during the century to date.

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* Niwinski, Alice, "Pioneering Prefabs", Urban Reader, Vol. 9, No. 3, 1982, pp. 5-7.

But the larger question is, how much space are people willing to build or buy for themselves, given that they are not confined to a basic unit only? There is not only a reality of having too little space but there is also a reality of having too much space. These parameters are questions of household size, life cycle and affordability, in their more obvious relationships, and will be discussed in the behavioural sections. But they are also more subtly and, one supposes, importantly connected to historical trends of behaviour. Do better educated people require more space for personal reasons? How does such a question overlap with that of the slight but emerging tendency for people to work at home and so transfer the work place to the home? What have technological changes such as television and the appliance revolution done to the patterns of needed spaces? And what will the micro-computer do? Will the worker and his family have to relinquish the "parlor", so hard won in the nineteenth century industrial town house, and be forced to build to imitate the one room apartment with its cooking counters closed off behind folding doors? And do contemporary open plan designs in expensive large houses merely cultivate the attitude of the less wealthy to a point of accepting such spatial arrangements, albeit on a very reduced scale? Is B.C. Mills, Design A republished in a publicly financed journal because there is an almost unconscious sense of its appropriateness to-day, rather than its merely being an historical curiosity? Of course all such questions are much too speculative in a empirical study such as the present one, but they are the sorts of questions which give point to any empirical work in the first place.

AREAS OF ENLARGED DWELLINGS

These areas represent the new indoor dwelling space available in expanded houses. Across the north shore this space had been enlarged by the end of 1980 to some 5,881,530 square feet, nearly six million, divided among the approximately 2,500 homes undergoing expansion. Thus the average size of house rose to 2,353 square feet, a quite comfortable space. The smallest mean size of house by municipality, 2205 square feet, is represented in the City, while the largest, 2,472 square feet, represents West Vancouver. North Vancouver District lies in an intermediate position with a mean of 2,302 square feet, a figure slightly under the north shore mean. Thus the West Vancouver figures may again be seen to pull up the overall mean although the distribution at the north shore level is not greatly skewed. (Table 10)

The intermediate position of North Vancouver District is further pointed out in its values of range, 900 to 3,805 square feet, these representing a higher minimum range than for either the City or West Vancouver (690 and 814 square feet respectively) and a lower maximum than either of the other municipalities (4,048 and 7,294 square feet). It is also worth noting that this same relationship holds among the municipalities when the first and third quartiles are compared, that is the District has the highest value of first quartile (1,769 square feet compared with 1,645 for the City and 1,705 for West Vancouver), and the lowest value of third quartile (2,683 square feet as against 2,697 for the City and 2,949 for West Vancouver). Thus the dispersion of values is less for the District than for either the City or West Vancouver. Given that the District is the municipality which accounts for the greatest population, number of dwellings, and amount of construction, this restricted dispersion of values would suggest that it represents in greatest degree the 'homogeneous suburb' of the last 20 years.

TABLE 10 AREAS OF ENLARGED DWELLINGS:
(square feet)

	North Shore				City of North Vancouver			
	Total	Mean	Range	Quartiles	Total	Mean	Range	Quartiles
1975 N=47	103,763	2,207.7	1,110-4,901		1975 N=7	13,838	1,976.9	1,440-2,490
% diff.	- 25.7	+9.1			% diff.	-1.7	+37.7	
1976 N=32	77,078	2,408.7	1,161-3,766		1976 N=5	13,608	2,721.6	1,592-2,962
% diff.	+17.8	-3.3			% diff.	-50.9	-18.1	
1977 N=39	90,800	2,328.2	1,247-7,294		1977 N=3	6,689	2,229.7	1,744-3,080
% diff.	+10.8	-4.0			% diff.	+176.8	+3.8	
1978 N=45	100,576	2,235.0	901-3,736		1978 N=8	18,518	2,314.8	1,098-3,287
% diff.	-1.8	+5.2			% diff.	-57.2	-31.6	
1979 N=42	98,754	2,351.3	690-4,879		1979 N=5	7,918	1,583.6	690-2,698
% diff.	+18.7	+10.7			% diff.	+54.0	+54.0	
1980 N=45	117,182	2,604.0	900-4,329		1980 N=5	12,197	2,439.4	1,562-4,048
					% diff.	-51.7	-19.4	
N=250	588,153	2,352.6	690-7,294	1722 2212 2730	1981 N=3	5,896	1,965.3	1,781-2,096
				S_k = 0.06	% diff.	+27.3	-4.5	
					1982 N=4	7,507	1,876.8	1,094-2,896
					N=40	86,171	2,154.3	690-4,048
								1645 2022 2697
								S_k = 0.57
					Sub Total ('75-'80)			
					N = 33	72,768	2,205.1	690-4,048

N = 33 72,768 2,205.1 690-4,048

TABLE 10 AREAS OF ENLARGED DWELLINGS
(square feet)

	North Vancouver District				West Vancouver				
	Total	Mean	Range	Quartiles		Total	Mean	Range	Quartiles
1975 N=24	54986	2291.1	1207-3316		1975 N=16	34939	2183.7	1110-4901	
% diff	-36.6	+ 1.4			% diff	-18.1	+9.2		
1976 N=15	34854	2323.6	1408-3600		1976 N=12	28616	2384.7	1161-3766	
% diff	+22.4	-8.2			% diff	+44.9	+8.6		
1977 N=20	42660	2133	1290-2794		1977 N=16	41451	2590.7	1247-7294	
% diff	+12.8	+2.6			% diff	-18.1	-12.7		
1978 N=22	48125	2187.5	901-3730		1978 N=15	33933	2262.2	1251-3736	
% diff	-5.3	+9.7			% diff	+ 33.4	+11.1		
1979 N=19	45581	2399	1330-3805		1979 N=18	45255	2514.2	814-4879	
% diff	+30.1	+3.0			% diff	+1.0	+13.6		
1980 N=24	59287	2470.3	900-3583	1769 2228 2683	1980 N=16	45698	2856.1	1654-4329	1705 2228 2949
N=124	285493	2302.4	900-3805	1769 2228 2683 S_k=-0.01	N= 93	229892	2472.0	814-7294	1705 2228 2949 S_k=0.32

The opportunity thus arises within this study to point out the historic difference in house size, and by implication, social status and development possibilities within the City which not only has the small dwellings and properties referred to several times in this report but also has some very large structures and elegant homes, especially the older ones in the east central section of the town. Few of these would require additions, and so do not figure importantly here. Many would serve well as small apartment blocks in a manner imitative of the West End's filtering process during the past two decades. Should that come about to any significant degree it would represent an illustration of similar processes, up-dated, to those experienced in the West End. But, up-dating may also mean modification of process, and this would include the following: pressure for apartment space, partly a result of easy access to downtown jobs via the Sea-Bus; revitalization projects which might spawn off the current thrust in this direction in the Lower Lonsdale area; heritage preservation designations of certain buildings, possibly including residences; zoning changes which might affect certain areas; citizen participation either to promote change and 'development' or to resist change in the truculent manner of such resistance; resolution of the 'hot' issue in the City of illegal suites.

But external pressures such as these are only part of the story, for the changes in lifestyles of householders will also have great bearing on the demand for space. This is perhaps more appropriately discussed in the behavioural discussions to follow below, but they would include the changing appreciations of privacy for various members of the household, the resulting segregation of space such as separate bedrooms for children, possibly specialized work space,and so on. If this need also should coincide with a desire for more 'open plan' designs, the implication is surely the consumption

of more space, some of which will be obtained by house expansion. Thus, over the years, the point may be reiterated from the previous section that the tendency will be for house sizes to grow larger. Certainly it would seem that they never grow smaller, although available household space could be reduced with the subdivision of houses into apartments, a development which would change the subject matter here.

RATIOS OF ADDITION AREAS TO PRE-EXPANSION AREAS

Table 11 shows the ratios of additions to pre-expansion areas. For the north shore as a whole the mean ratio for the six years of the study is .312, indicating that on average an expansion project increased the size of the house by about 31 percent. The lowest annual mean during the study period was .200 in 1979, while the highest was .395 in 1976.

These ratios give some measure to a point made earlier, that the City has experienced on the whole less proportionate increase per project than is true for the two Districts. Thus the six year ratio for the City, .282, falls short both of the north shore average and of the values for North Vancouver District (.319) and West Vancouver (.313). On an annual basis there is some considerable fluctuation in the City, as is illustrated by the low 1977 value of .106 followed in 1978 by the much higher .403. These, however, should be seen in part as the effect of a small sample. The same pattern is evident in West Vancouver between 1977 and 1978, although the magnitude of difference is less as would be expected given the greater value of N. North Vancouver District ran counter to these trends between 1976 and 1978, however, in that its ratio of expansion continued its climb almost on a straight line from 1975 to 1977 but then dropped to 1978 while the other two municpalities both recovered rapidly in 1978. In fact, the City and West Vancouver's ratios converged to be almost identical in 1978 before diverging in 1979 and to 1980 with the City's ratio remaining the higher. But after 1978 the signs are the same for all municipalities, a decline to 1979 and a rise to 1980. North Vancouver City declines to 1981 and 1982 and, in all probability, the two Districts also experienced declines in those years.

While there may appear to be considerable fluctuation about the mean in the municipalities, the north shore curve is confined within closer limits of

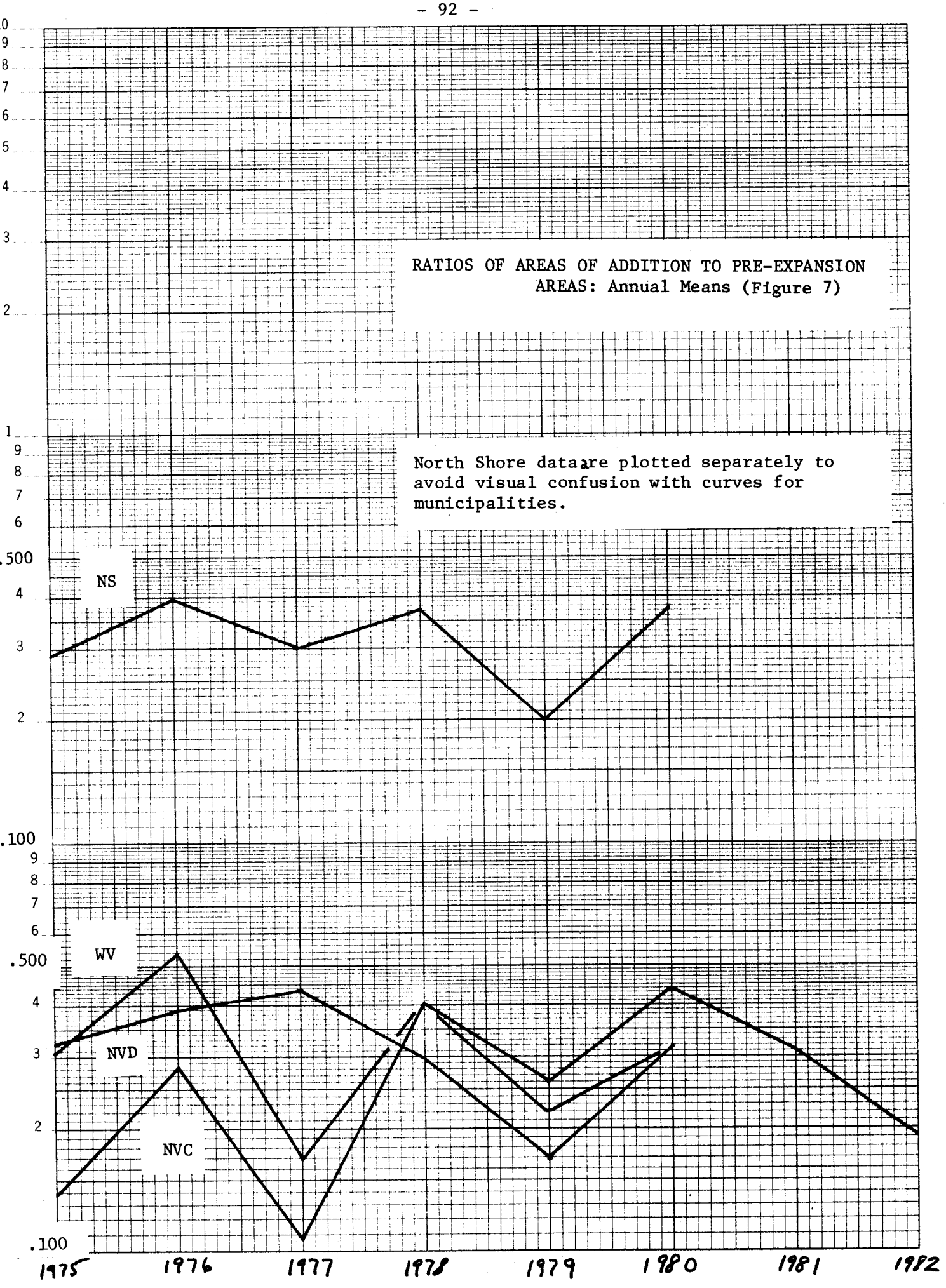
TABLE 11 RATIOS OF ADDITION AREAS TO PRE-EXPANSION AREAS

TABLE 11 RATIOS OF ADDITION AREAS TO PRE-EXPANSION AREAS

	North Shore			North Vancouver City		
	Mean	Range	Quartiles	Mean	Range	Quartiles
1975 N=47	.289	.020-1.446		0.138	.020-.310	
% diff.	+37.7			+105.1		
1976 N=32	.395	.035-2.071		.283	.035-.165	
% diff.	-23.8			-62.5		
1977 N=39	.301	.012-1.083		.106	.048-.207	
% diff.	+23.9			+280.2		
1978 N=45	.373	.007-1.854		.403	.049-1.854	
% diff.	-46.4			-36.2		
1979 N=42	.200	.005-1.395		.260	.118-.549	
% diff.	+87.0			+68.5		
1980 N=37	.374	.028-1.656		.438	.037-1.210	
% diff.				-29.0		
1981 N=3				.311	.057-1.62	
% diff.				-38.6		
1982 N=4				.191	.051-.598	
N=242	.312	.005-2.071	.083 .159 .392	N=40 .273	.020-1.85	.051 .118 .281
			S_k = 1.013			S_k = 0.84
				'75-'80 N=33 .282	.020-1.85	

TABLE 11 RATIOS OF ADDITION AREAS TO PRE-EXPANSION AREAS

	North Vancouver District					West Vancouver				
	Mean	Range	Quartiles			Mean	Range	Quartiles		
1975 N=24	.322	.031-1.446				1975 N=16	.306	.034-.899		
% diff	+19.9					% diff	+74.2			
1976 N=15	.386	.053-1.192				1976 N=12	.533	.042-2.071		
% diff	+13.0					% diff	-68.5			
1977 N=20	.436	.090-1.083				1977 N=16	.168	.012-.729		
% diff	-31.4					% diff	+141.7			
1978 N=22	.299	.008-1.652				1978 N=15	.406	.007-1.556		
% diff	-43.8					% diff	-45.6			
1979 N=19	.168	.034-.731				1979 N=18	.221	.005-1.395		
% diff	+88.7					% diff	+44.3			
1980 N=24	.317	.028-1.656				1980 N=8	.319	.038-.920		
N=124	.319	.008-1.656	.092	.188	.421	N=85	.313	.005-2.071	.074	.147	.319
			S_k=0.83						S_k=0.81		


RATIOS OF AREAS OF ADDITION TO PRE-EXPANSION AREAS: Annual Means (Figure 7)
North Shore data are plotted separately to avoid visual confusion with curves for municipalities.
NS
WV
NVD
NVC
1975
1976
1977
1978
1979
1980
1981
1982

variability. Thus while individual projects may vary from very small additions to major expansions, from a general standpoint one may expect that the average expansion project will add about 30 or 31 percent to the original house. Such an estimate may not have close predictive application in any municipal policy, but at the general level, whether metroplitan, regional, provincial or national, it may have some utility.

ROOMS AND SPACES BY ACTIVITY COMPLEXES

This section discusses the data relating to uses of expansion spaces, as shown in the plans submitted for municipal approval. The data thus refer to intended uses. Some kinds of spaces in houses do indeed have some functional flexibility, for example bedrooms may convert easily to offices or sewing rooms, and so could be identified in more than one way. But the patterns of space identification in the plans, the consistency of the data, and observations made during interviews give confidence in the overall reliability of the data presented here.

Table 12 is a 'functional classification' of additional spaces. It was developed by allocating labels and terms taken from the records to clusters or groups in which the terms were either synonymous or were clearly members of a family of terms. The eight categories so developed would appear to encompass all the types of spaces in a single family house, sundecks, garages, carports, swimming pools and other outdoor spaces excepted.

The classification shows, without deletion, all the terms which appeared in the records. The full listing serves here to illustrate something of the range of language employed and, in turn, may offer from circumstantial evidence insights into the aspirations of homeowners who wish to increase their living space.

The number of cases for each use are listed for each municipality. Totals for each municipality and for the north shore as a whole are also shown. Line A records the percentage of the whole in each category represented by each municipality. When Line A for each category is compared with the total for the whole table, it may be seen that there is a certain consistency among the three municipalities in some categories of space function. Further, their respective shares of the total in each category allow for inter-municipal comparisons to

TABLE 12 ROOMS AND SPACES BY ACTIVITY COMPLEXES: A FUNCTIONAL CLASSIFICATION

	NVC	NVD	WV	Total NS
Bedroom Group				
bedroom	31	58	63	152
master bedroom		17	4	21
master bedroom ensuite	4	2	5	11
dressing room		2	1	3
guest room		1	1	2
spare room	1	2		3
nursery			1	1
study-bedroom		2		2
Total	36	84	75	195
A. Percentage of category total(row)	19	43	39	101
B. Percentage of all categories for each municipality (column)	33	28	32	30
Bathroom Group				
bathroom	10	38	24	72
washroom			1	1
toilet		1		1
powder room		2	4	6
bathroom in master bedroom	2	1		3
Total	12	42	29	83
A.	15	51	35	101
B.	11	14	13	13
Hallway and Entrance Group				
hall	1	5		6
entrance	2	11	14	27
entrance hall		1		1
entrance lobby			1	1
foyer	1	2		3
mud room		1	1	2
enclosed entry		1		1
entrance and closet		1		1
hall and nook		1		1
lanai			1	1
atrium	1	1		2
Total	5	24	17	46
A.	11	52	37	100
B.	5	8	7	7
Kitchen Group				
kitchen	8	14	16	38
pantry	1		1	2
breakfast nook/room		1	1	2
nook or kitchen nook		8	2	10
Total	9	23	20	52
A.	17	44	39	100
B.	8	8	9	8

		NVC	NVD	WV	NS Total
Public Room Group					
living room		7	15	11	
dining room		10	19	13	
living-dining room			2	2	
family and dining room				1	
	Total	17	36	27	80
	A.	21	45	34	100
	B.	16	12	12	12
Family Room Group: General Activity					
family room		4	34	14	
recreation room		3	8	2	
recreation and hobby room				1	
den		1	4	2	
hobby room				2	
playroom			4	6	
sun room		3		1	
garden room			1		
solarium		1	1		
conservatory			1		
sitting room		1			
	Total	13	53	28	94
	A.	14	56	30	100
	B.	12	18	12	15
Family Room Group: Specialized Activity					
library			1		
study/studio		1	9	8	
office		1	1		
billiard room			1		
music room				2	
dark room			1		
sewing room		1	1		
sauna			4	2	
study-utility				1	
	Total	3	18	13	34
	A.	9	53	38	100
	B.	3	6	6	5
Utility Group					
laundry		2	3	3	
furnace			1		
workshop		2	3	2	
storage		3	12	13	
utility		2	2	3	
closet (walk-in)		2		1	
pool equipment room				1	
root cellar				1	
	Total	11	21	24	56
	A.	20	38	43	101
	B.	10	7	10	9

		NVC	NVD	WV	NS Total
unfinished			2		
unknown		3			
	Total	3	2	0	5
	A.	60	40	0	100
	B.	3	1	0	1
Grand Total		109	303	233	645
	A.	17	47	36	100
	B.	101	102	101	100

be made. Overall, as shown in the "Grand Total", 17 percent of the new spaces (new rooms and extended rooms) occurred in North Vancouver City, 47 percent in the District, and 36 percent in West Vancouver. Again at an overall level, these figures may be compared with certain of the broad socio-demographic characteristics of the north shore. (Table 13)

The development of new space in North Vancouver City is in precisely the same proportion as the number of single family dwellings in relation to the north shore. But this is markedly less than the proportion of population (25 percent). The difference is to be expected, however, for this is the municipality of the greatest growth in apartment construction. North Vancouver District, however, with 54 percent of the dwellings, has not 'kept pace' in adding new spaces in that only 47 percent of the north shore total is found there. In contrast, 36 percent of the new spaces are found in West Vancouver expansions, larger than its share of dwellings by the same magnitude of 7 percentage points as North Vancouver District is smaller. It is important to keep in mind that these data on new spaces refer to identified space use rather than to area. This emphasizes that the discussion refers to activity spaces, or functional space. Thus the expanded activity spaces in North Vancouver District are virtually identical in their proportion to the population there (48 percent), but run well ahead of the population proportion in West Vancouver, which is much closer to the proportion of single family houses there (29 percent). The directions of the relations thus contrast with each other and it would appear that in North Vancouver District there is a building response to pressures of people on space to a greater degree than is true in West Vancouver. In the latter the building activity would appear to be in response, to a greater degree, to perceived needs or desires for greater specialization of space.

The Bedroom Group of spaces overwhelmingly dominates expansions. The total

Table 13

NEW AND EXTENDED ROOMS BY ACTIVITY DESIGNATION
IN RELATION TO 1981 POPULATION AND NUMBERS
OF SINGLE FAMILY DWELLINGS

	NS	NVC	NVD	WV
New/Extended Rooms (%)	645(100)	109(17)	303(47)	233(36)
Population (%)	135,047(100)	33,952(25)	65,367(48)	35,728(27)
Single Family Dwellings (%)	33,550(100)	5,715(17)	18,265(54)	9,570(29)

number, 195, is more than twice the number in the second ranked group, Family Rooms for General Activity (94). In total, bedroom spaces accounted for 30 percent of all additions, and in each municipality the proportions were close to this mark, from 28 percent in North Vancouver District to 33 percent in West Vancouver.

In the next rank three activity groups are linked by their close proportionate importance, these being the Family Room Group: General Activity (15 percent), Bathroom Group (13 percent) and Public Room Group (12 percent). The general case for the north shore is then an alternation in importance between rooms for privacy and 'public' activity, the sequence being, as ranked, bedroom, family room, bathroom and public room. Bedrooms and bathrooms are often linked, of course, by proximity and/or exclusive association as in an en suite. There is a proportional development which may be suggested, therefore, that, for every two bedrooms added, one bathroom or en suite is also added. These of course are in addition to any existing bathroom facilities.

There is a proportionate difference to be noted among municipalities, that in North Vancouver City 33 percent of the added space is for bedrooms, a figure very close to that for West Vancouver, whereas the proportion is somewhat less, at 28 percent, for North Vancouver District. As proportions of the north shore (line A, Table 12), bedroom space in the City and West Vancouver are 19 percent and 39 percent respectively, while that for North Vancouver is 43 percent. North Vancouver District's emphasis is upon bathrooms (51 percent) to a greater degree than is the case in either of the other municipalities.

The Family Room Group for General Activity indicates a greater emphasis in the District (56 percent) than in either the City (14 percent) or West Vancouver (30 percent). These latter are also below the general norm for the north shore, while the former is higher. The greater proportion of young families in the

District would seem to help account for this difference, as would the ease with which such a general room is attached to an existing house there. Many houses there have attached carports, and these are easily enclosed. Further, carports are popular candidates for family room construction, for they are often adjacent to the kitchen and easily supervised.

The Public Room Group is most marked in its municipal distribution by its comparative emphasis (21 percent) in North Vancouver City. The large number of small houses in the City makes this emphasis understandable, for houses from the pre-television era which have little extra space in them can be very restrictive. The case studies which follow illustrate in several of them the need for more public room space.

The third rank of activity space groups includes the Utility Group (9 percent of all new space), the Kitchen Group, the Hallway and Entrance Group (7 percent) and the Family Room Group for Specialized Activity. The values for these, and the respective rankings by municipality, may be inspected in Table 12 and described in the same way as the more important categories referred to above. It will suffice here to make some general observations.

To provide a hallway, or to enlarge one, is to increase the house in such a way as to augment and improve its space for hanging clothing, receiving guests, and blocking drafts from reaching other rooms. But a basic house needs no hallway, as the numerous worker cottages, all over Canada, with entries directly into their living rooms, attest. This space when added, and while not absolutely necessary, is a mark of 'home improvement'. The slightly elaborate terminology chosen for this space by some householders, as shown in Table 12, gives a hint that in the scheme of household spaces there is status associated with hallways and entrances.

All houses have kitchens, and so to enlarge a kitchen is also to improve the house, perhaps by allowing for eating to occur there if the kitchen before were too restricted. Given the present tendency for small houses to be discussed in the design field (see Appendix 2 on the HUDAC home), and so the restriction of cooking spaces to small efficiently laid out bar counters or U-shaped counters, the enlargements of kitchens, as documented in this study, may be regarded as a measure of the increase in living standard pursued in and by the single family household. Having said this one wonders why more kitchens are not expanded, for the kitchen seems increasingly to be the central room of the home and is often regarded to be both a public and private space. In fact there is a great deal of attention being paid to kitchens, although not all of it is expressed in their enlargement, the factor which can be measured here. But the gutting and redesigning of kitchens not only renews the equipment and furnishings; they often also make the layout more efficient and roomy and therefore the renovations have the effect of an expansion.

In utility additions the dominant space need is for storage. This point is developed in relation to children and their needs in a later section, but one is struck that the need of space to accommodate possessions is so strong. One might ask whether this is simply a transferred need when a space consuming activity, such as playing table tennis, occupies a room which otherwise could be used for storage. But this is doubtful. For the central space of such a room would not in all probability be devoted to storage anyway, for storage spaces tend to be closed off from the normal activity areas. Thus the reason for the need for more space seems to be in response to a greater quantity of possessions. Certainly as the household matures its accummulation of goods increases, and this would correspond with the growth in the family. Thus the emphasis on storage is consistent with findings, discussed later, regarding household maturation.

The material presented here shows some general consistency, the best example being that the Kitchen Group of expansions are spread across the three municipalities in almost exactly the same proportions as are all expansion groups taken together. (Line A comparison for Kitchen and Grand Total). The greatest departure from this pattern is in the City's small emphasis on Family Room Group for Specialized Activity, the District's lack of emphasis on bathrooms but enthusiasm for family rooms for general purposes, West Vancouver's opposite tendency in family room construction but its comparatively great emphasis on utility functions, specifically storage space. Perhaps the municipal departures from the north shore standard are notable mainly for their modest proportions, however, suggesting that the way of life, as expressed in the specific construction of activity spaces is more uniform than differentiated. What would be of further interest would be the changes that might emerge in these proportions over a period of time; for these, in turn, would herald changes in the evolution of housing landscapes.

BUILDING OR ARCHITECTURAL COMPLEMENTS

Data on building complements were developed by recording notes from architectural and building drawings with a view to describing the various building forms used in expansion projects.

A building or architectural complement may be defined as the physical addition which is built on a house in order to effect an expansion of living space. It is restricted here to refer to enclosed heated space, and the chief concern of this section is with the forms of these additions. The forms are also related here to the spatial increases in house sizes.

Drawings for all sample expansions were inspected and a typology of building complements was thus empirically derived. The guide given in Table 14, with pictographic illustration, eventually became the set of ground rules by which the forms of expansion were identified and classified. This guide, then, is also a Classification of Building or Architectural Complements.

It was felt that for present purposes it was not necessary to develop rules of priority for recording types, for the problems which have arisen in the application of this scheme were minor. But to illustrate: a conflict would appear in a case where a "two storey wing" might be built (see Table 15 for sub-types). Should this be included under "wing" (B 4), or under "tower of attached rooms" (C 9)? While it could be argued that the plan form should take priority over vertical space, in this case the volume of heated space enclosed is large relative to the amount of land occupied, and so the expansion would be classified as C 9, a "tower of attached rooms". In fact such conflicts proved to be rare, and were resolved in favour of what appeared to be the most important factor. If such cases had been common, other sub-types would have been created. Thus it may be claimed that for these communities, at least, the classification represents a full typology of building addition forms.*

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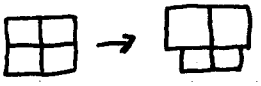
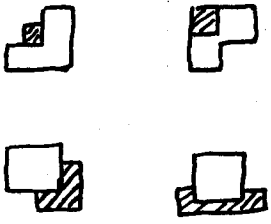
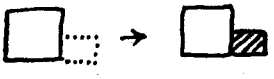
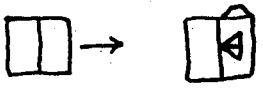
* The classification was originally developed for the first phase of this work, reported to CMHC in September, 1982. It has been modified here by the additions of two further types, one each in Category C and E.

TABLE 14 TYPES OF BUILDING (ARCHITECTURAL) COMPLEMENTS

Complement type	Plan Form	Remarks
Storey		- basement or upstairs
Wing		- to create L shape or corner wing -three outside walls
Rooms attached		- three outside walls
Expansion of existing rooms		- former outside walls removed
Corners		- inner corner fill-in, 2 outside walls; outer corner fill-in, 2 outside walls; outer corner wrap-around, 4 sides outer walls; outer corner wrap-around 5 sides
Enclosure of previously defined space		- enclosure of sundeck, patio, carport etc.
Roof and side detail		- addition of dormer and bay window
Miscellaneous		- connector to outbuilding - general case would be to enclose space between carport, garage, etc.

Modifications to the classification could be suggested. For example, type C 10, "tower of rooms attached with part of upper floor overhanging carport or other open space", has only six occurrences on the north shore out of 78 for the C category as a whole. Perhaps C9 and C10 should be combined. This was considered but rejected because the building form itself is distinctive. In modern coastal houses large overhangs of various sorts are common; and the mildness of the winters and comparatively low cost mean that carports are probably more common than garages. To combine the protection of a carport with a multi-storey expansion is, therefore, not only ingenious but also simply sensible. Protection for more than a car is offered in a carport (bicycles, garden equipment, deep freezes, etc.) and the space is cheaper to provide than a garage. Further, there are more subtle things involved: the convenience of a dry entry to the house, often directly into the kitchen; an outdoor sheltered play space which is easily supervised; and the boxy look of some expansions involving overhang space, which look is felt by some to be pleasing. These considerations have informed certain judgements in developing the classification.

The classification itself has seven major categories, with a miscellaneous category added to these. The lack of entries under "Miscellaneous" implies both the fullness of the classification and the finite nature of the types of expansion. With regard to the latter, although wood frame construction is flexible and 'plastic', it appears that there is only a limited number of acceptable expansion types. This limit would be related perhaps to a number of influences, among them being: (a) a limited need for extra space, both as to type and amount. In the discussion of room functions the point is developed that the way of life to be housed does not seem to be diversifying and, if it is, it is accommodated in general purpose spaces. Without the imperative to create new forms of specialized space, the upper limits to space demand,

and so space forms, will be apparent. (b) structural limitations of the existing house in the absence of major and costly modification. The assumption that there is a fairly constant square foot price for additions is widely held, and cost estimates are commonly based on this; certainly they are so based by municipal building inspectors. Thus there is a built-in assumption that projects will generally not proceed beyond a certain degree of complexity for, to do so, "would not be worth it". (c) zoning limitations specified in the by-laws.

I. Patterns of Building Complements

Data accompanying the classification (Table 15) show in Column I the frequency of occurrance, by absolute and proportionate (percentage) figures, of expansions in each category and sub-category. Although there is some variation in emphasis by municipality, certain categories are clearly more dominant than others. The general situation, as shown for the north shore, indicates that the top two categories are "Rooms Attached to Existing House" and "Wing", the overall most important sub-type being a simple wing (B4) with 47 of the 68 occurrences in this category. With 32 of the 78 occurrences in "Rooms Attached", the simple case (C7) is predominant. These sub-types are morphologically similar and relatively simple to design and build, and thus it is perhaps no surprise that they should occur so frequently.

Category F, the enclosure of previously defined space, ranks third. This is felt to be a distinctive and important category for it reflects work undertaken within dimensions which have been identified previously, and it represents a connection between outdoor and indoor living spaces. The pre-existence of an outdoor space which is well defined, such as a sundeck, and the habit of seasonal use of this space, would have already transformed such areas into living space at some stage prior to an expansion. There is thus a sense in which to enclose the space is merely to complete a process which has been in

TABLE 15

CLASSIFICATION OF BUILDING (ARCHITECTURAL) COMPLEMENTS: NORTH SHORE

Building Complements		I										II			
												Ratio of House Size Increase			
		75	76	77	78	79	80	81	82	T	%	.845+	.445+	.095+	.094-
		frequency										frequency			
A. STOREY	1 storey		5	1	5		2	1		14		7	1	4	2
	2 half storey or less	3		3	2	3	2			13			2	8	
	3 basement i house raised	1	1	1						3		2			
	ii excavated or extended	1								1				1	
										31	10	9	3	13	2
B. WING	4 wing (three outer walls)	7	6	7	12	8	5		2	47			4	26	10
	5 wing over carport or other space	1	4	1	1	2		1	1	11				3	8
	6 two storey wing	4	1	1	1	1	2			10		2	5	2	1
										68	22	2	9	31	19
C. ROOMS ATTACHED TO EXISTING HOUSE	7 rooms attached (3 or more outer walls)	7	3	4	6	6	5		1	32		4	6	13	4
	8 rooms attached over carport or other space	6	3	2		3	5			19			1	12	4
	9 tower of room att'd (2 or 3 storey)	2	3	3	5	3	5			21		6	7	3	2
	10 ditto with part of upper floor overhanging carport	1	1	2	1	1				6		1		3	
										78	25	11	14	31	10
D. EXPANSION OF EXISTING ROOMS	11 expansion under overhang of roof		1				1			2				1	
	12 expansion beyond overhang of roof	3	1	4	2	1				11				3	5
	13 ditto & itself overhanging carport etc.	2			3		1			6				2	4
	14 2 storey extension under overhang	1								1					1
										20	7	0	0	6	10
E. CORNER DETAIL	15 inner corner fill-in (2 outer walls)		4	3	1	4	2			14				6	6
	16 outer corner fill-in (2 outer walls)	2		2	4	2	1			11			1	2	6
	17 outer corner wrap-around		1		4	1	2			8			3	2	3
										33	11	0	4	10	15
F. ENCLOSURE OF PREVIOUSLY DEFINED SPACE	18 enclosed carport or gargage	5	1	4	3	4	2			19				13	4
	19 enclosed sundeck or verandah or patio	1	2	7	2	4	2	1		19				3	10
	20 enclosed sundeck over carport or open space	1					3			4				1	3
	21 enclosed entry under roof overhang	2					1			3					1
	22 enclosed entry beyond overhang (new roof)		1	1						2					1
	i room added on top of existing room below						1			1					
	ii room added under existing sundeck						1			1					1
										49	16	0	0	17	20
G. ROOF & SIDE DETAIL	23 dormer	5	3	3	1	2				14				4	4
	24 bay window	2	1	2	1	1	1			8					3
										22	7	0	0	4	7
H. MISCELLANEOUS	25 connector to outbuilding	2	1		1				1	5		1			1
										5	2	1	0	0	1
TOTAL		59	43	51	55	46	44	3	5	306	99	23	30	112	84 249
%		19	14	17	18	15	14	1	2		100	9	12	45	34 100

TABLE 15

CLASSIFICATION OF BUILDING (ARCHITECTURAL) COMPLEMENTS: CITY OF NORTH VANCOUVER

Building Complements		I 75	76	77	78	79	80	81	82	T	%	II .845+	.445+	.095+	.094-
		frequency										frequency			
A. STOREY	1 storey		2		3			1		6		3			2
	2 half storey or less														
	3 basement i house raised		1							1					
	ii excavated or extended	1								1				1	
										8	15	3	0	1	2
B. WING	4 wing (three outer walls)	1		1	2	2	1		2	9				6	3
	5 wing over carport or other space		1		1			1	1	4					4
	6 two storey wing					1				1				1	
										14	27	0	0	7	7
C. ROOMS ATTACHED TO EXISTING HOUSE	7 rooms attached (3 or more outer walls)	2				1	1		1	5			1	2	1
	8 rooms attached over carport or other space														
	9 tower of room att'd (2 or 3 storey)				3		1			4		1	1		
	10 ditto with part of upper floor overhanging carport														
										9	17	1	2	2	1
D. EXPANSION OF EXISTING ROOMS	11 expansion under overhang of roof														
	12 expansion beyond overhang of roof	1								1					
	13 ditto & itself overhanging carport etc.														
	14 2 storey extension under overhang														
										1	2				
E. CORNER DETAIL	15 inner corner fill-in (2 outer walls)					1				1				1	
	16 outer corner fill-in (2 outer walls)	2			4					6			1	2	2
	17 outer corner wrap-around					1				1			1		
										8	15	0	2	3	2
F. ENCLOSURE OF PREVIOUSLY DEFINED SPACE	18 enclosed carport or gargage														
	19 enclosed sundeck or verandah or patio		2	2		1	1	1		7				2	2
	20 enclosed sundeck over carport or open space														
	21 enclosed entry under roof overhang														
	22 enclosed entry beyond overhang (new roof)														
	i room added on top of existing room below						1			1					
	ii room added under existing sundeck						1			1					1
										9	17	0	0	2	3
G. ROOF & SIDE DETAIL	23 dormer	1		1						2				1	1
	24 bay window														
										2	4	0	0	1	1
H MISCELLANEOUS	25 connector to outbuilding								1	1					
										1	2	0	0	0	0
TOTAL		8	6	4	13	7	6	3	5	52	99	4	4	16	16 40
%		15	12	8	25	13	12	6	10		101	10	10	40	40 100

TABLE 15 CLASSIFICATION OF BUILDING (ARCHITECTURAL) COMPLEMENTS
NORTH VANCOUVER DISTRICT

Building Complements		I. 75	76	77	78	79	80	T	%	II. Ratio of house size increase .845+	.445+	.095+	.094-
		frequency								frequency			
A. STOREY	1 storey		3	1			1	5		1	1	3	
	2 half storey or less	1		2		2	1	6			2	3	
	3 basement (house raised)	1		1				2		2			
								13	9	3	3	6	0
B. WING	4 wing (four outer walls)	4	4	3	8	1	4	24			2	16	4
	5 wing over carport or other open space	1	2					3				1	2
	6 two storey wing	1		1			1	3			2		1
								30	21	0	4	17	7
C. ROOMS ATTACHED TO EXISTING HOUSE	7 rooms attached (three outer walls)	2	2	2	2	3	3	14		2	4	6	1
	8 rooms att. over carport or other space	5	1	2		1	5	14			1	8	3
	9 tower of rooms att'd. (2 or 3 storey)	2	2	3	2	3	4	16		4	6	3	2
	10 ditto with part of upper floor overhanging carport	1	1	2	1			5		1		3	
								49	35	7	11	20	6
D. EXPANSION OF EXISTING ROOMS	11 expansion under overhang of roof							0					
	12 expansion beyond overhang of roof	2			1			3				1	2
	13 ditto & itself overhanging carport etc.	1			2			3					3
	14 2 storey extension under overhang	1						1					1
								7	5	0	0	1	6
E. CORNER DETAIL	15 inner corner fill-in (2 outer walls)		1		1	2	2	6				2	4
	16 outer corner fill-in (2 outer walls)					1		1					1
	17 outer corner wrap-around		1		3		1	5			2	2	1
								12	9	0	2	4	6
F. ENCLOSURE OF PREVIOUSLY DEFINED SPACE	18 enclosed carport or garage	5	1	3	2	2	2	15				10	3
	19 enclosed sundeck or verandah or patio			1	1	3	1	6					4
	20 enclosed sundeck over carport or open space						1	1					2
	21 enclosed entry under roof overhang	2						2					
	22 enclosed entry beyond overhang (new roof)							0					
								24	17	0	0	10	9
G. ROOF AND SIDE DETAIL	23 dormer	1		1		1		3					1
	24 bay window	1	1				1	3					1
								6	4	0	0	0	2
H. MISCELLANEOUS	25 connector to outbuilding		1					1					
								1	1	0	0	0	0
Total		31	20	23	23	19	27	142	101	10	20	58	36	124
%		22	14	16	16	13	19		101	8	16	47	29	100

TABLE 15 CLASSIFICATION OF BUILDING (ARCHITECTURAL) COMPLEMENTS
WEST VANCOUVER

Building Complements		I. 75	76	77	78	79	80	T	%	II. Ratio of house size increase .845+	.445+	.095+	.094-
		frequency								frequency			
A. STOREY	1 storey				2		1	3		3		1	
	2 half storey or less	2		1	2	1	1	7				5	
	3 basement (house raised)							0					
								10	9	3	0	6	0
B. WING	4 wing (four outer walls)	2	2	3	2	5		14			2	4	3
	5 wing over carport or other open space		1	1		2		4				2	2
	6 two storey wing	3	1		1		1	6		2	3	1	
								24	21	2	5	7	5
C. ROOMS ATTACHED TO EXISTING HOUSE	7 rooms attached (three outer walls)	3	1	2	4	2	1	13		2	1	5	2
	8 rooms att. over carport or other space	1	2			2		5				4	1
	9 tower of rooms att'd (2 or 3 storey)		1					1		1			
	10 ditto with part of upper floor overhanging carport					1		1					
								20	18	3	1	9	3
D. EXPANSION OF EXISTING ROOMS	11 expansion under overhang of roof		1				1	2				1	
	12 expansion beyond overhang of roof		1	4	1	1		7				2	3
	13 ditto & itself overhanging carport etc.	1			1		1	3				2	1
	14 2 storey extension under overhang							0					
								12	11	0	0	5	4
E. CORNER DETAIL	15 inner corner fill-in (2 outer walls)		3	3		1		7				3	2
	16 outer corner fill-in (2 outer walls)			2		1	1	4					3
	17 outer corner wrap-around				1		1	2					2
								13	12	0	0	3	7
F. ENCLOSURE OF PREVIOUSLY DEFINED SPACE	18 enclosed carport or garage			1	1	2		4				3	1
	19 enclosed sundeck or verandah or patio	1		4	1			6				1	4
	20 enclosed sundeck over carport or open space	1					2	3				1	1
	21 enclosed entry under roof overhang						1	1					1
	22 enclosed entry beyond overhang (new roof)		1	1				2					1
								16	14	0	0	5	8
G. ROOF AND SIDE DETAIL	23 dormer	3	3	1	1	1		9				3	2
	24 bay window	1		2	1	1		5					2
								14	13	0	0	3	4
H. MISCELLANEOUS	25 connector to outbuilding	2			1			3		1			1
								3	3	1	0	0	1
Total		20	17	25	19	20	11	112	101	9	6	38	32 85
%		16	14	20	15	16	18		99	11	7	45	38 101

Note: the figures for 1980 are for the first six months only.

progress for a period of time. This is not intended to overstate the case and to suggest that all sundecks and carports or other such spaces are destined to be enclosed. But for those pre-defined spaces which do happen to be enclosed at some time, it is felt that the form which results is often determined by the pre-existing outline. The creation of a patio or deck at some stage seems to make the property suggestible to further development at a later stage. The behavioural side of this would be an established, albeit seasonal, circulation pattern which the new construction would not disturb but merely enclose and so make possible in indoor form.

Table 16 indicates the ranking of categories of building complements by municipality, and for the north shore, by their proportionate frequency of occurrence as shown in Table 15. The purpose of this derivative table is to show diagrammatically the differences among the three municipalities in the emphases on different building complements. The overall impression is one of consistency, with a few notable changes. The top three categories B, C, F are in a linked grouping of their own. The second major group includes A, E, G and D, while H ("Miscellaneous") is on its own. It might be argued that the second group should be sub-divided into A and E, and G and D. The difference in emphasis between North Vancouver District and West Vancouver in respect of A and G is interesting, for A refers to major expansions of storey proportions whereas G refers only to what is essentially detail, some of it perhaps more decorative than functionally necessary. This evidence of building form emphasis may be kept in mind when the social and demographic characteristics of the sample population are discussed below. The proximity of types A and E in both the North Vancouvers is not surprising, because, although category E is termed "Corner Detail", the amount of space involved can be considerable, and thus these do not necessarily constitute minor or decorative work.

Table 16 IMPORTANCE BY RANK OF TYPE OF BUILDING COMPLEMENT

North Shore

Type	Percentage occrrence	NVC	NVD	WV
C	(25)	B(27)	C(35)	B(21)
B	(22)	*F(17)	B(21)	C(18)
F	(16)	*C(17)	F(17)	F(14)
E	(11)	*A(15)	A(9)	G(13)
A	(10)	*E(15)	E(9)	E(12)
G	(7)	G(4)	D(5)	D(11)
D	(7)	D(2)	G(4)	A(9)
H	(2)	H(2)	H(1)	H(3)

Letters correspond to building complements as identified in Table 15. Rank is determined by proportionate (percentage) frequency of occurrence. Ties which cannot be broken by reference to the actual frequencies are marked with an asterisk.

Certain categories may have interrelations among them. For example, C8, "Rooms attached over carport or other open space", may be close in effect to F20 "Enclosure of sundeck over carport or other open space". These are separate, however, because in C there were no prior spatial forms to give a hint as to the benefits of additional space enclosure such as there were in F. The potential offered by the forms created and classified here in F had to be conceptualized completely in advance in the minds of homeowners or the designers they retained. Interestingly enough, sundecks were sometimes included in the construction of additions in C, although they are not recorded here, and sometimes new sundecks were built in cases recorded in F in order to preserve the sundeck space at the same time that the former sundeck became part of heated and enclosed space. Thus the question of seasonal living space again arises. Attributes of climate, especially hours of sunshine would be important in any understanding of seasonal living space, as would be the questions of aspect, orientation and views. To what extent can space used seasonally for living be considered as additions?

Other relations may also be seen, for example between A and G where a dormer has been considered a "detail" if it did not express a major, half-storey expansion. And Category D, listing the expansion outwards of existing rooms, can be seen to connect in practice with room additions (C), corner details (E), wings (B), enclosures (F), and with both dormers and bay windows (G). On the drawings, however, except for specific forms such as bay windows, D type expansions involve enlargement based dimensionally on structural dictates of existing spaces and bearing walls, and are an easily identified general type designed merely to provide more space rather than unique forms.

II Building Complements and Spatial Expansion

Turning to the question of area, or floor space, the data in Column II show the percentage area changes by building complement and by category type in the classification. These data are generalized into four broad ranges from the ratios of additions to pre-expansion house areas. (Table 11) The ranges shown differentiate the largest and smallest additions, over 90 percent and under 10 percent, and split the main distribution at the 50 percent increase mark. Because there may be more than one architectural or building complement type in one project, Columns I and II are not directly comparable as to quantities shown.

The largest projects involve the fewest cases. Nine percent of north shore additions increased their living space by 90 percent or more. By extrapolation it may be seen that some 230 projects over the six years of this study have virtually doubled their living areas. In contrast, the largest group of projects, 45 percent representing about 1,120 cases, added between 10 and 50 percent extra space. And fully a third (34 percent) added less than 10 percent. Thus quite a lot of the projects, perhaps more than half of them, could be described as being modest to minor in terms of the extra space they provide in proportion to what was already in existence. This is important for, in the later discussion regarding pressures to expand, there is some suggestion that certain of these pressures are not to be denied and must find release in extra built space. Certainly the creation of a bedroom for an extra child seems like an essential step in some cases, but it is not necessarily a major one in spatial terms. It may, however, be a major step in terms of the relief provided by such space for the increase in privacy. Thus the social and behavioural meaning of additional space will vary from household to household and, more broadly, among types of households and communities.

SPATIAL DISTRIBUTIONAL CHARACTERISTICS

Throughout this discussion the results of investigations have been presented on a municipality basis for comparative purposes, and for the north shore as a whole. The comparative approach is traditional but important, for it allows characteristics of the phenomena under enquiry to be seen in terms of units which are familiar and potentially useful, and in a context well understood as having community (social and political) validity. Such a breakdown not only has advantages, however, but it also has disadvantages. For many purposes a finer spatial breakdown, with some attention being paid to the rational development of spatial units for comparison, would be desireable.

Some time was fruitlessly expended in January and early February attempting to make use of the Census geocode system. In the end the appropriate material could not be made available and an alternative system was used. This system lies behind the construction of the maps in this section.

The system may best be described as one employing isopleths to demonstrate spatial variability. It was decided to generalize the data on the basis of a 'neighbourhood' area size, here defined as an area of one mile diameter. Such an area has its best approximation to neighbourhood sizes in the more densely settled central areas, but it is a reasonable and easily understood approximation of a neighbourhood area across the north shore as a whole. Some confirmation for this comes from the results of the questionnaire survey in which neighbourhoods are identified by respondents. Elementary schools in the central areas are also approximately one mile apart.

Data are first plotted on the map and are then spatially generalized by averaging values within an area of one mile radius and plotting this average on a regularly spaced grid of points arranged as a triangular lattice. This

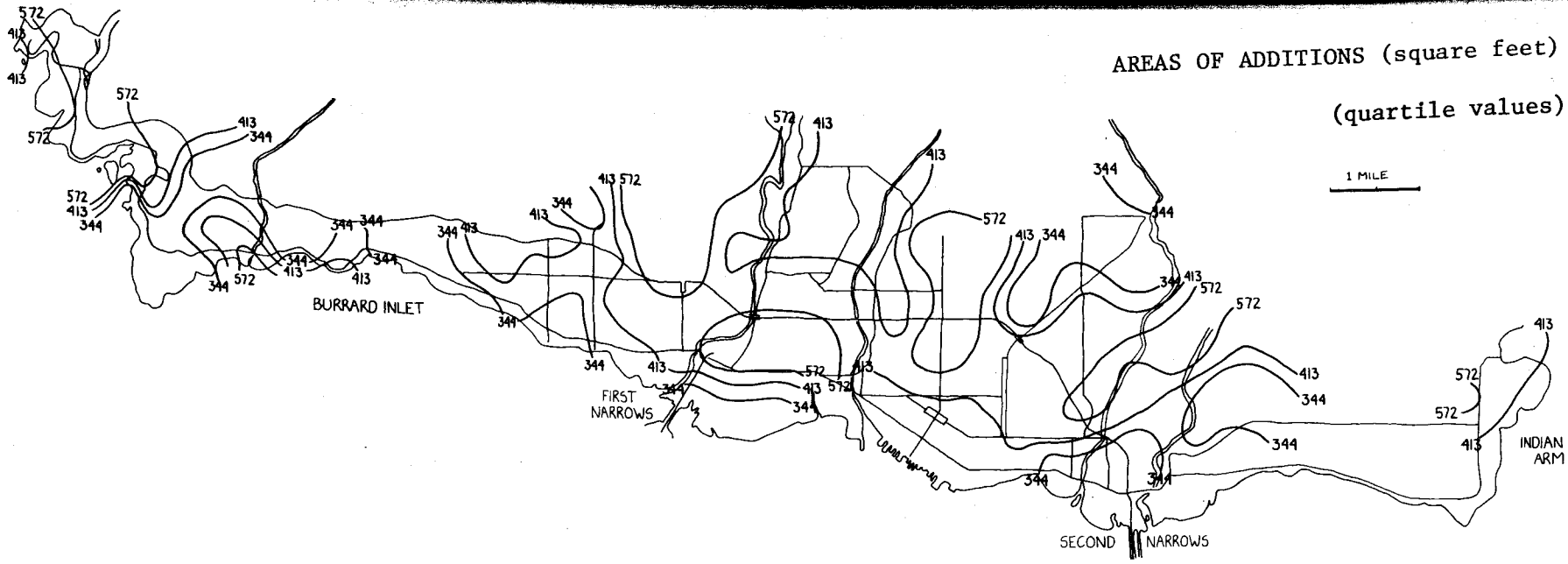
distribution of points then forms the basis for drawing isopleths, the values of which represent quartiles of the grid point values (excepting the age of dwellings map for which decades are shown). The resulting maps thus represent statistical surfaces which may be interpreted in the same way as contour maps. The specific advantage of this form of map is that it shows spatial variability independently of data collection units (municipality, census tract etc.) and to a uniform level of spatial accuracy. Thus, unlike many choropleth maps, one part of the map may be compared with another part with no loss of accuracy due to an unstable areal basis of data collection.

Turning to the maps themselves, it may be seen that the forms of isopleths indicate certain 'peaks', 'valleys', 'ridges' and 'hollows'. It is the comparison of this 'topography', from map to map which yields distributional insights internal to the north shore taken as a whole. The present age of dwelling map shows, in generalized form but accurately, the distribution of houses by age, as expressed in decades. This is purely descriptive and as expected the largest area of concentration of older houses (more than 30 years) is in the lower City. It is important to keep in mind that these houses represent those undergoing expansion rather than being a cross-section of all houses. But the general pattern of age for all houses would not in all probability be very different from that shown except in isolated occurrences such as in Deep Cove, on Indian Arm, where it appears the enlarged houses are dominated by very old cabins. The second area of older houses is just to the west of the First Narrows, in lower Ambleside. What is interesting is that these two concentrations are not isolated from each other but are joined by a band of houses of the same age which were built up the slopes and linked up across the Capilano River about two miles upstream from its mouth. This includes the lower British Properties and their 'opposite number' developments

in North Vancouver District and City. Moving away from this band of older houses, the housing gets progressively younger, whether upslope to the north, or to the west and east. A later development in the lower Capilano also stands out as marked by the 25 year closed isopleth, this representing a form of district 'infill'. The remainder of the map also shows patterns of housing by age but this central area isopleth formation is the dominant feature.

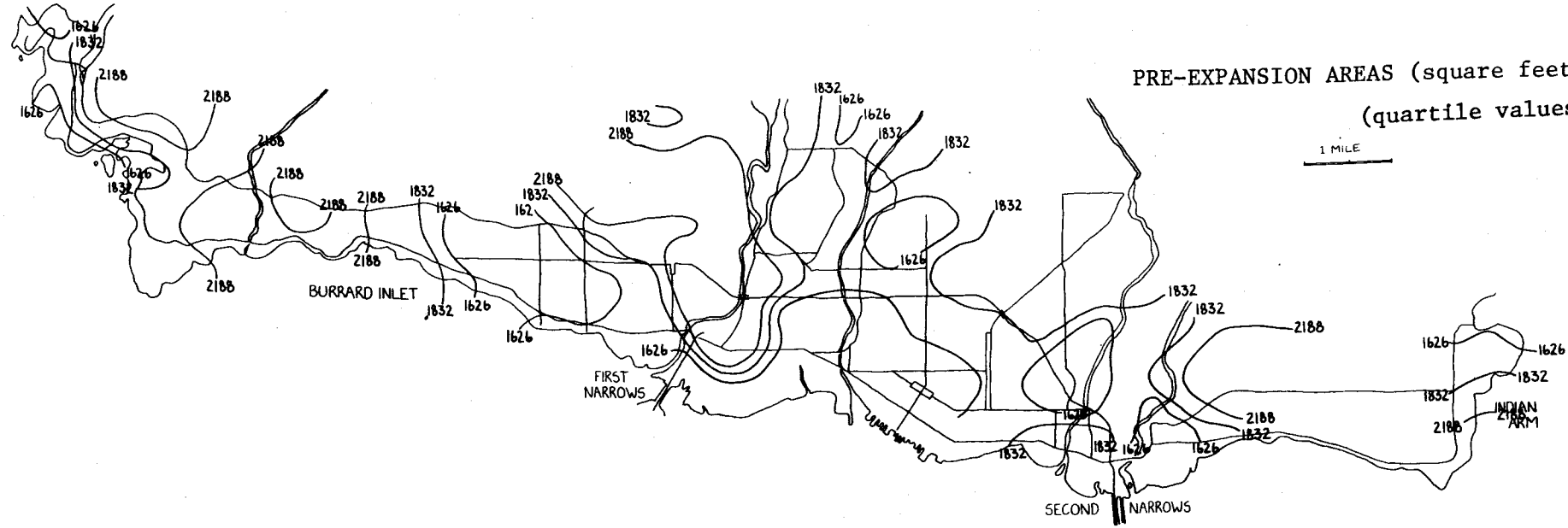
Turning to the pre-expansion area map one may note the general correlation of the older house areas with smaller houses, and the areas of larger houses in some areas correspond with newer houses. This is particularly obvious in the newer British Properties developments. But the relationship is by no means absolute and in fact one would not expect that age of house would always correspond to size. A comparison of the pre-expansion size map with the area of addition map brings out the fact that the relationship is in both directions, that is, larger houses have larger expansions on the one hand and they have smaller expansions on the other hand. A preliminary statistical correlation between the grid values of the two maps is thus suitably ambiguous ($r = -0.07$), and simply shows in this case the inadequacy of the statistical measure of association to bring out the spatial relationships. It is the maps themselves which portray the spatial variability and correspondences.

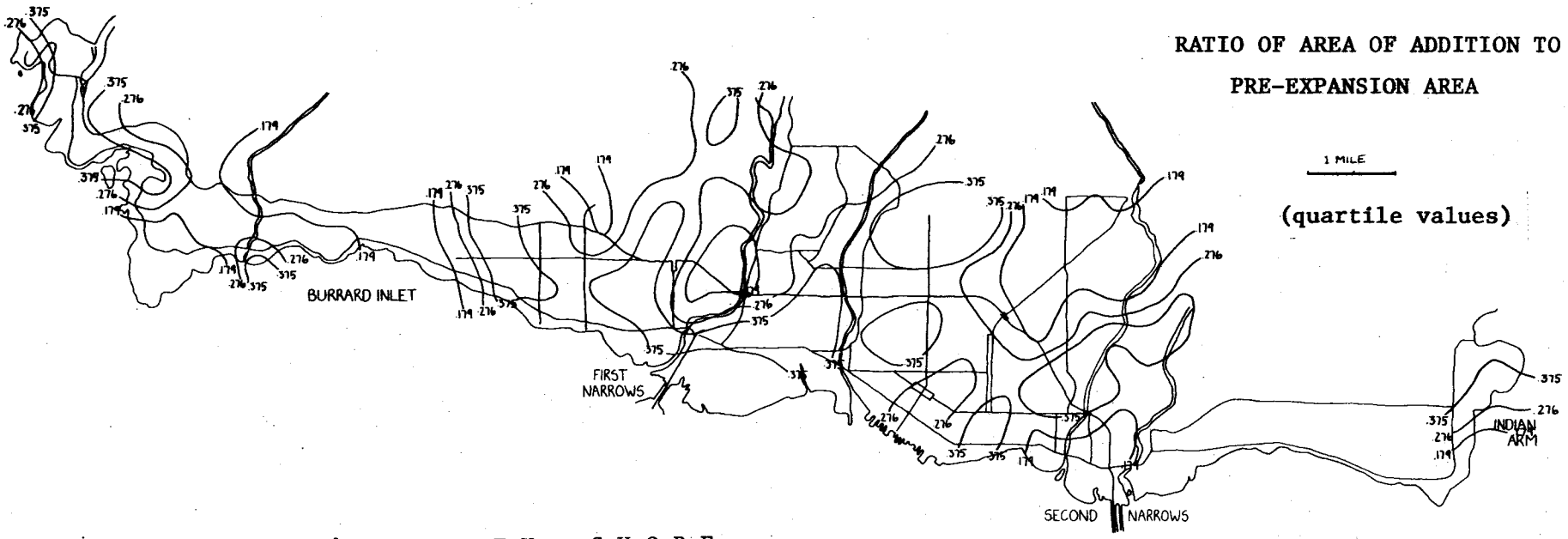
This also may be seen in the map of ratios of areas of addition to pre-expansion areas. The newer, larger houses of the lower Capilano River area are picked out here by the isopleths as having large additions but low ratios, while the opposite is true in the far western portions of West Vancouver where large areas of additions correspond to high ratios. The pattern of the central area is interesting, however, because a 'circle' of high ratios may be seen to be emergent around the low ratio area of the lower Capilano, this form emphasizing a shape which is characterized by some congruity with the



VANCOUVER'S NORTH SHORE

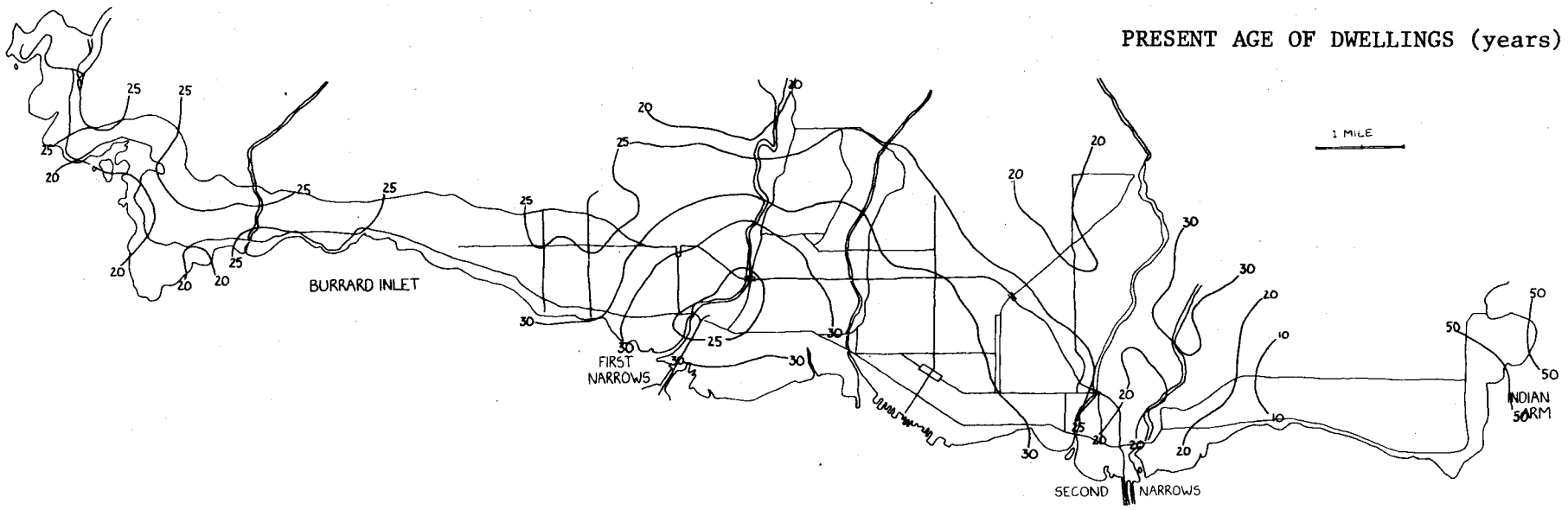
Figure 8





VANCOUVER'S NORTH SHORE

Figure 9

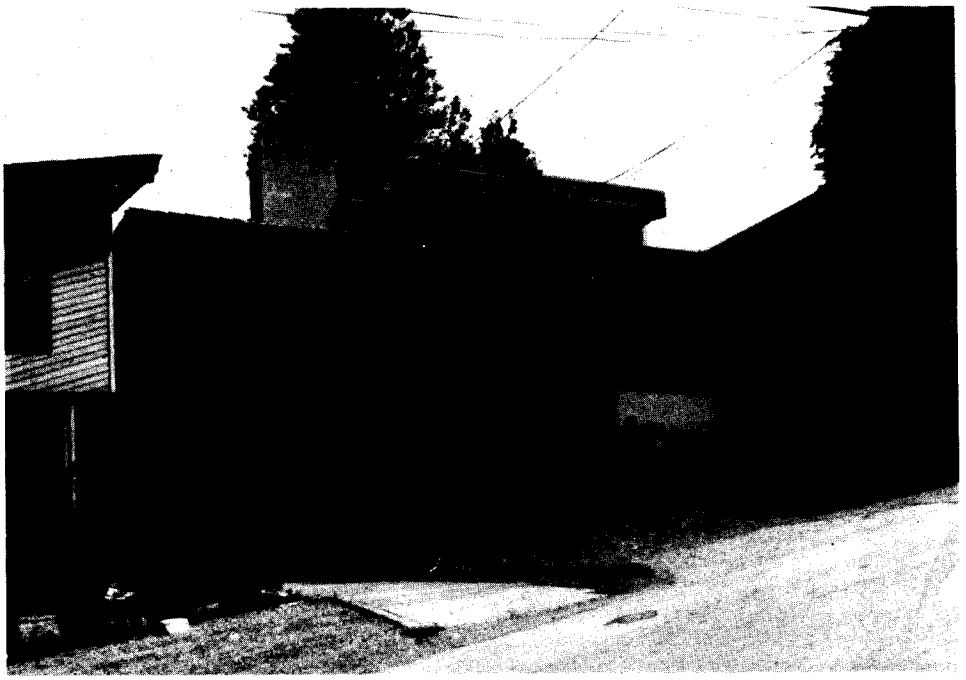


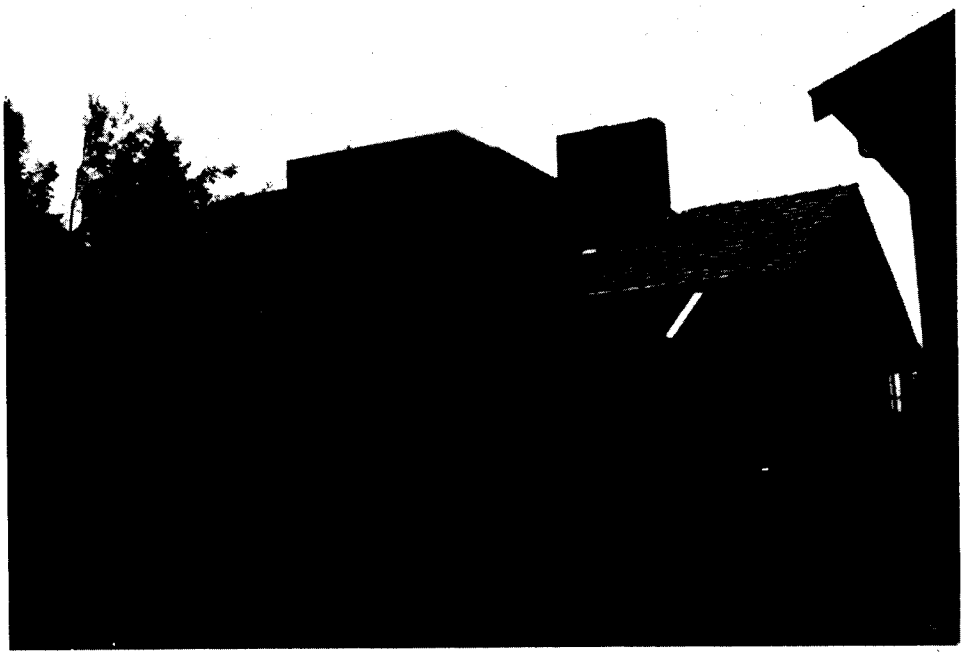
age of dwelling map.

These maps demonstrate that there are spatial expressions of the phenomena under study which pick out certain underlying urban structures. There is an alternating pattern of high ratios in the central north shore areas, these forming a pattern of high 'ridges' around a 'depression' of the lower Capilano. To the west, (West Bay, Caulfeild) and to the east (Lynn Valley and lower Seymour) areas of low ratios flank this central area, and at the western and eastern extremities both high and low ratios may be found. These extremes are somewhat unreliable in that they both represent patterns of suburbanization of older pre-existing villages whose houses have been expanded and improved on what amounts to a piece-meal basis. But the general patterns focussed on the central north shore are quite marked.

PART II

ILLUSTRATIONS



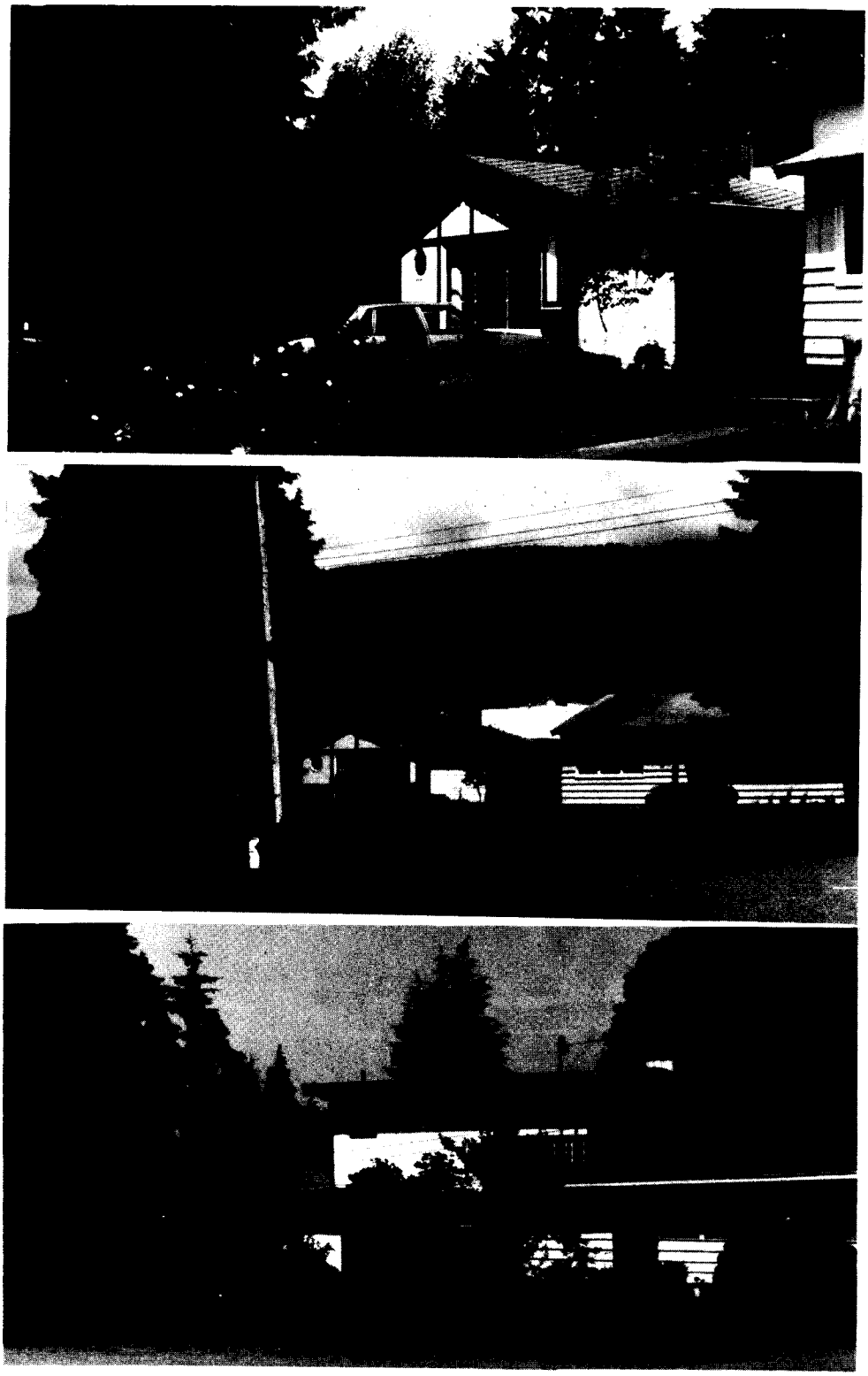


South-facing upstairs addition of master bedroom, bathroom and sauna, front and rear views. Detailing, such as in the railing, help to integrate the addition with the pre-existing house, the character of which is seen on the left. Small sloping roof extensions, both front and rear, extend over small extensions on the main level which form a 'pediment-like' base to the new upstairs. Internal modifications were necessary to accommodate stairs.

Illustration 1

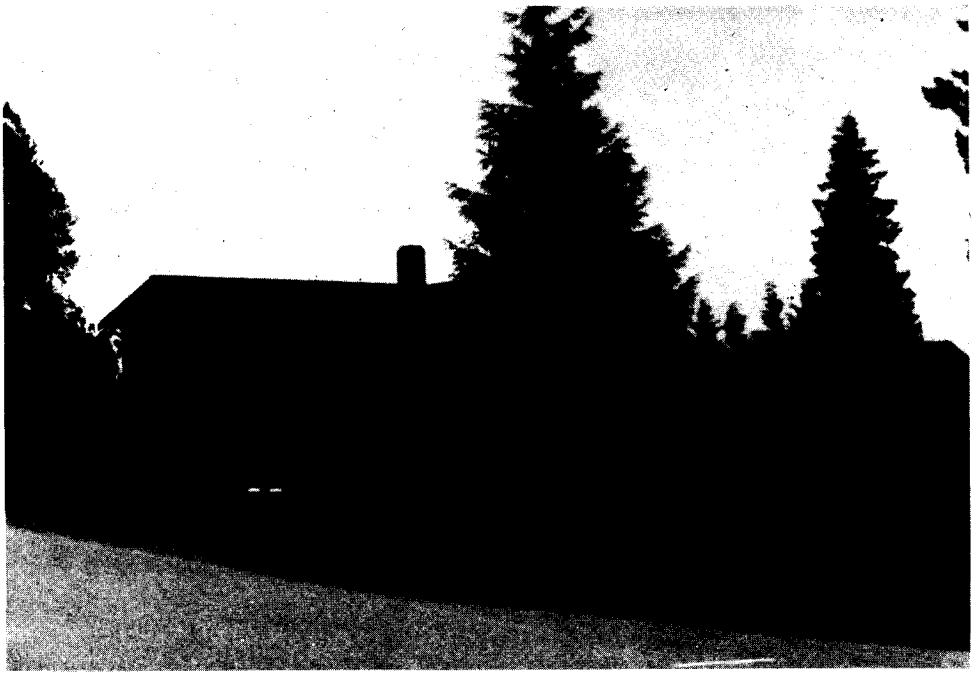
"Pre-defined" spaces for additions. The sun deck over an open but protected space. Both spaces are part of the accommodation of the household activity patterns, especially seasonally. The lower illustration shows the further 'progression' to the stage of a solarium, useful for sitting in winter, over an enclosed garage, and adjacent to a protected porch for summer sitting. The roof is of flimsy translucent material, and drapes may be seen on the left.

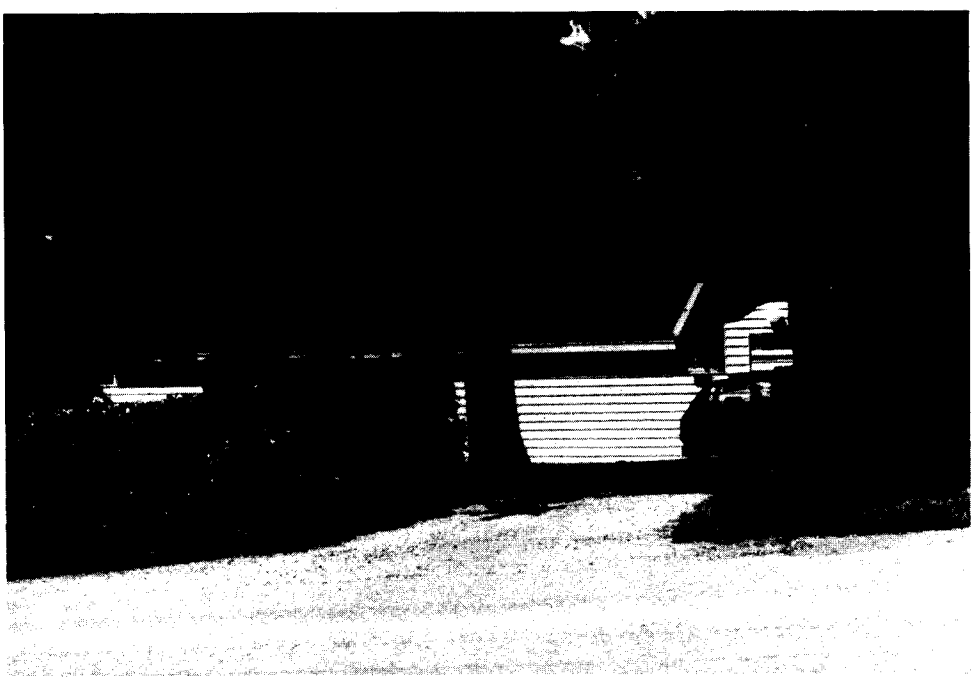
Illustration 2



The close-up of the house front shows a small bungalow with a two-storey addition behind. (A dark roof with skylight, behind, represents a half-storey expansion by the neighbour, this too being part of the sample of this study.) The middle picture shows the size and style imbalances of the original house and its addition. The side view (bottom) looks across the neighbouring yard.

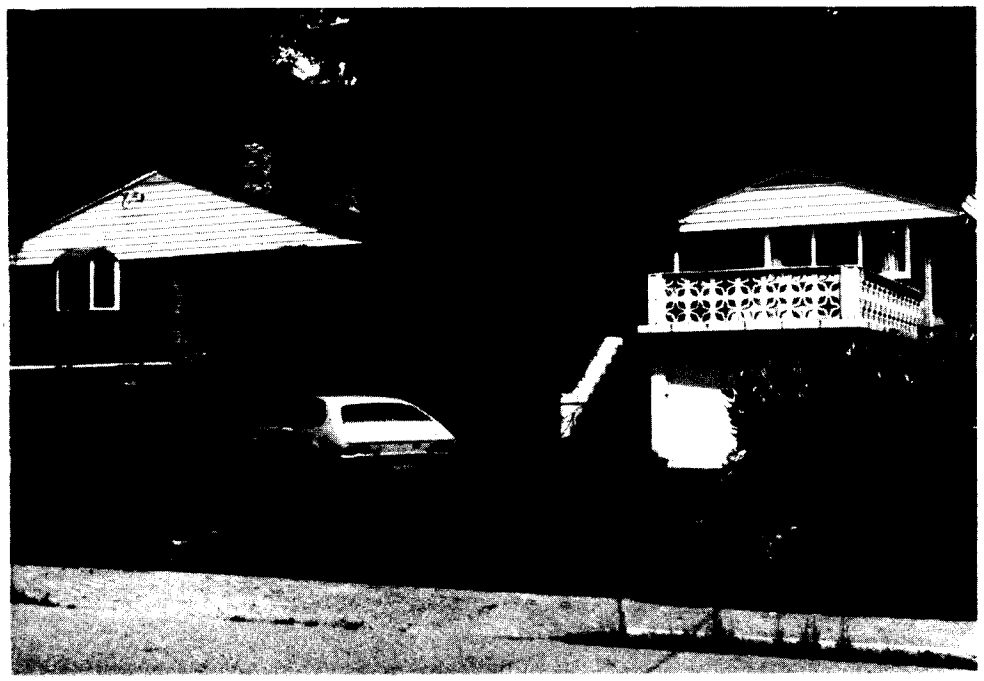
Illustration 3





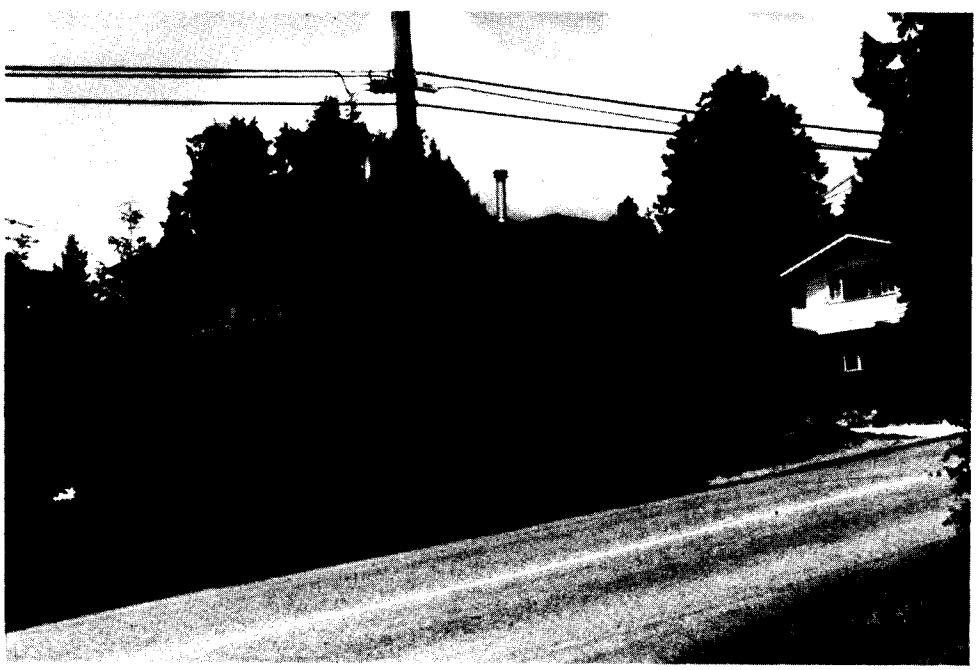
Rooms attached, contrasting examples. Upper: two storey addition for bedrooms and bathroom upstairs, kitchen and family space downstairs. A family of six exerts pressure to expand a small house! Lower: rooms built across the front of the house both to obtain space and to ensure privacy. The front entrance is concealed in the tiny courtyard on the right.

Illustration 4



Gable expansions to create wings thrusting forward from the front entry side. Upper: wings created on both ends of house, on the right including garage and sundeck. Lower: new wing extends up to the pre-existing garage and so connects the buildings.

Illustration 5



Well integrated whole storey additions. Upper:mock Tudor styling creates a house which 'fits' well in the neighbourhood, but the entire second storey is new. Lower: second storey has been added. The roof lines and overhangs are in the same style as the single storey original. South-facing open deck shown; it continues around the back along the west side.

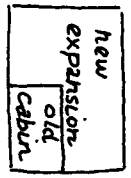
Illustration 6

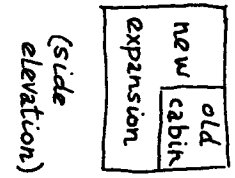
Major upper storey additions. Top:windows of the lower floor, on the right, are original. The front door has been brought forward to expand the hallway downstairs and to support the deck upstairs. Lower: a small upstairs deck is located above the front entrance which was extended forward. bay windows add to the fussiness of this extension. But the two houses are similar in concept regarding additional internal space.

Illustration 7

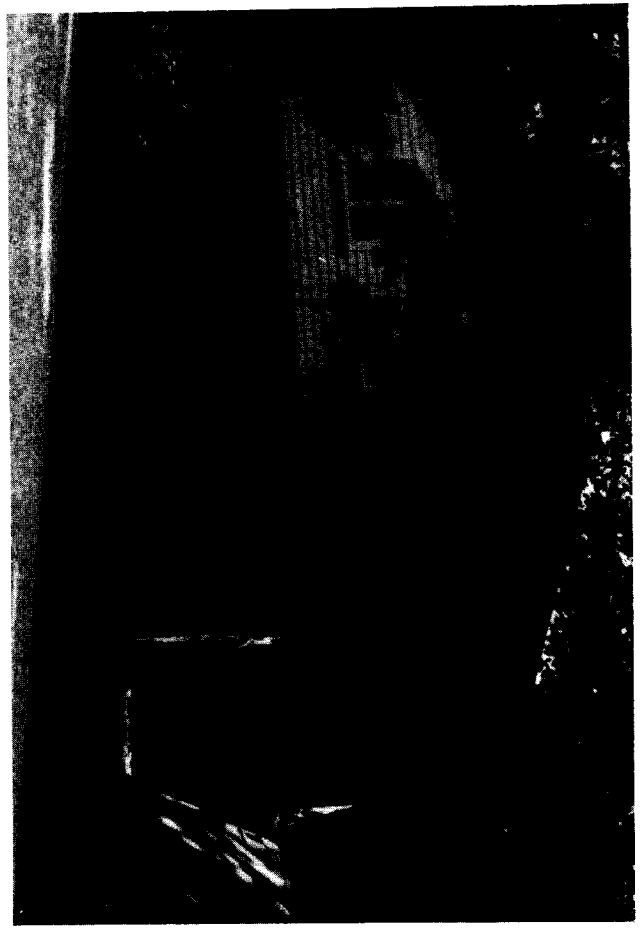
Incorporating small traditional cottages. Upper and middle pictures show two sides of the house expansion in progress. The small shingle sided cabin was raised, a new storey added below, and then extended. In the middle picture the former position of the fireplace on the cabin may be seen through the leaves. Lower: former cabin retained at ground level on right hand side, extended and a new storey added on top. Front entrance changed from right hand end to side as shown, and the feature window of small panes was moved from right of the now side door to present location on the new house front. These two cases are morphological opposites as the diagrams show, but end up as comparable houses of a standard design.

Illustration 8



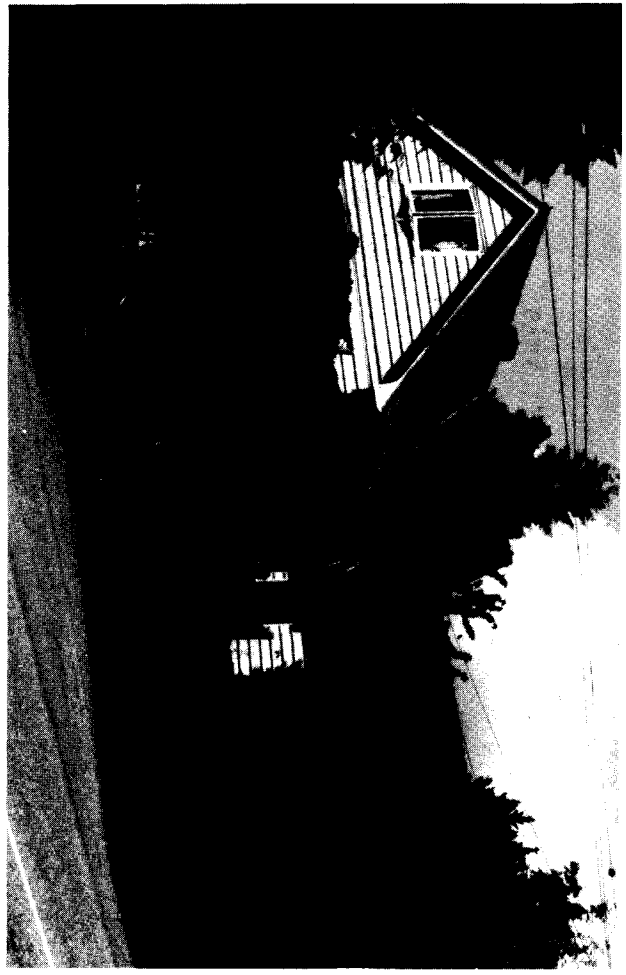


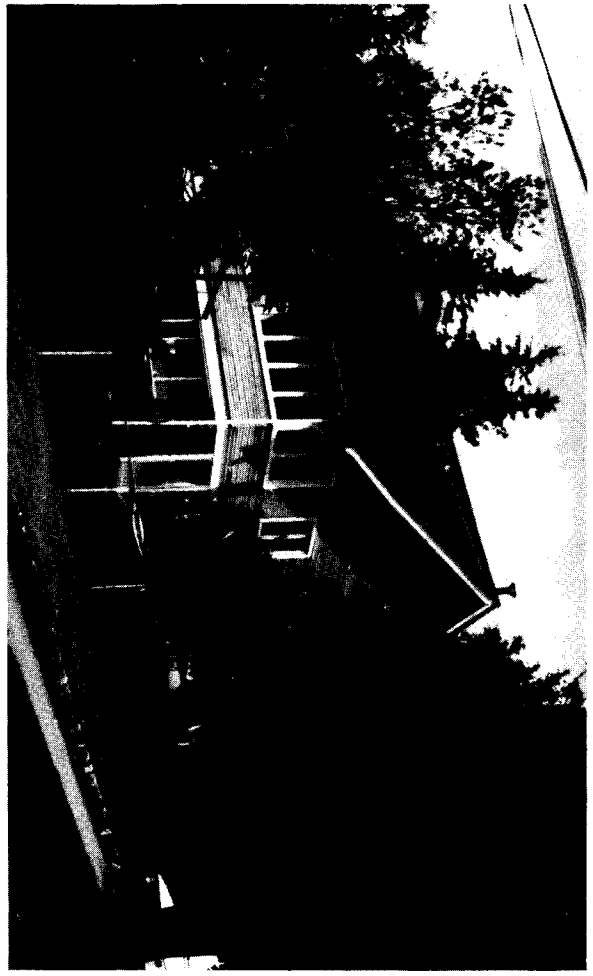
(side elevation)



Dormer additions. Top: dormers, front and rear, and new decks, extend pre-expansion living space upstairs. Middle: bathroom dormer addition in key right angle junction of the two wings of the house. Lower: dormer created where no upstairs existed before, over open space used as a carport. Small playtent, cat, yard clothesline and toys in the open area indicate the presence of children.

Illustration 9





PART III

CASE STUDIES OF PROPERTY DEVELOPMENT: CITY OF NORTH VANCOUVER

INTRODUCTION TO CASE STUDIES

Case studies provide the opportunity to explore patterns of development which are not necessarily apparent in cross-sectional study. In this research the case studies which follow illustrate this by following a chronological development of properties.

Property development is more than the history of households. Households come and go, and each contributes something to the development of the property. But the property itself has its own cycle of development which, overall, is dependent on the aggregate activity of householders. This cycle is normally recognized from the larger scale point of view of the building cycle. Difficulties in obtaining reliable case histories, or data from which to construct such histories, presumably account for the apparent lack of detailed case histories.

The construction of the case histories in this section were made possible because of the fairly complete record of properties kept by the City of North Vancouver. An examination of the complete property files for the sample taken in this study yielded eight properties, the histories of which were sufficiently complete and interesting, to make them useful in the present study. In an effort to set these into a more general pattern of cyclical development in the City, a plot was experimentally made of all permits ever issued to the study sample of houses, so far as the records allowed.

The time scale was constructed by season, so to bring out the annual ebb and flow of building activity. Unfortunately there seemed to be no pattern which could be usefully interpreted, although there is the benefit that this prod may open up a useful avenue for further research. While it may thus be impossible to provide further understanding of the case studies at this stage by such an approach, the reverse is not true, and the patterns of local building activity, derived from a series of cases in a sample, will not be possible to

interpret without the benefit of the case histories. Thus what is presented here is the essential groundwork for understanding the ways in which properties develop, additions to houses being part of such development.

Scanning the records, and writing the case histories, has allowed certain trends to be identified. These may be listed as follows:

a) Additions were not uncommonly built soon after the initial construction of the house. For example, a garage or carport might be built within two years.

b) Additions may be planned in stages, and thus the house may 'evolve' according to a scheme, and as time and finances permit.

c) Existing outdoor living space is frequently a target for enclosure as the extra addition.

d) If outdoor living space is sacrificed to indoor living space, further outdoor space is frequently constructed to compensate for the loss.

e) Some properties seem to go through long periods of evolution before reaching a 'climax' phase of development. This evolution may be 'independent' of homeowner in that all occupants seem to engage in property development activity during their respective tenures.

Property Development, City of North Vancouver

Case Study 1

The first record available for this property was for an electrical permit dated May 29, 1956 but the house is older than this date.

Ten years later, in 1966, the house changed ownership.

In December, 1972 another owner made application for a building permit to enclose the existing front porch in order to enlarge the living room and front bedroom. This permit also included an addition to the north east side of the house, consisting of a bathroom and bedroom. This latter addition was eventually deleted from the plans and the front porch enclosure was completed by August, 1973 (Figure 1).

In October, 1975 the owner applied for a building permit to construct a carport at the foot of his property at an estimated cost of $1,000.00.

In October, 1976 a building permit was issued for the enclosure of the existing sundeck to create a family room. It was necessary for this application to go through the Board of Variance as the minimum required side yard would be reduced by this addition. The Board approved the plans. The addition was to be 16 feet by 18 feet, to be constructed at an estimated cost of $6,000.00. The existing sundeck was to be enclosed and new stairs and fireplace were to be added (Figure 2).

A check in the field, in December, 1982, showed that a flimsy roof of corrugated fibreglass panels, resting on 2 x 4's,

covered the space between the garage and the western side of the property, so to create a covered parking space. A large stone fireplace had been constructed in the centre of the small remaining yard. Thus the property is now very fully developed: what is now not indoors is under cover, or used for seasonal outdoor living space, or reserved by virtue of set back requirements. Given that the letter from the Board of Variance noted their agreement that "undue hardship would result if the new construction were forced to comply with the zoning by-law", one may suggest that this represents an instance of considerable pressure for SFD living space within the confines of the survey and zoning systems. The building envelope would only permit future growth to be upward, and that would represent more costly growth. Such a property may thus be suggested to represent the point of conflict between inner city and suburban, between pressure for single family dwelling development to keep up with family needs on the one hand and the pressure for such land to be taken over to some more intensive land use under different codes and regulations. It may also be noted that the sequence of development has been to develop outdoor space for outdoor living, and then to enclose that space at a later date for indoor living, while continuing to develop further outdoor space for formal special purpose uses - parking and seasonal cooking.

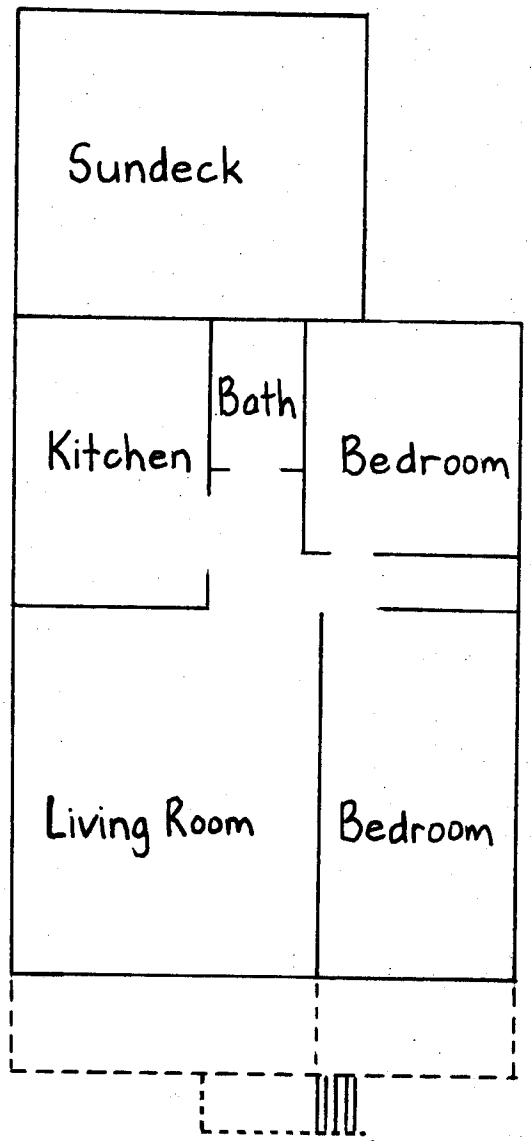


Figure 1

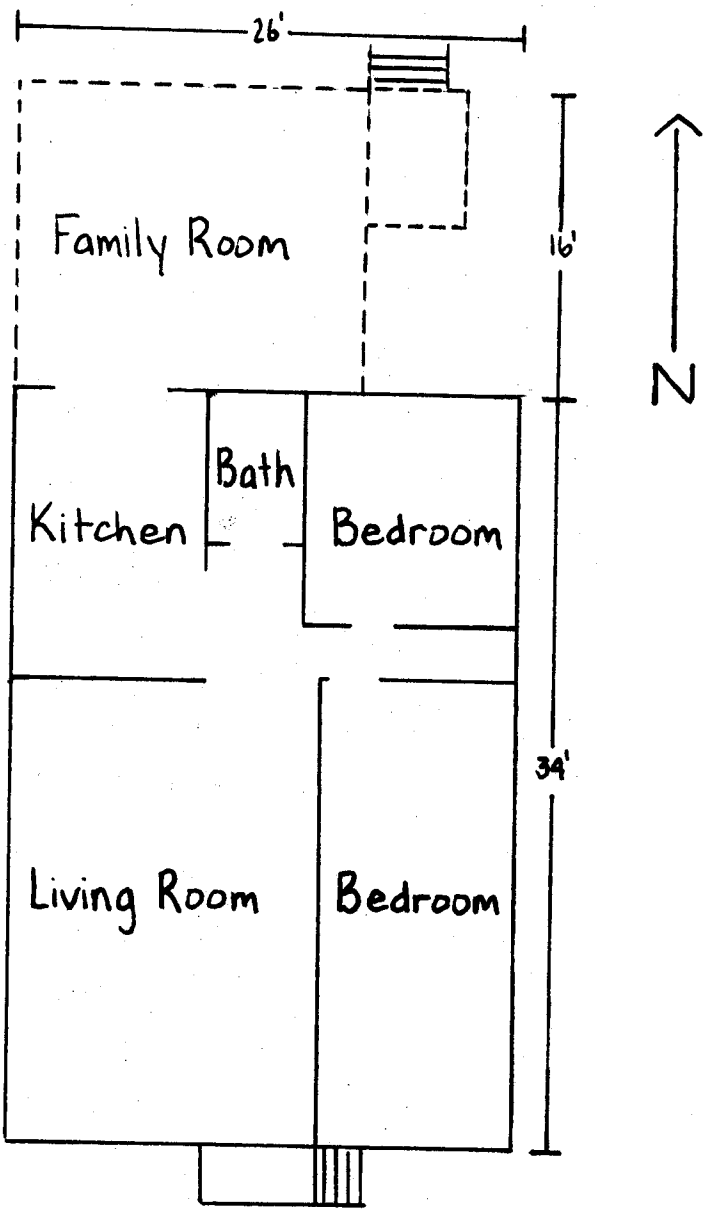
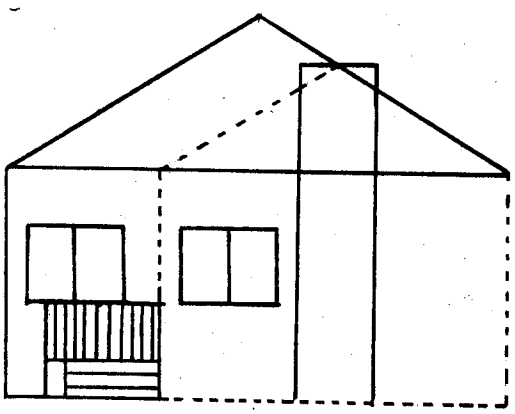
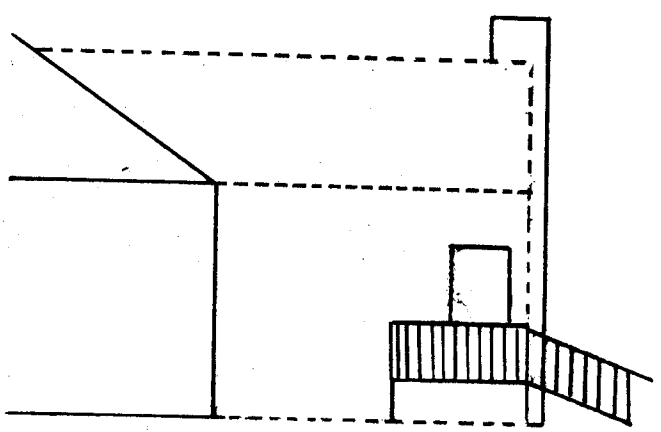


Figure 2



North Elevation



East Elevation

Figure 10

Property Development, City of North Vancouver

Case Study 2

The first record pertaining to this house was a check for gas installation, dated in December, 1958. This probably was associated with initial construction.

In December, 1967 the house was inspected for re-plumbing as well as for the addition of a bathroom to the basement. These changes were effected by the second owner.

In May, 1975 application for a permit was made to add a bathroom and bedroom to the third level (upstairs) of the house. An east-facing dormer, running the whole width of the house, was constructed at an estimated cost of $5,000.00. The owner at the time was in the construction industry and carried out the work himself (Figure 1).

In November, 1980 the same owner inquired into subdivision procedures. He wished to sub-divide into three the two lots which jointly made up the property. The three would measure 55 feet by 154 feet, 43 feet by 154 feet, and 42 feet by 154 feet. In order for this proposal to be accepted it was required that the owner move or demolish the existing house as it straddled one of the newly proposed lot lines (Figure 2). In addition, any new lot was required to be fully serviced, thus connections to water, sanitary sewer and storm drainage would have to be provided. Lane access and off street parking also had to be provided, and some land was dedicated to the creation of a lane.

In January, 1981 the owner began the process of subdividing his two properties, and the following March he began to construct a dwelling on one of the new lots. The house measures 32.5 feet by 33 feet and is of stucco and wood construction, with a duroid roof. The house has three levels and comprises ten rooms, all heated by gas. The estimated cost was $80,000.00.

This case is an example of property development to enhance personal equity. But it is also a case of intensification of property development, which is not only permitted, but presumably beneficial to the City. In the event one new house was built on a newly created extra lot, a pre-existing house remained in place, and a house was moved from a lot boundary straddling position to a newly created lot. Thus land use was made more intense within existing regulations. Further, current standards were applied in the new construction, and so the property may be said, in conventional terms, to have been upgraded even as density was increased. This house is located near the outer limits of the City in an area which grades imperceptibly into the more suburban, and newer, neighbourhoods of the District of North Vancouver.

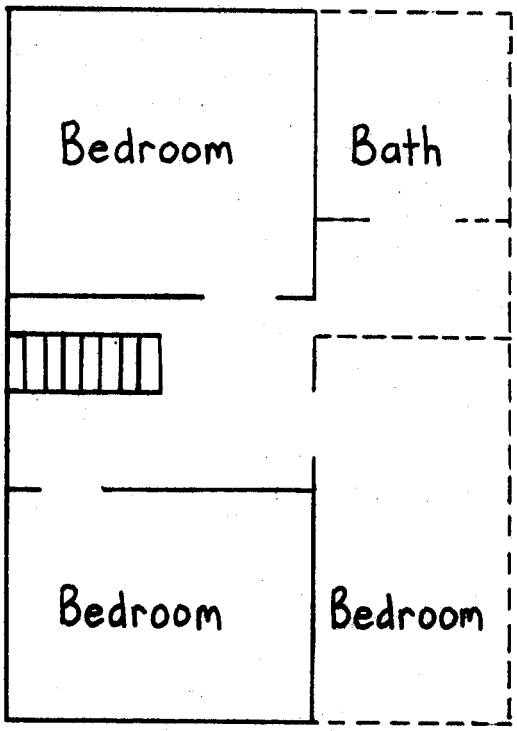
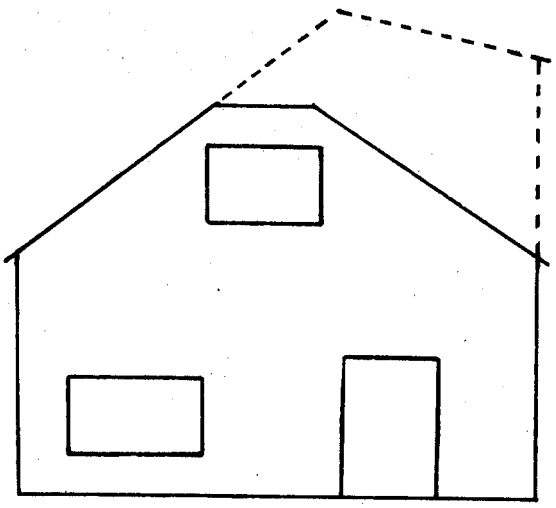


Figure 1



South Elevation

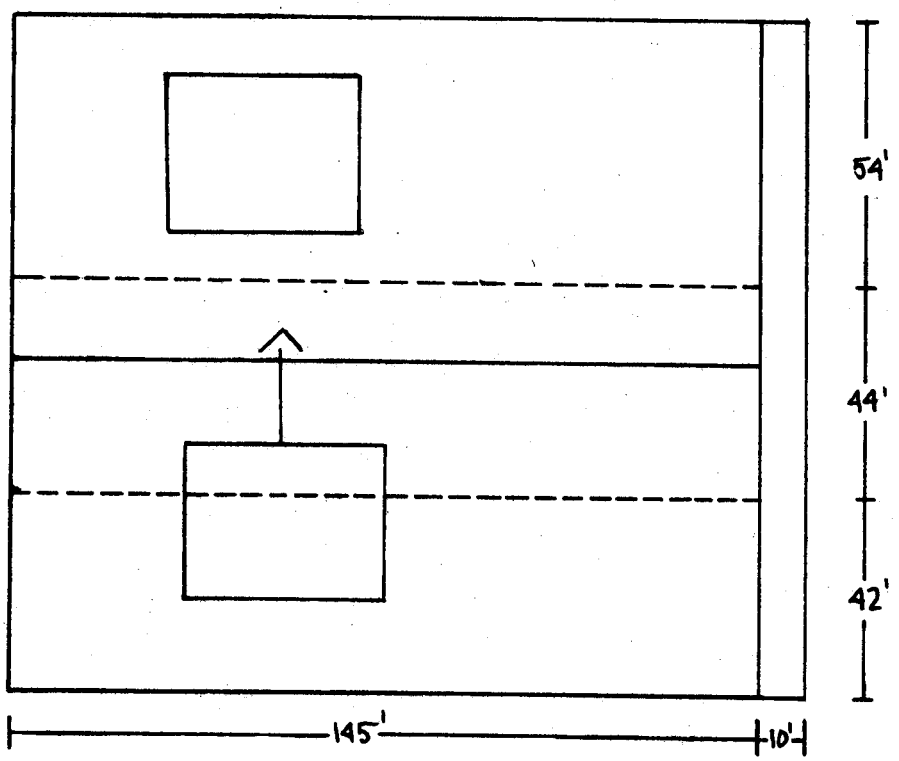


Figure 2

Figure 11

Property Development, City of North Vancouver

Case Study 3

The original house was erected in 1947. It was and remains a small house, the original dimensions being 24 feet by 30 feet. A foundation of an 8" continuous concrete wall supports the house over a crawl space. The house was originally heated by a stove and there was thus no need for a furnace room. The living room and one bedroom faced north, a bathroom and kitchen were entered from a central hall, and a pantry/utility room faced south (Figure 1). The estimated cost to build the house was $3,500.00, and the wiring and plumbing was completed by June, 1949.

In March, 1966, under new ownership, the house underwent extensive alterations. The wall was removed between the living room and bedroom and a new wall was constructed so as to decrease the size of the bedroom, the additional space being utilized as a hallway passing through to the rear of the house. Closets were constructed in the bedroom and bathroom. The wall was removed between the pantry and utility room, thereby enlarging the kitchen. The room whose use was unspecified in the original plans now became a bedroom in which a closet was constructed. Further, a porch was constructed off this bedroom and a playroom was added off the old utility room (or new kitchen). The playroom is at a lower level, by two steps, than the original house (Figure 1). Many of the alterations were interior renovations - removal of walls, construction of

storage space, with an addition of one room and porch to the rear of the house. During this time a gas furnace and water heater were also installed, the space to house these, and a chimney, being taken from the central hallway area.

In July, 1971, a building permit was granted for the additions of a carport, sundeck, and dining room. The permit also covered stuccoing the house and constructing an asphalt shingle gable roof. The carport was built on the east side of the house, facing north to the street. The front bedroom (on the north-east corner) was divided to become a front entrance and additional space to the existing living room. The porch at the rear of the house, on the south-west corner, was enclosed to create the dining room. A small deck was constructed off the dining room and this was connected to a new sundeck, built above the existing playroom on the south-east corner. A new Spanish-derivative facade was constructed and this visually integrates the main house and carport. The front door and the carport entrance each now have an arched appearance, and a concave roofline extends east from the main ridgeline to the outer wall of the carport (Figure 2). The estimated cost of this work was $3,000.00.

In February, 1976 the owner applied for a permit to build a utility room to the east side of the house, behind the existing carport, to be entered from the kitchen. The cost was estimated at $3,000.00 (Figure 3).

In April, 1978 the same owner applied for a building permit

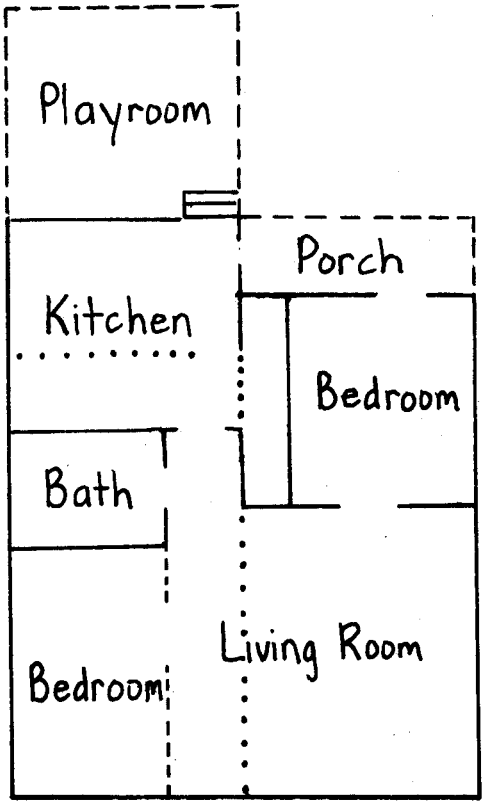


Figure 1

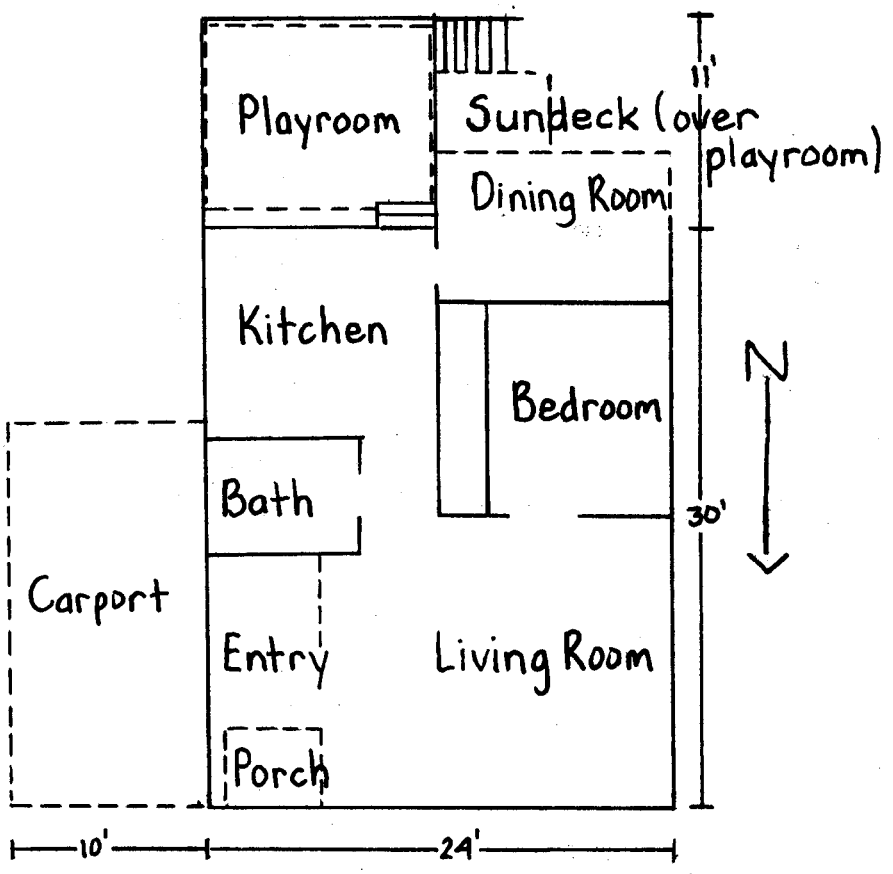
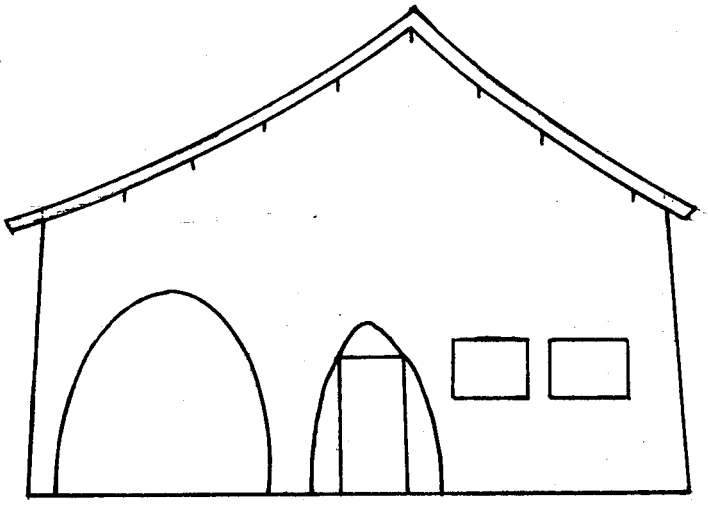


Figure 2



North Elevation

Figure 12

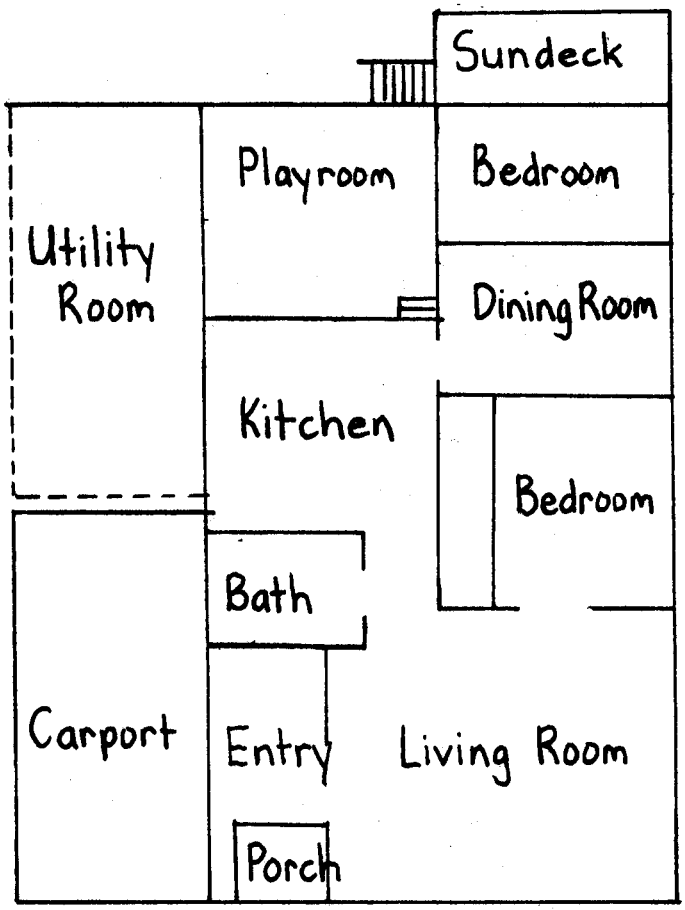


Figure 3

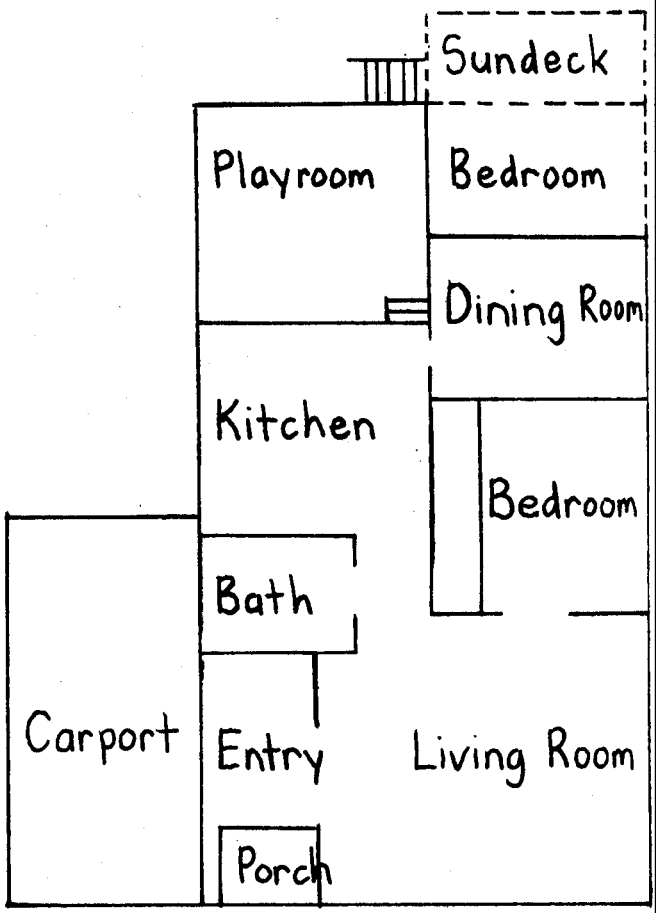


Figure 4

Figure 12

to add a bedroom and sundeck to the rear of the house. The bedroom was constructed on the south wall of the dining room, with a sliding door out to the sundeck (Figure 4).

As in Case Study 1, this property development illustrates a continuing and active evolution of a small house to a moderately-sized house. The property boundaries are approximately 60 x 120, and so less confining than the narrow lot of Case 1. Nevertheless, the piece-meal manner of growth suggests the weight of economic pressure on the owners to create more space for themselves, although there would appear to be little demographic pressure as the present occupants, both born in the 1920's, have resided here for ten years. There is one point of pressure, however, in that at least one room is used to run a small business. The owners' sensitivity to the piece-meal evolution of the building may be inferred from the rather dramatic attempt to integrate the appearance of the house, to make it seem to be a single unit, by the application of a facade which is the outstanding visual characteristic.

Property Development, City of North Vancouver

Case Study 4

In September, 1941 a building permit was issued to erect a one and one half story frame house on a foundation of concrete blocks. The dwelling measured 24 feet by 28 feet and consisted of six rooms. The house was to be heated by a stove and cost approximately $2,080.00 to build.

In July, 1948 a building permit was issued to pour a standard eight inch concrete wall foundation at a cost of $450.00.

Twenty years later, in December, 1968 a gas furnace and water heater were installed. There is no record to indicate whether this was the first or a replacement furnace and heater.

In July, 1978 a building permit was granted for a major addition to be built. This consisted of 360 square feet each to the basement and main floor, and 1,032 square feet to the upstairs (a new second floor). The additions to the lower levels were made on the downslope side to the rear of the house facing south, and the cost of construction was estimated at $25,000.00. During this construction phase the first entrance was changed from the north side to the east side, and this necessitated a change in address as the property is a corner lot. The basement addition was made at full height, the original house being on a crawlspace. This added space was to be used as a recreation room. The addition to the main

living level was to be used as kitchen and family-dining areas, these being divided by a counter. An indoor fireplace and barbeque was constructed in this area, suggesting that the space may be used for living and informal gatherings. The new upstairs was to comprise two bedrooms with built-in desks and closets, a sewing room, bathroom, and a master bedroom with its own entrance to the bathroom. A sundeck off the master bedroom is entered through sliding glass doors. The exterior of the house was to be covered by vinyl siding (although the project is not yet complete as to siding), and the roof is tar and gravel. The addition is heated electrically.

A carport was also included in the original plans for the addition, with a sundeck to be built above. In September, 1978, however, a building permit was granted to construct a garage instead. The sundeck is approached from the new family-eating-entertaining area. This is an example of an extremely ambitious plan for creating a larger house. One wonders why an addition of this scope was even contemplated, rather than razing the pre-existing house and building a new one from scratch. The answer probably lies in two points: that many people are convinced that it is cheaper to add more space than to build anew; and there is also a lingering feeling that the house one <u>knows</u> is the one that is wanted. This latter point is deeper than the expression "better the devil you know than the one you don't know", for in buildings that sentiment would simply translate to knowing the functional problems of one house as

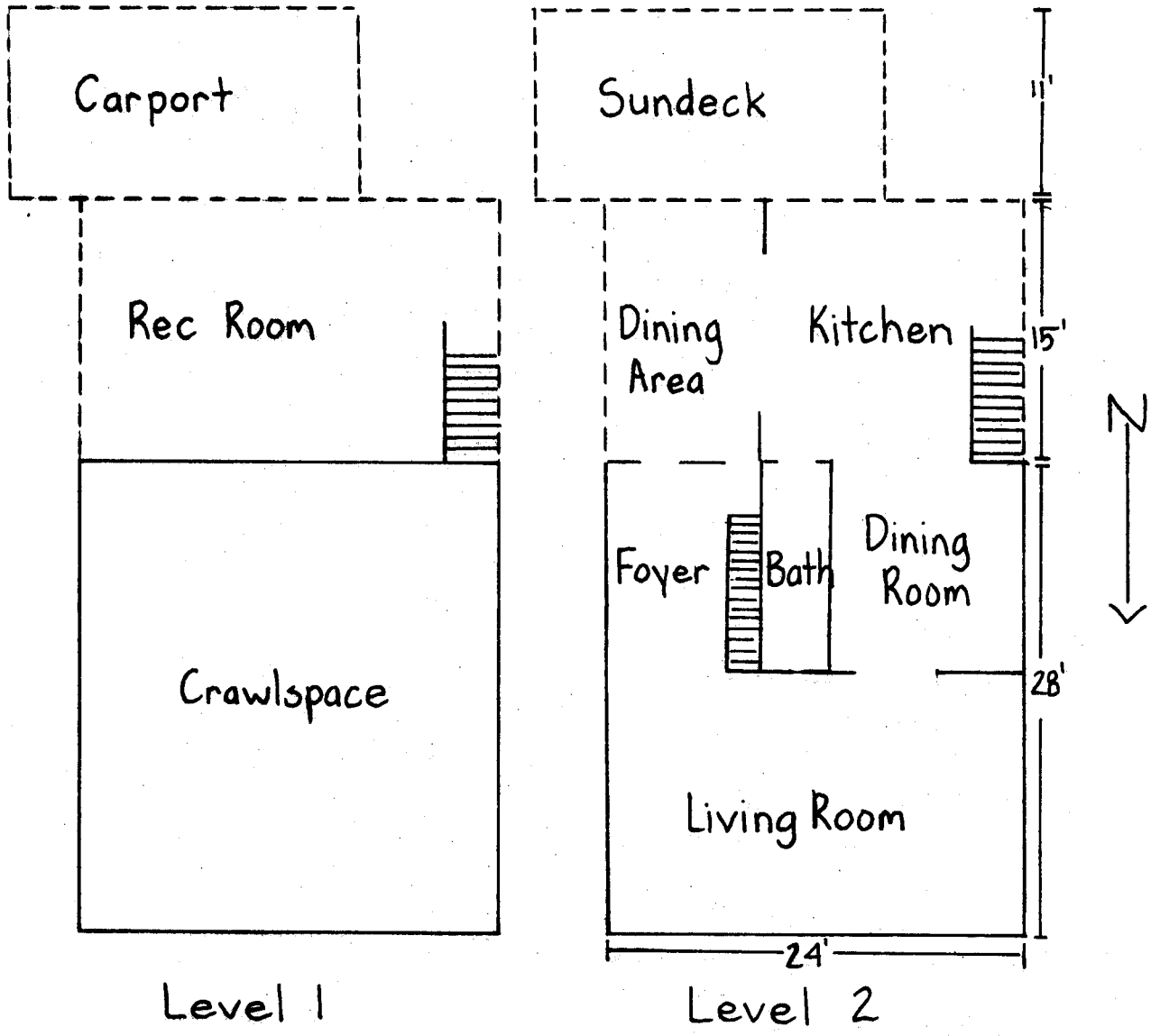

Carport
Sundeck
11'
Rec Room
Dining Area
Kitchen
15'
N
Foyer
Bath
Dining Room
Crawlspace
28'
Living Room
24'
Level 1
Level 2

Figure 13

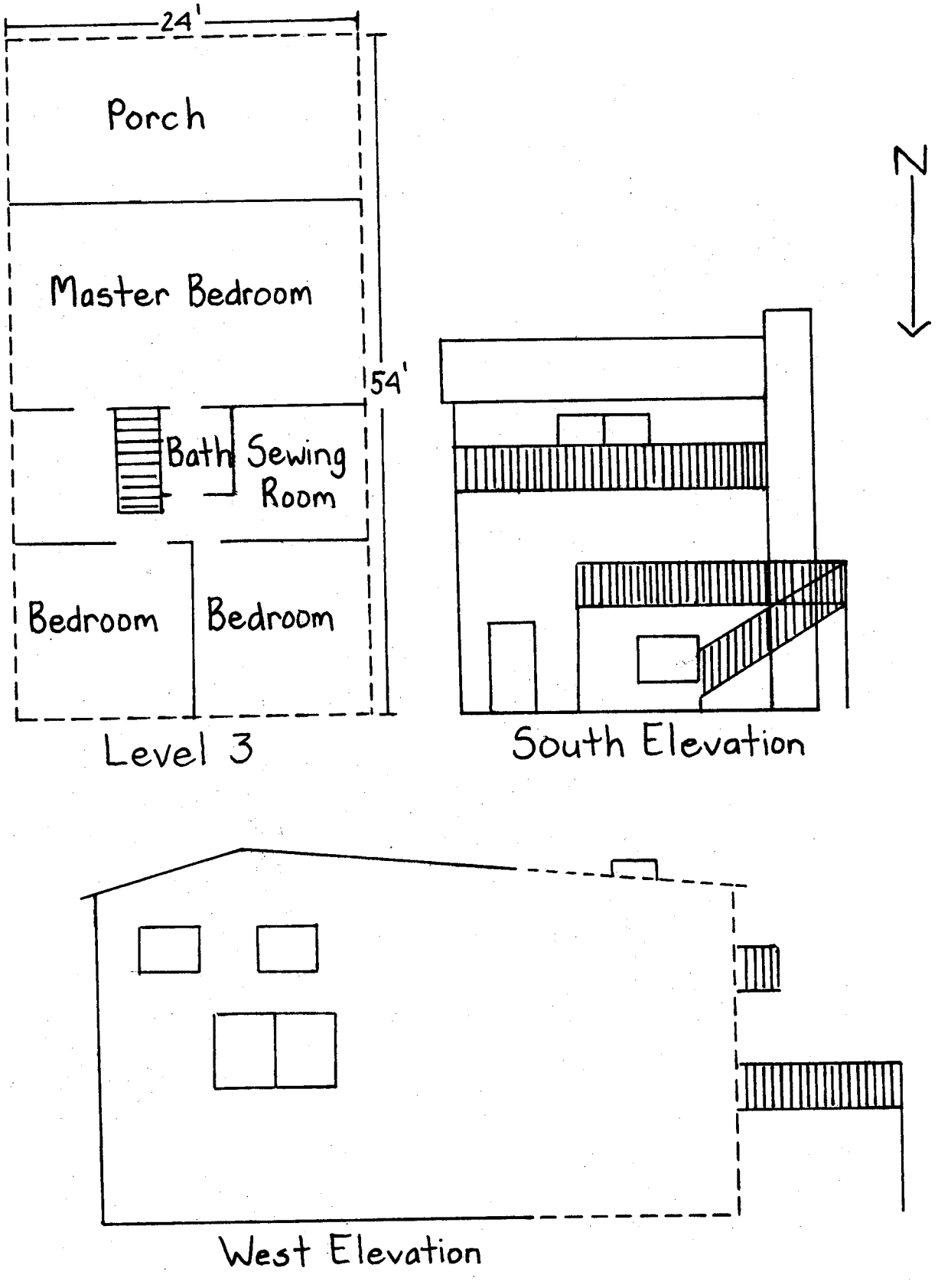

24'
Porch
Master Bedroom
54'
Bath
Sewing Room
Bedroom
Bedroom
Level 3
N
South Elevation
West Elevation

Figure 13

against not knowing them in a new house. Rather, I am inclined to think that at the level of society with which we are dealing, a level in which people would be generally unable to move to a hotel until the contractors were finished, a level in which people would have to and probably want to live on the premises during construction, there is a mentality of watching over what is solid in ones' assets and building on them, rather than willingly destroy their physical existence, when they still have utility value, in favour of a cash-generated start to a new building. This distinction in some way also divides a group so characterized from the 'financial risk takers' who, as in Case 2, would be willing to go through the legalities of property division and speculation to build towards the future. In the present Case, the project is still unfinished, much of the work apparently being done by the homeowner over an extended period to conserve costs and materials.

Property Development, City of North Vancouver

Case Study 5

In March, 1953 a building permit was issued to erect a frame dwelling, measuring 38 feet by 28 feet on a double lot. The foundation was made of poured concrete and enclosed a full, unfinished basement. The main story consisted of six rooms - livingroom with dinette, kitchen, three bedrooms and a bathroom (Figure 1). The house was heated by a hot air furnace and the cost of construction was estimated to be $9,000.00 (Figure 1).

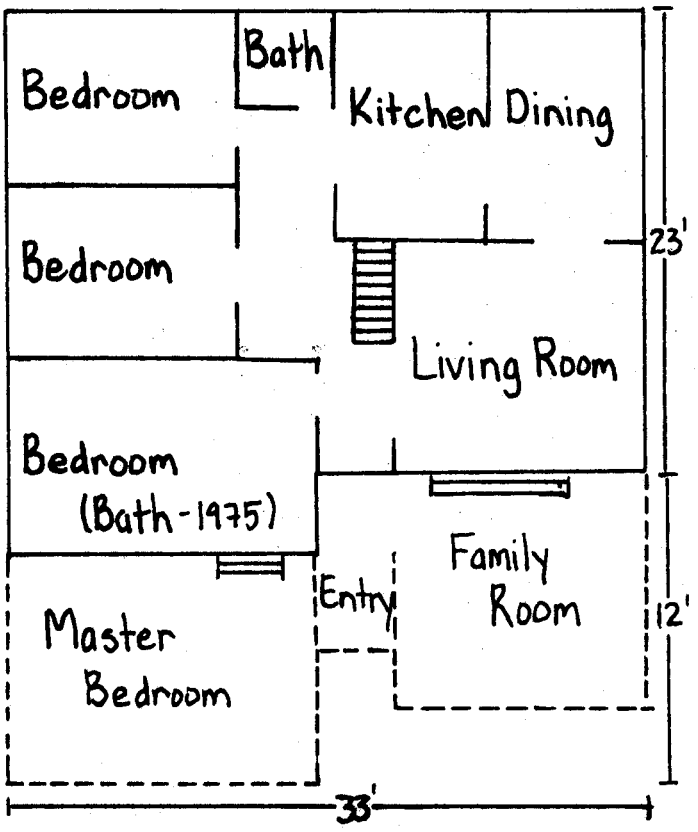
Five months later, a building permit was granted to construct a carport on the west side of the house at an estimated cost of $150.00.

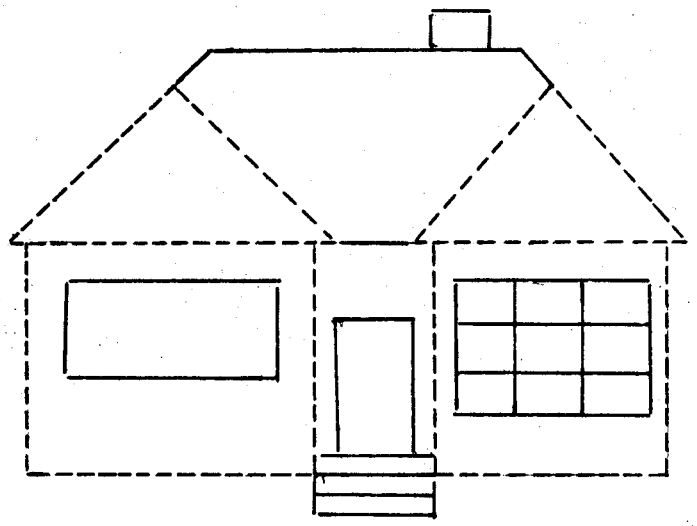
In August, 1959 a new owner took out a plumbing permit to switch the property from spetic tank to sewer.

Eleven months later, a second carport was attached to the existing carport at an estimated cost of $100.00.

In May, 1972 an investment company, which had presumably bought the property, proposed to sub-divide it into two single losts. The City engineer accepted the proposal with the proviso that the carport be removed. This was required because the carport would, if left in position, violate the side yard setback by-laws. He suggested constructing a carport or garage at the rear of the property.

Four months later, after a request to continue using the carport as a non-conforming building had been denied, and





South Elevation

Figure 14

after a neighbour had lodged a complaint that the carport would be too close to the property line and so constitute a fire hazard, the owner applied for a permit to build a carport at the foot of the property. Thus the property could be, and was, sub-divided. A new house was constructed on the newly created lot.

In June, 1973 the owner applied for a permit to construct a sundeck on the north side of the house. This was to be of cedar at an estimated cost of $500.00. The Board of Variance granted its approval for this project, there being a slight non-conformity in the siting of the original house.

Two years later, the same owner took out a permit to add a family room and bedroom to the front (southern side) of the house. The addition was built at a slightly lower level than the original house, over a crawlspace. The existing front windows and door were re-used. An ensuite bath to the newly constructed bedroom was build in the space of the old bedroom. The cost was estimated to be $10,000.00. Nineteen months later the project was complete.

In October, 1980 the owner applied for a permit to install a gas furnace and gas water heater.

Property Development, City of North Vancouver

Case Study 6

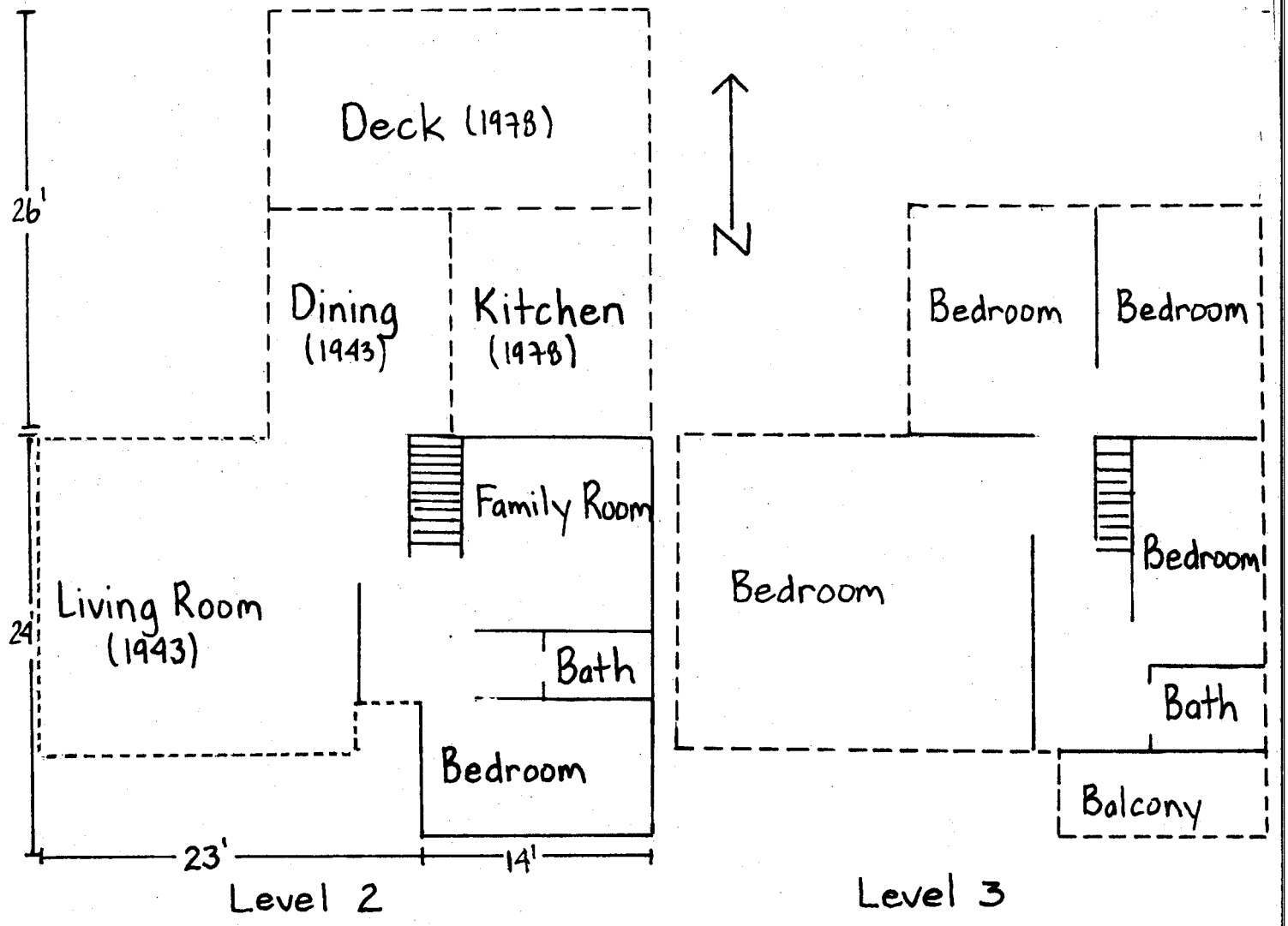
In June, 1942 a building permit was issued to erect a one story dwelling measuring 14 feet by 24 feet. The house consisted of only four rooms: a combined kitchen and living room, bedroom, bathroom, and utility room. The permit stated that the rooms were to be enlarged at a later date. The foundation was built with concrete blocks, and the house was to be heated by a stove (Figure 1). The owner built the house over a period of ten months at an estimated cost of $1,000.00.

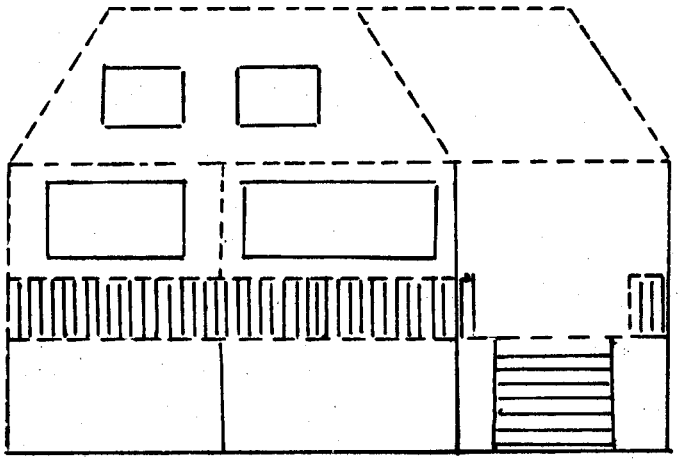
In September, 1943 a permit was issued to add two rooms, a living room and a kitchen with dining area, over a new full basement. The old kitchen was converted to a bedroom (Figure 2). The cost was estimated at $500.00 and it took about six months to complete the job.

During the next 30 years the house changed ownership three times and minor alterations were made. An oil burner was installed to replace the heating stove and the septic tank was replaced by a sewer connection.

In May, 1973 a building permit was granted to raise the dwelling two feet, from six to eight feet basement clearance. The cost was estimated at $2,000.00 but there is no record of the intended use of the new basement space.

In April, 1978, a building permit was issued to a different owner to add an upper floor to the existing dwelling. This





North Elevation

Figure 15

floor was to measure 33 feet 6 inches by 38 feet 6 inches and provide space for four bedrooms and a bathroom. The kitchen on the main floor was also to be extended, and a workshop and bathroom were to be added in the basement under the kitchen. The addition at these two levels squared off the house in the north-east corner. A carport was also added, at basement level, surmounted by a sundeck, and extending across the back of the house.

The addition to the main floor of the house resulted in changes to the functions of existing rooms. The old kitchen dining area became a dining room, and a former bedroom became a family room. The cost of construction was estimated to be $15,000.00. To date the work has not been completed.

Property Development, City of North Vancouver

Case Study 7

The building of this house commenced in the summer of 1975. The house was to comprise 1,288 square feet. Nine rooms were to be finished with the recreation room and front entrance occupying part of the ground floor, the remainder of that floor being a ground level basement. The design, sometimes referred to locally as a "Vancouver special", provides for the enclosure of a comparatively large amount of space quite economically. With aluminum siding the estimated cost was $32,000.00 and construction was in progress for about six months.

Four and one half years later, in December, 1979, the same owner added a garage, study and pantry to the rear of the house, that is, the north side. At the same time a bedroom was installed in part of the unfinished basement (Figure 2). One may note, parenthetically, that two months earlier the owner had applied for a business licence for a dental laboratory.

During the following summer, 1980, a sun room was built on part of the existing sundeck, on the north side of the house over the garage.

In this case we have a quite recently built house, of standardized but comfortable and efficient design, being expanded not long after its initial construction. The motive here would seem to include needed space to conduct a small business as well as a need for general living space.

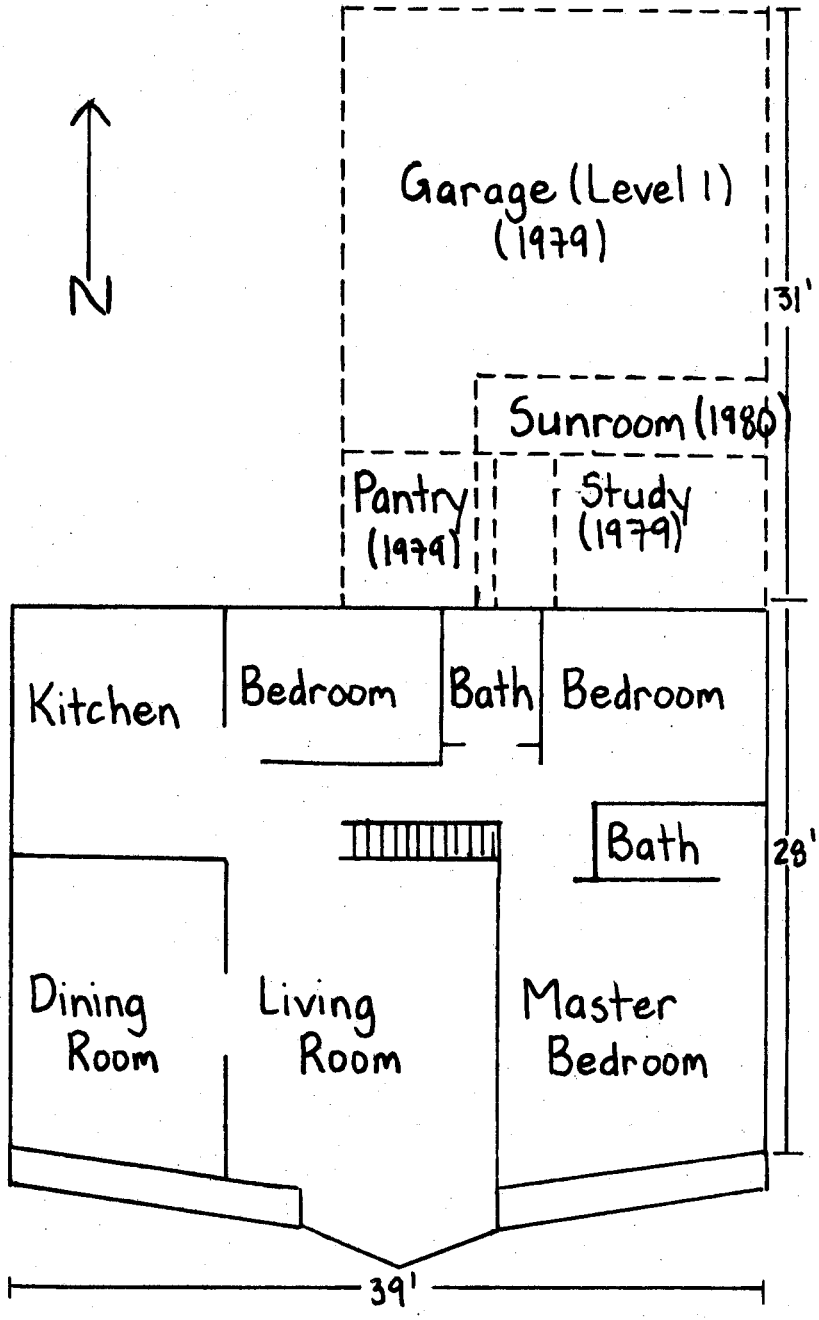

N
Garage (Level 1)
(1979)
31'
Sunroom (1980)
Pantry
(1979)
Study
(1979)
Kitchen
Bedroom
Bath
Bedroom
Bath
28'
Dining
Room
Living
Room
Master
Bedroom
39'

Figure 16

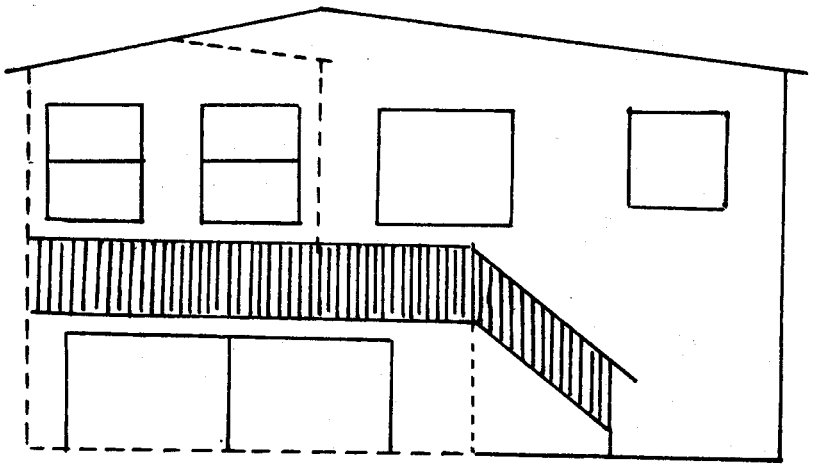


Figure 16

Property Development, City of North Vancouver

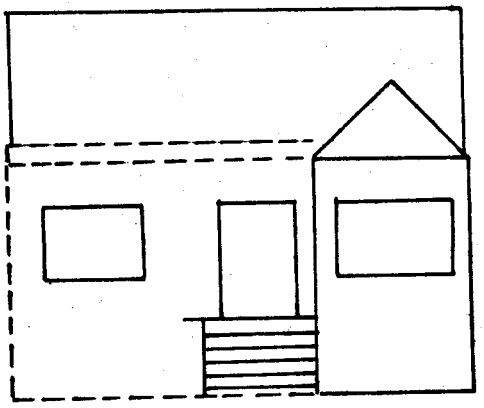
Case Study 8

A permit to erect a 24 foot by 24 foot one story dwelling, mounted on a concrete block foundation, was issued in September, 1941. There were to be only four rooms - a living room, kitchen, bedroom and bathroom - and the house was to be heated by a stove. The estimated cost was $1,600.00. Construction was completed in three months, at about the same time the sewer was connected. Seven years later a poured concrete wall was constructed to replace the concrete block foundation, and it is probable that it was at this date, September, 1948, that a basement was excavated.

During the next eight years the house changed ownership three times with minor alterations being made intermittently in that period. In 1964 the bathroom on the main floor was renewed with the installation of new fittings, and a toilet and laundry tubs were installed in the basement. A gas furnace and water heater followed in 1965. There is no record to indicate whether this was the first or a replacement furnace.

In September, 1966 a carport was built as an unattached structure on the property, the estimated cost being $350.00.

By the addition of the basement the heated area of the house had doubled in size, but this was still a very modest dwelling. In June, 1979 another owner applied for permission to build a laundry room on the rear of the house, facing south, an addition which would square off the building. This



South Elevation

Figure 17

construction added 96 square feet and it is easily identifiable as an addition because of its flat tar and gravel roof, a very common and economical roof form over small expansions. The addition also integrates the rear entry - being accessible both to kitchen and laundry - and thus unites the commonly juxtaposed home activities of cooking and laundry. (This juxtaposition in small houses, however, has only become easy with the advent of modern spin washers and dryers, as wringer washers required double laundry tubs, and so accompanied the more necessary isolation of the laundry function in basements for about a generation.) A small back porch was constructed at the entry door, (Figure 2) and the project was estimated to cost $2,500.00.

This is clearly a case of a very modest property being expanded, at first dramatically in proportional terms, but then only gradually over the years. Presumably such a place meets the needs of those who wish to own a home but have little need for much space or who have limited means. The nature of the expansions identifies a point of some interest, that is the desire and need to house modern household possessions of the technical order: cars, laundry machines. The whole question of material possessions is implicated here. Further, the removal of a washing machine, and perhaps dryer from the basement, not only places the activity associated with them close to the kitchen but also releases the basement from machine drone, lint, and excess humidity, and would create further space for possible finishing.

PART I V

SOCIAL AND BEHAVIOURAL CHARACTERISTICS OF HOUSEHOLDS WHICH HAVE EXPANDED THEIR DWELLINGS

SOCIAL AND BEHAVIOURAL CHARACTERISTICS OF HOUSEHOLDS WHICH HAVE EXPANDED THEIR DWELLINGS

It is important to note that all data presented in Part II refer to characteristics of the sample population and not to the population of households at large. Where appropriate, however, comparisons between these data and general population characteristics will be drawn, the reference for the latter being the socio-demographic profile provided in Appendix 1.

Two principal bodies of data were created in order to attempt to understand the social and behavioural aspects of the study of house expansion. These were a questionnaire survey conducted through the post, and interviews of selected households which returned the survey form. It was felt that this two-pronged approach would be desirable and productive, for the methods in each case are quite different. I had at first proposed to conduct formal interviews only, but, because interviews in this study were necessarily conducted while moving about the house of the interviewee, it became immediately apparent that home interviews had to be conducted in an open manner. I say "necessarily" for many houses were expanded by a sequence of alterations in order to accommodate the expansion, and thus it was not only desirable to trace the sequences but also necessary for most householders to think of the project in those terms. This being the case, it was decided that a mailed questionnaire would be the most appropriate form of survey in order to privide a standardized coverage of issues. This further provided a good cross section of the sample, both in statistical and spatial terms, a cross section which might have been difficult to achieve otherwise. The open interview method was thus also scaled down.

The Questionnaire

The questionnaire was composed in four main parts, designated A, B, C, and D. (See sample copy overleaf) Part A, "House Characteristics", was devoted to

to a few points concerning the house itself, points which were felt to be easily answered and which filled in topics where some ambiguity had been experienced in interpreting the architects' and builders' drawings. But these questions were kept to a minimum, however, because the questionnaire was devoted to eliciting information regarding the behavioural rather than the morphological side of the enquiry. It was also a general concern to keep the questionnaire within reasonable limits of length, as well as to allow for reasonable spacing in the format.

Part B, "Family and Household Characteristics", was aimed at two major points, the life cycle of the household in general, and the provision of space specifically designed for the accommodation of children. This latter means, in effect, bedroom space, for it is very common for children to have some if not all of their toys and possessions in their bedrooms, and the family room generally may be thought of as incorporating within it the 'play room' function. In addition, however, this Part also provides information which allows a description of the specific demography of those households engaged in house expansions.

Part C, "Household Tenure and Neighbourhood", was aimed at the contextual relationship of the household within the community. Thus the information refers to the length of tenure before the addition was built, the contextual issues surrounding the expansion such as the length of time consumed in commuting, and the limits of the perceived local neighbourhood. These are related directly to questions put in Part D, "Expansion Decisions and Project". In this last section respondents were asked to set their expansion decision against the alternatives of doing nothing or moving to another house. This decision might well have been in process of discussion for some time, and might well have been made with very consciously held, and specific, reasons in mind.

STUDY OF SINGLE FAMILY HOUSE EXPANSION ON VANCOUVER'S NORTH SHORE

Department of Geography
Simon Fraser University
Professor L.J. Evenden

A. HOUSE CHARACTERISTICS

1. Number of rooms in house: _____

2. Full basement: yes _____ no _____
   If "no", is there a partial basement? yes _____ no _____

3. Proportion of basement finished: (circle one) >3/4; >1/2; >1/4.

4. Uses of basement rooms: (list) _____ _____ _____

5. What form did your expansion take? (eg. extra bedroom on rear of house)

   _____

B. FAMILY AND HOUSEHOLD CHARACTERISTICS

1. Number of persons in household: _____

2. Number of adults: _____

3. Number of pre-school children: girls _____ boys _____

4. Number of elementary school children: girls _____ boys _____

5. Number of secondary school children: girls _____ boys _____

6. Children's years of birth: _____ _____ _____ _____

7. Decade of adult's births: (e.g. 1950's) _____ M _____ F

8. Do the children have separate bedrooms? Yes _____ No _____

9. Have they ever shared bedrooms while you have lived in this house?
   yes _____ no _____
   If "yes", at what stage did they move into separate bedrooms?

   _____

C. HOUSEHOLD TENURE AND NEIGHBOURHOOD

1. How long have you lived in this house? _____

2. Where did you move from? _____
   (If outside present municipality, please indicate town, province or country; if within present municipality, please indicate neighbourhood e.g. Lynn Valley)

3. Did you decide to live here mainly because: (circle one or more)
   a) you liked the house
   b) you liked the neighbourhood
   c) there was good house market potential
   d) the journey to work was convenient
   e) the price was right
   f) other (specify) _____

4. Where do you work? (circle as appropriate)
   a) downtown Vancouver
   b) North Vancouver City
   c) North Vancouver District (indicate neighbourhood or centre)
   d) West Vancouver (neighbourhood or centre)
   e) other _____

5. Estimate the time spent commuting each day (one way to work) for each adult who goes out to work. _____M _____F

6. Do you normally go to work: (a) by bus (b) by car? (circle one)

7. Describe what you think are the approximate limits of your neighbourhood. (Use street names, creek names, hill names, etc.)

   _____

   _____

D. EXPANSION DECISIONS AND PROJECT

1. Estimate how long you actively planned to expand your house, before actually doing so. _____

2. Did you consider the alternative of moving to a larger house?
   Yes _____ No _____

3. Why was the alternative rejected? (circle one or more as appropriate)
   a) cost
   b) house quality
   c) neighbourhood characteristics
   d) desire to stay with the same school
   e) journey to work considerations
   f) other _____

   Comment on choice of answer: _____

   _____

4. Was your decision to expand connected with your stage of family or household development? Yes _____ No _____
   Explain: _____

5. Were the blueprint plans for the project drawn by: (circle one)
   a) an architect
   b) a builder/contractor who did the actual work of expansion
   c) independent builder's draughtsman
   d) member of your own household or friend

6. Was the work carried out mainly by:
   a) general contractor who did everything
   b) several sub-trades co-ordinated by the homeowner
   c) several sub-trades co-ordinated by an independent project manager
   d) homeowner
   e) other _____

7. It is common for homeowners to be physically involved in home expansion projects. How would you describe your involvement? (circle one or more)
   a) major participation in certain areas in which we have skills (e.g. painting, carpet laying, etc.)
   b) worked with most trades as helper
   c) worked only as co-ordinator but did not do physical work
   d) restricted participation to preparation, clean up, and "being on hand" to answer questions
   e) "threw up hands" in despair, avoided contact with the project to the greatest possible extent
   f) undertook to do the major finishing work at a pace the household could stand

8. How long did the project take from start to finish? _____

9. In the end, would you say the project was reasonably well on budget?
   Yes _____ No _____ If "no", what went wrong? _____

   _____

Although there was no general invitation for respondents to elaborate on the issue of their expansion as a whole, there were several places within the questionnaire which invited commentary on specific matters. Some illuminating remarks did appear in these sections. In total 203 questionnaires were sent out and 106, or 52 percent were returned. The rate of usuable returns was 48 percent (98), there being some returned by the post office as undeliverable, and a few returned by people looking out for the homes of friends who were away. It is felt that a return rate of 52 percent accounted for is very satisfactory. The spatial distribution of responses is shown in Figure 1 indicating a good spread across the whole of the north shore. The lowest municipal rate of return was from the City of North Vancouver, from which twelve out of forty questionnaires were received.

FAMILY AND HOUSEHOLD

Information derived from Part A proved most useful as a cross-check of that already in hand from other sources, and is thus incorporated in the discussion of morphological characteristics. The discussion here focusses on Parts B, C, and D.

Number of persons: background

The number of persons in a household is presumed to have some bearing upon the need to expand the house. But this is a general statement and it may not be inferred that the factor of numbers in the household will necessarily be important in the decision to expand in all individual cases. Thus the nature of this relationship is not clear in advance. In 1981 there were some 51,575 households on the north shore (Table 17). Virtually one-half (49 percent) were households of 2-3 persons, and this rate holds for the constituent municipalities within one percentage point. West Vancouver reflects the north shore distribution

Table 17 PRIVATE HOUSEHOLDS BY NUMBER OF PERSONS, 1981

	No. Persons	No. Households	/ %
North Vancouver City	1	6,190	38
	2-3	7,790	48
	4-5	1,895	12
	6-9	230	1
	10+	10	-
	Total	16,120	99
North Vancouver District	1	3,025	14
	2-3	11,005	50
	4-5	7,200	33
	6-9	710	3
	10+	5	-
	Total	21,945	100
West Vancouver	1	3,265	24
	2-3	6,655	49
	4-5	3,185	24
	6-9	410	3
	10+	-	-
	Total	13,515	100
North Shore	1	12,480	24
	2-3	25,450	49
	4-5	12,280	24
	6-9	1,350	3
	10+	15	-
	Total	51,575	100

Note: derived from Socio-demographic Profile for reference convenience.

precisely, in that 24 percent of households are composed of only one person, and, similarly, 24 percent are composed of 4-5 persons. These three categories of household composition by size account for 97 percent of the private households. The two North Vancouvers contrast with this 'norm', although in different ways. While they both have virtually one half of their households in the 2-3 person category, the City has 38 percent of its households with only one member, while the District has only 14 percent with one member. The directions of contrast are reversed, however, in the 4-5 person category, with the City dropping to 12 percent and the District rising to 33 percent. These comparisons bring out the general pattern that the City demonstrates essentially 'inner city' characteristics, which the District is clearly a 'family-oriented' municipality. West Vancouver holds an intermediate position.

These relationships are also reflected in the important characteristic of families in relation to numbers of children. As shown in Table 18, 50 percent of all families on the north shore in 1981 fell into the 1-2 children category. There was no municipality which reflected this aggregate accurately, however, West Vancouver falling to 45 percent, and the City falling further, but marginally, to 43 percent. Both these municipalities are remarkable for their emphasis on families with no children at home, these comprising 42 percent in West Vancouver and rising to 50 percent in the City. In all three municipalities, however, the frequencies fall off very steeply to the 3-4 child category and beyond to the 5+. We thus note that these municipalities are not only characterized by relatively small households, but they also (and it follows) are municipalities of small numbers of children. These rates of children at home have declined over the years, as shown in the composite Table 19 and in this are consistent with general demographic trends. (See Socio-demographic Profile) But their import here is the implication that, as a general matter,

Table 18

FAMILIES IN PRIVATE HOUSEHOLDS BY NUMBER OF CHILDREN AT HOME, 1981

	No. Children Home	No. Families	%
North Vancouver City	0	4,405	50
	1-2	3,760	43
	3-4	570	7
	5+	30	-
	Total	8,755	100
North Vancouver District	0	5,740	31
	1-2	10,065	56
	3-4	2,355	13
	5+	80	-
	Total	18,240	100
West Vancouver	0	4,095	42
	1-2	4,470	45
	3-4	1,235	13
	5+	55	1
	Total	9,855	101
North Shore	0	14,240	39
	1-2	18,295	50
	3-4	4,160	11
	5+	165	1
	Total	36,860	101

Note: derived from Socio-demographic Profile for reference convenience.

and other things being equal, there would appear to be a decrease over time of the need to expand the private dwellings, or single family houses. Further, as the mean size of house before expansion is some 1,880 square feet, it might be assumed that such a living area would provide satisfactorily capacious housing for the 'average' family of 2-3 persons. But it is clear that there is constant building activity and, as a general point, one may note that this activity may be viewed as resulting from action to relieve perceived pressures on household space, these overlapping with households which do not fall in the 'average' space consumption category, that is those which have larger numbers of family members but less space. Secondly, one may note that, as far as space construction and consumption is concerned, the continuing activity represents a rise in living standard as defined spatially. Lastly, additions to houses represent the investment of household resources in a capital gains tax shelter.

Numbers of persons: expansion households

The mean number of persons per household undergoing expansion is 3.9 across the north shore as a whole. This is the same average as for the City, but is lower than the 4.2 figure in North Vancouver District and higher than the 3.6 figure representing West Vancouver. There is some fluctuation in these values on an annual basis, the lowest being 2.9 in 1976 (but based on a small sample for that year) and 4.7 in 1980. In 1976, 1977 and 1979 the mean values in North Vancouver District and West Vancouver were identical at 3.0, 3.5 and 3.8 respectively, but in the remaining three years, 1975, 1978, and 1980, the North Vancouver figures were consistently higher than the respective ones in West Vancouver. The margin of difference was only 0.2 in 1975 but rose to 1.6 in 1978 and 1980. Admittedly these averages are based on small numbers of

Table 19

	NORTH VANCOUVER DISTRICT							WEST VANCOUVER							NORTH SHORE							NORTH VANCOUVER CITY	
	75	76	77	78	79	80	Total NVD	75	76	77	78	79	80	Total WV	75	76	77	78	79	80	Total NS	Total (75-82) NVC	Total (75-80) NVC
1. Mean No. persons in hsld. (Number of households)	4.2(11)	3.0(4)	3.5(10)	4.6(9)	3.8(8)	5.1(11)	4.2(53)	4.0(9)	3.0(2)	3.5(6)	3.0(6)	3.8(6)	3.5(4)	3.6(33)	4.1(22)	2.9(7)	3.5(16)	4.0(19)	3.8(15)	4.7(17)	3.9(96)	4.1(12)	3.9(10)
2. Mean No. adults (ditto)	2.6(11)	2.0(4)	2.1(10)	2.6(9)	2.1(8)	2.5(11)	2.5(53)	2.3(9)	2.0(2)	2.2(6)	2.3(6)	2.5(6)	2.0(4)	2.3(33)	2.5(22)	2.0(7)	2.1(16)	2.4(19)	2.3(15)	2.7(17)	2.4(96)	2.3(12)	2.1(10)
3. Mean no. pre-schoolers (0-5 yrs) girls				.1	.5	.2	.1			.2		.2	.5	.1			.1	.1	.3	.3	.1	.08	.10
boys			.2	.3		.1	.1	.1	.5				.3	.1	.1	.1	.1	.2		.1	.1	.17	0
4. Mean no. elementary schoolers(6-12yrs) girls	.4	.3	.5	.4	.1		.3	.3	.5			.2	.3	.2	.3	.3	.3	.3	.3	.1	.3	.33	.40
boys	.6	.5	.2	.3	.6	.5	.5	.3		.3	.2	.4		.2	.5	.3	.3	.3	.5	.4	.4	.25	.30
5. Mean no. secondary schoolers (13-18yrs) girls	.3	.3	.2	.2	.1	.6	.3	.4		.3	.4	.6	.3	.4	.4	.1	.2	.3	.3	.5	.3	.50	.50
boys	.4		.3	.5	.3	.6	.4	.5		.5	.2	.2		.3	.5		.4	.4	.2	.4	.4	.42	.30
Total children in responding hslds(Σ3,4,5) girls	7	2	6	7	6	8	36	7	1	3	2	5	4	22	16	3	9	11	13	16	68	11	10
boys	11	2	7	11	7	13	51	9	1	5	2	3	1	21	21	3	12	17	10	15	78	10	6
Mean no. children per hsld - all ages	1.6	1.0	1.3	2.0	1.6	1.9	1.64	1.8	1.0	1.3	0.7	1.3	0.8	1.30	1.7	.9	1.3	1.5	1.5	1.8	1.52	1.75	1.6
6. No. children by age 1yr.	3		3	1		2	9	2	1	1		1	1	6	5	1	4	1	1	3	15	1	0
2yr.	1	1			1		3						1	1	1	1			1	2	5	1	1
3	3	1	1	3		2	10						1	1	3	1	1	3	1	3	12	1	1
4	2		1	1			4	2						2	4		1	1		1	7	2	1
5	2				1	1	4	2		1			1	4	4		1		1	2	8	0	0
Subtotal pre-schoolers (%)	11	2	5	5	2	5	30(34)	6	1	2	0	1	4	14(29)	17	3	7	5	4	11	47(30)	5	3
6	2			1	2		5	2						2	4			2	2		8	1	1
7	2		2	1		2	7	1						1	3		2	2	1	2	10	2	2
8	1		1	1	2		5	3		2	1	1		7	5		3	3	3	1	15	3	3
9	1			2		1	4					2		2	1			2	2	1	6	0	0
10	1			2	1	2	6	2		1			1	4	4		1	3	1	3	12	2	2
11				1			1	1		1	1	2		5	1		1	3	2	1	8	2	2
12		1	1		1	3	6			1	1	2		4		1	2	2	3	3	11	1	1
Subtotal elementary schoolers(%)	7	1	4	8	6	8	34(38)	9	0	5	3	7	1	25(51)	18	1	9	17	14	11	70(45)	11	11
13				1	2	1	4	1			1			2	1			2	2	2	7	2	1
14				1		3	4	1						1	1			1		3	5	0	0
15	1		1	2		2	6				1	1		2	2		1	4	1	2	10	3	2
16	1			1		2	4				1		1	2	1			3		3	7	1	1
17			2			2	4	1			1			2	1		2	1		2	6	1	0
18					1		1					1		1					2		2	0	0
Subtotal secondary schoolers(%)	2	0	3	5	3	10	23(26)	3	0	0	4	2	1	10(20)	6	0	3	11	5	12	37(24)	7	4
Others						2	2(2)													2	2(1)	1	0
Total all ages	20	3	12	18	11	25	89(100)	18	1	7	7	10	6	49(100)	41	4	19	33	23	36	156	24	18
No. hslds by no. of children (%) 0	2	1	2	1	2	3	11(21)	1	1	2	3	1	1	9(27)	3	3	4	5	3	4	22(23)	2(17)	2(20)
1	2	2	3				7(13)			1		2		3(9)	3	2	4		2		11(12)	1(8)	1(10)
2	4	1	4	5	5	3	22(42)	5	1	2	2	1	3	14(42)	10	2	6	8	7	7	40(42)	5(42)	4(40)
3	2		1	2	1	3	9(17)	3		1	1	2		7(21)	5		2	5	3	4	19(20)	3(25)	3(30)
4	1					1	2(4)							0(0)	1					1	2(2)	1(8)	-
5				1			1(2)							0(0)				1			1(1)	-	-
5+						1	1(2)							0(0)						1	1(1)	-	-
7. Mean age of adults (yrs) M	41	46	44	40	41	47	43	42	36	46	44	53	50	46	41	45	45	43	46	47	44	45	44
F	41	46	42	49*	41	46	42	39	41	47	44	49	48	45	40	39	44	42	44	44	42	42	42
8. Separate bedrooms for children (%) (N=83) Yes	8	3	10	7	6	8	42(86)	7	1	4	3	5	3	23(92)	17	5	14	13	12	13	74(89)	11(79)	9(100)
No	2	0	1	1	1	2	7(14)	2						2(8)	4		1	1	1	2	9(11)	3(21)	0(0)
9. Children ever (N=83) shared bedrooms (%) Yes	5	2	6	5	2	5	25(52)	4		1	1	1	1	8(31)	9	2	7	8	3	7	36(43)	5(46)	3(33)
No	5	1	3	3	5	6	23(48)	5	1	3	3	4	2	18(69)	12	3	6	7	10	9	47(57)	6(55)	6(67)

*Figure inflated by presence of octogenarian living with family. Without this person the mean age would be 39.

returns for expansions in some years, but the increase does carry the implication that the greater pressures for space arising from household numbers have been more acutely felt in the District rather than in West Vancouver. This is consistent with the tendency for larger expansions to be built on North Vancouver District houses, as expressed in the median values of 309 square feet to 280 square feet in West Vancouver.

It should also be noted that these average family or household numbers place those who expand their houses just on the high side of the distribution of houses by number of persons, as referred to above. (Table 19) Specifically, the value 3.9 for the north shore implies that expansion houses appear on the borderline between houses of 2-3 and those of 4-5 members, and thus on the high side of the central position of category 2-3, as shown in Table 17. Similarly, each municipality may be seen to occupy an analogous position as expressed by the categories and values in this table. Thus it is clear that there is some relationship to be found between the activity of house expansion and the total numbers of persons in the household. But it is also known that the relationship is not necessarily complete, straightforward or clear.

Numbers of Adults: Expansion Households

When it comes to the numbers of adults per household, however, some different perspectives may be noted. There was no questionnaire returned which specifically identified that there was only one adult present in the household, although several indicated the presence of more than two. This is not to say that in every case there were 'perfect' nuclear family constructions, consisting of husband-wife, father-mother teams plus children, for in a few cases a widowed, divorced or separated household head might have been living with grown children and or another adult. Nor does this imply that there might not be other cases

like these to be found among these households from which questionnaires were not returned. But the body of material assembled does lead to the observation that expansion activity occurs principally where nuclear family households are present and behaving in a relatively traditional manner, caring for family and household.

Given the rise of the single person household in general, however, both in Vancouver and in Canada, this suggests that, from the point of view of house expansion, this modification of traditional living patterns has not yet penetrated, to any significant degree, the single detached housing market on the north shore. But some incidental observations, and general social trends, may mean that this direction of change, should it continue and grow, may not be far away. A series of cases observed by this researcher possibly point some directions on this.

(a) In 1982a middle aged man bought a 2,800 square foot house on two equal floors, and in so doing moved from the City of Vancouver. He continues to work downtown. Almost immediately on moving into his new house he rented the downstairs to two single young women. Presumably his motive is investment as well as finding an outlet for his energies in property maintenance, and one presumes further that he will not actually expand the house. But there will in all probability be no children in that house in the foreseeable future.

(b) An 1,800 square foot house was purchased about five years ago, by a young, single, professional woman. She lived alone with her fashionable dog for a couple of years, and represented quite a different life style in the neighbourhood than that represented by her predecessors, a middle aged professional couple who had moved to another residence following the 'emptying of the nest'. But her behaviour was one of quiet demeanour in contrast to that of the young singles in a rented house near her. She was thus accepted easily. Later she was joined by a mate, and the couple produced a child. The dog died

and was not replaced. Shortly afterward they sold the house and moved. Their destination is unknown, but all signs would point to having 'moved up the market', using that first family home as a 'starter' home. The potential for expansion of this home is impossible to gauge, although it might be noted paranthetically that it did once undergo expansion when a family room was added by the original owners, before the period of this present study and at a time when their two children were living at home. The house has turned over twice since the couple left, having presumably been used as a speculative investment.

(c) A professional family with two daughters lived in a standard but adequate house with a pleasant view, and each daughter had a separate bedroom. The house might be estimated to have about 3,000 square feet, including a full finished basement, and it had been well maintained. They decided to move when the girls were half-way through high school. This move took them to a larger house, possibly only a short time before the nest might empty. They sold their property to an immigrant household, probably of Italian background, and the new owners immediately doubled the population of the house with what appears to be an extended family, including one or two small children. But there appears to be more than one adult couple. They have been very energetic in developing the yard, by building a stone barbeque fireplace and adjoining patio, by paving more space for parking, and by planting and rearranging the garden-including grape vines against a south-facing wall. One would perhaps hazard a guess that this house has a high potential for expansion. Further, the character of the neighbourhood is clearly open to modification, and the demonstration of this in choice of painting styles and colours is clear evidence of a social evolution expressed in house character. This example represents the opposite tendency noted for the increase in one person households, and is to be associated with an elusive variable, ethnic shifts and concentrations, as well as stages of family

development within the social fabric.

Many more examples could be cited, as would be the case in any community - two unmarried adults of the same sex deciding to buy a home jointly in order to secure their own futures; or an immigrant oriental family seeking special permission to expand their house sufficiently to accommodate two sets of in-law parents in their traditional pattern of caring for the elderly - but these suffice to indicate that changes are afoot, changes which may well presage a new set of attitudes to the livability of and potential for the single family house as a structure. Perhaps what has happened in parts of the City of Vancouver, historically in the west end, followed by Kitsilano, and now the east side, might be taken as a forerunner for north shore developments. But while this may be part of the story, it would also be necessary to note that the north shore is physically removed from the main city, and remains, as a consequence, perceptually removed as well. Its municipalities are somewhat insular in their attitudes, and thus there may always be a modified version of generally expected urban developments to be observed on the north side of the inlet.* Should adult-oriented living develop in the style, say, of Sausalito and Marin County in metropolitan San Francisco, and this is a possibility in West Vancouver, there could be a major shift in the uses of and modifications to housing structures, and not necessarily to raze them in favour of new construction, but quite possibly to preserve and modify them. Some of this is clearly speculative, but given that the decision-making power rests with

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* This may appear to contradict the evidence presented later in the discussion of the journey-to-work but in fact it does not. For the functional connections between the north shore and other areas are not at issue at this point. From a perceptual point of view the crossing of the inlet to go home is in some important sense also to enter the home territory, a perception not unrelated to insular attitudes.

adults, then the question of more than population density in households is implied. Pressures from children's numbers, to be discussed next, are obviously important, but children alone cannot force the expansion of houses except through the decisions and organization of adults in the households. Thus the basic behaviour of adults is clearly an important focus.

Numbers of persons: children and their stages of life in expansion households

The mean number of children per household expanding their premises was 1.52 for the north shore during the six years of this study. Because the samples become small for individual years in each municipality, the mean number of children reported annually in each place is not necessarily a reliable guide to detailed trends. Given that, however, it is interesting to note that only once, in North Vancouver District in 1978, did expansion households average two children. This is consistent with the observation that the numbers of children are perhaps surprisingly small, but it is even more surprising that households which feel that their living space should be expanded have themselves so few children on average.

Information was supplied in two ways on the stage of childrens development. Children were first referred to in categories of sex and stage of schooling, and, second, they were categorized by age at the time of expansion. There was an excess of boys over girls in responding north shore households (78 to 68) due to an imbalance in North Vancouver District of 51 to 36. It is of course impossible to say why households expanding their space should have such an imbalance, and it may merely be a random occurrence. But perhaps not entirely, for we are dealing here not with the population at large but with that specific sub-group of single families, living in detached dwellings, which chooses to expand its several premises. And so the question may be raised, although not answered here: is there something in the behaviour of boys which demands spatial

accommodation in the family house to a greater extent than does the behaviour of girls?

Whatever may be the answer to this, there is no disputing the life stages at which expansions are most commonly carried out. For the north shore, and for North Vancouver District, 30 percent of children were pre-schoolers at the time of house expansion. This level is essentially the same in West Vancouver where the score is 29 percent. This substantial proportion may be taken to represent the activity of households anticipating the need for more space. Or, if second or third children are the ones being counted because these are the stages when the expansion occurred, perhaps the felt need would be for an immediate increase in space. A further factor would be that an expansion may be built in anticipation of trading or selling a house on better terms for a larger one. There is a great deal of effort involved in this latter approach, but an energetic couple sometimes decides on this approach in order to trade their starter house for their 'dream home'. This work, in the case of one interviewee, was seen to be a commitment at this stage of the children's lives (pre-school) in order that in future the parents, but especially "daddy", would be able to devote weekend and evening energies more to the children and family recreation. Whether it works out that way is of course a moot point, for often these energetic people appear to be almost locked into a pattern of activity in which building and home renovation are pastimes. The syndrome of expanding the house as a behavioural response to the problem of having something to do is difficult to pin down, but one sensed it in some interviews, and one also senses it in the behaviour of people in the 'home handyman supermarkets', and lumber yards, where men may be seen admiring and eventually buying the newest gadgetry marketed so cleverly by Black and Decker or Sears. One sometimes

is led to speculate, therefore, that the economic argument, and presumption, that resale value is enhanced by addition to the house, is only an acceptable rationalization for giving expression to a deeper urge to create and to be in intimate touch and control of what is one's own. This may be a more important urge than is generally recognized when one considers that most of those returning questionnaires work downtown (Figure 18) and so presumably sit at the desks of large companies whose direction is little affected by their efforts.

But the greatest time of building activity, in households with children, occurs in the elementary school years. Setting aside the option of moving house, at this family stage there is a new coping strategy necessary in family life. For this is the stage when children begin to grow larger and physically to occupy more space. They also become stronger and of course are active. Six year cribs give way to full-sized beds; new possessions, including bulky sports equipment and bicycles, are acquired; but not all toys of the earlier pre-school stage may be discarded. This identifies a need for storage space. And it would be this researcher's impression that many of the older houses being expanded, those built before about 1960, would not have the required storage space.* Many of the toys and possessions of the last 20 years would appear to be both larger and more numerous in households than formerly. It would be instructive to

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* On the north shore one should discount romantic references to larger, roomy and perhaps ramshackle houses of yesteryear in which the whole family, along with aunts and cousins, led an idyllic existence. There are a very few such places dotted here and there, but they were never numerous and always expensive in contemporary terms. The typical family lived in a more typical boxy house of two or three bedrooms, and, only in certain cases and a few areas, where wealth was an important factor, were larger elegant homes built. These too are present but are more important to-day than formerly, and so do not form except by context any of the point being developed.

have a study on the changing relative cost of toys during the last two or three generations. This is the age of the plastic revolution in toy manufacture, and to recognize the easy availability of more and larger toys is to imply, further, the pressure on household storage space.

The elementary school stage is also one in which television watching and, recently, computer games are popular pastimes. These are added in some households to older but space-consuming activities such as darts, billiards and table-tennis. While billiards in particular may once have been a hallmark of the more wealthy, it is now a common suburban game in recreation rooms. Pressure for these games, and thus the space for them, collectively, would begin during the elementary school years. Unless the parents themselves were devoted to such activities, the need to respond to them in spatial terms might well have been unanticipated at the time of house purchase. Thus the consideration to expand, to add some useful space, comes about, and the enclosure of a carport or the addition of a bedroom or family room as a newly defined element of the building complex on the property might suggest itself.

Although not a great deal of time might be consumed in deciding what form the expansion should take, it perhaps does not require very much time to plan and execute a simple addition. (See below regarding times for project completion). What would take more time would be the dawning realization of the need for more space, the interpretation of family squabbles and frustrations in terms of a spatial impetus and solution, the understanding of the suggestions of teachers that children should be provided with a dedicated place to study as they enter the years when homework assignments begin and in preparation for high school. Thus nearly one-half (45 percent) of children are of elementary school age (6-12 inclusive) when expansions are built onto their homes. In North Vancouver

District this proportion is 38 percent, and in West Vancouver it rises to 51 percent.

To place emphasis on the elementary school years, however, is not to suggest a naive conclusion that expansions to houses are not important in either the pre-school or secondary years. They clearly are important then as the data in Table 19 would indicate. About 30 percent or more children are pre-schoolers when expansions are built, and about one-quarter of children are in secondary school years. In the former there are reasons of anticipation of the need for more space, and the immediate need if perhaps the pre-schoolers are the youngest members of their families. In the latter would be the continuing need for more space as the children grow and become more active, and especially if they are joined by younger siblings reaching the school age years. The actual drop in the proportions between elementary and secondary schoolers is from 45 percent to 24 percent respectively, representing a drop by 21 percentage points across the north shore. In North Vancouver District this drop is only 12 percentage points, from 38 percent to 26 percent, but in West Vancouver it is fully 31 percentage points from 51 percent to 20 percent. The implication is that it takes a little longer in the life cycle of the family to make this adjustment in North Vancouver District than it does in West Vancouver.

Once the expansions are complete, however, the pressure from the presence of children for further expansion would obviously be reduced. But given the relatively small number of children in the average family, one cannot escape the impression that the standard of living, as measured by space consumption in single family houses, is high all across the north shore (and across Canada as well).

The discussion above, regarding numbers of children, may be made more specific in regard to the sample here, in that of those returning questionnaires,

42 percent of expansion households on the north shore have two children living at home. Only 20 percent have three children, and fully 23 percent had no children at home. Only 12 percent had one child, and thus it appears that families which have expanded their houses aim to have more than one child, although quite a number (23 percent) are now either in the empty nest category or have never had children. This last category is slightly higher (27 percent) in West Vancouver, and slightly lower (21 percent) in North Vancouver, but both of these municipalities share the north shore proportion of 42 percent for the 2 child category.

Stage of life of adults in expansion houses

The fact that expansions occur during the elementary school years suggests that the parents involved are not in the first flush of their marriages but have been building the fabric of their family lives for some time. In fact the mean age of parents is mainly in the early forties, and those few exceptions which appear do so only in individual years rather than across the whole study period. For the north shore the family man engaged in house expansion averages 45 years of age and his wife 42 years. A cautionary note should be sounded about these data, however, for the questionnaire asked for the decade of parents' births, rather than a specific date. This was felt desirable in order to obtain this information, for it is well known that many people would choose not to reveal their specific ages. What was obtained, however, was complete in that no respondent refused to fill out the item, and some actually entered their birth years. Where they did so the actual ages were used in the computations; where the decade was indicated the mid year of the decade was used to calculate an age figure. Thus the information was derived in a somewhat standardized and generalized form. What it does reveal incontrovertibly, however, is that, on

average, house expansion is not an activity which is undertaken in the twenties, or even the early to mid-thirties. It begins in the late thirties and goes on for perhaps a decade, but there were only two years, 1979 and 1980, both in West Vancouver, when the average age of men expanding their houses reached or passed fifty. This was, incidentally, also a time when the average age was high in North Vancouver District, and one may suggest that, especially in 1980, the motive for expansion included an increased entrepreneurial element. A man in his early fifties, eyeing the runaway increase in the value of his property during those two years, and seeing the possibility of building a 'nest egg' towards retirement, might easily have been informally advised by family and friends to cash in on what was perceived to be a 'bonanza', perhaps first adding a little to the place to increase its value by a modest further investment. But that was perhaps somewhat exceptional and does not detract from the main finding that house expansions are built mainly by mature couples, who feel family pressures on space, who are well enough established to be able to pay for an expansion or to assume the extra debt, and yet who see a long enough future for there to be a prospect of enjoyment of the extra space.

Sharing bedrooms

Mention was made above of the relatively capacious dwellings represented in these single family dwellings. Further evidence for this is found in the information regarding the sharing of bedrooms by children. Fully 89 percent of returns indicated that their children had separate individual bedrooms, this figure being 86 percent in North Vancouver and 92 percent in West Vancouver. In a very few cases, where there are larger families, the returns indicated that the pattern was mixed, with some children sharing while one or more had private rooms. In general the latter would be the older children.

From the point of view of the present study, however, the comparison of these proportions with those children "ever sharing" rooms in the present house is very important. It may be seen that 57 percent of children on the north shore have always had separate rooms, or, to express it in the terms of the question, have never shared rooms. The difference betwen this proportion, and the 89 percent having separate rooms at the time of the survey may be taken as a measure of the increase in space, of privacy, and of living standard of the children in households choosing to expand their premises. This difference would have to be discounted by the number of cases in which children have left home since expansion. That number is not known but, given that the survey is very recent, would not at the moment be large. There is also a general pattern to be observed of young people staying at home longer these days, and so putting to use the extra space added to their homes. (See Appendix 3)

HOUSEHOLD TENURE AND NEIGHBOURHOOD

Questions regarding household tenure and neighbourhood were designed to provide contextual knowledge about the location of expansion dwellings within a spatio-temporal behavioural framework. This in turn allows insight into the character and stability of the communities, and hence into the motives for expansion. Data in Table 20 are arranged in order of questions posed on the questionnaire in Part C.

The length of tenure in expansion houses is an important consideration, for it helps to indicate whether expansions are undertaken in the main for their use value or their exchange value and carries implications for the stability of the community. Data in question 1 are expressed in mean numbers of years of residence at the time of expansion. The variation between the three municipalities is almost non-existent, as clearly the mean tenure, at the time of adding living space to the house, is twelve years. What must be remembered is that some expansions may not be the first projects ever undertaken by these same households on these same houses, and this accounts for the cases in which people undertake an expansion very soon upon moving into a house. But the tendency for a decade and more to pass before undertaking an expansion is consistent with the findings above that a high proportion of projects occur when children are in elementary school. The pattern of life would thus appear to be that the house, upon purchase, is sufficient for the early years of marriage and also for the early years of family growth. As the younger siblings approach elementary school age, and the older ones approach and enter high school, however, the need for space becomes apparent to the point of taking action. A decade or a dozen years may have passed and the parents will have reached their forties.

There is, in addition to expansion, the option of moving to another house to obtain more space. Thus the question of where householders had moved from,

Table 20 HOUSEHOLD TENURE AND NEIGHBOURHOOD

		NS	NVC	NVD	WV
1.	How long have you lived in this house? (Mean number of years)	N=98 12.3	N=12 12.1	N=53 12.4	N=33 12.1
2.	Where did you move from?/(%)	N=98	N=12	N=53	N=33
	1) present municipality	30(31)	5(42)	14(26)	11(33)
	2) other north shore	18(18)	2(17)	7(13)	9(27)
	3) GVRD	33(34)	3(25)	22(42)	8(24)
	4) B.C.	6(6)	0(0)	4(8)	2(6)
	5) other	11(11)	2(17)	6(11)	3(9)
3.	Principal reasons for deciding to live here (%)	N=260	N=30	N=147	N=83
	a) liked house	60(23)	8(27)	31(21)	21(25)
	b) liked neighbourhood	71(27)	6(20)	39(27)	26(31)
	c) good house market potential	18(7)	1(3)	13(9)	4(5)
	d) convenient journey to work	33(13)	5(17)	19(13)	9(11)
	e) price was right	51(20)	8(27)	29(20)	14(17)
	f) other	27(10)	2(7)	16(11)	9(11)
4.	Place of work by area (%)	N=116	N=17	N=61	N=38
	a) downtown Vancouver	44(38)	5(29)	21(34)	18(47)
	b) North Vancouver City	11(10)	4(24)	4(7)	3(8)
	c) North Vancouver District	15(13)	3(18)	9(15)	3(8)
	d) West Vancouver	12(10)	2(12)	5(8)	5(13)
	e) other	34(29)	3(18)	22(36)	9(24)
5.	Time spent commuting to work one way (mean number of minutes)				
	M	(approx)30	31	27	38
	F	(approx)25	26	16	30
6.	Mode of travel to work (%)	N=95	N=11	N=50	N=34
	bus	15(16)	2(18)	7(14)	6(18)
	car	80(84)	9(82)	43(86)	28(82)

to their present locations, was an attempt to add a spatial component to the temporal one of tenure. Perhaps a finer mesh of locational origins would have been desirable to obtain, but in the interests of obtaining as large a number of correctly completed forms as possible it was felt that to ask for only a five part breakdown was the best approach. This was probably a correct decision, for although the questions were all completed to the level of a five part differentiation of places or areas, the sub-request for neighbourhoods in the north shore municipalities to be identified elicited a poor response.

For the north shore as a whole 31 per cent of moves were from within the present municipalities, the highest value (42 percent) being in the City, and the lowest (26 percent) in the District of North Vancouver. This indicates a very local and loyal citizenry in the City, one which is long term in its commitment, and perhaps one which might find it difficult to afford more costly houses up the slopes. The lesser value for the District is a reflection not only perhaps of a more mobile population, but also of the more recent development of some of the lands of the District for single family house development. In West Vancouver there is a tradition of families moving in and out in response to company transfers of the fathers from other cities, but by the time they expand their houses many of these people, some of them upwardly mobile executive families, have been in Vancouver long enough to feel they belong. But there is also a split in all these municipalities between those who have lived there a long time - and have been raised there - and the comparative newcomers. And in between these two is a group which moves locally on the north shore. The 27 percent in West Vancouver who identify that they come from the North Vancouvers indicate by comparison that West Vancouver is a destination for some, perhaps a place to aspire to. There is a reverse pattern of households moving from the comparatively expensive West Vancouver to North Vancouver in order to obtain similar housing at

less cost, and thus to release a body of capital funds (and this was a pattern that received extra impetus in the recent period of high mortgage interest rates) but over the long term it is more generally felt that the weight of the movement is the other way, that people trade up from North Vancouver in order to increase their equity and, some may feel, their social standing. Thus the comparative rates of movement into the North Vancouvers from other north shore municipalities are less at 17 and 13 percent.

If the first two categories of "present municipality" and "other north shore" are taken together, however, what emerges is a strong tendency for what might be called 'north shore loyalty' to emerge. This has both temporal and spatial expressions. Overall, 49 percent of the north shore moves were within this area. Keeping in mind that at the time of expansion the average tenure of households, as noted above, is 12 years, a remarkable spatial and temporal stability in the house expansion population seems to be implied. If the general popular notion holds true that Canadians move an average once every five years, then it may be seen that the subdivision of the population we are dealing with, those adding to their houses, is a very stable element. This is perhaps not unexpected, but it does contradict the suspicion that the main reason people add to their homes is to sell them for a quick profit. Quite the opposite would seem to be the case.

It is interesting that the 'loyalty factor' seems to reach about the 60 percent level both in North Vancouver City and in West Vancouver, but is lower at 40 percent in the District. (Table 20 2(1) plus 2(2)). The City and West Vancouver are the municipalities with the greatest sense of identity. This is not to say that the District is socially and politically amorphous, but it has no central core and the main foci of its commercial provision, perhaps with the exception of Lynn Valley, are to be found either in the City or in West Vancouver.

As might be expected, the GVRD ranks as substantial source of population, and this is especially the case in the District (42 percent as against about 25 percent in the City and West Vancouver). Thus it may be seen that the District is importantly the destination of families moving to the north shore, and this point is the converse of that regarding loyalty to the north shore. This may be expected in part because the District is the largest municipality as far as numbers of households and single family dwellings is concerned. This has been increasingly the case over the years, and has been true for more than two decades. In 1961 47 percent of single family dwellings on the north shore were in the District. By 1971 this proportion had risen to 50 percent, and to 54 percent in 1981. (Socio-demographic profile in Appendix 1)

The relatively small values recorded here for origins outside the GVRD do not permit firm conclusions. Movement from elsewhere in B.C. and from other sources is too small to generalize about, save the observation that those moving from outside B.C. often have come from overseas rather than from other parts of Canada.

The principal reasons for deciding to live in the present dwellings are mainly accounted for in the five reasons indicated in section 3, Table 20. As may be seen, the idea of good house market potential ranks the lowest across each municipality. Does this mean that people who move to the north shore have come to settle with this being their last intended move? Does it mean that respondents were reluctant to admit that they have notions of trading up, or selling for a good profit? Or does it mean that the move was made because it was the right move at the time, and the householders did not worry about an undefined future benefit because they were too busy getting through their daily lives? In this last question there is no implication that householders would close the door firmly on a future beneficial move, it is simply that

such a move was not a planned one at the time of moving to the present house. In any case the main positive reasons for moving are, for the north shore, indicated as liking the house and neighbourhood as the primary ones (50 percent when taken together), followed by the factor of price (20 percent). The journey to work reason was most strongly felt in North Vancouver City, this being apparently a place where people desire less to commute any real instance. This is also the area of the main concentration of industry, especially water-front and dockyard industry. To house the worker has been a traditional role of the City since the start of the Second World War, as Hardwick has pointed out. The convenience of the journey to work falls to a low of 11 percent in West Vancouver, and this low value is perhaps associated with the group of people raised there who also work there, the 'traditional population', and those newcomers for whom punching theclock is not necessary and who can arrange their arrival to work with a certain flexibility. This relieves them from some of the pressure associated with the journey-to-work, and allows for a greater freedom of location of house. It is also pertinent to note that the sense of community in West Vancouver is importantly expressed in its own bus system. Only recently, and only partially, amalgamated with the Urban Transit Autority, it has always been well used by the population and recently became a focus of community municipal solidarity when its takeover by the larger Authority was mooted. Through the actions of the Mayor and Council an accommodation was made to allow this bus line to retain its identity with the municipality, and that incident seemed to have the effect of increasing its ridership. The point of introducing this is to say that the journey-to-work is probably not an important issue to many in West Vancouver, for access to downtown, or to the centres of commercial activity anywhere on the north shore, is easy, cheap and fast, whether by public transit or by private car. This is consistent with

the reasons given for rejecting a move to another house to obtain more space, as shown in part 3 of Table 20.

It is popularly held that the north shore is a place of high property values, and in many areas, especially in West Vancouver, this is true. Thus one notes with interest that 20 percent of the respondents indicated that their decision to locate in their present houses was because "the price was right". North Vancouver District is the 'average' municipality here, with the City being higher in response to price (27 percent) and West Vancouver being lower (17 percent). Thus one notes what is known locally, but perhaps not widely appreciated, that there is a wide range of property prices on the north shore, and some are very modest. What may contribute to the popular idea of high price may involve a more subtle point, that the price per square foot of living space may be high, for it is true that lot prices are not low and many moderately priced properties have smallish houses. Thus to move to the north shore may involve a trade-off between more house and yard space for an equivalent price in a suburbanizing valley community such as Surrey or Langley, and accepting the more costly and time-consuming journey to work downtown from these other locations. The trade-off may also involve a willingness, unarticulated at the time of purchase, to do something about living space should the need arise. And thus expansions may be 'in the air' from an early stage.

The reasons for rejecting the alternative of moving house, listed in Table 21 are in general complementary to the reasons for deciding to locate in present houses, and they represent decisions taken at the time of expansion rather than those made some years earlier on the initial location. As already mentioned, the journey-to-work is of relatively minor importance, and the principal reasons were tied up in considerations of cost (26 percent), satisfaction with the neighbourhood (27 percent), followed by house quality (16

percent) and considerations of schools (9 percent). This last is evidently of comparatively minor consequence in the decision-making process pertinent to this issue, and one might note that despite, and perhaps because of an active public discussion about school quality, it is generally the impression that north shore schools are of good standing, thus relieving the householders of this worry in their locational decisions.

The high scores on the returns for "other" reasons, unspecified, is interesting, for this is a much higher score than the equivalent entered for part 3 in Table 20 the reasons for moving to present locations. And this would seem curious, for the information in Table 21 as already noted, represents much more recent information. Perhaps the categories "a" through "e" simply failed to capture the reasons, although they are the same categories as in Table 20 with the exception of house "market potential", a reason not relevant in section 3. There is perhaps something more subtle, something which involves the settlement process, perhaps to be referred to as the settlement feeling. "I got used to the longer journey-to-work" was a comment made during an interview with a respondent in eastern North Vancouver who works on the west side of the City of Vancouver. The value of "other" is higher in North Vancouver City and in West Vancouver than it is in the District. These are also the two places where the "loyalty factor" was most pronounced, where the migration from outside the north shore was least. I am led to believe that perhaps the "other" category simply means in general "all of the above" taken together, as well as perhaps a few other factors such as closeness to family members, not specifically enquired about in the survey. Thus in the settlement process a decision to move, and the action following, is a stark major turning point for many and the reasons are clear. But the decision not to move is much more complicated and 'soft', there being the alternative to fall back on what is one's own, to 'stay with

the devil you know', in short perhaps to add an expansion to solve the space problems without having to engage all the energy required to relocate and to fit into new surroundings. Thus part 2 of Table 21 records that just over half (56 percent) of those expanding their houses did not consider the alternative of moving. Although nearly half did consider it (44 percent) they rejected the alternative for a mixture of fairly powerfully expressed reasons, namely cost and neighbourhood first, and house quality and other undefined reasons second. In total for the north shore, these accounted for 86 percent of the scores.

There is some variation to be noted as between municipalities, particularly that cost was most important in the City (30 percent) and least important in West Vancouver (21 percent), but that neighbourhood was reversed in importance between these two places (15 and 31 percent respectively) the District remaining constant at 28 percent. Further, house quality and schools were ranked most importantly in the City. Thus a family orientation appears to emerge more strongly in the City, in the terms that the present study can capture, that is attention to the house and its structure in relation to the behavioural patterns of the family itself.

The place of work, the destination of the commuter, is most importantly downtown Vancouver. This is shown graphically in Figure 18. For the north shore 38 percent of respondents travel daily to the downtown and the next most important destination is off the north shore but away from downtown. Thus 67 percent are employed off the north shore, indicating that for a substantial majority of those expanding their houses the north shore municipalities serve as 'bedroom' communities.

There is some important sub-regional variation in this, however, a variation consonant with general trends. North Vancouver City is the destination for the highest porportion of its own residents of any municipality, supporting

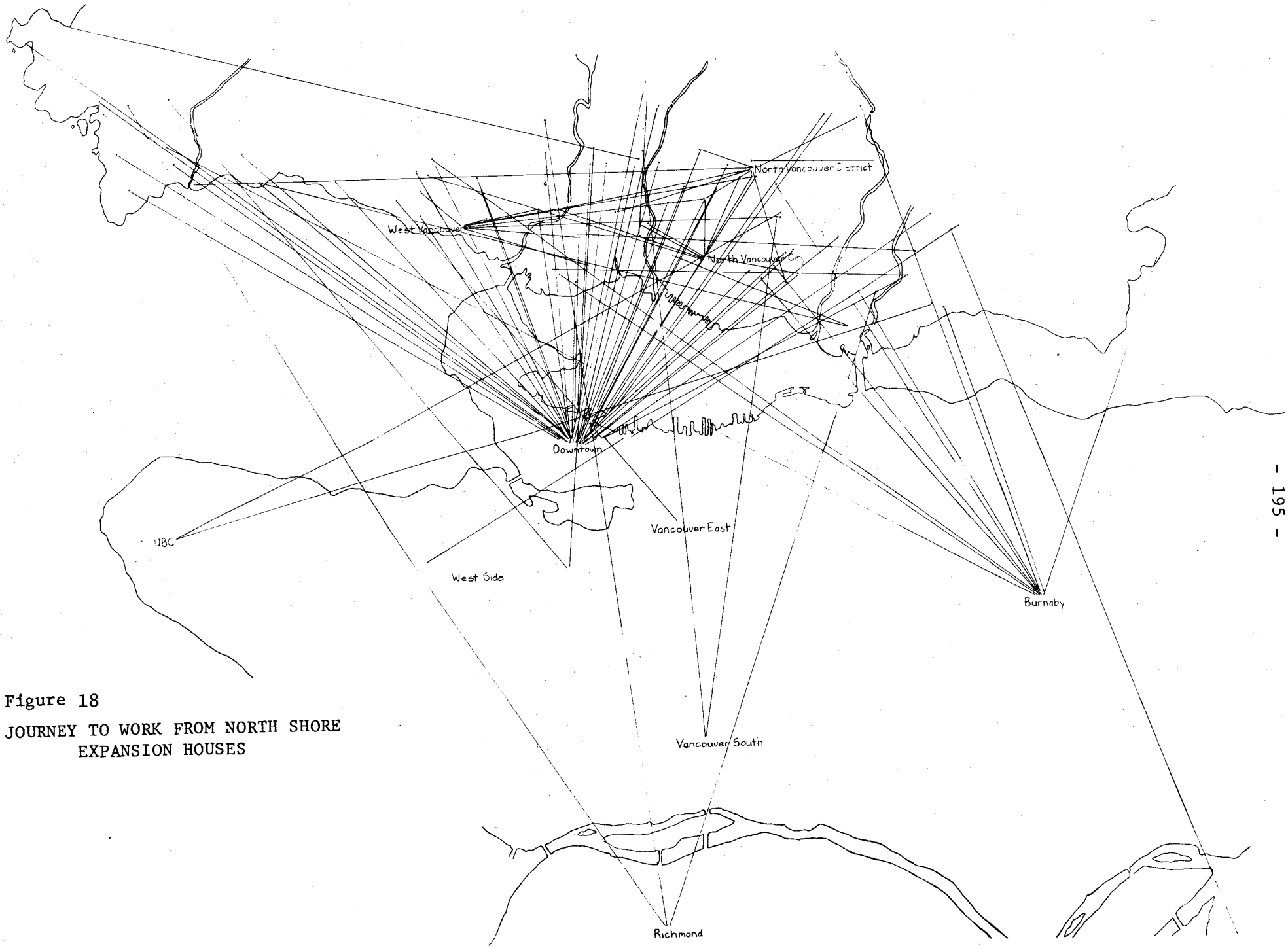

Figure 18

JOURNEY TO WORK FROM NORTH SHORE EXPANSION HOUSES

the discussion regarding convenience of the journey-to-work. In contrast, almost half (47 percent) of West Vancouver respondents are employed in downtown Vancouver. They also spend the longest times getting to work, although the times listed in section 5 of Table 20 are means for all destinations. About one-third (34 percent) of respondents in North Vancouver District are employed in downtown Vancouver, but the highest proportion (36 percent), somewhat surprisingly, work in areas off the north shore and away from the downtown. This identifies a pattern of movement across the Second Narrows Bridge into the eastern parts of Vancouver and its adjacent suburban municipalities which are themselves becoming, increasingly, centres of employment in the metropolitan area. Like the First Narrows access to downtown, this second crossing of the inlet provides relatively fast and easy access to the mass of built-up areas spreading east and south-east of the downtown core, and within the 1970's the connections across the Fraser River for car drivers, via the Knight Street Bridge, became a simple matter. Despite appearances of separation, the north shore communities are thus not isolated from the metropolitan area as a whole, although the western side of it would tend to focus on the downtown and western sides of Vancouver itself. The Sea-bus, which connects the foot of Lonsdale Avenue with the downtown at the CPR Station, emphasizes this orientation, and connects via bus feeder routes on the north shore to single family dwelling areas.* But this is a general point and serves as context to the fact of the present survey, that 84 percent of workers travel to work by car. This is a fairly constant proportion, although it is slightly higher in the District (86 percent) than in the City and West Vancouver at 82 percent each.

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* For a discussion of the importance of bridges in Vancouver's suburban development, albeit focussing mainly on the crossings of the Fraser River, see my Vancouver: Western Metropolis, Western Geographical Series, No.16, 1978, University of Victoria. Chapter 10 "Shaping the Vancouver Suburbs".

Respondents were asked to identify the boundaries of their neighbourhoods by street, stream, landmarks or other important features. This question concluded the section on household tenure and neighbourhood, and the question followed those which enquired about commuting. It was placed in this position to throw the respondents' mind back to the local scale of the neighbourhood, as identified in question three of this section, but after they were asked to consider the larger spatial scale of commuting. Most of the respondents provided answers in the form of boundary indications, as requested, although ten did not respond to this question. The results are shown in map form in Figure 19. The map preserves the information of the year in which the expansion of the house took place, although it does not appear that there is any clear relationship between stage of house expansion and neighbourhood boundary perception.

Numerous neighbourhood studies over the years, in various social sciences, have been conducted to try to enquire into nature of the neighbourhood. Those that have emphasized spatial delimitations have been oriented to standards of measure involving shopping patterns, elementary schools and the like, and boundaries have not always been identifiable as sharp lines but often have been zones of transition in the emphases of movement throughout adjacent areas. Taking from this research experience, the boundaries on this map should be seen in the broader zone of transition context. Even given this, it is of some surprise that so many neighbourhoods should be so small as these map identifications show. This is after all, a car owning society, and these suburbs house few people who do not own cars.

The main central areas, between the First and Second Narrows, show a wide variation in the sizes of neighbourhood perceptions. If the perception of neighbourhood sizes varies with stage of development, then one would expect that

V A N C O U V E R ' S

N O R T H S H O R E

(Small circles identify the locations of residences. These are shown connected to neighbourhood boundaries. Dates indicate year of expansion.)

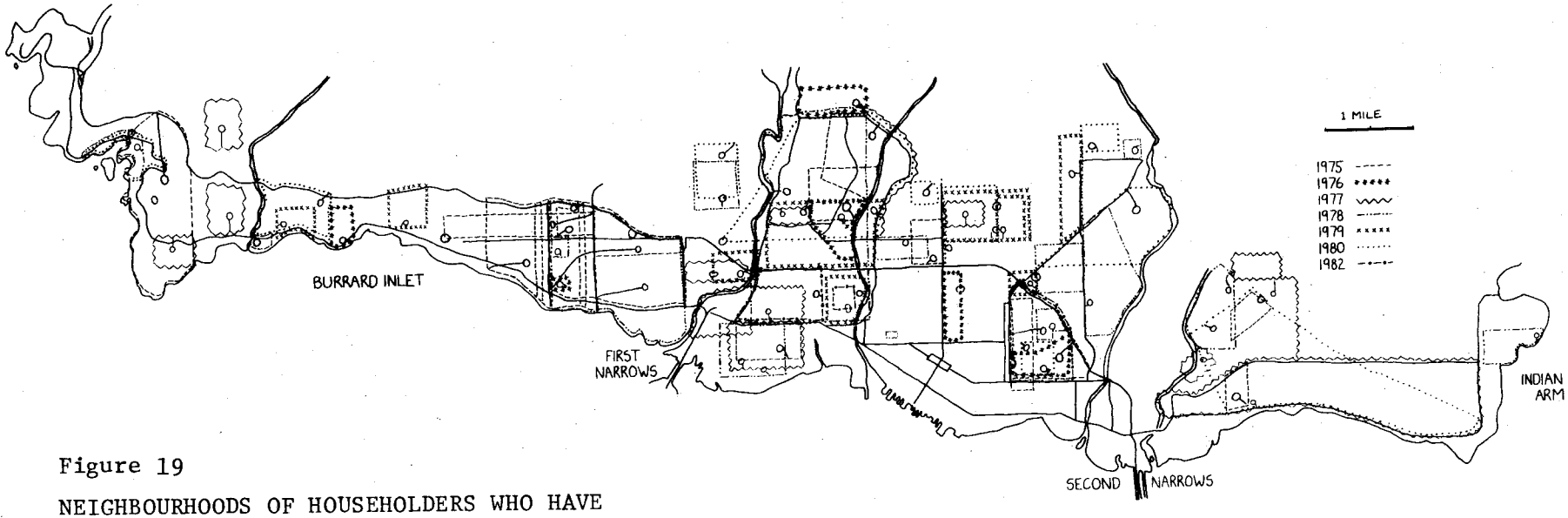

Figure 19

NEIGHBOURHOODS OF HOUSEHOLDERS WHO HAVE EXPANDED THEIR HOUSES

the variation would have several facets. It might be that in the initial stages of north shore development, to the extent that neighbourhood would be an applicable concept at all, the areas would be large enough to encompass the scattered dwellings of acquaintances. As the area became filled up, then the perception of the neighbourhood boundaries would be withdrawn to a more localized area. At some stage the smallest worthwhile unit would be 'identified', by whatever standards residents might choose.

How do these ideas fit a car-oriented set of suburbs barely two generations old? One might suggest that the carving up of the area by the designation of 'through streets' imposes strong "natural" boundaries, in the sense that traditional sociology uses the term "natural". Thus "natural areas" may be further implicated. Would it follow that the perception of neighbourhoods would involve a decrease in area with an increase in traffic, traffic which would demand more through streets? Certainly there have been outcries against certain traffic development proposals, in existing built-up areas, on the grounds that they would damage existing neighbourhoods, including creating hazards for children on bicycles and elderly pedestrians. So it would seem that even a car-owning public, in the areas around their homes, would identify the neighbourhood as a place where a person can still be in touch with a scale more appropriate to foot traffic and to those with limited personal mobility.

The fact that there are relatively few commercial outlets of the corner store variety within walking distance in most areas does not seem to affect this perception. The coming of the weekly shopping habit, by car, at the supermarket, perhaps has allowed for this more 'pure' form of neighbourhood to become established, one essentially residential in character and focussed in the community on the local park, the elementary school, and to some extent the churches, whose gymnasia/auditoria also serve the functions of community halls.

Thus the hallmark of the local neighbourhood is not commercial in any real way but is, rather, institutional, and public or voluntary in its financing. The strength of commercial zoning, and the resistance to its expansion as in the controversies over the establishment of "neighbourhood pubs", albeit in commercial areas, indicate that a protective attitude towards the neighbourhood is prevalent. Some respondents indicate quite large neighbourhoods, but these would be from those who regard the local ease of access by car to be a standard of neighbourhood identification. Others indicate very small neighbourhoods. Even given the variations of understanding of the term among different respondents, the very small areas shown (by respondents not too shy to take part in such a survey) would seem to imply a protective feeling about their life spaces and, ultimately, their own properties. The economic conclusion would simply but incompletely be that residents are, in these expressions of neighbourhood size, protecting the market values of their properties.

Thus their is great variation in the sizes of neighbourhoods identified. While there may be no apparent relationship between size and year of house expansion, the probing of the idea of neighbourhood is important for it relates to the question of whether residents are sufficiently satisfied with their neighbourhoods to further invest in their present houses, rather than to move. Overall, it appears that there is such satisfaction, for it has already been shown that expansions only take place after an average residence period of 12 years. But this satisfaction is probably not unconnected with the protective attitude (and vigil) maintained for the neighbourhood.

EXPANSION DECISIONS AND PROJECT

Limited reference has already been made in the last section to materials presented in Table 21. The purpose of this section is to present findings regarding the active parts of the house expansion project - the decisions to build and the householder's involvement in the work. Although the average tenure before expansion was fairly lengthy, averaging 12 years, it would appear that the length of time actually planning a project is between one and two years. It averages 18 months for the north shore, but is shorter in the two North Vancouvers (14 and 15 months) and longer in West Vancouver (24 months). Possibly these municipal differences stem from the less apparent pressure on space in West Vancouver, so that homeowners there do not feel the pressure to act so quickly. There would seem to be some support for this in the life cycle stages as shown in section 4(b), for the West Vancouver cases show a less peaked distribution around stage 4, acknowledging that this stage has the same emphasis, at 37 percent, as it does in North Vancouver District. The greatest peaking occurs in the City, however, and although the sample is small, it would seem that the greatest pressure is felt in respondents in the City to the need for space at this stage, and they respond the most quickly, in an average 14 months.

Such a length of time would be sufficient to consider comfortably the option of moving and, if rejected, to arrange for plans to be drawn and municipal permits obtained. But it is not so long that planning time could be wasted if the householder were to be involved in the drawing of the plans, or even if he were just to consult a number of people for ideas and estimates. If children are present it would seem advisable to build during the summer months so as to have them settled in the expanded house by the time school starts. And of course much of the aim in building is to take advantage of the good summer weather. Thus the cycle of decisions would seem to involve a felt need for more space,

Table 21 EXPANSION DECISIONS AND PROJECT

		NS	NVC	NVD	WV
1.	Planning time (mean number of months)	18	14	15	24
2.	Was the alternative of moving considered?	N=97	N=12	N=53	N=32
	Yes	43(44)	8(67)	23(43)	12(38)
	No	54(56)	4(33)	30(57)	20(63)
3.	Reasons for rejection of moving alternative (%)	N=176	N=20	N=104	N=52
	a) cost	46(26)	6(30)	29(28)	11(21)
	b) house quality	28(16)	4(20	16(15)	8(15)
	c) neighbourhood	48(27)	3(15)	29(28)	16(31)
	d) liked school	15(9)	3(15)	9(9)	3(6)
	e) journey to work	10(6)	0(0)	8(8)	2(4)
	f) other	29(17)	4(20)	13(13)	12(23)
4.	a) Decision to expand related to family life cycle	N=92	N=11	N=51	N=30
	Yes (%)	60(65)	8(73)	35(69)	17(57)
	No (%)	32(35)	3(27)	16(31)	13(43)
	b) Life cycle stage (%) (see note below)	N=88	N=12	N=46	N=30
	2 -	1(1)	0(0)	0(0)	1(3)
	3 -	18(21)	2(17)	11(24)	5(17)
	4 -	35(40)	7(58)	17(37)	11(37)
	5 -	18(21)	1(8)	11(24)	6(20)
	6 -	16(18)	2(17)	7(15)	7(23)
5.	Who drew the plans? (%)	N=100	N=12	N=55	N=33
	a) architect	41(41)	5(42)	19(35)	17(52)
	b) the builder	16(16)	2(17)	9(16)	5(15)
	c) independent builders draughtsman	8(8)	2(17)	5(9)	1(3)
	d) household member or friend	35(35)	3(25)	22(40)	10(30)
6.	Who did the work? (%)	N=112	N=16	N=57	N=39
	a) general contractor	39(35)	4(25)	18(32)	17(44)
	b) sub-trades, homeowner co-ordinator	23(21)	5(31)	12(21)	6(15)
	c) sub-trades, independent project manager	8(7)	1(6)	3(5)	4(10)
	d) homeowner	34(30)	5(31)	22(39)	7(18)
	e) other	8(7)	1(6)	2(4)	5(13)

	NS	NVC	NVD	WV
7. Homeowner's involvement (%)	N=132	N=15	N=76	N=41
a) major phases, skilled work	51(39)	6(40)	34(45)	11(27)
b) worked as helper to trades	13(10)	1(7)	9(12)	3(7)
c) co-ordinator only	16(12)	2(13)	5(7)	9(22)
d) preparation, clean-up, "being on hand"	20(15)	1(7)	9(12)	10(24)
e) avoided project	1(1)	1(7)	0(0)	0(0)
f) finishing work	31(24)	4(27)	19(25)	8(20)
8. How long did the project take? (mean no. months)	N=98	N=12	N=53	N=33
	13	7	13	15
9. Was the project on budget?	N=97	N=13*	N=53	N=31
Yes (%)	77(79)	11(85)	39(74)	27(87)
No (%)	20(21)	2(15)	14(26)	4(13)

* One project reported on two phases.

Note: Life cycle stages of family development are adopted from P.B. McLeod and J.R. Ellis's study of housing consumption in Perth, Australia. They in turn follow E. Duvall. The principal feature of their approach is that it takes the needs of the family to be more closely tied to the maturation of the oldest rather than the youngest child. In practical terms, in the present study, what might be called the flow-through effect of several children passing through their various stages of development at the same time within the same household cannot be accounted for. McLeod and Ellis follow Hoffman in calling this the "vintage effect" and make reference to this problem in handling cross-sectional data. They note that "We know of no work which specifically considers vintage effects in the analysis of housing consumption across the family life cycle..." pp. 178, footnote 4. There are eight stages identified in their classification, but only six, stages 2 through 6, are employed here.

Family life cycle: stages (after McLeod and Ellis)

1. Single, age of head less than 35 years, no children.
2. Couple, age of head less than 35 years, no children.
3. Couple, age of eldest child less than 6 years (pre-school).
4. Couple, age of eldest child between 6 and 12 years.
5. Couple, age of eldest child between 13 and 17 years.
6. Couple, age of head above 35 years, no children.
7. Single, age of head above 35 years, no children.
8. Single parent family.

perhaps towards the end of a school year, an initial casting about for ideas, a period of time firming up ideas and having them rendered into concrete plan form, the obtaining of permits and dealing with contractors and tradesmen. Throughout all this there would be a planning process relating to the financing of the project, from simple saving to renegotiating mortgages or taking out loans.

In West Vancouver the household's planning period averages about two years. This reflects simply less pressure of family development as already noted, and as shown in the spread of projects over the later life cycle stages. Recalling the discussions regarding morphology, it will be remembered that in West Vancouver a higher proportion of rooms are expanded than is the case of the North Vancouvers, and this implies a more complex design process, one which must take detailed account of structural characteristics of the pre-expansion house in order to create the expansion. This may in turn account for the generally more detailed and so higher quality plans presented over the years for approval in this municipality. This is not to say that plans in the North Vancouvers are not adequate. But experience in this study showed that the greatest attention to design was paid in West Vancouver.

Thus the question of "who drew the plans" is raised. The highest proportion drawn by architects is found in West Vancouver while the lowest proportion of "household member or friend" is found in the City. There may be some ambiguity as to the responses in this question, for on inspection of the questionnaires the impression was gained that the distinction between architect, builder/ draughtsman, and independent builder's draughtsman may have been too fine. Further, the fairly large proportion of plans drawn by a household member or friend masks the respondent of professionals (architects and others) whose business it is to draw such plans. As an aside, the most exquisite set of plans seen in this project was drawn by an industrial draughtsman for his own

expansion, although the expansion itself might be disputed by architects if it were claimed to rank first in design quality of the building. Thus the major points to arise from this section are that architects are heavily involved in the designs of expansions, and so are homeowners. Both these carry elements of surprise, for the expectation initially was that in general, for most projects, the builder would be the designer, this being a more economical but yet professional approach. It is true that in the Vancouver area there are large numbers of architects, and perhaps this 'population density' of these professionals exerts its own pressure in the design market. The result would seem to be, however, that in many projects there may be a high standard of design observed.

Involvement of the homeowner in the expansion project is not only substantial at the design phase, but it is even more substantial in the physical work of the project. Only one percent of respondents indicated that they avoided the project and had no involvement. If involvement in certain phases requiring skills (carpet laying and painting were given in the questionnaire as examples), and finishing work are combined, fully 63 percent of the involvement of respondents is implicated. Lesser, but not unimportant, proportions of respondents indicated that they worked as helpers to the trades, worked as the trades co-ordinator in bringing them in at the appropriate points and so working as project managers, and in "being on hand" to answer questions as they arose in the project. It is worth pointing out that just being on hand can be an extremely important role, for numerous situations arise in an expansion project which require decisions of preference. Without such presence the tradesmen must make their own decisions and an accumulation of decisions made with the best of intentions but not to the preference of the householder can poison the already strained atmosphere of an expansion project. This is especially important in those cases where major modifications to pre-existing houses must be made.

The strained atmosphere has been referred to in passing, and one can see from the length of time taken to complete the average project why that might be the case. All concerned are acutely aware of the fact that every hour is costly. Thus the length of time to complete a project, an average 13 months, may seem to put the price of expansion out of reach. In fact very often there is a pattern of work which involves an initial burst of enthusiastic work which then tapers off. Major obvious progress can and often is made at the framing stage. But delays in co-ordinating electrical, plumbing, and roofing and drywalling jobs can gradually work to build up frustration, this coinciding with a build-up of bills and debts connected with the project. Thus there may be a rapid diminishment of activity as soon as the structural essentials are in place and inspected, the remainder to be completed at a much slower pace. The total months identified as needed on average to complete a project are much longer than the period of time involved in the major initial effort. As everyone says, "Its the finishing that takes forever". This cycle of work helps also to explain the 24 percent of respondents who identified the category, 7(f) in the questionnaire, "undertook to do the major finishing work at a pace the household could stand". To this might also be added, "and at the much reduced rate of expenditure, if the householder is doing the work". In this the comparisons among the municipalities are in the expected directions, that there is the most involvement in the physical work in the North Vancouvers and the most restriction to co-ordination and "being on hand" in West Vancouver.

So, was the project on budget? Answers to this question also require caution in individual cases, for what was paid to an architect and builder are not necessarily what the project cost. In some cases notations from respondents indicated bitter memories of what they felt was overcharging, but in many cases the project was simply identified as having been on budget. In fact this is

overwhelmingly the case with an average of 79 percent claiming this. What may not always have been accounted for, however, is the homeowner's work, and the extra materials bought for finishing work over a longer period. Whether this amounts to a substantial proportion of the total cost is impossible to say, except that it would vary a great deal from case to case. Building inspectors, in recording estimated costs, use a formula of multiplying the expansion area in square feet by the going rate per square foot, but this rate refers to contractors' estimates rather than to householders actual costs. As these are possibly too detailed and complicated at the 'micro level' to worry about in studies of housing provision, emphasis is perhaps better shifted to reiterate what was reported in the survey that 79 percent felt they were on budget. The lowest percentage, 74, was from North Vancouver District, while the City and West Vancouver reported proportions of 85 and 87 percent respectively. The implication of this finding, when combined with the behaviour of personal involvement in the project, is that there is a high level of satisfaction with the economics of expansion, when the economics are taken as a part of the total expansion project. In short, to expand the house in which one lives on the north shore would appear to be a very satisfying project. For it is involving, creative, and seems to result in something of which the householder is proud. It not only creates exchange value but it also satisfies a desire or urge to have direct involvement in fashioning the house, the most intimate environment of life.

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APPENDICES

SOCIO-DEMOGRAPHIC PROFILE: VANCOUVER'S NORTH SHORE

L. J. Evenden
Department of Geography
Simon Fraser University

		1951	1961	1971	1981
I Population total			City of North Vancouver		
	NV(C)	15,687	23,656	31,845	33,952
			District of North Vancouver		
	NV(DM)	14,469	48,971	57,860	65,367
			District of West Vancouver		
	WV	13,990	25,454	36,440	34,347
			North Shore		
	NS(T)	44,146	88,081	126,145	135,047
	V(C)		384,522	426,260	414,281
	GVRD				1,169,831
II Male and Female >25/ /% of total population	NV(C)	9,452/60	13,411/57	18,315/58	22,360/66
	NV(DM)	8,944/62	20,795/53	30,555/53	40,095/61
	WV	9,307/67	14,957/59	21,945/60	24,340/68
	NS(T)	27,703/63	49,163/56	70,815/56	86,795/64
	V(C)		246,203/64	265,250/62	282,830/68
	GVRD				746,150/64
III Marital status: A. married/ /% of total population	NV(C)	8,130/52	11,718/50	16,270/51	16,750/49
	NV(DM)	8,028/56	19,257/49	28,410/49	34,500/53
	WV	7,696/55	12,698/50	18,290/50	19,035/53
	NS(T)	23,854/54	43,673/50	62,970/50	70,285/52
	V(C)		187,320/49	198,518/47	186,965/45
	GVRD				579,495/50

		1951	1961	1971	1981
III Marital status: B. married/ single/widowed/divorced /% of total	NV(C)	9,011/57	13,071/56	18,175/59	20,775/61
	NV(DM)	8,722/60	20,431/53	29,845/52	38,290/59
	WV	8,676/62	14,103/56	20,370/57	22,580/63
	NS(T)	26,399/60	47,605/54	68,390/54	81,645/61
	V(C)		215,564/57	229,855/55	236,645/57
	GVRD				686,745/59
IV Occupied single detached/attached private dwellings /% of total all dwellings	NV(C)		4,631/69	5,410/47	5,715/36
	NV(DM)		9,993/97	13,810/89	18,265/84
	WV		6,722/93	8,690/74	9,570/71
	NS(T)		21,346/88	27,910/72	33,550/65
	V(C)		75,937/	76,100/50	85,750/50
	GVRD				275,310/63

Note: 1971 and 1981 figures include both "single detached" and "single attached" houses. In 1951 and 1961 the "single attached" category was not used, the only distinction being that between "single detached" and "apartments and flats"

			1951	1961	1971	1981
V	Total Private Households:					
	A. Households by number of persons /% of total					
	NV(C)	1	331/7	845/12	2,345/20	6,190/38
		2-3	2,206/49	3,239/46	5,990/52	7,790/48
		4-5	1,580/35	2,281/32	2,530/22	1,895/12
		6-9	397/9	647/9	630/5	230/1
		10^+	23/1	25/-	20/-	10/-
	Total		4,537/10	7,037/99	11,515/99	16,115/99
	NV(DM)	1	381/8	580/6	880/6	3,025/14
		2-3	2,355/52	4,012/38	6,210/40	11,005/50
		4-5	1,474/33	4,653/ 45	6,890/44	7,200/33
		6-9	282/6	1,175/11	1,630/10	710/3
		10^+	9/	13/	25/	5/
	Total		4,501/99	10,433/100	15,635/100	21,945/100
	WV	1	392/9	703/10	1,965/17	3,265/24
		2-3	2,405/54	3,248/44	5,320/45	6,655/49
		4-5	1,397/31	2,702/37	3,575/30	3,185/24
		6-9	247/6	714/10	915/8	410/3
		10^+	4/-	11/-	15/-	--
	Total		4,445/100	7,378/101	11,800/100	13,515/100
	NS	1	1,104/8	2,128/8	5,190/13	12,480/24
		2-3	6,966/52	10,499/42	17,520/45	25,450/49
		4-5	4,451/33	9,636/39	12,995/33	12,280/24
		6-9	926/7	2,536/10	3,175/8	1,350/3
		10^+	36/-	49/-	60/-	15/-
	Total		13,483/100	24,848/99	38,940/99	51,575/100
	V(C)	1	11,124/11	20,342/17	41,995/27	66,615/38
		2-3	52,105/51	56,715/48	71,040/46	72,425/52
		4-5	28,899/29	30,293/26	29,555/19	26,555/15
		6-9	8,163/8	10,547/9	10,370/7	7,105/4
		10^+	1,039/1	508.	460/	335/
	GVRD Total		101,330/100	118,405/100	153,420/99	173,035/99

			1951	1961	1971	1981
VI	Total Families in Private Households: by number of children at home /% of total					
	NV(C)	0	1,525/35	1,971/32	3,570/42	4,405/50
		1-2	2,117/49	2,847/47	3,700/43	3,760/43
		3-4	582/13	1,111/18	1,125/13	570/7
		5+	93/2	185/3	185/2	30/-
	Total families		4,317/99	6,114/100	8,580/100	8,765/100
	NV(DM)	0	1,545/37	2,351/24	3,480/24	5,740/31
		1-2	2,033/49	4,763/48	7,280/50	10,065/56
		3-4	511/12	2,424/25	3,470/24	2,355/13
		5+	66/2	297/3	415/3	80/-
	Total		4,155/100	9,835/100	14,645/101	18,240/100
	WV	0	769/30	2,157/33	3,490/37	4,095/42
		1-2	1,241/48	2,909/44	3,920/41	4,470/45
		3-4	457/18	1,396/21	1,855/20	1,235/13
		5+	97/4	150/2	235/2	55/1
	Total		2,564/100	6,612/100	9,500/100	9,855/101
	NS	0	3,839/35	6,479/29	10,540/32	14,240/39
		1-2	5,391/49	10,519/47	14,900/46	18,295/50
		3-4	1,550/14	4,931/22	6,450/20	4,160/11
		5+	256/2	632/3	835/3	165/1
	Total		11,036/100	22,561/101	32,725/101	36,860/101
	V(C)	0		39,604/41	43,940/43	40,715/42
		1-2		39,973/43	40,380/40	43,820/45
		3-4		13,833/14	14,630/14	11,490/12
		5+		2,330/2	2,695/3	1,115/1
	Total			95,740/100	101,645/100	97,140/100

Note: (1) NV(C) - City of North Vancouver, NV(DM) - District Municipality of North Vancouver, WV - District Municipality of West Vancouver, NS - North Shore V(C) - City of Vancouver, GVRD - Greater Vancouver Regional District.

(2) Profile compiled from Census of Canada, March, 1983.

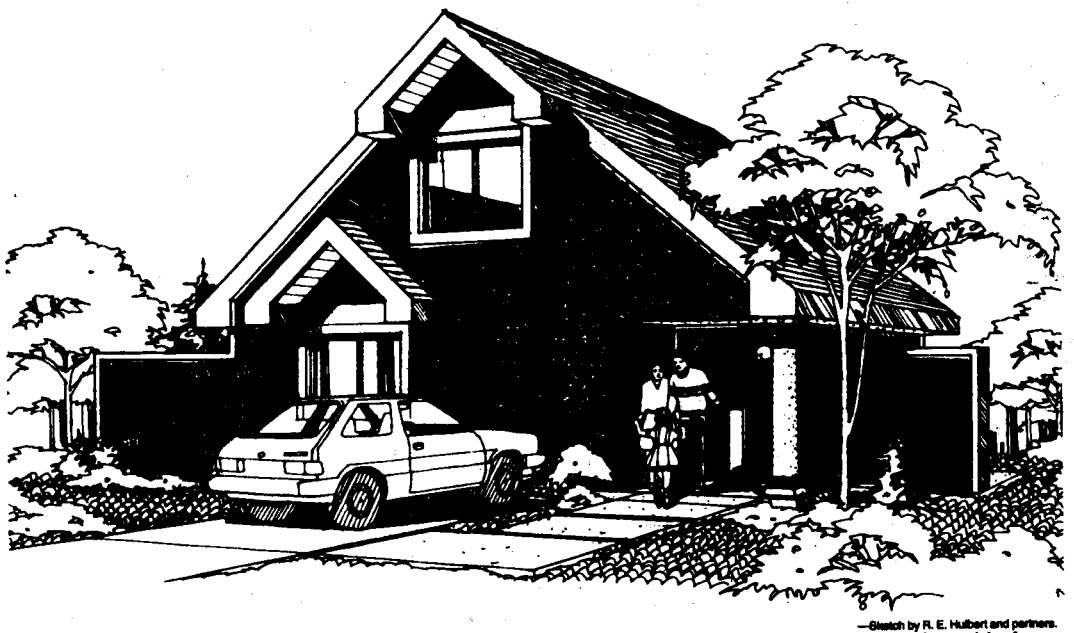
HUDAC STARTER HOME

Special Classified Advertising Feature

The Vancouver Sun

H 1 ★★★★ SAT., FEB. 5, 1983

Triple "A" demonstration home opens today



—Sketch by R. E. Hulbert and partners.

HUDAC'S GREATER VANCOUVER Triple "A" demonstration home, which promises to be economical to build and heat, will be open to the public from 11 a.m. to 9 p.m. starting today.

HUDAC's Triple "A" demonstration home officially opens for public viewing today. Constructed in just forty days, the home is located at the corners of Georgia and Thurlow Streets.

The demonstration home is part of a joint venture between HUDAC and the Super Efficient Home Program (SEEH) sponsored by the federal government's department of Energy, Mines and Resources and administered by the Housing and Urban Development Association of Canada.

The demonstration home is designed to ensure a reduction of as much as 60 to 80 per cent in the cost of energy used for heating space, water, appliances and lighting.

Known as R-2000 homes, these units are able to achieve high levels of energy efficiency through the installation of two to three times more insulation than is normally found in an average new house on the B.C. housing market.

HUDAC's Triple "A" home is designed for first time buyers. It is a smaller home which provides basic accommodation while offering the potential for future expansion as a family's needs change.

Architect Richard E. Hulbert created the Triple "A" home with the Triple "A's" in mind. The home is affordable, adaptable and accessible. Optional designs for the main floor and the upstairs space give purchasers a wide selection of models from which to choose.

HUDAC's Triple "A" home will sell at approximately $34,000 (for a modified version), plus land. Assuming a cost of 25,000 for a small lot, HUDAC officials estimate purchasers could acquire a home for $60,000.

"Depending upon the design format and options you select, this house can be a starter, a middle-life home for the growing family or a retirement home," says Jarl Rosenberg, president of Market Link Realty Consultants Ltd. "The adaptability of design in terms of structural expansion, interior finishing, siting flexibility and consumer features gives this home an exciting appeal."

Rosenberg is HUDAC's representative charged with marketing and promoting the Triple "A" home.

Bill Kennedy, Executive Director, HUDAC Greater Vancouver explains HUDAC's involvement in the Triple "A" home. "The events of 1980-81 made housing almost totally unaffordable in Vancouver. In late 1981 HUDAC determined that what the housing industry and consumers needed was smaller homes, smaller lots, smaller mortgages, smaller monthly payments and smaller expectations."

HUDAC's Triple "A" home is designed to meet those needs.

"HUDAC's goal of affordable housing will come about when all levels of government and the industry work together to ensure an adequate and proportionate share of narrower, lower cost lots and simultaneously seek out innovative measures to promote and enhance high density single family detached housing accommodation," says Kennedy.

Lower Mainland residents have an opportunity to tour the Triple "A" home for the next month. It will then be moved to a permanent site and sold. Simultaneously HUDAC will be sponsoring the construction of 16 similar homes in Coquitlam on the about-to-be-opened Riverview Subdivision.

Additional federal grants have been made available for demonstration homes to be constructed and made available for sale in Prince George, Nanaimo and Surrey. Thirty more demonstration homes will be completed, with federal assistance, throughout B.C. in 1983.

The Triple "A" demonstration home is furnished by IKEA.

The admission charge to tour the home is $2 for adults. Proceeds from ticket sales will go to CKNW Orphans' Fund.

The demonstration home is open from 11 a.m. to 9 p.m. daily.

The home of the future? Go and see for yourself.

Affordable housing

Any detached home that costs $44,000 or less, plus land, has got to feature some pretty cost-cutting construction techniques, right?

Wrong. Behind the handsome 1"x10" bevelled cedar siding of HUDAC's Triple A home are all the conventional features you'd expect to find in a quality wood frame home.

In fact, you'll find a level of quality superior in many ways to existing suburban homes and condominiums. This home is built under the R-2000 program and includes such features as wall framing of 2"x6" lumber for greater structural strength. This additional space allows a thicker layer of insulation, R-28, in the ceiling and exterior walls.

An air-to-air heat exchanger recovers and reuses up to 70% of the heat from the air being exchanged. It can slash heating costs and improve air quality in the home.

All windows are double-glazed with a ½" air space to act as a barrier to outside heat and cold.

Electric baseboard heating is featured throughout.

The cost economies come not from skimping on quality but from the smaller scale of the basic home and the standardization of dimensions which keep material costs and construction costs to a minimum.

The optional "base interior" at $29,750 plus land is an attractive feature for the first time buyer who wants to move into his/her own home with a minimal outlay of cash.

To save money this version is constructed without the R-2000 program, carpets or appliances. Walls are left unpainted. Closet doors and faces on kitchen cabinets have been omitted to allow buyers to finish the interior how and when they choose. Alternatively, buyers with available funds may choose a fully loaded interior package for $44,000 plus land.

Public invited to home

The HUDAC "Triple A" demonstration home on the corner of Georgia and Thurlow will be open to the public daily from 11 a.m. to 9 p.m. starting February 5th. Net proceeeds from the $2. adult admission fee will go to the CKNW Orphans' Fund project. Children under 16 years of age will be admitted free.

The admission ticket to the HUDAC home entitles the holder to a chance on the draw for the IKEA furniture used to furnish the home. As well, each ticket holder will receive an IKEA canvas shopping bag with IKEA catalogue and literature from the manufacturers who provided materials used in the construction of the demonstration home.

What is Triple "A"?

Wondering just what does Triple "A" Mean?

Well, where the HUDAC home is concerned Triple "A" stands for affordable, adaptable, and accessible.

The house is affordable but still features quality construction. The house, built to normal construction standards, meets all building codes as well as the R-2000 energy program requirements. To reduce the time required for on-site labour, new approaches using component systems for trusses, floor joists and headers have been implemented. Ideally the home will be built on a smaller and therefore, lower cost lot.

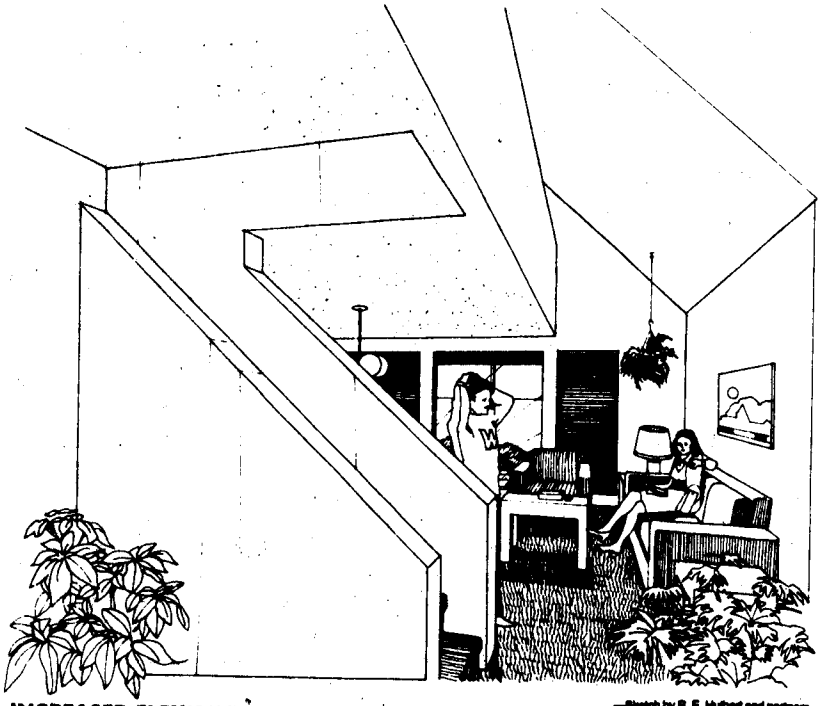
The house is adaptable to the community as a whole. The homes are directed to "first time" buyers who cannot afford a larger home. With an initial investment of $6000, the first time buyer may purchase a home with a partially unfinished interior. The first floor is completely finished. In the "no frills" version, the upstairs level will have walls and ceiling intact but partitions to separate the area into small room units are not included. The house is designed for future expansion as the expectations, needs and finances of the family change.

The house is accessible to all age groups and includes features to accommodate the handicapped. To be accessible, these houses should be in all types of communities with all kinds of lifestyles. They must be near shopping areas, parks, work, recreational facilities and schools.

The Triple "A" home is a smaller home designed for young couples just starting out who have given top priority to the acquisition of a home. It is a house which provides basic accommodation and may have unfinished space which the owner may choose to complete. At the same time it is designed to permit the easy addition of extra space.

The house is also very suitable for people about to retire who find their larger homes have exceeded their needs.

Triple "A" gives Canadians tickets for housing train



—Sketch by R. E. Hulbert and partners.

INCREASED FLEXIBILITY at lower cost makes Hudac's Triple "A" home an attractive housing option for young, retired, professional or single parent families. Artist's rendering shows optional loft and volume living room ceiling. Interior space can be adapted to suit the family's special needs.

Consider the train.

The locomotive pulls a First Class passenger car. Despite hefty prices, tickets are in demand. Nor do empty seats abound in Executive Coach, the second car on the train, where tickets sell for slightly less. Profits and demand for seats are so high that Economy Coach is dropped, thus making rail travel a privilege for the rich.

Unexpectedly, ticket sales fall. To attract more travellers, Economy Coach is reinstated. The twist? Tickets can be upgraded in future, as finances permit, to allow passengers to move into Executive Coach and First Class.

"Triple "A's" object — first and foremost — is to provide consumers with affordable tickets for the housing train," says architect Richard Hulbert, creator of the Triple "A" home.

"Once aboard, consumers can adapt their tickets as their expectations, needs and finances change. But let's first make the tickets accessible."

Affordable, accessible, adaptable — these are the criteria against which Hulbert formulated concept and plans for the new housing solution which, he argues, can provide the qualities associated with single family detached housing at approximately two and one half times the density.

"The home is affordable not because it's cheap," Hulbert says, "but because it is designed to responsibly use building materials, space and land. It's accessible to more users because all living functions are located on the main floor, at ground level. And, it is adaptable to a variety of building conditions and lifestyles."

Space stretching design, a classy exterior and well designed interiors featuring large entry foyer, volume ceiling, simulated island kitchen, and oversize bath, make the home feel larger than its actual 650 square feet. (60 square meters.)

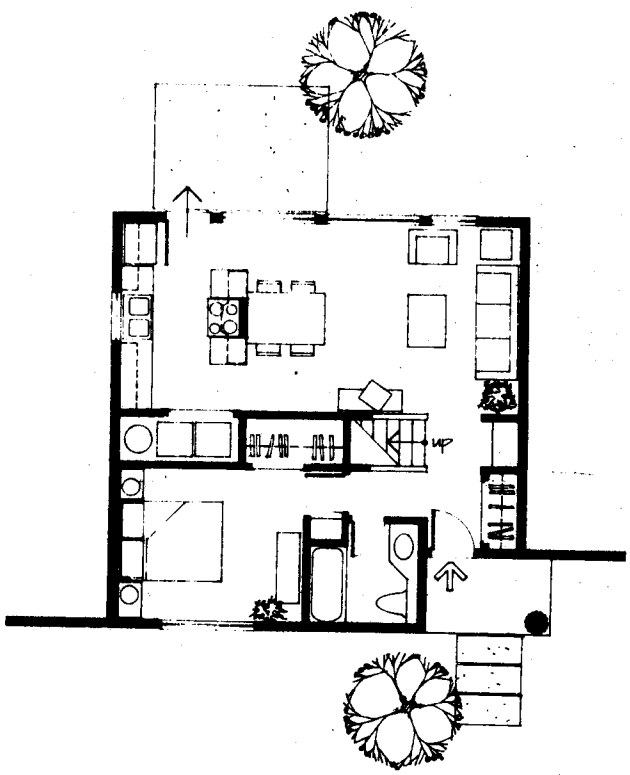
Richard Hulbert, FRAIC, AIA, RCA, has acquired many awards in his ten years in practice as an architect.

As a member of the Task Force on Energy Efficiency and Land Planning for HUDAC's National Technical Research Committee, Hulbert is an outspoken advocate of Land Efficient Housing, a term he prefers to "compact housing."

"What Land Efficient Housing tries to do," says Hulbert, "is to promote the qualities and amenities that people associate with conventional single family detached homes and to use those features as the basis for better land use."

"So the key word becomes planning — planning of spaces inside and out, trying to see how efficient we can be."

Triple "A" costs flexible



—Sketch by R. E. Hulbert and partners.

PROTOTYPE PLAN shows floor plan of basic Triple "A" home. Interior spaces are designed as activity centres rather than as rooms with names. The use of the upstairs loft may be determined by the owner.

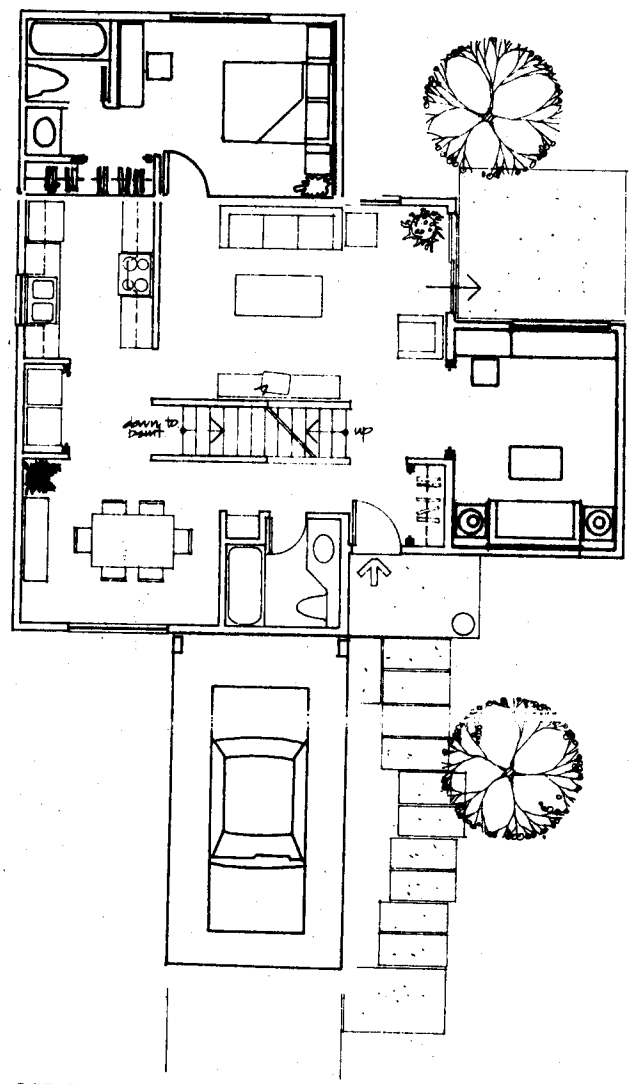
This super energy efficient Triple "A" home can be purchased for $44,000 (plus land.) This includes the upstairs finished just as you see it in the demonstration home at Georgia and Thurlow, and with the R-2000 energy saving features that will reduce the electrical space heating cost to $4.70 per month. ($2.62 per month with natural gas).

Part of the magic of this type of home is the purchaser's option of having one like this model built for even less money.

Here is how it works. The standard model finished as a one bedroom home ready to be finished (no stairs or dry wall upstairs) can be purchased for approximately $32,900 (plus land). For the energy conservation option add $4600 to cover thicker walls, more insulation, different windows, air tight construction and an air-to-air heat exchanger unit. Should you want your builder to finish the upstairs count on $6500 to do it just like the demonstration home.

These prices are estimates because material and labour costs fluctuate. They do, however, include a reasonable mark-

See Flexible page 7



OPTIONAL EXPANSION of the basic model is feasible. This plan shows an added carport, den and master bedroom. The original master bedroom has become a formal dining area.

THE SUN, May 28, 1983

SWEET HOME!

Hard times refill the empty nest

By ELIZABETH GODLEY

THE average parents devote a good 15 years to teaching their young to fend for themselves. Lovingly, they nurture that nascent spark of independence, waiting for the day they won't have to remind son or daughter to pick up the wet towels, brush the teeth or eat the spinach. They are working toward the day they can sit back and bask in the glow of a job well done.

The day the kid moves out.

But more and more parents are facing a new phenomenon spawned by tough times. Grown-up children, victims of unemployment and high interest rates, are moving back home.

Forget the empty nest, a term coined to describe the period of loss and loneliness many parents experience when their fledglings take off.

The latest syndrome is the *refilled nest.*

Seven years ago, Kathleen Jones figured she'd left home for good. Now 30, she's been rooming with her parents for the past two months.

"I simply ran out of money," says Kathleen, a divinity student at the Vancouver Theological College.

As an undergraduate at Simon Fraser University 10 years ago, she could afford to live in an apartment of her own, thanks to the savings bonds her parents banked for her, well-paid summer work, and a part-time job.

Times have changed. "I know that what cost me $200 a month 10 years ago is now costing me $500." Part-time work is scarce, and last term Kathleen was forced to apply for a student loan for the first time.

Moving back home hasn't been easy. "It's a real change in lifestyle from being independent and determining my own times and ways of doing things, to coming back to a place where the patterns are already set."

She is the eldest of five, two of whom are in their teens and still living in the family home, a spacious six-bedroom house in North Vancouver. "All of us — Mom, Dad and my brothers — recognize this isn't the best situation. There's going to be a lot of adjusting and adapting and tension," Kathleen says.

Her mother, Joyce, agrees. She worries that a good relationship with her daughter might be jeopardized, and speaks of "a fear that you might get back into the heavy parenting of a 30-year-old who doesn't need it."

A woman whose attachment to her family is clear, Joyce is not afraid to confess that Kathleen's return to the nest complicates her life.

JOYCE JONES and daughter Kathleen, who moved back home two months ago

MARK VAN MANEN

"I don't have any problems saying that we [husband Art, a chartered accountant, and she] are looking forward to some time just on our own," she says. Both Joyce and her husband sense "a feeling of weariness — oh my gosh, you know — one more at home."

The secret, says Joyce, is communication. "You've got to be able to sit down together — meaning all five of us — and talk about it."

Frank Bane wishes he and his parents could do just that. Since January, when the 30-year-old technician moved in with his parents, he's learned first-hand how important communication can be.

Because they cannot discuss their differences, Bane and his mother are, in his words, "driving each other bananas."

His divorce 18 months ago left Bane trapped between a rock and a hard place. Saddled with huge mortgage payments on a house that wouldn't sell, he decided that living cheaply was a priority. He moved into a basement room in his parents' Fraser Valley house.

Because he believes revealing his identity would make matters worse at home, Bane (not his real name) is reluctant to disclose details of his troubled family relationships. But things are bad. His mother's nagging makes daily life a trial, he says.

Slowly, Bane is learning to control his annoyance at what he perceives as his mother's refusal to admit her son is an adult. "I realized that that's her, and I'm not going to change her.

"Before, I would get angry, whenever a situation like that came up. Now, I think, 'Okay, this is her house, her rules — I think it's ridiculous, but I will just accept it instead of getting upset.' "

With luck, Bane expects to have a place of his own by this time next year. For some families, the future is less certain.

Jane and Tim McGiffin are victims of bad timing. Both in their mid-20s, they graduated from two-year vocational courses in 1979, married the following February and welcomed a baby into the world 11 months later.

The layoffs in the forest industry hit Tim a year ago. He and his family were forced to leave Tofino, where he worked as a technician. When Jane's parents offered a basement room in their Burnaby split-level, there really was no choice.

"If they'd just been a little older, they'd have been well-established when the recession hit," says Jane's mother, Eleanor Vivian. She and husband Edward were happy to welcome their daughter and her family home, and appreciated the chance to get to know their granddaughter.

"It was nice for my husband and me — but I didn't think it was that nice for a young married couple," Eleanor says.

Aware of her daughter's lack of privacy, she confesses she found sharing a kitchen with her daughter to be trying. Jane's culinary experiments with Chinese cooking didn't jibe with her dad's meat-and-potatoes expectations.

Tim and Jane spent a year in Burnaby before they found work caretaking a Vancouver apartment block. But Jane is due home again, while her husband works for the summer on Vancouver Island.

"It's just a matter of survival," Eleanor says. "You just have to survive the best way you can until this is over."

Jan Cook, a 33-year-old office worker with a 16-year-old son, moved back in with her widowed mother in November after 17 years on her own. Burdened with a huge Visa bill, mostly for restaurant meals, and $200-a-month payments on a half-acre recreational lot in the Cariboo, Jan faced facts.

Her net earnings, $1,300 a month, wouldn't stretch to cover her living expenses and those of her son.

Both Jan and her mother, Betty, are happy with the arrangement. Jan pays utility bills and helps out with food costs, making Betty's pension go farther.

Her mother's thrifty ways, learned the hard way during the 1930s, impress Jan. "She's so good at economizing, she can make a penny stretch into a dollar. I'm learning a lot."

Betty enjoys the company. "I'm used to a big family . . . having people around keeps you in the stream and you don't get in a rut."

Both appreciate the warm family feelings generated by living together again. When times are tough, "everybody's got to pool together, and that's what we're doing now, helping each other out," Jan says.

PIONEERING PREFABS

What could a small settler's hut on the prairies possibly have in common with a bank on Vancouver Island designed by one of Canada's leading architectural firms? The hut, in Saskatchewan, and the Canadian Bank of Commerce,* at the corner of Bay and Douglas in Victoria, were among hundreds of prefabricated wooden buildings produced between 1904 and 1910 by the British Columbia Mills, Timber and Trading Company.† Many, including the bank, are still standing.

Though prefabricated buildings are popularly regarded as a mid-twentieth century phenomenon, they have, in fact, been used in North America since colonial times. The arctic explorer Sir Martin Frobisher transported the sections of an entire house from England to Baffin Island in the sixteenth century. The first church in Halifax, Nova Scotia, erected in 1750, was prefabricated in New England. Ready-made homes sheltered many of those who flocked to California during the gold rush of 1849. And the homesteaders who moved into the prairie states between 1860 and 1890 often used "knock-down" buildings, as prefabs were sometimes called.

The large-scale settlement of western Canada around the turn of the century created another demand for prefabricated housing, especially on the prairies, where building materials were scarce. Since most settlements grew up in the vicinity of the recently built Canadian Pacific Railway, it was often easier to bring in ready-made houses than to build from scratch on the spot. Prefabrication saved newly arrived settlers considerable time and trouble, allowing them to get down to the business of earning a living.

Though a number of mills in the United States and Canada tapped the market for ready-made buildings in newly settled areas of western Canada, the sectional building system devised by the B.C. Mills Company was probably the best. As the name "knock-down" suggests, many types of prefabs were intended as temporary accommodation and were flimsily constructed, providing little protection against Canadian winters, but the B.C. Mills houses were meant to be permanent. They were "free from annoying drafts, and much warmer than the average house built in the usual quick contractor style," as a satisfied customer from Winnipeg put it in a letter to the company.

Several features of the B.C. Mills system, developed and patented by Edwin Mahoney, manager of the com-

VANCOUVER CITY ARCHIVES

The simplest of the prefabricated houses offered by B.C. Mills was the Settlers' Series, Design A, priced at $100 in the company's 1905 catalogue.

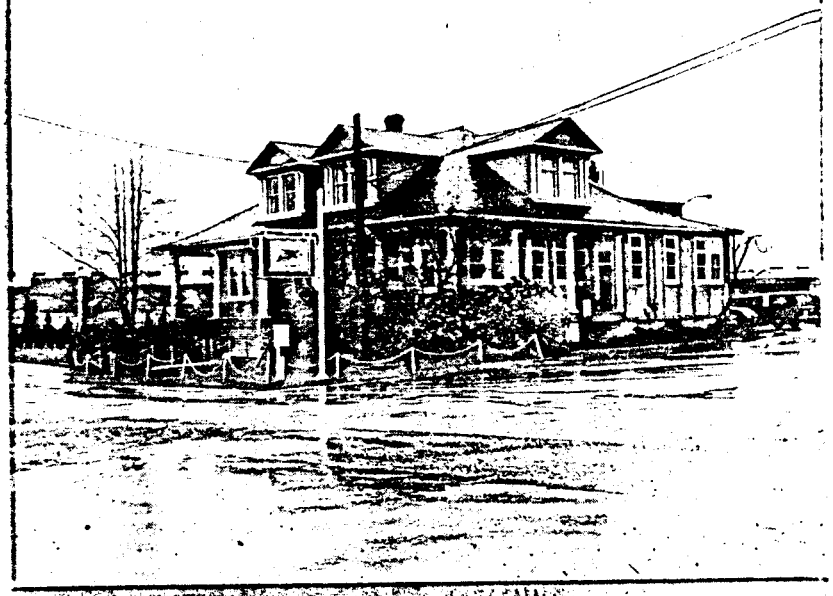
* The Canadian Bank of Commerce, founded in 1867, amalgamated with the Imperial Bank of Canada in 1961 and became the Canadian Imperial Bank of Commerce.

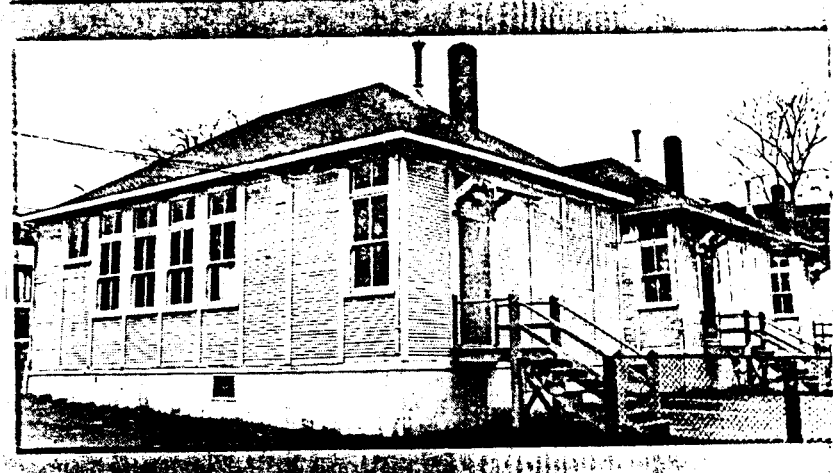
† The company, which grew out of the old Hastings Mill Co., [illegible] on the Lower Mainland.

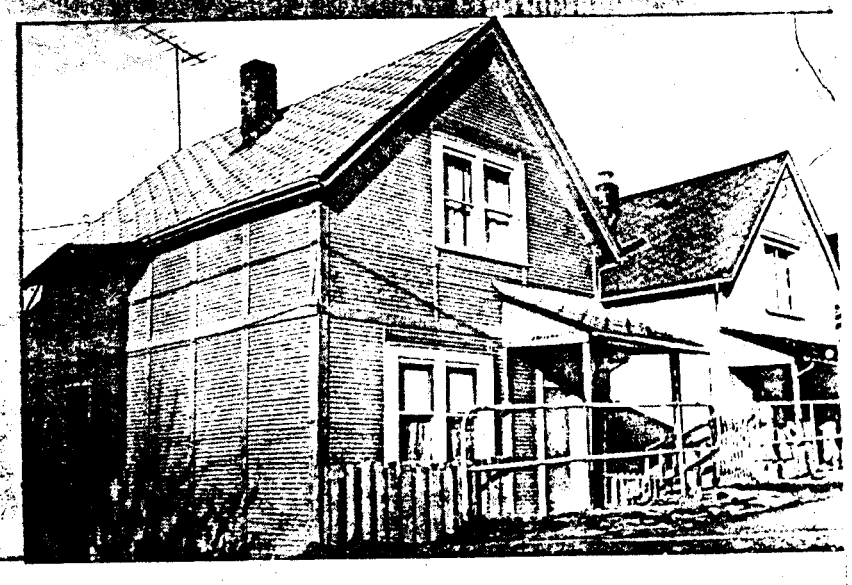
pany's Royal City Mills branch, gave it an edge over other prefabrication systems. Layered wall panels, incorporating several thicknesses of wood and tarpaper, with air chambers in between, offered insulation against severe weather. Tight interlocking joints, reinforced by bolts, connected the panels securely to each other, while moulded sills protected the joints at the floor and roof levels. The company found the system advantageous because it could be adapted to various building styles and provided a use for short ends of wood previously discarded as scrap.

A B.C. Mills prefab was preassembled on the company's premises, fitted, painted, and then pulled down and packaged for delivery. Each package contained numbered sections, which included windows and doors incorporated into panels, as well as flooring, sills, and roofing. Iron chimneys were available, but anyone who wanted a brick chimney had to build it himself. Although illustrated instructions were included with every unit, a customer could quite easily alter the layout and interior finish of his house to suit himself. Assemblage required little expertise. "It is the rapidity of construction that is the best recommendation," wrote the *Daily News-Advertiser* in 1904. "Two men, unused to the construction, may erect one of the sizes indicated [between 500 and 800 square feet] in four or five days."

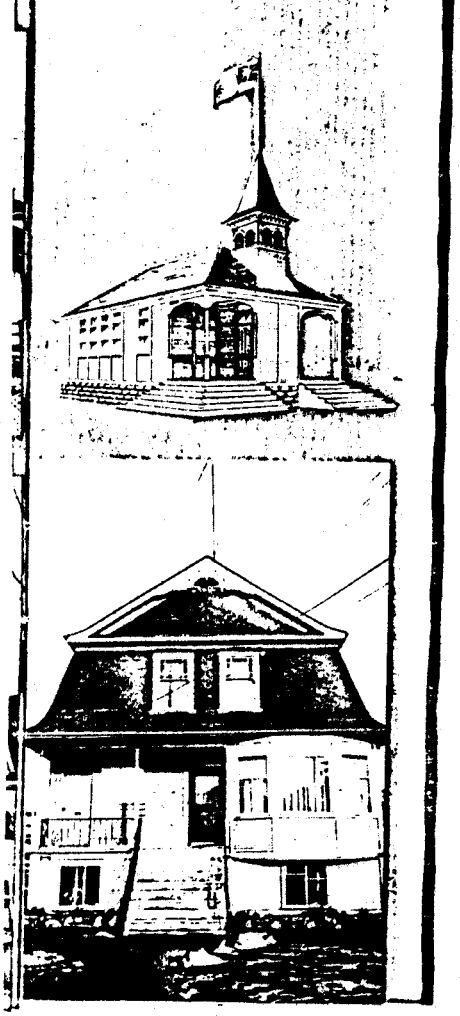
B.C. Mills introduced its prefabrication system to members of the press and the public in 1904 at Winnipeg's Dominion Exhibition, where it displayed five ready-made cottages, and at New Westminster's Royal Agricultural Exhibition, where three cottages were erected. The prefabs were an instant hit, winning medals at both fairs and attracting praise for their appearance and workmanship. The *Winnipeg Tribune* announced: "Heretofore the idea of the so-called 'portable houses' has been somewhat sneered at, and but little faith has been fixed on such ready-made buildings, but it would not be a random guess to say that even the most pessimistic would enthusiastically eulogize on the good points of these ready-made houses were he to pay a visit to the exhibit of the







(LEFT) In 1905, B.C. Mills erected a general office as a showpiece for the special features of ready-made construction. Located at 50 N. Dunlevy in Vancouver, the building is today the home of the Flying Angel Seamen's Club.
(CENTRE LEFT) This row of prefabricated schoolhouses on Twelfth Ave. near Cambie St. now houses the Vancouver Society for Total Education.
(BELOW) The B.C. Mills schoolhouse design shown here includes all the frills: cloakrooms, porches and a bell tower.
(BOTTOM LEFT) Two more variations of the B.C. Mills ready-made system, at 515 and 521 Hawks Ave.
(BOTTOM RIGHT) Although this example of the Townhouse Series (Design O-O-O) at 1735 E. First Ave., is well preserved, the interior has been rebuilt into suites



British Columbia Mills, Timber and Trading Co., of Vancouver, at the Dominion Exhibition."

All eight houses displayed at the two fairs were sold on the spot. Orders flooded in, not just from rural areas, but from Winnipeg, Vancouver and other urban centres then in the throes of a population boom. In response, the company expanded its prefab operations, developing new house models and branching out into schoolhouses and other buildings. A catalogue published in 1905 described and illustrated the range of ready-made buildings available, from the one-room hut in the "Settlers' Series," costing $100, to the two-storey house in the "Town House Series," priced at $845. A schoolhouse model sold for $850 with a bell tower, $665 without. Reports in the press of the day suggest that these prices were competitive with those for conventionally built structures.

The ready-made system also turned out to be practical for commercial buildings. B.C. Mills used it for a number of its own structures, including an attractive main office at the foot of Dunlevy Street. Erected as a showpiece for the system, this building now houses the Flying Angel Seamen's Club. The B.C. Telephone Company used prefabricated houses as telephone exchanges in various Fraser Valley towns. And several banking firms turned to the prefabricated buildings as a quick way of constructing attractive branches in western towns where materials and labour were hard to obtain during the first decade of the century.

The Canadian Bank of Commerce proved to be the biggest commercial user of the panel system. The bank began erecting B.C. Mills prefabs in 1905, and the majority of the 80 or so branches built in Western Canada over the next five or six years were prefabricated. At first, the bank adapted ready-made houses to its needs. But when a steady demand for new branches in the western provinces became apparent, it hired the well-known Toronto architects Darling and Pearson (who designed Toronto General Hospital and Montreal's Sun Life Assurance Building) to design bank buildings suitable for the prefab system.

For several years a number of the portable banks were always kept on hand in Vancouver, ready for shipment at a moment's notice. Victor Ross, in *A History of the Canadian Bank of Commerce*, reports that, after the 1906 earthquake wrecked the bank's offices in San Francisco, two of these prefabs were sent down as possible replacements. Though it turned out that the bank didn't need the buildings right away, they were put to good use in the devastated city.

Given the remarkable success of the B.C. Mills ready-made system, it's surprising to learn that the company got out of the prefab business after only six years of operation. But the rising costs of producing and shipping prefabricated buildings — at a time when construction materials were becoming cheaper because of growing competition in an expanding lumber industry — made prefabricated buildings a poor proposition.

In 1910, Prudential Builders Ltd., one of a new breed of companies getting into the mass production of housing in Vancouver, took over the rights to the B.C. Mills patented sectional system. The firm hoped to use the system to build its housing projects, but part way into its very first project, Talton Place, north of Shaughnessy Heights, the company became aware that the use of prefabs was increasing construction costs. The project was completed using on-site construction methods, and Prudential decided to abandon prefabrication. With that decision the B.C. Mills ready-made system disappeared from the market.

A.N.

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EXPANDING THE SINGLE FAMILY HOUSE:

A PROCESS OF HOUSING STOCK MODIFICATION

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the Canadian Association of Geographers.
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INTRODUCTION AND PURPOSE

The dwelling of a household has long been recognized in human geography to be a fundamental unit in the landscape.

The habit of governments, their agencies, and private organizations of keeping systematic accounts of the numbers of dwellings, their distributions and rates of construction and demolition, is further evidence that the dwelling is seen to be fundamental in society.

Just as the individual person is a basic concept in our literature and thought, so the unit household and unit dwelling are basic, although arguably more variable. But the dwelling, the physical expression of the household, offers a form of evidence and subject matter which provides specific avenues of enquiry into studies in human geography. For example, the internal arrangements and uses of spaces in a dwelling express characteristics of the household; the ability to command resources to create and to maintain the dwelling indicates the capacity of the household to sustain itself, to plan for its own reproduction or continuation, and to maintain a certain position in both the community and its contextual society.

But the landscapes of dwellings and of dwelling places, while locationally fixed, are otherwise in a continual state of modification and change. This would seem to be true in the societies of the modern industrial and post-industrial states as well as in those states generally described as "less developed". In modern states the construction of

dwellings forms a major economic activity, and large amounts of capital, labour and resources are devoted to it; further, construction is a major target for governmental manipulation and tinkering in the continuing attempts to adjust the economy.

At the household level, things may be even more dynamic. Household movement, or migration, is a constant process, although occurring at varying rates, and thus dwellings are constantly being traded, swapped, and rented among different households, even though they remain fixed in location. There is in this an implied increase in the potential for change, not only through maintenance of the existing fabric but also of modification to suit the changed purposes, needs and household self-image. While there has been much research into the demographic side of this matter, that is the study of activity patterns and migration, there would appear to be much less research extant on the physical transformations of dwellings, transformations which alter the spatial arrangements within the dwelling but which leave untouched those household arrangements external to it, such as journey to work patterns. This point or moment of change in a dwelling, when alterations and additions are effected, may thus be taken to be an important point of departure for research into the landscape of dwellings and it is the entry point in the present study.

Thus the purpose of this paper is to present some results of a case study into the phenomenon and process of the physical expansion of existing dwellings.

CONDITIONS AND CONSTRAINTS OF THE STUDY

1. This study is confined to that part of the housing landscape which comprises only single family dwellings.
2. The area of study is the region known as the north shore of Vancouver, and the study period comprises the six years from 1975 through 1980.
3. The dwelling changes studied refer only to those which have resulted in additional heated space for indoor living, that is space connected directly to the main house. Sundecks, patios, swimming pools and adjacent lounging areas, carports, garages, outbuildings and interior renovations are not of immediate concern.
4. Official statistics regarding construction are reported at a municipal level. But in British Columbia, at least, much of the activity with which I am concerned is reported only under "Miscellaneous", for the reason that the financial implications are small in any one year. So the activity is 'hardly worth' noticing. To this I might say:
    a) that the aggregate effect of such space accumulation, year after year in the urban and suburban landscapes, is suggested to be of far greater consequence than annual reports would lead us to believe; and
    b) there is an unremarked amount of activity which is not reported or permitted officially, and so does not appear at all in municipal statistics, even under "miscellaneous". Even if this latter

cannot be known, however, it may be suggested that the increase of space over the years, space accumulation in a word, is a subject which merits attention.

5. The geographical approach leads to an analysis and discussion in spatial rather than financial or monetary terms. This has the advantage that intrinsic values of units of measure do not change over time as do units of financial currency with inflation or its opposite. The disadvantage could be that findings may not generalize easily across boundaries separating regions of different building practice.

Study Area

This study is set in a major and distinctive sub-region of metropolitan Vancouver. The "north shore", as the area is known, comprises the lower flanks of Hollyburn, Grouse and Seymour Mountains, and residential development rises in places to about 1200 feet above the waters of Burrard Inlet and English Bay. It follows that a large proportion of residents enjoy fine views over the harbour, downtown Vancouver, English Bay and the Strait of Georgia. It is said by some that perhaps $10,000 can be added to the price of a fine house if it also has a fine view. The space economy of the house is therefore directly related to topography, that is elevation, slope, and direction, and to the composition of the visual landscape. Three municipalities jointly comprise the area, namely the City of North Vancouver, and the Municipal Districts of North and West Vancouver. The City is the principal old nucleus of urbanization, and the Districts essentially represent the growth of post World War II suburbs. The population overall comprises some 135,000 people, according to the 1981 Census, and the overwhelmingly predominant form of housing (65 percent, or 33,550) is the single family dwelling placed on lots which vary from small 33 foot x 100 foot properties to estates of more than an acre. Houses, too, vary in size enormously from a few remnant four room cabins to minor mansions in the millionaire class; but in all cases they are built of frame construction and may be described as being almost malleable because of the ease with which alterations can be effected.

Method

Two approaches, broadly categorized as morphological and behavioural, were followed.

All building permits issued during the years 1975 through 1980 were studied, and a usable basic list of 2,547 cases was extracted. From this, 254 cases, that is ten percent, were randomly selected for study.

The principal source of data from the municipalities was the set of architectural or builders plans which must accompany an application for an addition. These were studied and eight basic categories were empirically derived for the information they yielded. These included aspect, with reference to points of the compass, orientation, with respect to the front entrance, room functions, rooms added, rooms extended, architectural complements, areas of addition, and areas of original dwelling. Most of these categories can also be studied by floor level, and, where that was possible, analysis was also carried out by floor. This produced a considerable body of morphological data.

The social or behavioural side of this research is still in progress but the basic approaches have been two-fold: a mail questionnaire was circulated to all households in the sample, and personal follow-up interviews are being conducted at present. I shall confine myself here to two categories of findings, namely rooms added and extended, and areas of additions. [These latter are discussed in terms of square feet, this usage being consistent with that in the Vancouver area building industry.]

FINDINGS

Rooms added and extended

By extrapolation from the ten percent sample, there were some 5,200 rooms added, and 1,470 pre-existing rooms extended to new dimensions. Some 2,010, or 81 percent of places had rooms added to them, while 890, or 36 percent of places had existing rooms extended. On average 2.6 rooms were added per project while 1.7 rooms were extended.

Some double-counting occurs in arriving at these cross-sectional results, for some projects involve both forms of work, that is adding new rooms and extending existing rooms. To be specific, 380 places, or just over 15 percent of projects, involved both forms. But this overlap has significance in the building process itself. For some rooms must be extended by virtue of structural dictates in order to add other rooms; or a new structure, such as a beam installation across an opening, may release a wall from its bearing function and allow an extension to be created at the same time as an addition is built. These opportunities occur commonly when an extra floor is added. But there is also a sense of taking the opportunity to extend an existing space or room at the same time as an addition is built, so to obtain extra space with reduced fixed costs.* And builders may not be slow to point out the little extras to enhance the house and project, and

* fixed costs would involve those costs incurred only once, whether for a larger or modest project, such as labour, some material, costs of permits, and the inconvenience of disruption.

to point out the economies of doing the work all at once as an augmented project. This can on occasion be good advice but the ambiguity involving overheads is presumably the focus of architects and designers when they urge upon their clients the need to know precisely what sort of addition they want.

There is some municipal and spatial variation in approach to additions and extensions. The City of North Vancouver is the smallest municipality in area, and concentrates most of the inner city qualities of north shore landscapes. Thus the houses are smaller on average, are built on smaller lots, and the income levels of the householders tend to be the lowest of the three. Eighty percent of the projects there added rooms, and 25 percent extended existing rooms, while in the District of North Vancouver 86 percent of places added new rooms and 30 percent extended old ones. This latter municipality is younger in the history of its development and in recent years has had the greatest experience of young family life on the north shore. It is also more affluent than the City and its larger lot sizes on average provide available space for expansions.

West Vancouver stands in some contrast to these two cases. It incorporates its own small "inner city" areas along the Marine Drive, and parallels North Vancouver District in its later development up the slopes. It also has the highest levels of income and is reputed to be jealous of a way of life in which good taste and aesthetic appreciation are intrinsically

important, or are important for effect. Whatever the motive, the modification to existing houses involves the largest expansions on average, but, importantly here, involves the lowest proportion of rooms added (69 percent) and the highest proportion of existing rooms extended (41 percent). Attention to views and the layouts of living spaces are implicated here as against the mere addition of space. Thus living space here carries at least two implications - functional and aesthetic - although the space involved may still be measured in square feet. It may be of interest to mention the widely held impression among homeowners, builders and designers, that it is common practice for construction jobs to be estimated higher for West Vancouver projects than for those in the North Vancouvers. This higher price is charged both on materials and labour and may reflect the idea that those who can afford it should pay more, a kind of informal tax on the rich. Indeed, this may be a case of conspicuous consumption being urged upon a tolerant rather than demanding market. But in the present context, the extra charge may also be read as the price of a different kind of space, one which the homeowner may be fussy about, which may demand greater care in workmanship, and in which better quality materials may be used. It takes more patience to match a new extension to a pre-existing pattern of building and finish than it does to slap up a newly framed room.

Areas of additions

Turning to areas of additions, almost 1,200,000 square feet of heated space were added to single family dwellings during

the six years studied. The lowest annual increase was just under 150,000 square feet in 1979 while the highest increase was nearly 260,000 in 1980. The mean annual rate of addition was just under 200,000 square feet.

The mean pre-expansion size of house for the north shore was 1,881 square feet, while the mean post-expansion size was 2,353 square feet. The mean expansion was 466 square feet. (2,353 sq. ft. - 1,881 = 472. This differs from the calculated mean because pre-expansion and post-expansion means are calculated from different data and so should be about the same and are within 5 square feet).

The mean expansion was quite consistent in all three municipalities, varying from a low of 462 square feet in West Vancouver to a high of 468 in the City of North Vancouver. This difference is so small as to be negligible, for as a practical matter these areas represent rooms of 22 feet by 22 feet. This size can be thought of as the enclosure of a double carport for a family room, or perhaps the addition of a two bedroom wing or dormer.

The distribution of area of addition values is skewed, however, and the medians are perhaps better representations of typical cases. They also differentiate the municipalities. The lowest value of median, 240 square feet, represents the City while the highest value, 309 square feet represents the District of North Vancouver. Almost exactly at the mid point between these lies the value of 280 square feet for West Vancouver. Thus, typically, the smallest expansions are

found on the smallest houses, that is in the City, although it is not true to say that the largest expansions are generally on the larger houses. They are, in fact, generally on the medium-sized houses to go by the comparative municipal evidence.* West Vancouver houses are the largest before additions are built on them but their expansions typically are not as large as are those of North Vancouver District. In order to interpret this one may recall the comment made earlier that there are more rooms extended in West Vancouver projects than in the two North Vancouvers, and thus the actual space created is typically a more modest proportion of the house, expanding the rooms and spaces already there, rather than creating new rooms.

The distributions of these values of additional areas are more complex spatially, however, than a three-part municipal breakdown would suggest, and the maps are designed to show this spatial variation by isoline divisions based on values of individual cases averaged over a uniform neighbourhood size defined as an area with a radius of one mile.

* the general correlation, for the north shore, between area of addition (Y) and pre-expansion area (X) is: $r = -.07$ (data are map grid values). This means that there is no general north shore-wide association. But a finer breakdown by area, not yet carried out, may show higher levels of association between these variables. There is some impressionistic suggestion from the maps that this would be so.