

A COMPARATIVE ANALYSIS OF THE IMPACT OF  
SINGLE-DETACHED HOUSES AND APARTMENT UNITS  
ON HOUSING RESOURCES AND MUNICIPAL FINANCES

by

D. W. Bugey

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AN ABSTRACT OF  
A COMPARATIVE ANALYSIS OF THE IMPACT OF  
SINGLE-DETACHED HOUSES AND APARTMENT UNITS  
ON HOUSING RESOURCES AND MUNICIPAL FINANCES

If Canadian consumer demand for housing underwent a significant change in favour of apartment units compared to single-detached houses, significant savings in housing resources would result, with little significant impact on municipal finances.

Chapter 1 develops a sample population of 1,000 persons based on the 1966 Census of Canada. Chapter 2 develops a model apartment complex and a model housing development to contain the sample population, and to derive cost figures. These cost figures are compared in Chapter 3.

Chapter 4 compares the impact of the two different housing models on Municipal Finances.

Chapter 5 presents a summary of conclusions based on analysis made to this point.

Chapter 6 examines consumer Attitudes and Preferences regarding the two types of housing, and Chapter 7 deals with consumer demand for housing, and shifts which have occurred in this demand.

Chapter 8 examines two possible patterns of housing in 1971. One is based on the distribution of housing by type revealed by the 1966 Census, and the second is based on a projected distribution. Comparisons are made of the impact of these two distributions on housing resources and municipal finances.

Chapter 9 presents summary and conclusion material based on Chapter 8.

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## INTRODUCTION

The purpose of this study is to make a comparison of two different types of housing accommodation--apartments and single-detached dwellings. Together, these two types accounted for 85.2% of all occupied dwellings in the 1966 Census of Canada, and, therefore, represent the two predominant forms of housing in Canada.

The comparisons made are of two types: cost comparisons aimed at establishing the relative impact of the two housing types on housing resources; and comparisons of the different impact that these two types have on municipal finances.

There are many differences between apartment units and single-detached houses other than structural differences, and in the course of this study I have tried to eliminate these in order to isolate and assess the impact of structural differences only on housing resources and municipal finances.

Initially, a sample population of 1,000 persons is evolved and fitted into two different housing models, one consisting of an apartment complex and one, a development of single-detached houses. This was done to

derive cost figures for dwelling units which would be suitable for housing a cross section of the Canadian population, and to eliminate cost differentials which might occur because apartments were designed for small families and houses for large families.

Cost differentials may also occur as a result of locational differences, particularly with respect to the central urban location of a considerable amount of apartment construction. To eliminate cost differences attributable to locational differences, it was assumed that both types of housing were constructed on unserviced land of equal value per acre, and that all municipal services had to be provided.

As well, a variety of other non-structural differences are dealt with in the section on Consumer Attitudes and Preferences.

The first five sections present a static comparison of the impact of these housing types on housing resources and municipal finances. The latter sections apply these derived figures to the aggregate demand for housing in Canada for the period 1966-1971.



## CHAPTER 1

### POPULATION SAMPLE

#### Introduction

The purpose of this section is to derive a model population of 1,000 persons based on the 1966 Census of Canada. This is done in order to ascertain the housing requirements of such a population, and to derive housing costs and other information which would be applicable to the Canadian housing situation.

#### Population Sample

The first stage in the construction of this model is the development of a population sample. Since this study is based upon the housing requirements of the Canadian population in general, all statistics are based on the 1966 Census of Canada.

The sample is composed of a representative distribution of 1,000 persons in the general population of Canada. The housing requirements of this sample are arrived at by an examination of the number of households, families, and non-family persons which the 1966 Census revealed. For statistical convenience, Census definitions are used, subject to the qualifications introduced

following them:

### Census Definitions

**Household:** . . . consists of a person or group of persons occupying one dwelling. It usually consists of a family group, with or without lodgers, employees, etc. However, it may consist of a group of unrelated persons, of two or more families sharing a dwelling, or of one person living alone. Every person is a member of some household, and the number of households equals the number of occupied dwellings. . . . Households may be classified as family or non-family.

**Family:** A census family consists of a husband and wife (with or without children who have never married) or a parent with one or more children never married, living together in the same dwelling.

**Non-family Persons:** Persons not in families are those persons living alone, living with unrelated individuals, or living with relatives, but not in a husband-wife or parent-child relationship.

### Qualifications for Population Sample

**Households:** All households in the sample are assumed to be either one-family households, or non-family households. All collective households (ie. institutions, hotels, motels, large lodging houses, etc.) are excluded leaving only private households. In this sample, the term household refers only to private households. In 1966 one family and non-family households accounted for respectively 82.0% and 15.5% of all households, for a total of 97.5%. The remaining 2.5% were households containing two or more families. (see Table 1, page 5)

The 1966 Census reported the total Canadian population at 20,014,880 and the number of households at

5,180,473. Excluding persons in large collective households, the population figure becomes 19,366,746. (see Table 2, page 6) This results in a household-population ratio of approximately 26.7%. A representative population of 1,000 persons would contain 267 households and would divide between one-family and non-family households as indicated in Table 3, page 7.

TABLE 1  
HOUSEHOLDS BY NUMBER OF FAMILIES  
CANADA, 1966

Number of Families Per Household	Number of Households Per Category	Percentage of Households per Category
0	804,064	15.5
1	4,246,753	82.0
2	124,052	2.4
3	5,253	.1
4+	351	.0
TOTALS	5,180,473	100.0%

Source: 1966 Census of Canada, Volume II  
"Households and Families, Household Composition,"  
Catalogue Number 93-904, Table 14.

TABLE 2  
DISTRIBUTION OF PERSONS BY TYPE OF HOUSEHOLD

Type of Household	Category of Person	Number of Persons	Percentage of persons in each type of household	Number of persons in sample of 1,000
Private Family Households	Family Persons	17,629,640	91.0	910
	Non-family Persons	622,067	3.2	32
Private Non-family Households	Family Persons	0	0.0	0
	Non-family Persons	1,115,039	5.8	58
TOTAL		19,366,746	100.0	1,000

Source: Letter from Dominion Bureau of Statistics, February 24, 1969.

The 1966 Census revealed the breakdown of families by number of children as set out in Table 4, page 7.

Families containing 0 to 4 children accounted for approximately 91% of all families. Because this study deals in part with apartment dwellings, and because of the inherent problems in housing large families in apartments, the statistical sample being evolved will not include families containing more than four children. With this

adjustment made to the figures in Table 4 they apply to sample of 224 family households as indicated in Table 5. (see page 9) This results in the sample of 1,000 persons being divided as follows: 224 family households containing a total of 778 family persons; 330 children and 448 married adults and 32 non-family persons. 43 non-family households containing a total of 190 non-family persons.

TABLE 3  
HOUSEHOLDS BY FAMILIES

	Number In Canada	Percentage	Number In Sample
One-Family Households	4,246,753	84.1	224
Non-Family Households	804,064	15.9	43
TOTAL	5,050,817	100.0%	267

Source: Table 1, page 5.

The sample is aimed at being representative of the Canadian population, but comparison with 1966 Census figures reveals a significant discrepancy. The percentage of persons in family-households is too low, (see Table 2, page 6) resulting in an abnormally high density for non-family households.

TABLE 4

FAMILIES BY NUMBER OF CHILDREN 24 YEARS  
AND UNDER AT HOME, CANADA, 1966

Number of Children	Number of Families	Percentage of Families by num- ber of children
0	1,309,580	29.0
1	881,088	19.5
2	928,434	20.4
3	628,515	13.9
4	363,701	8.0
5	188,333	4.2
6	101,178	2.2
7	55,209	1.2
8	31,453	0.7
9+	38,775	0.9
TOTALS	4,526,266	100.0

Total Number of Children in Families: 8,656,245

Average Number of Children Per Family: 1.9

Source: 1966 Census of Canada Volume II, "Households and Families, Children in Families", Catalogue No. 93-610, Table 58.

TABLE 5

FAMILIES BY NUMBER OF CHILDREN 24 YEARS AND UNDER  
AT HOME, CANADA, 1966; SAMPLE 220 FAMILY HOUSEHOLDS

Canada			Sample, 220 Family Households		
Number of Children	Number of Families	Percentage of Families by Number of Children	Number of Families	Number of Persons	Number of Children
0	1,309,580	31.9	72	144	0
1	881,088	21.4	48	144	48
2	928,434	22.5	50	200	100
3	628,515	15.4	34	170	102
4	363,701	8.8	20	120	80
TOTALS	4,111,318	100.0%	224	778	330
Persons in Non-Family Households (from Table II)				32	
				<hr/> 810	

Source: Computed from Table 4, page 8.

In 1966, 8,656,245 children accounted for 44.5% of the population in private households. The sample figure is 33.0%. This discrepancy is largely the result of two previous adjustments:

- 1) the omission of all households containing more than one family; and
- 2) the omission of all families containing five or more children.

The first adjustment eliminated 2.5% of all households. If the families represented by these households contained the Canadian average of 1.9 children per family, they would represent approximately 5.9% of all children.

The second, and much more significant adjustment, omits all families containing five or more children. This represents only 9.2% of all families but 18.4% of all children. (see Table 4, page 8)

The fact that the proportion of children is understated in the sample, causes an abnormally high density for non-family households. 190 non-family persons make up 43 non-family households, a density of 4.4 persons per household. In the Census population, 1,115,039 non-family persons make up 804,064 non-family households, a density of 1.4 persons per household. (see Table 3, page 7)

There are a number of ways of adjusting the population sample to make its characteristics more closely resemble those of the census population:

- 1) Increase the number of family households and thereby the number of children and parents. However, since I have assumed all families to consist of husband and wife, with or without children, the number of married persons in the sample is 448 (44.8%) which corresponds well with the Census figure of 43.4%. (see Table 6, page 11)



TABLE 6  
POPULATION BY MARITAL STATUS,  
CANADA, 1966; SAMPLE

Marital Status	Percentage Distribution		Distribution in Sample of 1,000	
Single		54.4		544
Under 15 years	33.5		335	
15 years and over	20.9		209	
Married		43.4		434
Widowed		1.9		19
Divorced		0.3		3
TOTALS		100.0%		1,000

Source: 1966 Census of Canada, Volume 1, "Population, Marital Status," Catalogue No. 92-612, p. 1.

2) A second alternative would be to keep the number of families at 224, but increase the proportion of families with children to bring the percentage of children more in line with that of the Census population. In addition, this would reduce the number of non-family persons.

3) A third alternative would be to increase the number of non-family households, thereby lowering the density.

4) A fourth alternative would be to increase the number of non-family persons living with family households.

5) A combination of two, three, or all four of the above alternatives.

The alternative chosen was 5), and all four components were altered. The number of family households was increased from 224 to 235. This alteration yields 47% of the sample married, compared with 43.4% of the Census population. If those divorced or widowed are included with the married group, the figure is 45.6%. The distribution of families with children was altered as outlined below in Table 7. (See also Table 6, page 11)

TABLE 7

FAMILIES BY NUMBER OF CHILDREN 24 YEARS AND UNDER  
AT HOME, CANADA, 1966; REVISED SAMPLE, 235 FAMILY HOUSEHOLDS

Canada				Revised Sample, 235 Family Households		
Number of Children	Number of Families	% of Families by number of Children	Number of Families	Number of Families	Number of Persons	Number of Children
0	1,309,580	31.9	29.8	70	140	0
1	881,088	21.4	17.0	40	120	40
2	928,434	22.5	17.0	40	160	80
3	628,515	15.4	19.2	45	225	135
4	363,701	8.8	17.0	40	240	160
TOTALS	4,111,318	100.0%	100.0%	235	885	415

Source: Computed from Table 4, page 8.

In the original sample, children accounted for 33.0% of the population compared to 43.3% in the Census population. The revised sample figure is 41.5%. The sample families with four children were altered by the largest percentage, from 8.8% to 17.0% of all families. Census figures revealed that families with four or more children accounted for 35.0% of all children and 17.2% of all families. Since this sample is not including families with more than four children, the original sample simply removed those with more than four children. As a result the category of families with four children represented 23.4% of all children and 8.8% of all families. This in turn caused an understatement of the percentage of children and of larger families in the sample. In the revised sample families containing four children account for 38.6% of all children and 17.0% of all families, giving a more representative weight to larger family units.

As a result of adjustments made to family households, the number of non-family persons dropped from 19.0% to 11.5% of the sample, a closer approximation of the Census figure of 9.0%. The 115 non-family persons are distributed as follows: 32 with family households and 83 in non-family households. The original sample contained 43 non-family households, which with 83 persons resulted in a density of 2.7 persons per household. The Census figure is 1.4 and it was felt that 2.7 was still too high, so the number of non-family households was increased to 50, resulting in a density

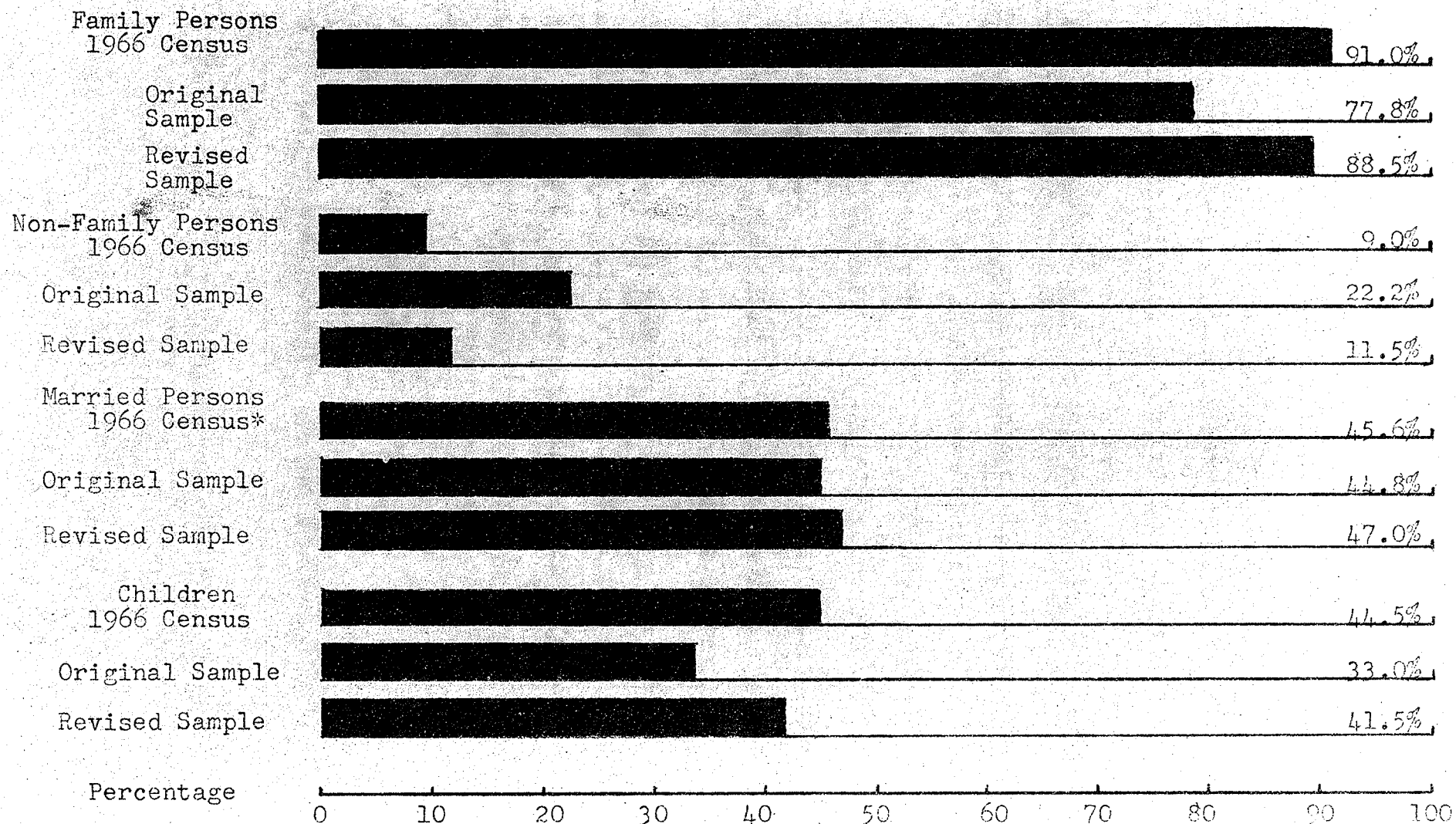
of 1.7 persons per household. The number of non-family persons living with family households was increased from 32 to 40 persons, resulting in 75 non-family persons living in 50 non-family households--a density of 1.5.

Other characteristics of the original and revised sample and the 1966 Census figures are presented in Figures 1, 2 and 3.

In summary, the revised sample of 1,000 persons is made up as follows: 235 family households comprising 925 persons--470 married adults and 415 children, 24 years and under living at home, and 40 non-family persons living as relatives or lodgers with family households; and 50 non-family households comprising 75 persons.

Such discrepancies as remain will not basically affect the analysis for which the sample was designed. In cases where there is an overstatement or understatement built into the sample, qualifications will be made to the analysis.

FIGURE I  
POPULATION IN PRIVATE HOUSEHOLDS  
1966 CENSUS OF CANADA: 19,366,746 (100.0%)  
POPULATION SAMPLE: 1,000 (100.0%)



\*Based on total Census population of 20,014,880 persons, and includes those widowed or divorced.

FIGURE II

TOTAL NUMBER OF PRIVATE HOUSEHOLDS  
 1966 Census of Canada: 5,180,473 (100.0%)  
 Original Population Sample: 267 (100.0%)  
 Revised Population Sample: 285 (100.0%)

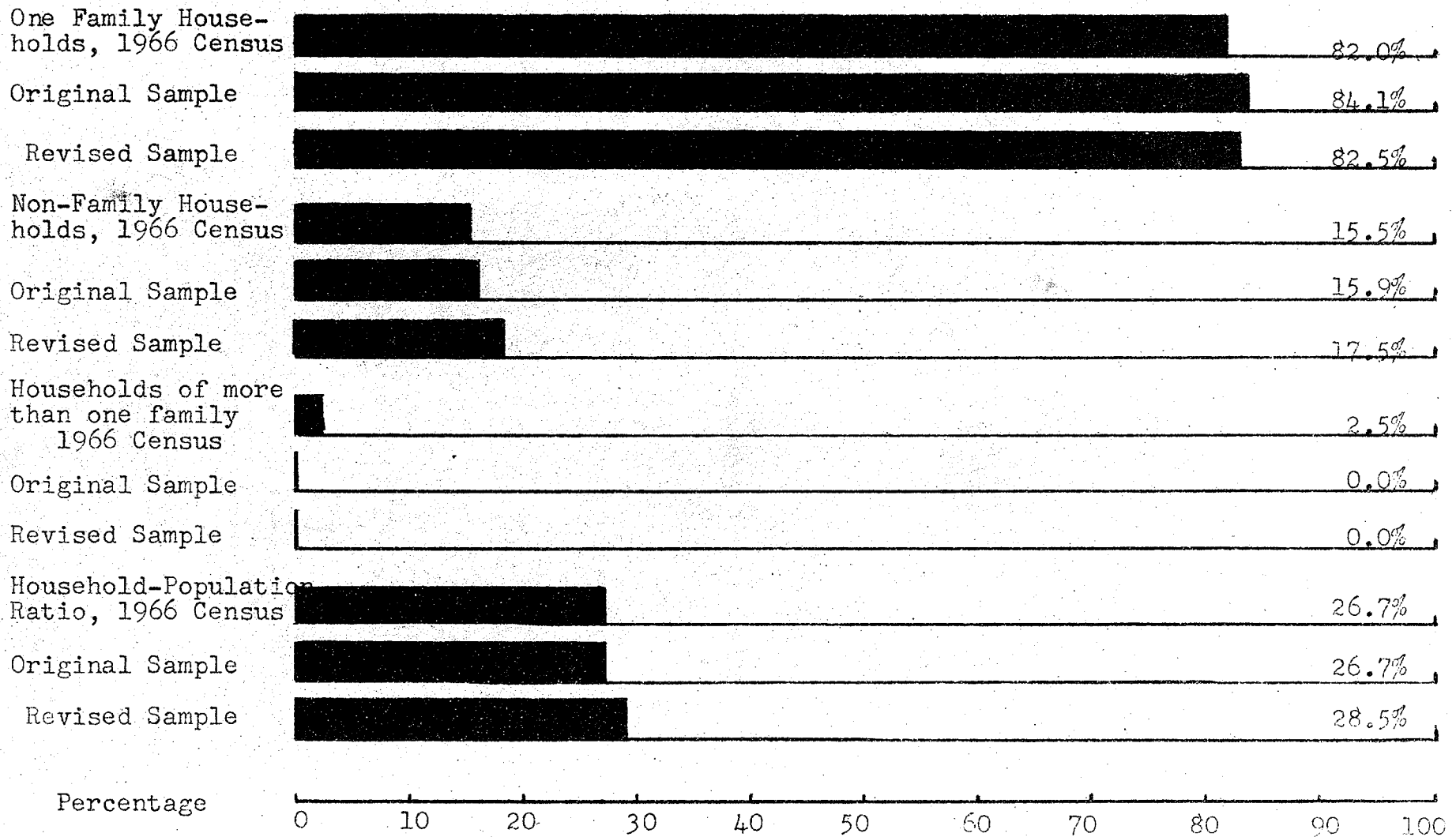
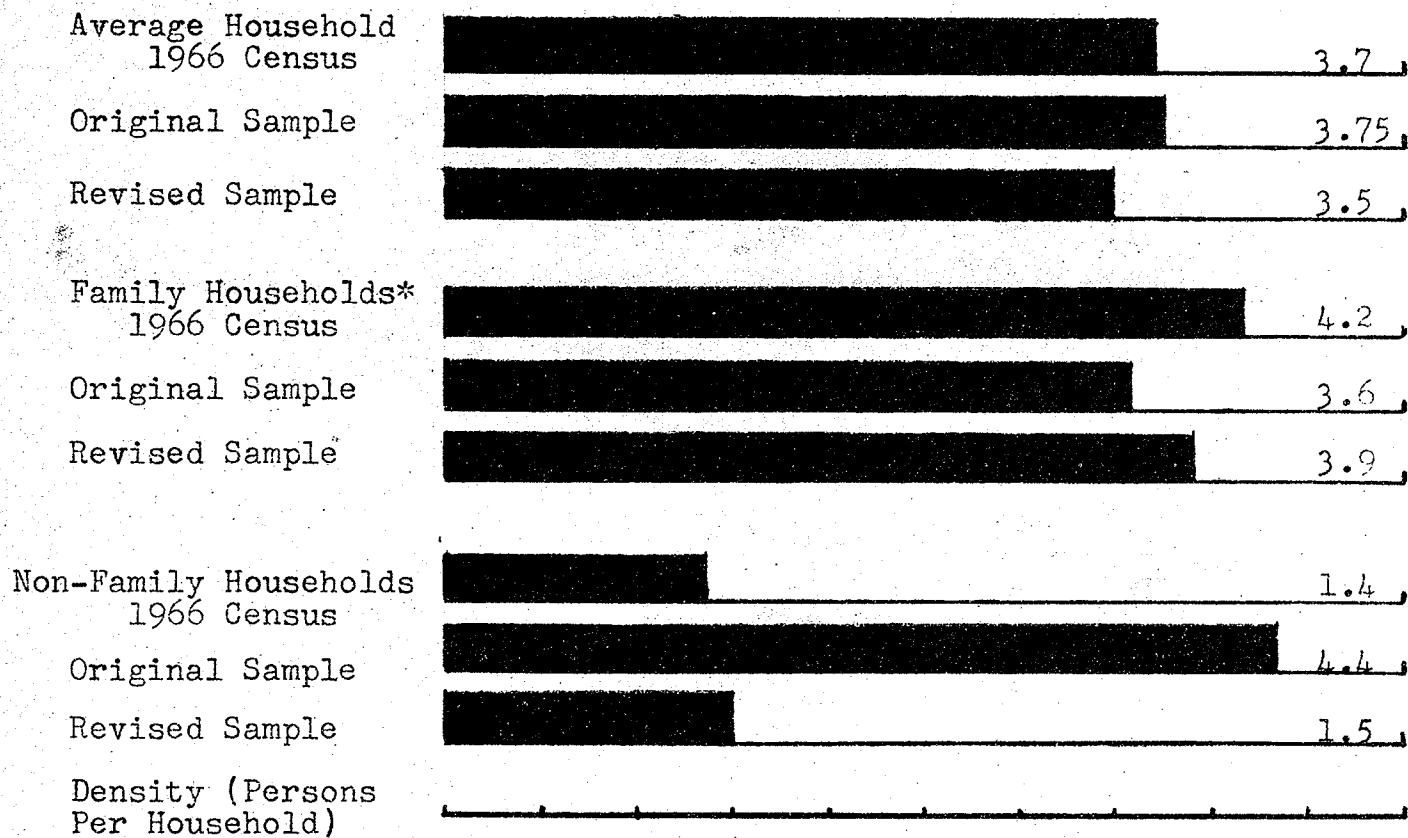


FIGURE III

DENSITIES  
Persons Per Household



\*Includes Non-Family Persons Residing in Family Households

## CHAPTER 2

### HOUSING MODELS

#### Introduction

The purpose of this section is to examine two alternative methods of housing the population sample of 1,000 developed in the previous section. Case I develops an apartment complex and sets out the costs involved in housing the sample in this manner. Case II houses the same sample in a development of single-detached houses.

Cost figures were gathered from a variety of sources: the Lower Mainland Regional Planning Board; Planning Director, North Okanagan Regional District; the firm of Meiklejohn, Gower and Associates, Architects; member agencies of the Okanagan-Mainline Real Estate Board; local municipal offices of Vernon and Coldstream, B. C., and local contractors. Unless otherwise indicated all figures represent averages of estimates from the above sources.

Both of these models contain households which are not suitably housed--large families in apartment units, and single person households in single-detached houses. This was done to evolve cost figures for two extreme cases and it is not implied that such households would or should choose such housing.



Case I: Population Sample Housed in Apartment Units

The hypothetical apartment building in Case I consists of 285 apartments in ten stories. The distribution of apartments by number of bedrooms and number of square feet is outlined in Table 8.

TABLE 8  
DISTRIBUTION OF APARTMENTS BY NUMBER  
OF BEDROOMS AND SQUARE FOOTAGE

Number of Apartments	Number of Bedrooms	Square footage Per Apartment <sup>a</sup>	Total Square Footage
80	1	600	48,000
95	2	800	76,000
80	3	950	76,000
30	4	1,050	31,500
285 apartments			231,500 sq. ft.

<sup>a</sup>Square footage based on Central Mortgage and Housing Corporation requirements and estimates by Meiklejohn, Gower, and Associates, Architects.

Since the total square footage indicated in Table 8 does not include allowances for hallways, laundry rooms, etc., an addition of 20% (46,300 square feet) of the total square footage was added to represent non-useable living area, bringing the total to 277,800 square feet.

The population sample developed in Part I is housed in this complex as indicated in Table 9, page 20.

TABLE 9

DISTRIBUTION OF HOUSEHOLDS IN APARTMENTS  
BY TYPE OF HOUSEHOLD, NUMBER OF PERSONS PER  
HOUSEHOLD, AND NUMBER OF BEDROOMS PER APARTMENT

Type of Household	Number of Persons Per Household	Number of Bedrooms				Total Households
		1	2	3	4	
Family	2	50	20	--	--	70
	3	5	35	--	--	40
	4	--	25	15	--	40
	5	--	--	30	15	45
	6	--	--	25	15	40
Non-Family	1	25	5	--	--	30
	2	--	10	5	--	15
	3	--	--	5	--	5
	4	--	--	--	--	--
	5	--	--	--	--	--
	6	--	--	--	--	--
TOTALS		80	95	80	30	285

This distribution is compared to the Census distribution in Table 10 on the following page.

TABLE 10

HOUSEHOLDS BY NUMBER OF PERSONS  
CENSUS 1966; SAMPLE POPULATION 1,000

Number of Persons	1966 Census		Sample Population	
	Number of Households	Percentage of Households by Number of Persons		Number of Households
1	589,571	11.4	10.6	30
2	1,197,338	23.2	29.8	85
3	879,391	16.9	15.8	45
4	912,343	17.6	14.0	40
5	665,880	12.9	15.8	45
6+	412,480	7.9	14.0	40
6+	935,950	18.0	----	--
7	229,275	4.4	----	--
8	128,295	2.5	----	--
9	72,393	1.4	----	--
10+	93,507	1.8	----	--
TOTALS	5,180,473	100.0	100.0	285

Source: 1966 Census of Canada, Volume II, "Households and Families, Households by Size". Catalogue #93-603.  
Table 9.

Other data regarding this hypothetical apartment building are presented on the following page and in Figure IV, page 23.

- |   |                |
|---|----------------|
| 1. Square footage occupied by apartment building:<br>(exterior dimensions 82 x 323)   | 26,500         |
| 2. Parking: Based on a requirement of $1\frac{1}{4}$ parking stalls per apartment at 250 square feet per stall including entry: | 90,000         |
| 3. Landscaped recreation and playground area (approximately 475 square feet per household)                                      | 139,500        |
| 4. Total <u>square</u> footage of land required by apartment complex:<br>(approximately 5.87 acres)                             | <u>256,000</u> |

Case II  
Population Sample Housed in Single-Detached Dwellings

This section of the model develops a housing complex consisting of 286 serviced residential lots laid out on a grid pattern. For purposes of comparison, 1/286th of the cost of the serviced development will be deducted to facilitate comparison with 285 unit apartment complex.

This hypothetical development comprises 285 single-detached dwellings. The distribution of these by square footage and number of bedrooms is indicated in Table 11, page 24.

The population sample developed in Part I is housed in this development by the same distribution used in the apartment complex in the preceding Case. (see Table 9, page 20)

FIGURE IV  
APARTMENT COMPLEX

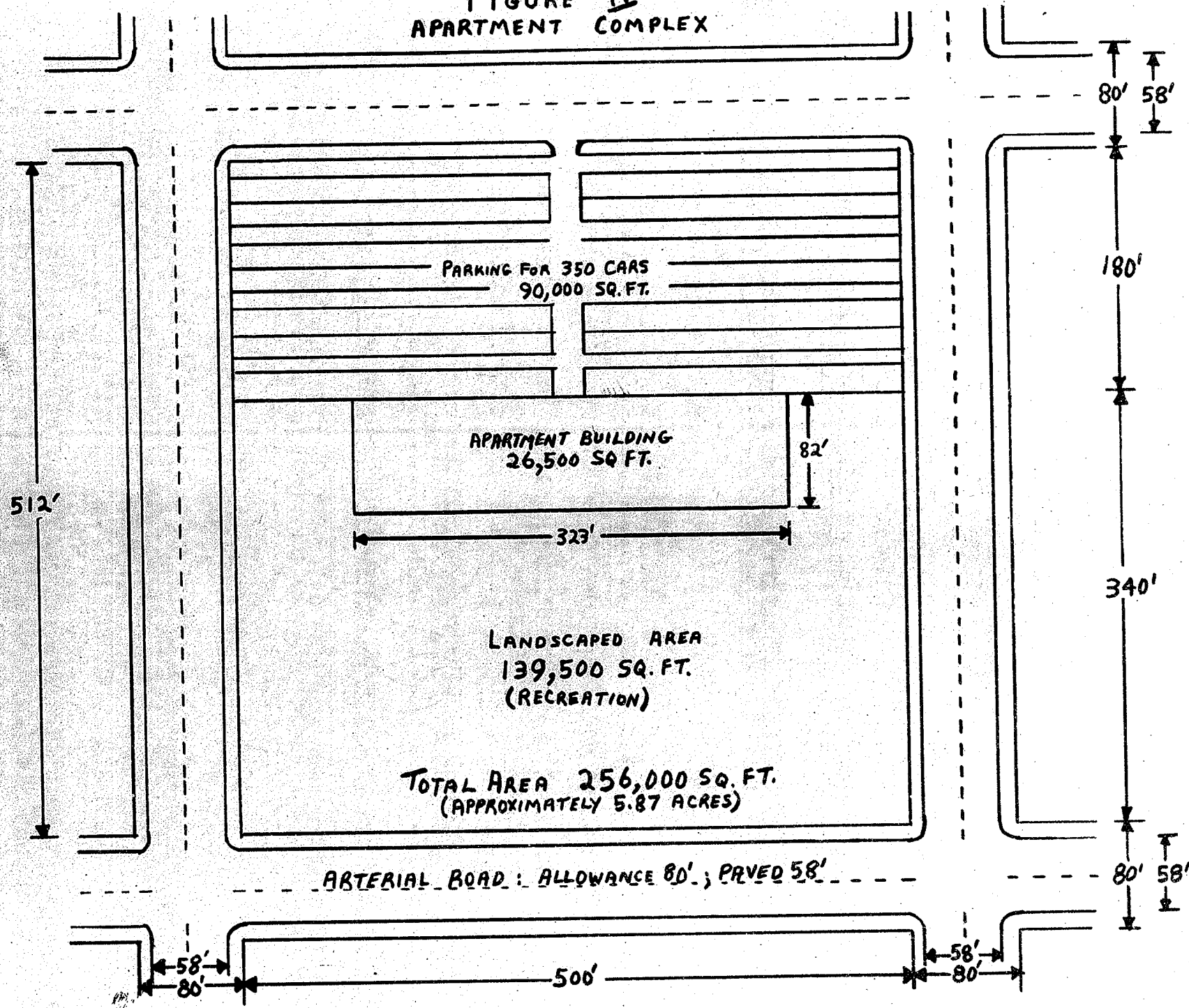


TABLE 11

DISTRIBUTION OF SINGLE-DETACHED DWELLINGS  
BY NUMBER OF BEDROOMS AND SQUARE FOOTAGE

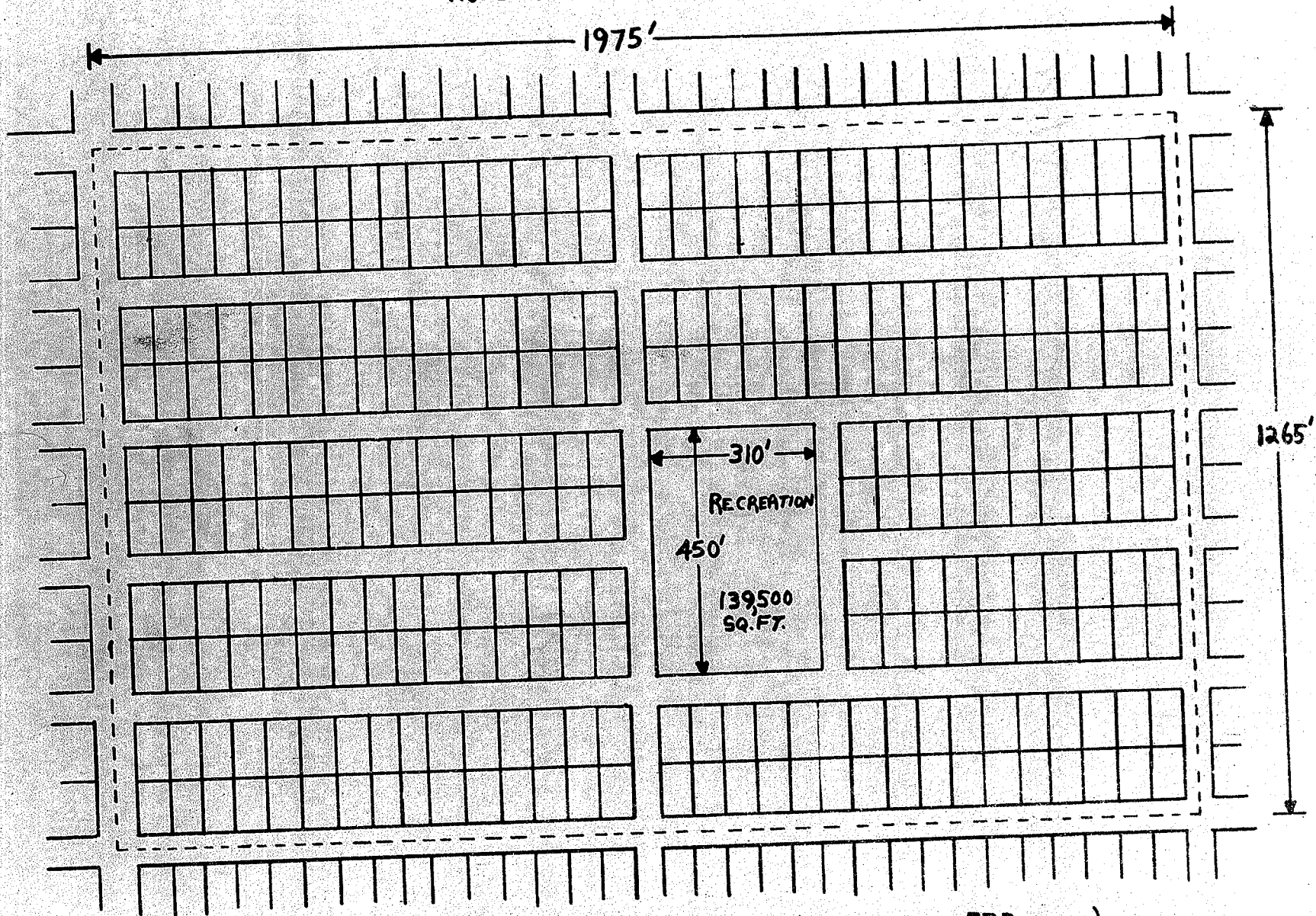
Number of Dwellings	Number of Bedrooms	Square Footage Per Dwelling <sup>a</sup>	Total Square Footage
80	1	900	72,000
95	2	1,100	104,500
80	3	1,250	100,000
30	4	1,400	42,000
285 dwellings			318,500 sq. feet

<sup>a</sup>square footage based on Central Mortgage and Housing Corporation average figure for 1967, and estimates by Meiklejohn, Gower and Associates, Architects.

Other data regarding this hypothetical housing development are presented below and in Figure V, page 25.

1. Square footage of residential lots  
 $286 \times 6,000 =$  1,716,000  
 (all lots are 60' x 100')
2. Landscaped recreation and playground  
 area:  $450' \times 310' =$  139,500
3. Road allowances 642,875
4. Total square footage of land required  
 by housing development  
 (approximately 55.5 acres) 2,498,375

**FIGURE V**  
**HOUSING DEVELOPMENT**  
**286 RESIDENTIAL LOTS 60' BY 100' TO**  
**HOUSE ENTIRE POPULATION SAMPLE**



**SITE : 2,498,375 SQUARE FEET (APPROXIMATELY 57.3 ACRES)**

## CHAPTER 3

### COMPARISON OF COSTS

#### Comparison of Capital Costs

To facilitate cost comparisons between the two types of housing identical servicing is provided for each. Both are serviced as follows:

- 1) asphalt roads (and parking area in the case of the apartment complex);
- 2) six inch curbing;
- 3) concrete sidewalks four feet wide;
- 4) ornamental street lights at 150 foot intervals;
- 5) water distribution through six inch mains;
- 6) eight inch sanitary sewers;
- 7) twelve inch storm sewers;
- 8) fire hydrants at 500 foot intervals.

Arterial roads with an allowance of 80 feet and paved width of 58 feet bound the apartment complex on four sides and the housing development on two sides. Other roads in the housing development are local roads with an allowance of 50 feet and a paved width of 28 feet. Both developments are assumed to be surrounded by other housing and the costs of serviced border roads are shared with such adjacent housing.

The costs of services charged to housing in the models is outlined in Table 12, page 27.

Construction and land costs are as follows:



- 1) Apartment complex--\$11.00 per square foot including landscaping.
- 2) Housing development--\$14.00 per square foot including landscaping.
- 3) Raw unserviced land suitable for residential development--\$3,800 per acre.

Gross comparative costs of the two models are set out in Table 13, page 28.

TABLE 12  
COSTS OF SERVICES TO RESIDENTIAL LAND

Service	Description	Cost
Water Mains	6" diameter	\$ 9.00 per lin. ft.
Sanitary Sewer	8" diameter	10.00 per lin. ft.
Storm Sewer	12" diameter	12.00 per lin. ft.
Curbing	6" concrete	1.00 per lin. ft.
Sidewalks	4 ft. width, concrete	5.00 per lin. ft.
Roads	Asphalt, including excavation, fill and leveling	.50 per sq. ft.
Street lights	Ornamental, underground wiring, 150 foot interval	600.00 per light
Hydrants	500 foot interval	500.00 per hydrant
Miscellaneous		
Water and Sewer connections	per residential lot	100.00
	per apartment building	500.00
surveying	per residential lot	30.00
	per apartment building	1,000.00

TABLE 13

SERVICING, CONSTRUCTION, AND LAND COSTS  
FOR APARTMENT COMPLEX AND HOUSING DEVELOPMENT

Item	Apartment Complex		Housing Development	
	Requirements	Costs	Requirements	Cost
Water Mains	580 lin. ft.	\$ 5,220	11,850 lin. ft.	\$106,650
Sanitary Sewer	580 lin. ft.	5,800	11,850 lin. ft.	118,500
Storm Sewer	1,172 lin. ft.	114,064	11,850 lin. ft.	142,200
Curbing	2,112 lin. ft.	2,112	22,680 lin. ft.	22,680
Sidewalks	2,024 lin. ft.	10,120	22,680 lin. ft.	113,400
Roads	63,612 sq. ft.	31,806	387,903 sq. ft.	193,950
Street Lights	12 lights	7,200	66 lights	39,600
Hydrants	4 hydrants	2,000	20 hydrants	10,000
Connection	---	500	286 @ \$100	28,600
Surveying	---	1,000	286 @ \$ 30	8,580
TOTALS		\$124,812		\$784,160
Adjustment			Minus 1/286th	- 2,742
ADJUSTED TOTALS	Servicing Costs	\$124,812	Servicing Costs	\$781,418
Construction	277,800 sq. ft. @ \$11 per sq. ft.	\$3,055,800	318,500 sq. ft. @ \$14 per sq. ft.	\$4,459,000
Architects fees	7%	254,000	----	
Land	5.87 acres @ \$3,800 per acre	22,306	57.3 acres @ \$3,800 per acre	217,740
TOTALS		\$3,332,106		\$4,676,740
Adjustment			Minus 1/286th of land	- 761
Adjusted Totals	Construction and Land Costs	\$3,332,106	Cost construction And Land Costs	\$4,675,979
COMPOSITE TOTALS	All costs	\$3,456,918	All costs	\$5,457,397

Future comparisons of shifts in housing demand will be based on these derived cost figures. To facilitate their use in this context both per-household and per-capita costs have been derived and those are set out in Table 14.

TABLE 14  
PER HOUSEHOLD AND PER CAPITA COSTS  
OF APARTMENT COMPLEX AND HOUSING  
DEVELOPMENT

Cost	Apartment Complex	% of Total Cost		Housing Development	Cost of Apartments as a Per- centage of the cost of Houses
Total Cost	3,456,918	100.0	100.0	5,457,397	63.4%
Per Household Cost	12,130			19,150	
Per Capita Cost	3,457			5,457	
Services (total)	124,812	3.6	14.3	781,418	16.0%
Per Household Cost	438			2,740	
Per Capita Cost	125			781	
Land (total)	22,306	.7	4.0	216,979	10.3%
Per Household Cost	78			760	
Per Capita Cost	22			217	
Construction (Including architect fee) (total)	3,309,800	95.7	81.7	4,459,000	74.2%
Per Household Cost	11,614			15,650	
Per Capita Cost	3,310			4,459	

### Comparison of Operating and Maintenance Costs

In addition to capital investment in housing, there are a number of other costs of a non-capital nature which must enter any consideration of the allocation of housing resources. Most of these expenditures continue for decades into the future and, therefore, the precise magnitude that some of these costs might assume, presents some difficulty. All cost figures used here are based on present prices.

The aim of this section is to establish comparative figures on the cost of housing, as opposed to the cost of a house (or an apartment). Factors considered are such items as interest, utilities, municipal taxes, etc.

Mortgage interest is one of the more costly features of housing. The total investment in serviced land and construction for the apartment complex was \$3,456,918.00, and for the housing development was \$5,457,397.00. I have assumed that financing was obtained with a down payment of 10%, an amortization period of 25 years, and an interest rate of 9%. Table 15 outlines the impact of mortgage financing on these costs. (see page 31)

If the apartment complex were designed as a condominium, the figures in Table 15 would represent most of the cost differential between the two types of housing. However, since condominium housing is not a significant percentage of Canada's housing stock, this would be an unrealistic

assumption to make. Thus, the apartment complex is assumed to be rental accommodation and other costs must be added.

TABLE 15

MORTGAGE PAYMENTS: PRINCIPAL AND  
INTEREST: APARTMENT COMPLEX; HOUSING DEVELOPMENT<sup>a</sup>

Item	Apartment Complex (\$)	Housing Development (\$)
Total Investment	3,456,918.00	5,457,397.00
Down Payment (10%)	345,692.00	545,740.00
Size of Loan (90%)	3,111,226.00	4,911,657.00
Monthly Payment	25,760.32	40,667.54
Annual Payment	309,123.84	488,010.48
Total amount repaid	7,728,096.00	12,200,262.00
Total interest paid	4,616,870.00	7,288,605.00
Average Investment	12,130.00	19,150.00
Average Down Payment	1,213.00	1,915.00
Average Loan Size	10,917.00	17,235.00
Average Monthly Payment	90.39	142.69
Average Annual Payment	1,084.68	1,712.28
Average Total Payment	27,117.00	42,807.00
Average Interest Paid	16,239.00	25,633.00

<sup>a</sup>All payments represent principal and interest at 9% on an amortization period of 25 years. Interest is compounded semi-annually as provided by the National Housing Act.

Ten percent of the cost of this complex is equity capital. If the entrepreneur were to realize a return on his investment of \$345,692.00 at 7%, this would add approximately \$24,200 to the total annual cost, \$84.91 to the average annual cost of each apartment, and \$7.08 to the average monthly cost of each apartment.

In addition there are the costs of managing the complex, janitorial services, etc. These costs are assumed to be \$15,000.00 annually, and do not include repairs, re-decorating, or major maintenance. This would equal an annual cost of \$52.63 per apartment, and a monthly cost of \$4.39.

It is customary when setting rents to make allowance for a vacancy rate. Within the scope of this model it is not possible that one of these units will be vacant. Nevertheless, if an economic rent is to be determined, this factor must be considered. Assuming a 5% vacancy rate on an annual rent of approximately \$1,200.00, a contingent loss of approximately \$17,000 per year would have to be covered. This would raise annual rents by \$59.65, and monthly rents by \$4.97.

The effect of these factors is summarized below in Table 16.

TABLE 16

PRINCIPAL AND INTEREST PAYMENTS AND MISCELLANEOUS  
COSTS LEVIED ON APARTMENT COMPLEX

Item	Total Annual Cost (\$)	Per Unit Annual Cost (\$)	Per Unit Monthly Cost (\$)
Principal & Interest	309,123.84	1,084.68	90.39
Return on Equity	24,200.00	84.91	7.08
Management	15,000.00	52.63	4.39
Vacancy Allowance	17,000.00	59.65	4.97
TOTALS	365,323.84	1,281.87	106.83

Two other costs which have to be considered for both houses and apartments are insurance and utilities. These costs are outlined on the following page in Table 17.

To consider the longer term allocation of housing resources, maintenance costs must be considered. These would include such things as repainting and redecorating, structural maintenance and repairs, and replacement of integral units of the structure, such as furnace, water tank, etc., to ensure that the housing units do not suffer deterioration. This would normally be a small item of expenditure in the first few years but would assume greater significance with the increasing age of the structure. Since it is primarily related to the structure itself, these costs are based on the construction costs of the respective housing complexes. To maintain these units for an indefinite life I have assumed that an annual cost equivalent to 5% of the construction cost would be necessary. In the case of the apartment complex, this would involve a total annual cost of \$16,549.00; a per unit annual cost of \$58.00; and a per unit monthly cost of \$4.83. For the housing complex the comparable figures are: \$22,295.00; 78.23; and \$6.52.

The remaining charge against these housing models is municipal taxation. This is dealt with in detail in a following section. For purposes of assessing it as a cost levied against housing, I have applied a taxation rate of

TABLE 17

UTILITY AND FIRE INSURANCE COSTS  
APARTMENT COMPLEX AND HOUSING DEVELOPMENT

Item	Apartment Complex			Housing Development		
	Total Annual Cost (\$)	Per Unit Annual Cost (\$)	Per Unit Monthly Cost (\$)	Total Annual Cost (\$)	Per Unit Annual Cost (\$)	Per Unit Monthly Cost (\$)
<sup>a</sup> Fire Insurance	4,700.00	16.50	1.38	5,700.00	20.00	1.67
<sup>b</sup> Electricity	41,040.00	144.00	12.00	51,300.00	180.00	15.00
Telephone	17,100.00	60.00	5.00	17,100.00	60.00	5.00
Metered Water	11,400.00	40.00	3.33	17,100.00	60.00	5.00
Garbage Disposal	5,130.00	18.00	1.50	6,840.00	24.00	2.00
<sup>c</sup> Heating	13,680.00	48.00	4.00	38,343.00	134.50	11.21
TOTALS	90,050.00	326.50	27.21	136,383.00	458.50	39.88

<sup>a</sup>Figures for urban area, structures only, courtesy Allstate Insurance. (Apartment Complex \$106.30 for first \$25,000; \$4.30 per thousand of remainder of value for 3 year policy).

<sup>b</sup>Figures include lighting, electric appliances, and water heating. Courtesy British Columbia Hydro and Power Authority.

<sup>c</sup>Figures are as follows for houses for natural gas heating.

900 sq. ft.	\$116.00 per annum
1,100 sq. ft.	133.50 per annum
1,250 sq. ft.	145.50 per annum
1,400 sq. ft.	158.00 per annum

The apartment complex is calculated on a commercial rate. Courtesy of Inland Natural Gas.



35 mills to the full cost of serviced land and to 75% of the cost of construction for both projects. The results are shown in Table 18, page 36.

A summary of capital costs, plus maintenance and operating costs, and municipal taxation evolved in this section are presented in Table 19, page 37.

TABLE 18

MUNICIPAL REVENUES FROM APARTMENT COMPLEX  
AND HOUSING DEVELOPMENT (MILL RATE: 35 MILLS)

Item	% of Value on which Mill Rate Levied	Apartment Complex		Housing Development	
		Value on Which Mil(\$ ) Rate Levied	Revenue(\$ )	Value on Which Mil (\$ ) Rate Levied (\$ )	Revenue(\$ )
Serviced Land Per Household Revenue	100%	\$ 147,118.00	5,149.13 18.07	998,397.00	34,943.90 122.61
Improvements Per Household Revenue	75%	2,482,350.00	86,882.25 304.85	3,344,250.00	117,048.75 410.70
Total Revenue			92,031.38		151,992.65
Total Per Household Revenue			322.92		533.31

Source: Table 14, page 29.

TABLE 19

SUMMARY OF OPERATING COSTS, MAINTENANCE  
COSTS, CAPITAL COSTS AND MUNICIPAL TAXES

Item	Apartment Complex			Housing Development		
	Total Annual Cost (\$)	Per Unit Annual Cost (\$)	Per Unit Monthly Cost (\$)	Total Annual Cost (\$)	Per Unit Annual Cost (\$)	Per Unit Monthly Cost (\$)
Principal & Interest	309,123.84	1,084.68	90.39	488,010.48	1,712.28	142.69
Return on Equity	24,200.00	84.91	7.08	----	---	---
Management	15,000.00	52.63	4.39	----	---	---
Vacancy Allowance	17,000.00	59.65	4.97	----	----	---
Insurance & Utilities	90,050.00	326.50	27.21	136,383.00	458.50	39.88
Repairs & Maintenance	16,549.00	58.00	4.83	22,295.00	78.23	6.52
Municipal Taxes	92,031.38	322.92	26.91	151,992.65	533.31	44.44
TOTALS	563,954.22	1,989.29	165.78	798,681.13	2,782.32	233.53

Source: Table 15, page 31; Table 16, page 32; Table 17,  
page 34 and Table 18 page 36.

## CHAPTER 4

### IMPACT OF DIFFERENT HOUSING DENSITIES ON MUNICIPAL FINANCES

#### Comparison of Annual Costs Imposed on the Municipality

A municipal government is responsible for a wide variety of services. In this section I have attempted an examination of municipal expenditures with a view to determining the magnitude of the cost differentials in these services, which would accrue as a result of the different residential densities outlined in the preceeding models.

To facilitate this comparison, I have evolved a hypothetical breakdown of various municipal expenditures as a percentage of total municipal expenditures for a model municipality.

There are fairly wide differences in the distribution of municipal funds from one city to another, and the percentages given in Table 20, page 39, are of necessity only general guide lines within which to assess the models under discussion.

Since municipal administration covers commercial and industrial areas as well as residential areas, there is some difficulty in isolating the impact of residential density upon municipal expenditures. Some services are

provided almost exclusively for residential areas, for example, playgrounds, etc., while others such as roads, sewers, and other public works are shared by residential, commercial and industrial areas. Of those which are shared, most are related to the size of the land area which they occupy.

TABLE 20

## BREAKDOWN OF MUNICIPAL EXPENDITURES BY PERCENTAGE

Item of Expenditure	Percentage of Total Municipal Expenditure
General Administration . . . . .	6.0%
Public Works Maintenance . . . . .	7.5%
Sanitation and Waste Removal . . . . .	4.0%
Health and Social Welfare . . . . .	10.0%
Education . . . . .	33.0%
Recreation and Community Services . . . . .	9.0%
Police Protection and Law Enforcement . . . . .	5.0%
Fire Protection . . . . .	4.5%
Debt Charges . . . . .	10.0%
Reserves . . . . .	2.5%
Capital and Loan Fund Contributions . . . . .	6.0%
Miscellaneous . . . . .	2.5%
TOTAL. . . . .	100.0%

Source: B.C. Bond Dealers Assn., 1968 British Columbia Municipal Yearbook, Vancouver, Mitchell Press Limited, 1969. 138 pp. (Also consulted were the Annual Financial Statements of a number of British Columbia Municipalities)

There are extreme variations among municipalities as to the distribution of land between commercial, industrial and residential use. The newly developed residential suburbs might approach 100% of land in residential use, while the center of an older city, if it is under a separate

municipal administration, might have 80% to 90% or more of its land in commercial and industrial use. For purposes of comparison, I have somewhat arbitrarily assumed that 70% of municipal land is in residential use, and 30% in commercial and industrial use.

I have further assumed that the residential area of the municipality is divided between different forms of housing approximately according to the figures revealed by the 1966 Census. (See Table 21 below)

TABLE 21  
OCCUPIED DWELLINGS BY STRUCTURAL TYPE: CANADA, 1966

Type of Dwelling	Number of Dwelling Units		Percentage
Single-Detached	3,234,123		62.4
Single-Attached	401,754		7.7
Double House		238,758	4.6
Other		162,996	3.1
Apartment	1,516,419		29.4
Duplex		339,941	6.6
Other		1,176,478	22.8
Mobile	28,177		.5
TOTAL	5,180,473		100.0%

Source: 1966 Census of Canada, Volume II, "Households and Families, Dwellings by Structural Type and Tenure", Catalogue #93-602, Table 3.

If dwellings other than apartments and single dwellings are eliminated, and percentages calculated on this basis, single-detached houses would account for 73.3% and apartments for 26.7% of all housing units. Those eliminated were primarily other types of multiple dwellings, and thus, the figure for single-detached houses is probably overstated. However, for purposes of this section, I have assumed that the municipal residential area consists of approximately 73.3% single-detached dwellings, and 26.7% apartment dwellings.

Having made these assumptions about the municipality, I shall attempt to assess the impact of the differing residential densities on municipal expenditures. The items of expenditure will be dealt with in the order they appear in Table 20, page 39.

General administration would include such items as wages and salaries for the "civil service", office supplies, equipment, maintenance, and expenses, legal and audit fees, and assessment expenses.

Most of these items would not vary significantly within the residential densities under discussion. However, assessment expenses would, in view of the fact that for the housing development model, for example, 285 assessments, tax notices and collections would have to be processed, as opposed to one for the apartment complex model. This aspect of administration commonly accounts for between 15% and 20% of

total general administrative expenses.

Using the higher figure of 20% and applying the assumptions made above, if all dwelling units were apartments, and if it took one-tenth of the time and expense to deal with apartment units as it would take with ~~single-detached~~ detached dwelling units, this would reduce the expenses of General Administration from 6.0% to slightly less than 5.3%, a total savings in municipal expenditures of approximately .7%. If the same municipality had only single-detached dwellings, the figure of 6.0% would increase to approximately 6.3%.

The largest cost differentials are those connected with the maintenance of municipal public works such as roads, sewers, etc. These differentials are outlined in Table 22, page 43.

The annual costs per dwelling unit are \$2.08 for apartment units and \$17.27 for single-detached houses. It would cost a municipality approximately 12% of the cost of servicing single-detached houses, to service apartment units. Public works maintenance represents 7.5% of municipal expenditure in the hypothetical breakdown given. If 70% of the municipality is residential, about 5.25% would apply to the residential area. The ratio of land requirements for apartment dwellings as compared to single-detached dwellings which was evolved in the preceeding models was roughly 10:1



TABLE 22

ANNUAL MAINTENANCE COSTS OF MUNICIPAL SERVICES FOR  
APARTMENT COMPLEX AND HOUSING DEVELOPMENT

Item	Per Unit Annual Maintenance Cost (\$) <sup>a</sup>	Apartment Complex		Housing Development	
		Requirements	Annual Maintenance Cost (\$)	Requirements	Annual Maintenance Cost (\$)
Water Mains (6")	.045/lin. ft.	580 lin ft.	26.10	11,850 lin ft.	533.25
Sanitary Sewers (8")	.150/lin. ft.	580 lin ft.	87.00	11,850 lin ft.	1,777.50
Storm Sewers (12")	.050/lin. ft.	1,172 lin ft.	58.60	11,850 lin ft.	592.50
Curbing (6" concrete)	.004/lin. ft.	2,112 lin ft.	8.45	22,680 lin ft.	90.72
Sidewalks (4' concrete)	.006/lin. ft.	2,024 lin ft.	6.14	22,680 lin ft.	136.08
Roads (Ashphalt)	.0026/sq. ft.	63,612 sq. ft.	265.39	387,903 sq. ft.	1,008.55
Street Lights (150')	11.85 per light	12 lights	142.30	66 lights	782.10
TOTALS			593.88		4,920.70

<sup>a</sup>These costs are based on the following life expectancies:  
water mains--60 years; sanitary sewers, storm sewers, curbing and street lights--50 years;  
sidewalks--40 years; and roads--20 years.

Source: Pearson, N., What Price Suburbia, A Study published in  
mimeograph by the Lower Mainland Regional Planning Board, New Westminster, B. C.,  
November, 1967.

in favour of apartments. If this were applied to public works expenditures, 267/7597 of the 5.25% would be for servicing apartment dwellings and 7330/7597 for single-detached dwellings. If the entire residential sector consisted of single-detached houses, the land area required would be 31.6% greater; if it consisted solely of apartments, it would be approximately 13.1% of its original size. This compares to a 12% cost figure for serving apartment units noted above. If servicing costs for roads, sewers, etc. are proportional to the land area being serviced, then the 5.25% of municipal expenditures devoted to servicing residential land would decrease to 0.69%, if all dwelling units were apartments. The 7.5% public works figure would drop to approximately 2.9%, a saving in total municipal expenditures of 4.6% annually. If all dwelling units were single-detached houses, the figure of 7.5% for public works maintenance would increase to 9.2%.

The item of Sanitation and Waste Removal includes such items as sewage treatment and disposal, and garbage collection and disposal. I have assumed that people will create the same amount of sewage and garbage regardless of the relative densities in which they are housed, so any cost differential would have to be related to disposal. Sewage treatment and disposal is related to the volume of sewage, not to residential density. Garbage collection and

disposal is conceived here as a municipal service for which an economic fee is charged--\$1.50 per month in the case of apartment units and \$2.00 per month in the case of single-detached houses. (see Table 17, page 34) Hence, while a differential exists, the relative density of housing would not impose a different burden on municipal expenditures.

Health and social welfare costs are likely to be related to factors other than residential densities. Areas of high density are not necessarily prone to higher health and welfare costs--slum tenements are, while luxury high rise apartments are not. Therefore, it is difficult to argue that density per se would alter the 10.0% figure given in Table 20, 39.

An increasingly large proportion of municipal revenues are devoted to education. It is unlikely that the relative densities of residential living outlined in this model would materially affect the cost of providing this service. Approximately two-thirds of the cost of most public school systems is accounted for by teacher's salaries, and most of the remainder is spent on buildings, equipment and supplies. Transportation is the major factor which would vary significantly with residential density, and this is a very small percentage of most education budgets.

Recreation and community service such as parks, playgrounds, museums, libraries, etc., are difficult to

assess. If a high density pattern allowed concentration of facilities there might be some savings here. However, it would appear that the grandiose scale on which this sometimes occurs, when such cultural and recreational facilities are concentrated, might more than outweigh the economies of scale which this produces--unless, of course, a value is imputed to the collective aesthetic value which is produced.

Such facilities as concert halls, municipal museums, and art galleries, etc., would not likely be duplicated, and the effect of residential density would be more related to the accessibility of these services than to the cost of providing them. The personnel necessary to operate these services might be increased slightly with lower density, but land set aside for playgrounds, parks, etc., would not likely be greater.

I have assumed that the overall cost of providing such services would decline by 2%, from 9% to 7% of municipal expenditures, if all dwellings were apartments. Conversely, if all dwellings were single-detached, I have assumed that the cost of providing these services would increase by 1%, from 9% to 10% of total municipal expenditures.

Police protection and law enforcement expenditures are not likely to vary significantly with density. The RCMP, in contracting to service municipalities recommends

one police officer per thousand citizens. Under such contracts, salaries commonly account for about 80% of the cost of police protection. Some minor savings in fuel might result in a high density pattern because of fewer streets to patrol, but it is unlikely that this would significantly alter the cost of providing the service. Law enforcement services (ie. magistrates' salaries, court costs, etc.) are related to the incidence of crime. For this to vary, it would be necessary to prove that the incidence of crime was a function of residential density.

Fire protection is also not likely to vary significantly with density. While there might be a wider dispersal of equipment and personnel in a low density area, with some increase in cost for the duplication of facilities, this would be weighed against dealing with fires in the multi-storied structures of a high density area which would require expensive specialized equipment. The salary component of fire protection is of the magnitude of 65% to 70% and this would not likely vary significantly with density.

Debt Charges, Reserves, and Capital and Loan Fund Contributions are primarily related to the manner in which a municipality is required to finance its operations--usually established by the provincial government. Some variation might occur here if the municipality had a significantly different pattern of capital expenditure as a

result of residential density. There is, however, little evidence to suggest this would necessarily be the case.

In summary, if an average municipality with the pattern of expenditures outlined in Table 20, could somehow be transformed into one whose entire residential area consisted of apartment units, the savings in municipal expenditures would be as follows in Table 23, page 49,--a total saving of approximately 7.3%. Included as well is the situation where the same municipality has only single-detached houses in its residential area. In this case, its expenditures would be some 3.0% higher. See Table 23.

TABLE 23

BREAKDOWN OF MUNICIPAL EXPENDITURES BY PERCENTAGE: AVERAGE MUNICIPALITY;  
HIGH RESIDENTIAL DENSITY MUNICIPALITY; AND  
LOW RESIDENTIAL DENSITY MUNICIPALITY

Item of Expenditure	Average Municipality	High-Residential Density Municipality	Low Residential Density Municipality
	Percentage of Total Municipal Expenditures	Percentage of Total Municipal Expenditures	Percentage of Total Municipal Expenditures
General Administration	6.0%	5.3%	6.3%
Public Works Maintenance	7.5%	2.9%	9.2%
Sanitation and Waste Removal	4.0%	4.0%	4.0%
Health and Social Welfare	10.0%	10.0%	10.0%
Education	33.0%	33.0%	33.0%
Recreation and Community Services	9.0%	7.0%	10.0%
Police Protection and Law Enforcement	5.0%	5.0%	5.0%
Fire Protection	4.5%	4.5%	4.5%
Debt Charges	10.0%	10.0%	10.0%
Reserves	2.5%	2.5%	2.5%
Capital and Loan Fund Contributions	6.0%	6.0%	6.0%
Miscellaneous	2.5%	2.5%	2.5%
TOTALS	100.0%	92.7%	103.0%
Savings Accruing to High Residential Density	---	7.3%	---
Increased expenditures Accruing to Low Residential Density	---	---	3.0%

Source: Table 20, page 39.

### Comparison of Annual Municipal Revenues

The aim of this section is to examine the impact on municipal revenues which would be attributable to differences between apartment dwellings and single-detached dwellings.

Because taxation on land and improvements is levied on commercial and industrial property, as well as on residential property, the assumptions made in the previous section on the distribution of land between commercial and industrial, and residential use will be applied here. It was assumed that 30% of the municipal land area was in industrial and commercial use, and that 70% was in residential use.

The proportion of dwelling units as between apartments and single-detached houses was assumed to be 26.7% apartment units and 73.3% houses. This assumption will also be used in this section.

Municipal revenues are forthcoming from a number of sources, and the exact proportions vary somewhat from one municipality to the next. However, two major items consistently serve as their greatest source of income--taxation on property and improvements, and grants from senior levels of government. The bulk of these grants are from provincial governments, and, therefore, some variations occur from province to province. Figures used here are based on the grant system operating in British Columbia.



As in the previous section, I have drawn up a schedule of sources of municipal revenue to serve as a guide in discussing the impact of different forms of housing on municipal revenues. See Table 24, below.

TABLE 24

BREAKDOWN OF MUNICIPAL  
REVENUES BY PERCENTAGE

Source of Revenue	Percentage of Total Municipal Revenue
Taxation on Property and Improvements . .	67.0%
Government Grants . . . . .	20.0%
Licenses and Permits . . . . .	4.0%
Rents . . . . .	1.0%
Fines . . . . .	2.0%
Service Charges . . . . .	2.0%
Miscellaneous . . . . .	4.0%
TOTAL	100.0%

Source: B.C. Bond Dealers Assn., 1968 British Columbia Municipal Yearbook, Vancouver, Mitchell Press Limited, 1969. 138 pp. (Also consulted were the Annual Financial Statements of a number of British Columbia Municipalities)

In dealing with taxation on property and improvements the following assumptions are made:

- 1) taxation on land is based on 100% of the assessed value;
- 2) taxation on improvements is based on 75% of the assessed value;
- 3) improvements are limited to houses or apartment buildings;
- 4) land taxation is levied on serviced land; and
- 5) cost and assessed value are assumed to be equal.

On the basis of the two housing models evolved

previously, the differences between the tax bases of the two different housing forms is outlined in Table 25, page 53.

The high density pattern would yield 60.6% of the tax revenue of the low density pattern. If the municipality receives 67.0% of its revenue from property and improvement taxation, it would receive approximately 46.9% from the residential area, 8.5% of this from apartment units, and 38.4% from single-detached dwellings. If the entire municipal residential area consisted of apartment units, total municipal revenues would fall by approximately 15.1%. If all dwellings were single-detached units, total revenue would rise by approximately 5.5%.

The second major source of municipal revenue is grants from senior levels of government. The smaller source of money is the federal government. Their grants occur under the Municipal Grants Act, and a variety of other legislation and federal departments. They are not related to density, tenancy, or other aspects of the residential pattern, except for grants made through Central Mortgage and Housing Corporation for such things as Urban Renewal. Except where there is an unusual amount of federal government activity, their grants do not usually account for more than 2% or 3% of all government grants or something approximating .5% of total municipal revenue.

TABLE 25

COMPARISON OF MUNICIPAL TAX BASE AS BETWEEN  
APARTMENT COMPLEX AND HOUSING DEVELOPMENT

Item on Which Tax is Levied	% of Value on which Mil Rate is levied	Apartment Complex		Housing Development		Apartment Complex Value as Percentage of Housing Development Value (%)
		Total Value on which Mil Rate levied (\$)	Per Unit Value on which Mil Rate levied(\$)	Total Value on which Mil Rate levied(\$)	Per Unit Value on which Mil Rate levied(\$)	
Serviced land	100.0%	147,118	516	998,397	3,500	14.7
Improvements	75.0%	2,482,350	8,710	3,344,250	11,734	74.5
Total Tax Base		2,629,468	9,226	4,342,647	15,234	60.6%

Source: Table 18, page 36.

The structure of provincial government grants varies somewhat from province to province. In British Columbia, the bulk of such grants are made under three programs; the Provincial Homeowner Grant; a local Government Grant; and Social Assistance Grants. Together, these grants account typically for something in excess of 95% of all government grants. In addition to these, the Provincial government shares in the capital cost of school construction of from 50% to 90% of such capital costs, depending on the ability to pay of the school district involved. Other provincial capital-sharing arrangements apply to certain other capital expenditure programs of municipalities. Because they are geared to specific undertakings, these capital grants are not considered here. None of them has any connection with residential density.

The Social Assistance Grants are made to help municipalities defray the cost of Health and Welfare expenditures and are not related to the type of housing in the community.

The local Government Grants are based on a per-capita grant to the municipality, and likewise bear no relation to residential patterns.

The Provincial Homeowners Grant, however, is tied directly to tenancy. It is presently \$150 per year and is paid only to resident homeowners. It is applied as a

rebate on the current year's school taxes, of each eligible homeowner and owner-occupied apartment. Persons occupying dwellings as tenants, or who own mobile homes are not eligible to receive this grant. In fact, this grant is aimed at alleviating the burden of school taxes on rate payers, and is, in effect, an educational grant.

If it is treated as a homeowners grant, the consequences are startling for a municipality whose residential area is predominantly or totally made up of rental apartment units. The Homeowner Grants typically make up approximately 40% of all government grants, and such a municipality would find its total revenue some 8%, or so, smaller as a result. If all homes were single-detached dwellings, total municipal revenue would increase by roughly 3.4%.

If, however, the grant is treated as an educational grant, on the assumption that similar grants in other provinces would be forthcoming on a per-capita or per-pupil basis, then tenancy or residential density would not affect this source of municipal revenue.

With the exception of the Homeowner Grant system, it would appear that this source of municipal revenue would be unaffected by differing residential patterns.

Other sources of municipal revenue outlined in Table 25, page 53, would not vary with residential density except in the case of service charges. Included here would

be charges for water, garbage disposal, service connections, etc. If the charges levied were economic charges, the amount of money involved might vary slightly but any change in municipal revenues would be offset by a change in municipal expenditures.

Table 26, page 57, outlines the impact on the revenues of the model municipality if all of its residential area were changed from the 73.3-26.7% mixture of houses and apartments to 100% apartments, or to 100% single-detached dwellings.

TABLE 26

BREAKDOWN OF MUNICIPAL REVENUES BY PERCENTAGE: AVERAGE MUNICIPALITY;  
HIGH RESIDENTIAL DENSITY MUNICIPALITY; AND  
LOW RESIDENTIAL DENSITY MUNICIPALITY

	Average Municipality	High Residential Density Municipality	Low Residential Density Municipality
Source of Revenue	Percentage of Total Municipal Revenues	Percentage of Total Municipal Revenues	Percentage of Total Municipal Revenues
Taxation on Property and Improvements	67.0%	51.9%	72.5%
Government Grants <sup>a</sup>	20.0%	20.0% (12.0%)	20.0% (23.4%)
Licenses and Permits	4.0%	4.0%	4.0%
Rents	1.0%	1.0%	1.0%
Fines	2.0%	2.0%	2.0%
Service Charges	2.0%	2.0%	2.0%
Miscellaneous	4.0%	4.0%	4.0%
TOTALS	100.0%	84.9% (76.9%)	105.5% (108.9%)
Loss in Revenue Attributable to High Residential Density	----	15.1% (23.1%)	-----
Gain in Revenue Attributable to Low Residential Density	----	-----	5.5% ( 8.9%)

Source: Table 24, page 51.

<sup>a</sup>Figures in brackets indicate the impact on municipal revenues which would result if the B.C. Homeowner Grant were not made available to apartment units. (see discussion pp. 54, 55)

## CHAPTER 5

### SUMMARY AND CONCLUSIONS RESULTING FROM HOUSING MODELS

#### Introduction

This section proposes to examine the information available from the preceeding models and analysis, and to examine and summarize the nature and scope of differentials in costs imposed on housing resources, and of cost and revenue differentials imposed on municipal governments, as a result of the two different forms of housing. The conclusions reached here will serve as a framework in which to examine the Canadian experience in the area of housing.

#### Capital Cost Differentials

The overall capital cost of providing housing accommodation in apartment units is 63.4% of the cost of providing accommodation in single-detached dwellings.

This overall cost is made up of land costs, servicing costs, and construction costs. The greatest cost differentials are in land and servicing. An assumption made in the models is that the cost per acre of unserviced land was identical for both projects. 57.3 acres was required



for the housing development and 5.87 acres for the apartment complex, hence, the cost of land for the apartment complex was 10.3% of the cost of that for the housing development, and represented only 0.7% of the total cost of the complex, compared to 4.0% for the housing development. Serviced land cost \$514 per apartment unit (4.3% of the total cost) and \$3,500 per single-detached house (18.3% of the total cost).

Construction costs per apartment unit were \$11,614, and per house were \$15,650. An apartment unit would cost 74.2% of the construction cost of a house. This represented 95.7% of the total apartment cost, and 81.7% of the total cost of the house. There are two main factors which account for this difference in costs: the construction cost per square foot--\$11.00 for apartments and \$14.00 for houses; and the differences in the average size of the two types of housing--815 square feet for apartments, and 1,120 square feet for houses.

In terms of total capital cost, an apartment unit would provide about 72.8% of the living area of a house, for about 63.4% of the cost, and would contain a much lower serviced land component in its total cost.

#### Operating and Maintenance Cost Differentials

When the figures evolved in this section are added to the capital costs of the two types of housing and compared on a monthly basis, it costs \$165.78 to live in an

apartment, and \$233.53 to live in a house. To live in an apartment costs 71.0% of the cost of living in a house, and, as noted above, provides 72.8% of the living area.

Because both projects are financed at 9% interest over 25 years with a 10% equity, interest charges vary by the same percentage as capital costs--the cost of financing an apartment unit is 63.4% of that of a house.

Monthly utility and fire insurance costs are \$27.21 for apartments and \$39.88 for houses. These represent 16.4% and 17.1% respectively, of the monthly cost of housing accommodation in the two different types. Such services for apartment units cost 68.2% of the cost of such services to houses.

Municipal taxes account for \$26.91 (16.2%) of the monthly cost of an apartment and \$44.44 (19.0%) for houses.

#### Costs Imposed on Municipal Government

In examining this question, an attempt was made to set up a hypothetical pattern of municipal expenditure for a municipality of mixed industrial, commercial and residential areas, which contained, in its residential sector, 73.3% single-detached dwellings and 26.7% apartment units. Deviations in costs resulting from residential patterns were shown in percentages greater or smaller than those of the model municipality.

Only three areas of municipal expenditure showed significant variations due to residential density. These were General Administration (6.0% in the model municipality), Public Works Maintenance (7.5%) and Recreation and Community Services (9.0%), for a total of 22.5%.

General Administration expenditures would drop by 0.7% of total municipal expenditures if all dwellings were apartments, and would rise by 0.3% if all were houses--a total difference of 1.0%.

Public Works Maintenance expenditures would drop by 4.6% if all dwellings were apartments, and would rise by 1.7% if all were houses--a total difference of 6.3%.

Recreation and Community Service expenditures were particularly difficult to assess. However, it was assumed that they would fall approximately 2% if all dwellings were apartments and rise by approximately 1% if all were houses--a total difference of 3%.

In summary, if the model municipality contained only apartments in its residential area, its total expenditures would drop by some 7.3%; if it contained only houses its total expenditures would rise by some 3.0%--a total difference between the extremes of approximately 10.3%.

#### Revenues Forthcoming to the Municipal Government

The hypothetical municipality of the previous section was used here as well. With the exception of the Homeowner Grant system presently in effect in British Columbia, the

only source of municipal revenue which varied as a result of the residential pattern, was municipal taxes levied on land and improvements.

Based on cost figures evolved in the housing models, if all dwellings were apartments, the municipal tax base would be only 60.6% of the base available if all dwellings were single-detached houses. Since such taxation represents 67% of the municipalities revenues, any major change in this tax base is significant.

If all dwellings in the model municipality were apartment units, total revenue would fall by approximately 15.6%; if all were single-detached houses, total revenue would rise by approximately 5.5%--a total difference between the extreme cases of some 21.1%.

When compared to municipal expenditures, a significant fact emerges: if the model municipality had only apartment units, its expenditures would fall in total by 7.1%, but its revenues would fall by 15.1%. If, on the other hand, it contained only single-detached houses, its expenditures would rise by about 3.0% while its revenues would rise by some 5.5%.

## CHAPTER 6

### CONSUMER ATTITUDES AND PREFERENCES FOR APARTMENT UNITS VERSUS SINGLE-DETACHED DWELLINGS

#### Introduction

Thus far in the study there has been an assumption that single-detached houses and apartment units are substitutable modes of housing accommodation. While this is true in a literal sense, the attitudes and preferences regarding housing held by those who will inhabit them are relevant. If no consumers regard apartments as competing in the market with houses, then there is little point in a comparative examination of them. The purpose of this section is to examine consumer attitudes and preferences in the area of housing with a view to establishing the comparability of the two types of housing under consideration.

#### The Concept of the House

The concept of a house and what its function is, or ought to be is complex. Lewis Mumford defined a house in the following terms:<sup>1</sup>

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<sup>1</sup>Lewis Mumford, Modern Architecture, International Exhibition, Museum of Modern Art, New York, Feb. 10 to March 23, 1932, (New York: Plandome Press) (quoted from Nathan Straus, The Seven Myths of Housing, p. 95).

The modern house is a biological institution. It is a shelter devoted primarily to the functions of reproduction, nutrition and recreation. To expand the definition a little, the house is a building arranged in such a fashion that meals may be easily prepared and served . . . that rest and sleep may be enjoyed; that sexual intercourse may take place in privacy, and that the early care of the young may be opportunely carried on . . . . Add to these primarily physiological requirements, the provision of space for social companionship and play and study and the definition of the house is complete.

This definition is related closely to the typical husband-wife-children concept of the family, and this is, in a sense, a static concept. Family size, age, and composition change and this has a significant effect over time on the nature of consumer preferences for housing. Take, for example, the following hypothetical family through its life cycle and its related demand for accommodation.

At about age 20, our one-person family enters the housing market. Until about age 22 he occupies a room or small apartment alone. From age 22 to 24 he shares an apartment with a friend. At age 24 he marries and the family moves to another apartment. At 25 or 26 a first child is born and the family moves to a larger apartment. At age 29 a second child is born. The first is three and needs an outdoor play area. The second child needs a bedroom or a nursery. At this time the family would like to buy their first home, but lack a down payment; so instead they rent an older home near the edge of the city. In the husband's early 30's they purchase a small, new suburban house with

three bedrooms. It is too small, but the best they can afford. A third child is expected. In his mid-40's they sell their first house and make a down payment on a larger house--four bedrooms, den-guest room--and plan to live here permanently. In fact, they will probably remain here for 12 to 15 years at which time the children will be gone. They may then remain, move to a smaller house or an apartment, or in some cases to a more pretentious house. After the death of one partner, usually the husband in his mid-60's, the remaining partner may move to a smaller apartment, or into the home of a married child. Hence, our typical family has occupied six apartments, one rented house, and two or three owned houses. Of fifty or more years in the housing market, about twenty were husband-wife-children years. The motives for changing their housing were largely non-economic. While economic factors, to be sure, affected or limited their choice, they were not the primary incentive.

#### The Housing Market

Like all markets, the housing market is an imperfect one; the nature of the market itself affects the consumer's attitudes, and to some degree limits his choice. The product supplied by the market can be classified in a number of ways: by age--new or previously constructed dwelling units; by structural type--single-detached dwellings or some form of

multiple dwelling; by tenure--ownership or rental; by location--urban suburban, or rural; by price, size and so on. Various combinations of these result in a structure of submarkets, within the overall housing market, for example, the submarket for new, single-detached, 3 bedroom, suburban houses, for sale at about \$25,000.

Market restrictions on consumer preferences occur where a submarket is very small or perhaps almost non-existent; for example, condominiums (apartments for sale) or row housing are two submarkets in Canada in which the supply is very small and prices generally very high. The effect on consumers is to force them into other submarkets.

The two submarkets of concern here are those for new single-detached dwellings for sale and new apartment units for rent. These two submarkets in this order are the two most important housing submarkets in Canada, since approximately 85% of the population has chosen one of these alternatives.

### Consumer Attitudes and Preferences

#### 1. Single-Detached Dwellings--Ownership Tenure

Home ownership is a deeply rooted North American tradition and is for all intents and purposes, synonymous with the ownership of single-detached dwellings. Until recent years, for the majority, it was not a realizable dream. Various surveys have consistently shown a preference



for home ownership. Five surveys, conducted from 1931 to 1945, indicated that seven out of ten families preferred to own, and that nine out of ten owners preferred that status, while somewhat over one-half of renters would have preferred ownership.<sup>2</sup> The recent Report of the Task Force on Housing and Urban Development supports this contention, reporting that the Canadian desire for home ownership was " . . . one of the more unanimous impressions the Task Force evolved from its cross-country tour."<sup>3</sup> At its public meetings the Task Force commonly asked for a show of hands on the question, and claimed that response invariably indicated that "at least 80% of those present wanted to own their own home, the same figure . . . which Professor Edward Michaelson of Toronto obtained in a more scientific sampling."<sup>4</sup> These surveys, however, have often not been economically realistic. They have been based on tenure preference, rather than on financial capability.

Dealing with why home ownership is preferred, Nathan Straus sets out the following:

- 1) The sense of contentment and security felt by the family;
- 2) Additional self-respect from occupying a house owned by the family;

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<sup>2</sup>Louis Winnick, Rental Housing: Opportunities for Private Investment, p. 53.

<sup>3</sup>Canada, Report of the Task Force on Housing and Urban Development, p. 15.

<sup>4</sup>Ibid., p. 58.

- 3) Freedom to make improvements or alterations without asking the landlords permission;
- 4) Additional prestige among friends and in business associations;
- 5) Clear title to a home at the end of twenty-five years instead of a batch of rent receipts.<sup>5</sup>

To this list Louis Winnick adds the following:

- 6) Rising residential real estate prices which have resulted in capital gains, realized or not, for those who purchased early (in the post-war era);
- 7) Rising construction and operating costs can be more readily escaped by buying than by renting.<sup>6</sup>

Since World War II, in most larger urban centers, a preference for home ownership has almost automatically involved a preference for a suburban location. The existing stock of urban housing was not sufficient to absorb the increased demands on it and suburban development represented the most practical area for expansion. Why a positive consumer preference for suburban locations developed is the subject of differing points of view.<sup>7</sup> Some believe that improvements in transportation and communication merely made it possible for people to live as they had always wanted, in an environment of fresh air and sunshine, away from the undesirable facets of city life, and yet be able to retain their jobs in the urban labour market. Others

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<sup>5</sup> Nathan Straus, Two-Thirds of a Nation: A Housing Program, p. 90-91.

<sup>6</sup> Winnick, op. cit., p. 52.

<sup>7</sup> Meyerson, Terret, and Wheaton, op. cit., p. 87.  
(see also Winnick, op. cit., pp. 51-52.)

regard it more in the light of economic factors. Sustained prosperity, the developments of a housing policy favouring ownership, opening of large tracts of cheap suburban land, and the readiness of the construction industry to produce relatively inexpensive houses on a large scale, lured families to the suburbs. Others see the movement as pincers in action. The family can only escape the undesirable aspects of its urban location and find a more desirable environment in the suburbs by sacrificing locational convenience. This more desirable environment might include the beneficial effect of suburban living on children, and the desire to be near friends, relatives, or "the right sort of people". The differing view points emphasize that the large-scale development of suburban living has made home ownership possible on a much larger scale than ever before.

In addition to these factors, the financial position of large numbers of persons in the immediate post-war era was conducive to purchasing a home. Large accumulations of savings and other liquid assets, and freedom from debt, as a result of restricted consumption during the war, made possible large-scale home buying. These factors were reinforced by rising incomes and the trend to increasing numbers of working wives.

The trend to the suburbs has not gone unchallenged. With the development of suburban shopping areas, central

city business men have increasingly sought to bring consumers back. Increasing traffic congestion and the problems of parking in down town areas, have resulted in much greater locational inconvenience than suburban dwellers at first anticipated. New suburban areas are getting farther and farther away from the city center, and good locations are becoming scarcer and more expensive. Suburban densities are often higher than at first envisioned. Educational facilities are new, but almost always crowded and expensive. Taxes have risen greatly, and have, in some areas, given rise to invitations to industry and commerce to alleviate the residential tax burden, thus compromising the original character of the community. The way of life itself has not turned out as was first imagined. Some have found the dullness of living in a homogeneous community, with its pressures for conformity, objectionable. Certain inconveniences have accompanied the move to the suburbs. Often the nearest store is a mile or two away. Moreover, the family is to some extent isolated from the cultural life of the city center.

Much attention has been directed at examining why people move to the suburbs, but considerably less at why others do not, or why suburbanites return to the city. Central urban living does have certain advantages, and in the past two decades a preference for this location has

increasingly, involved a preference for rental accommodation as well. There are recreational advantages to this location. Theatres, museums, concert halls, art galleries and restaurants tend to cluster near the city center. Shopping is convenient, and proximity to employment is possible. Congestion and tiresome rush-hour traffic can largely be avoided. As these problems become more acute, central urban living becomes more attractive.

In spite of these and other factors which have disenchanted many suburban dwellers, suburbs continue to grow.

## 2. Apartment Units--Rental Tenure

Consumer attitudes toward apartment accommodation compared to houses are influenced by the difference in tenure as well as by differences in the housing units themselves. Since the predominant form of rental accommodation is apartment units, consumer preferences regarding tenure are also considered.

In spite of the preference for home ownership, there remain large numbers who, for one reason or another, choose to rent. They include the following:

- 1) newly married couples;
- 2) single individuals;
- 3) the highly mobile;

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<sup>8</sup>Winnick, op. cit., pp. 6-8.

- 4) the elderly;
- 5) the financially insecure; and
- 6) the "house-haters".

Undoubtedly, many within these groups would prefer ownership, but financial circumstances preclude this. Members of all groups, with the exception of the "house-haters", and, probably, the highly mobile group, would fall into this category. For some, rental is merely a temporary situation until a down payment is saved for the purchase of a home. For others, however, it is a permanent way of life. Those who prefer to rent, do so for a number of reasons, in most cases related not so much to a difference in tenure, as to the difference between house-dwelling and apartment-dwelling. Apartment-dwelling offers freedom from such chores as lawn cutting, and snow removal, repairs, maintenance, redecorating and so on which are taken care of by the management. Such factors would appear to be of particular significance to the elderly and to the "house-haters".

For the mobile group, which would certainly include a large segment of the newly married and single individual groups, apartment dwelling and rental tenure have distinct advantages. The typical lease is for one year, and most leases allow sub-letting arrangements for those who desire to leave before the expiration of the lease. The cumbersome process of selling a house is avoided. Most apartments contain the basic appliances, such as refrigerators and

ranges, thus eliminating, for newly married couples, the cost of acquiring these expensive appliances, for mobile individuals or families, the necessity of transporting them with each move. Partially or completely furnished premises offer even greater attraction in this area.

Certain non-economic factors, as well, appear to support an increased demand for rental housing, although their effect is difficult to prove conclusively. An apartment is less trouble to keep up than a house, and has an appeal to the larger numbers of families which have working wives. The shift of increasing numbers toward professional, managerial, and white collar employment, and a decline in the number of production workers may have an effect, since the professional man is more likely to rent than other people in his income class.<sup>9</sup> Apartments are suitable for the increasing numbers of students in post-secondary institutions who require rental accommodation. The growing scarcity, increased cost, and greater distance from the city of suitable land for suburban development, has removed some of the desirability of suburban living. Other factors mentioned above regarding the disenchantment with suburban living are also significant here.

#### Summary

There are a variety of qualitative differences

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<sup>9</sup>Ibid., p. 219.

between houses and apartments which are difficult to assess. The recreational value of back yards with the proximity to children's play areas, the storage and recreational potential of basements, the greater degree of privacy, and other factors peculiar to single-detached houses, undoubtedly have a strong impact on consumer preferences. Freedom from snow shovelling, lawn cutting, etc., are qualitative features favouring apartments which are equally difficult to measure precisely.

As has been pointed out, there are also a number of factors involved other than structural differences.

Consumer attitudes regarding housing feel the impact of a wide variety of extraneous influences. These include such diverse things as advertisements by Canadian and American producers of a host of consumer goods related directly or indirectly to housing; periodicals devoted primarily or exclusively to housing; preferences in location, structure, design and so on, in the offices of financial institutions and CMHC; housing codes and zoning ordinances; and the value and status implications of various types of housing.

In addition to these factors, consumers' attitudes are affected and in a way limited by the scale of operations of the modern merchant builder. The pattern of streets, the diversity of the housing available, the location or existence of community facilities, and other factors which help to shape the character of modern housing, are largely the result of the developer's planning, and not the result of individual decisions of prospective consumers.



In the eye of the consumer, then, how comparable are apartment units to single-detached houses? For most, the two types probably do not represent substitutes. The typical homeowner will not likely sell his house to take advantage of low rents. The large family will not likely consider apartment dwellings unless financial constraints force them out of the single-detached housing market. In any case, they may find difficulty in locating an apartment landlord tolerant of large families. The highly mobile, the newly married, the elderly, and the "house-haters", in most cases will enter the rental apartment market. More favourable mortgage terms--lower down payments, lower interest rates, or longer amortization periods, or any combination of these--would probably attract renters into the ownership market.

It is likely then, in the short run, that only for a marginal number of households are apartments and single-detached houses substitutes. This is primarily because consumer attitudes are influenced by such a wide variety of factors other than structural type. In the long run, the case is less clear. The changing composition of the population, changing real incomes, structural changes in the urban environment and numerous other factors could engender significant and far reaching changes in consumer attitudes.

## CHAPTER 7

### CONSUMER DEMAND FOR CANADIAN HOUSING

#### Introduction

This ~~chapter~~ proposes to examine the demand for housing in Canada. In the previous section consumer attitudes toward and preferences for various types of housing were examined. This section will deal with effective demand as displayed in the market, the determinants of this demand, and changes that have occurred in it. The following section will deal with the impact of this factor on housing resources and municipal finances in Canada.

#### Long-Run Determinants of Housing Demand Demographic Features

The ultimate long-run determinants of housing demand are to be found in demographic factors. By census definition, changes in the occupied housing stock are equal to net household formations. The major of these demographic features are as follows:

- 1) net family formation (the net sum of marriages, deaths, divorces, and immigrant families);
- 2) undoubling (determined by the ability of already existing families to maintain separate households);
- 3) non-family household formation.<sup>10</sup>

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<sup>10</sup>W. M. Illing, Housing Demand to 1970, p. 3.

The census definition of "family" consists of a husband and wife, with or without children, or a parent living with one or more children. The rate of net family formation is governed by past birth rates to a considerable degree. The factors of death and divorce appear to be reasonably stable. Immigration policy, and changes in it, affect net family formation significantly from time to time. From 1900 to 1939, average net family formation did not exceed 34,000 to 38,000 per year. (see Table 27, page 78) The growth rate of net family formation declined substantially from the early years of the century, when high net immigration was an important factor, to the end of the depression, during which adverse economic conditions tended to discourage or postpone marriages. From 1941 to 1951, net family formation averaged 68,000 per year, reflecting earlier postponements and immediate post-war marriages. From 1951 to 1961, the average was 86,000 per year, reflecting in part higher immigration. Net family formation declined slightly during the late 1950's and early 1960's, but, as of 1963, the rate has begun to increase again.

In the post-war period, undoubling of families has been an important source of demand. The rate of undoubling depends on income and employment, the level of rents, and the availability of suitable dwellings. These factors have been increasingly favourable in allowing existing families

TABLE 27

AVERAGE ANNUAL INCREASES IN FAMILIES AND HOUSEHOLDS  
BETWEEN CENSUS YEARS 1901-1966<sup>11</sup>

Year	Families		Family Households		Non-Family Households		Total Households	
	(000's)	%	(000's)	%	(000's)	%	(000's)	%
1901-11	34.3	2.8	na	na	na	na	39.1	3.3
1911-21	34.8	2.2	na	na	na	na	35.5	2.3
1921-31	35.5	1.8	na	na	na	na	46.3	2.4
1931-41	37.6	1.6	na	na	na	na	34.6	1.5
1941-51	68.2	2.4	56.4	2.2	8.0	2.0	64.4	2.2
1951-56	84.6	2.4	91.7	2.9	12.4	2.6	104.1	2.9
1956-61	87.0	2.2	97.0	2.7	28.6	5.0	125.6	3.0
1961-66	72.0	1.7	77.7	1.9	34.5	4.7	112.2	2.3

na: not available

note: data exclude Yukon and N.W.T.

Source: based on data from DBS and CMHC and estimates by  
Economic Council of Canada.

<sup>11</sup>Ibid., p. 9.

to establish separate households. The proportion of families maintaining separate dwellings rose from 90% in 1951 to 94% in 1961, and to 96% in 1966.

Since little doubling-up of families is voluntary, the constraints imposing this form of household organization are usually financial. Doubling-up usually implies overcrowding, and overcrowding is most heavily concentrated among families of low income. If this analysis is correct, then overcrowding in itself does not represent effective demand, and will not, of itself, bring about new construction. Hence, the rate of undoubling is to some extent related to the demand for moderate, low-rental, or subsidized housing.

The third demographic feature under consideration is nonfamily household formation. Non-family households consist of individuals or groups not related by marriage who maintain separate dwellings. This factor has assumed increasing importance in recent years, reflecting in part changes in attitudes and preferences. The three generation home is largely a thing of the past. Apartments and small suburban houses cannot easily accommodate a grandparent(s). However, the increased availability of small, attractive apartments, constructed in increasing numbers since 1958, has appealed particularly to non-family households. The better financial position of older people, due partly to improved old age security, the post-war period of sustained

prosperity, and improved private pension plans, have made increasing numbers of older people financially independent of their children, and therefore, more able to maintain their own household. Growing numbers of university students also increase the number of non-family households.

In the 1956-61 period, about three-fifths of such households were set up by the persons over 55, and approximately one-half of the total of such households were set up by women over 55. The majority of these households were created by the death of a husband or wife.

The real incomes of most of these non-family households are fixed incomes, determined by changes in pensions, price levels, and by asset holdings at retirement. The ability to maintain a separate dwelling would be particularly favourable to home owners in this category whose title is mortgage free.

An overview of total household formation would indicate the following general trends: From 1901-1941, average annual percentage increases slowed down, reflecting a parallel slow-down in the average growth rates of families. A large expansion of the number of households occurred from 1941 to 1961, due initially to the sharp post-war rise in net family formation, and subsequently sustained by increases in non-family households and to some extent by expanded post-war immigration. From 1961 to 1966, total

household formation declined somewhat, reflecting lower net family formation caused in part by lower net immigration. This was partially offset by further undoubling of existing families, and increased non-family formation.

#### Measuring Effective Demand

It is difficult to indicate with precision what the magnitude of demand differentials are for the two types of housing under consideration. If the distribution of single-detached dwellings and apartments in the housing stock is taken as a measure of effective aggregate demand, then, according to the 1966 Census, 62.4% of households preferred single-detached dwellings and 22.8% preferred conventional apartment units. The remaining 14.8% chose some other form of housing, characteristically other types of multiple dwellings (see Table 21, page 40). Closely parallel to the 62.4% figure for single-detached dwellings is the figure of 63.1% for dwellings which were owner-occupied.

If the distribution of structural type and tenure within the existing housing stock is indicative of effective demand, so are additions to this stock. Virtually all new construction enters the market for sale or rental; however, the picture is less clear for the existing stock. At any given time, the existing stock contains a large residual of houses which are not for sale and rented premises which are

not on the market. As well, there are significant numbers of each which are on the market. A third category, primarily houses, exists in a marginal area. Changing prices may lure them into the market or remove them from it.

The relationships between the existing stock and new construction are important. Obviously, the two do not compete in a pure sense, and the greater the difference perceived between new and existing units, the less competitive they are. Factors of age, location, size, design, style, quality, neighbourhood and so on--all play a role.

In judging the demand for housing, the annual increment added to the housing stock should reflect over a number of years, changes that occur in consumer preference. While new construction normally averages less than 3% per annum of the existing stock, it accounts, in the ownership category, for about one-half of the sales. New rental construction accounts normally for somewhat less than 10% per annum of new rentals, reflecting the much higher mobility among renters.<sup>12</sup>

Immediately following World War II, there was a strong demand for housing, and up until the early 1950's

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<sup>12</sup>Figures from Grigsby, W. G., Housing Markets and Public Policy, p. 180.



the rate of new construction barely kept pace with additions to families. From 1954 to 1958, the rate of construction exceeded net family formation, mainly in response to institutional and policy changes which aided residential mortgage financing. With the exception of two cyclical interruptions, the share of new residential construction in total output climbed steadily from the end of the war until 1958. Between 1946 and 1958, real Gross National Product increased by approximately 4.0% annually, while new residential construction (in constant 1949 dollars) increased by approximately 7.5% annually.

After 1959, the rate of new residential construction declined. From 1960 to 1964, its share in total output did not exceed 3.5%. In 1964 and 1965, it rose to just under 4% and then declined in 1966 to approximately 3.4%.

### Shifts in the Demand for Housing

#### 1. Long-term Changes in the Patterns of Canadian Life

A wide variety of factors have caused and are causing significant changes in the structure of Canadian residential life. All of these factors are to some degree causes or reflections of changes in demand for housing.

From a national point of view, the stock of housing is one of the country's most valuable assets, representing a national capital asset accumulated over decades; however,

it is an asset subject to physical deterioration and obsolescence due to technological and social change. The quantity and quality of the housing stock, and its arrangement in cities and neighbourhoods, shape, and are shaped by the structure of Canadian life. The housing stock and the way it is used change slowly from year to year, but these changes become significant in a generation.

A large part of Canada's housing stock is in the central areas of major cities and much of this in a state of deterioration. Residential areas built in the last century and in the earlier decades of this century have been surrounded by successive bands of urban and, more recently, suburban growth. Since its construction, much older housing has suffered from technological and locational obsolescence. Streets which previously were residential have, in many cases, become traffic routes to the suburbs. Many older residential areas have suffered the encroachment of commercial and industrial land uses prior to the introduction of zoning ordinances or due to changes in them.

The structure of residential life has changed greatly in Canada's short history as a nation. From a country characterized by the homestead, frontier settlement, and the small town of a hundred years ago, Canada has evolved into a nation of city dwellers. In the Canada of even fifty or sixty years ago, the typical residential setting

was rural or small townish (see Table 28 below).

TABLE 28  
DEGREE OF URBANIZATION: CANADA

Urban Center Size Group	Per Cent of Population in Urban Centers and Other Non-Farm Areas					
	1931	1941	1951	1956	1961	1966
100,000 & over	29.4	29.5	36.0	38.0	43.4	47.3
30,000-99,999	5.8	7.6	5.8	6.1	9.3	8.9
Subtotal	35.2	37.1	41.8	44.1	52.7	56.2
Other non-farm	33.6	35.8	38.0	39.5	35.9	34.2
Farm	31.2	27.1	20.2	16.4	11.4	9.6
Canada	100.0	100.0	100.0	100.0	100.0	100.0

Source: Census 1951, 1956, 1966.

Fifty or sixty years ago, residential life was essentially a stable process which, in the rural or small town environment, often centered around a dwelling unit large enough to contain a two or three generation family. By contrast, the post-war "homestead" is typically located in the suburb of a larger urban center. The ties with previous generations have become more tenuous, at least in a physical sense, and the three generation home has largely vanished.

## 2. The Impact of Residential Mobility

Our society has become more mobile in the last few decades and this factor has caused shifts in the demand for housing both geographically and structurally. Therefore, the concept of residential mobility deserves some considerations as it bears on demand.

In a previous hypothetical example, some indication of the causes of mobility was given. These were basically changing patterns of family life, particularly geared to the raising of children and to the changing economic position of the family over its lifetime.

W. Grigsby sets out the following as a method of classifying the types of moves undertaken by families:

### Group I: Vacators of Dwelling Units

- a) Those who dissolve their households because of divorce or the death of a member of the family;
- b) Migrants to other market areas;
- c) Intra-area migrants to same type of structure in the same tenure status;
- d) Intra-area migrants who shift to a different type of structure or to a different tenure status, or both.

### Group II: Occupiers

- a) New households;
- b) Immigrants from other market areas;
- c) Intra-area migrants to the same type of structure in the same tenure status;
- d) Intra-area migrants who shift to a different type of structure or to a different tenure status, or both.<sup>13</sup>

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<sup>13</sup>Ibid., p. 61.

While the above classification may be of value in examining what types of moves occur, it gives little insight into why they occur (or do not occur) and mobility is of sufficient importance to housing to justify investigation. The following statistics (based on U. S. figures) give some indication of its significance.<sup>14</sup> If past behaviour continues:

20-25% of families will move during the next one year;  
 30-33% will have moved within two years;  
 50-57% will have moved within five years;  
 75% will have moved within ten years; and  
 90% will have moved within twenty years.

Meyerson et. al. add the following observations:

Mobility is generally highest near the central core of the city, and at the fast growing periphery or suburban ring.

Mobility rates are inflated by multiple or frequent movers, who constitute a small percentage of the population, and yet account for a large proportion of the moves made.

Out of the 20% who do move each year, about 7% move for economic reasons having nothing to do with satisfactions or dissatisfactions with their housing.

An additional 2% or 3% are involuntary movers, moving not out of a desire to improve their housing satisfaction, but because their dwellings have been taken away through fire, demolition, sale or eviction.

Still another 1% have moved . . . (because) . . . a new family desiring an independent household has been formed.

Out of the 20% who move each year, perhaps only 8% actually move to obtain housing suitable to their needs. Of these, somewhat under half buy houses.

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<sup>14</sup>Meyerson, Terrett, and Wheaton, op. cit., p. 89-90.

A considerable proportion of moves within metropolitan areas result from upgrading; the process of moving to progressively better neighbourhoods as families improve their income and status.

Grigsy classifies movers by a simplified but somewhat parallel analysis.<sup>15</sup> He divides them into three groups:

The non-market oriented, who move with no reference to the market for reasons of death, changed employment, and so on;

The semi-market oriented, who, because of change in income, family size, etc., begin to search casually or seriously in the market and move;

The market-oriented, whose stimulus to move is not need or discontent but an attraction to something positive in the market supply.

The movement process, in and of itself, would appear to be an important element of demand. In contemplating moving, a family will weigh the possible benefits against the costs involved and its ability to meet these costs. The sheer effort and inconvenience of the process also plays a part. In the case of ownership, a decline in value of the present dwelling becomes a cost of movement, as well as the legal costs and real estate commission involved. The implication of this to housing demand is that when a family moves voluntarily, it moves to a substantially different housing unit--substantially better or poorer as the economic circumstances of the family might dictate.

Both rural-urban and urban-suburban shifts have

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<sup>15</sup>Grigsby, op. cit., pp. 187-188.

affected housing demand in Canada. The rapid growth of urban centers reflects, in part, the declining proportion of the labour force engaged in rural occupations. From 1941 to 1951 the number of families on farms decreased at an annual rate of 6,900. From 1951 to 1956 the rate increased to 10,000 (see Table 28, page 85). To the extent that these changes represent actual migration, the demand for non-farm housing is raised.

The urban-suburban movement has been dealt with in a previous section (see pp. 68-71).

### 3. Changes in the Composition of Newly Constructed Housing

In the last two decades there has been an increasing trend toward a greater proportion of apartment units in new construction, especially since 1958, and a relative decline, in percentage terms, of newly constructed single-detached dwellings (see Table 29, page 90, and Figures VI, page 91 and Figure VII, page 92). Single-detached houses accounted for 78.9% of all dwelling starts in 1949, and this proportion with some minor interruptions, has declined fairly steadily to 38.2% in 1968. Apartment units accounted for 12.8% of all housing starts in 1949 and have increased to 52.4% in 1968.

Since virtually all new construction enters the market for sale or rental there would appear to be a fairly well-established trend in favour of rental tenure and apartment units in that segment of the market which demands new housing.

TABLE 29

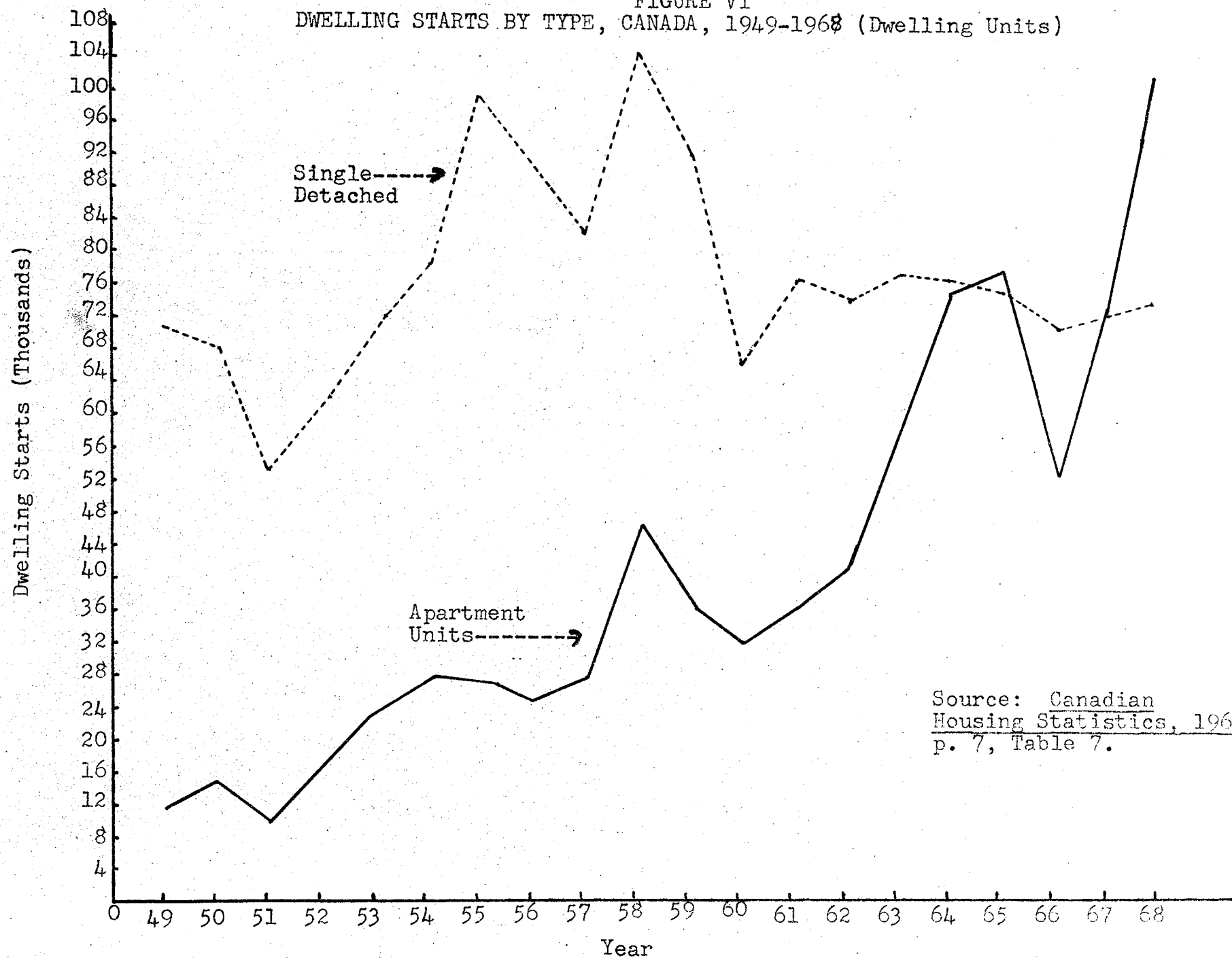
## DWELLING STARTS BY TYPE, CANADA, 1949-1968

Period	Single-Detached		Semi-Detached and Duplex		Row		Apartments		Total	% change from previous year
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total		
1949	71,425	78.9	7,536	8.3	---	--	11,548	12.8	90,509	
1950	68,675	74.2	8,664	9.4	631	.7	14,561	15.7	92,531	2.3
1951	53,002	77.3	5,658	8.3	54	.1	9,865	14.4	68,579	-26.0
1952	60,696	72.9	5,360	6.4	299	.4	16,891	20.3	83,246	21.8
1953	70,782	69.1	7,202	7.0	553	.5	23,872	23.3	102,409	23.1
1954	78,574	69.2	6,498	5.7	1,000	.9	27,455	24.2	113,527	10.9
1955	99,003	71.6	10,606	7.7	1,909	1.4	26,758	19.3	138,276	21.6
1956	90,620	71.2	9,441	7.4	2,263	1.8	24,987	19.6	127,311	- 8.0
1957	82,955	67.8	9,272	7.6	2,214	1.8	27,899	22.8	122,340	- 3.9
1958	104,508	63.5	10,713	6.5	2,457	1.5	46,954	28.5	164,632	34.7
1959	92,178	65.3	10,468	7.4	1,908	1.3	36,791	26.0	141,345	-14.1
1960	67,171	61.7	9,699	8.9	2,301	2.1	29,687	27.3	108,858	-23.0
1961	76,430	60.8	11,650	9.3	1,864	1.5	35,633	28.4	125,577	15.3
1962	74,443	57.3	10,975	8.4	3,742	2.9	40,935	31.4	130,095	3.3
1963	77,158	51.9	7,891	5.3	3,895	2.6	59,680	40.2	148,624	14.2
1964	77,079	46.5	8,706	5.2	4,755	2.9	75,118	45.4	165,658	11.4
1965	75,441	45.3	7,924	4.8	5,306	3.2	77,894	46.7	166,565	1.2
1966	70,642	52.6	7,281	5.4	5,000	3.7	51,551	38.3	134,474	-19.3
1967	72,534	44.2	9,939	6.1	7,392	4.5	74,258	45.2	164,123	22.1
1968	75,339	38.2	10,114	5.1	8,042	4.1	103,383	52.4	196,878	20.0

Source: CMHC, Canadian Housing Statistics, 1968. p. 7. Table 7.



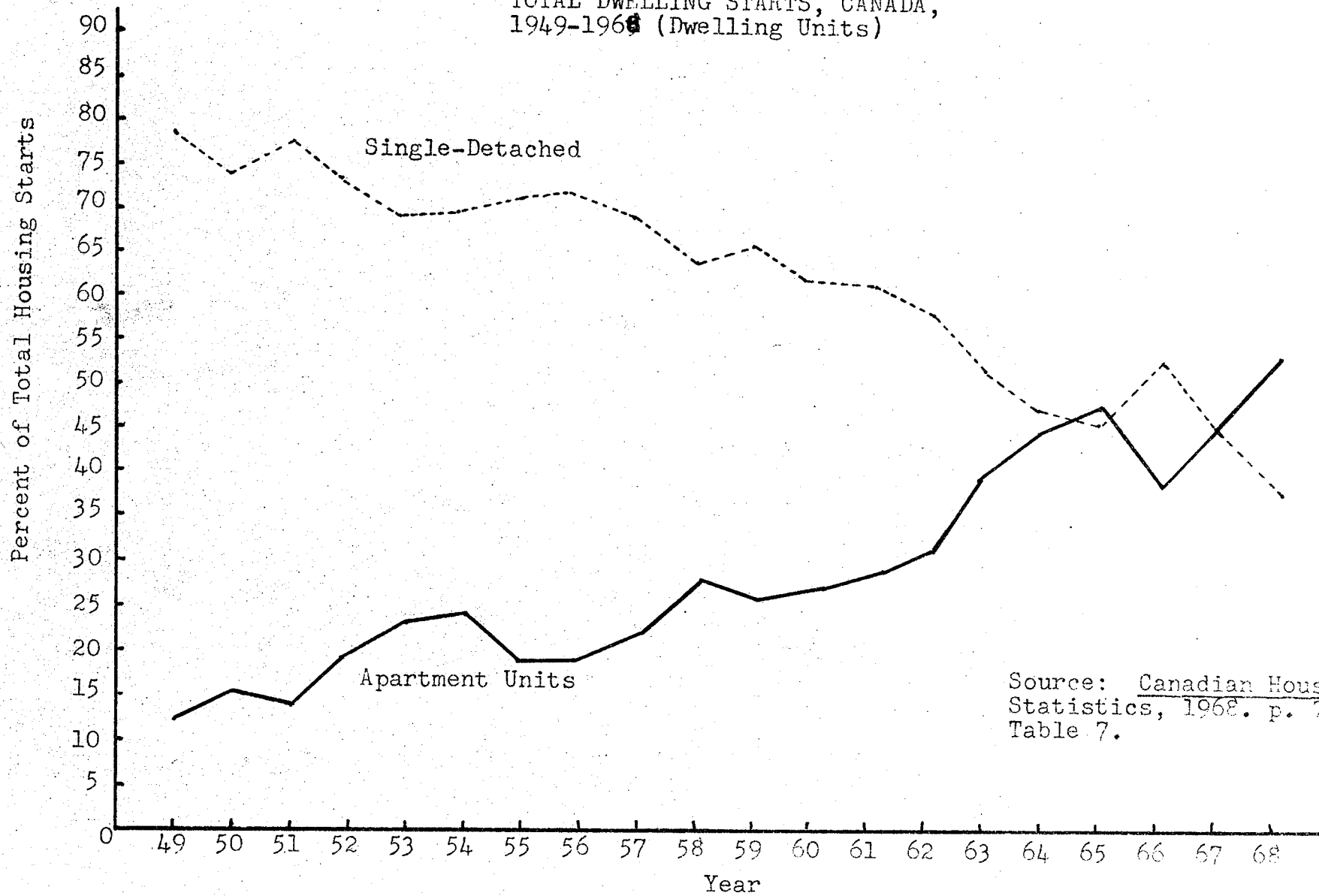
FIGURE VI  
DWELLING STARTS BY TYPE, CANADA, 1949-1968 (Dwelling Units)



Source: Canadian  
Housing Statistics, 1968.  
p. 7, Table 7.

FIGURE VII

DWELLING STARTS BY TYPE AS A PERCENTAGE OF  
TOTAL DWELLING STARTS, CANADA,  
1949-1968 (Dwelling Units)



Source: Canadian Housing  
Statistics, 1968. p. 7,  
Table 7.

There are a variety of reasons for this post-war phenomenon. A number of demographic features support an increased demand for apartment units and rental tenure: increasing net family formation, since most newly married couples are renters initially; increases in non-family household formation, since many elderly and single individuals prefer renting. Other population features support this trend as well: the increasing proportion of elderly in our population, and the increasingly long period of time spent by young people in educational institutions, especially at the post-secondary level. Both these groups are fairly heavy demanders of rental accommodation.

The increasing degree of urbanization in Canada and the greater mobility of the population generally (dealt with in the preceding section) raise the demand for rental accommodation to the extent that this more mobile population will try to avoid the long term commitments involved in mortgage financing and home ownership. A variety of factors regarding consumer attitudes toward rental apartment accommodation and owner occupied housing which were detailed in the section on Consumer Attitudes and Preferences also apply here.

Immediately following World War II, conditions were more favourable for single-detached dwellings than for apartments. Large numbers of households were in a financial position to purchase houses: restricted consumption during

the war resulted in freedom from debt and accumulations of savings and other liquid assets, large tracts of good suburban land was readily available, and mortgage terms were generally favourable.

The heritage of the depression and the experience of rent controls during World War II made rental entrepreneurs cautious. The same experiences had developed a sort of "low-rent psychology" in the public. Construction of dwellings for rent, therefore, did not appear to be a particularly profitable venture.

By the middle and late 1950's, conditions were moving in favour of apartment construction. Demographic features, noted above, were partially responsible. In addition, the accumulation of war savings was fading as was the public's "low-rent psychology". Good suburban land for residential development was becoming more scarce. Some disenchantment with suburban living was being felt.

As Canada entered the 1960's, housing costs continued to rise, interest rates considerably, and land and construction costs somewhat more moderately. These factors combined to make the purchase of a house more difficult; a larger down payment in dollars and higher monthly payment were required. Canadians' tastes in new housing have also resulted a more costly product. New housing typically contains a larger area in square feet, more special features such as extra

bathrooms, built-in appliances, more expensive floor coverings, feature walls and so on. The result of all these factors is to put the typical new suburban house beyond the means of a large number of potential purchasers. The precise magnitude of this effect is difficult to gauge. However, to the extent that those who are unable to compete in the new house market turn to the rental apartment market, the demand for this type of accommodation is strengthened.

The most significant recent increases in housing costs date back to 1966, the same year that marked the beginning of the most recent spurt in apartment unit construction (see Figure VI, page 91).

### Summary

In commenting on consumer demand for housing, the following observations can be made:

- 1) Demographic factors indicate a steadily growing demand for all types of housing but are especially favourable for the demand for apartment units with rental tenure;
- 2) Effective demand for new dwelling units, as measured by additions to the housing stock, has been moving in favour of apartment units;
- 3) Long-term changes in the patterns of residential life have greatly increased the degree of urbanization in Canada and, therefore, the demand for urban housing;
- 4) Rural-urban mobility and other forms of residential mobility have increased in the last few decades, and a more mobile population is likely to increase the

demand for rental accommodation somewhat to avoid the long-term commitments involved in the purchase of a home;

- 5) In the immediate post-war era a number of factors were more favourable to the construction of suburban single-detached dwellings. In the last decade conditions have become increasingly favourable toward apartment construction;
- 6) Mortgage terms, especially interest rates, and land and construction costs for new dwellings have raised the cost of housing significantly in recent years, putting it beyond many who would otherwise enter the new housing market. To the extent that these households turn to the rental apartment market, demand for this type of dwelling and tenure is strengthened.

## CHAPTER 8

### THE IMPACT OF CONSUMER DEMAND ON CANADIAN HOUSING RESOURCES, AND ON MUNICIPAL FINANCES, 1966-1971

#### Introduction

The purpose of this study is to compare the different impact of single-detached dwellings and apartment units on Canada's housing resources and on municipal finances. Thus far, a population model has been evolved and fitted into two different housing models--one consisting of single-detached dwellings and one consisting of an apartment complex--and comparative cost figures were calculated. The impact of the two different housing types on municipal finances was also examined. This was followed by an examination of consumer attitudes and preferences and consumer demand for housing in Canada.

On the basis of the analysis of consumer demand in the previous section there appears to be an established trend in new housing construction in favour of rental apartment units. The magnitude of this trend is indicated in Table 29 and Figures VI and VII, pages 90-92. If this continues over a number of years it will alter the composition of the housing stock in favour of a greater proportion of apartments.

The purpose of this section is to examine the impact of this trend on housing resources and on municipal finances for the period 1966-1971. This will be done by projecting the number of households and dwelling units to be expected by 1971, and comparing the composition of the resulting housing stock on two different bases: first on the basis of the distribution by structural type revealed by the 1966 Census; and second by a projected distribution of structural types based on the trend toward greater proportion of apartment units in new construction.

Cost comparisons of these two different housing stock compositions will then be made based on the housing models developed in previous sections. This will be followed by an assessment of the impact of this trend on municipal finances.

Case I: Distribution of Households and  
Dwellings by Structural Type in 1971,  
based on the 1966 Census Distribution  
of Dwellings by Structural Type

The components of housing demand from 1951 to 1966, and estimates to 1971 are given in Table 30, page 99.

It is estimated that during the period 1966 to 1971, an average of 190,000 housing units will be constructed each year. On the basis of the 1968 housing starts figure of 196,878 this goal would appear to be within the capability



TABLE 30

COMPONENTS OF HOUSING DEMAND 1951-1966 AND ESTIMATES  
TO 1971 (ANNUAL AVERAGES IN THOUSANDS)

Item	Actual Activity			Estimates <sup>a</sup>
	1951- 1956	1956- 1961	1961- 1966	1966- 1971
Marriages	129.0	131.8	135.7	174.8
Net Migration of Families	17.6	24.0	16.6	223.3
Deaths of Married Persons	56.1	62.3	68.7	74.3
Divorces	5.9	6.5	8.0	12.5
Net Family Formation	84.6	87.0	75.6	111.2
Undoubling	7.1	10.0	11.1	10.8
Net Non-family Household Formation	12.4	28.6	37.4	50.0
Net Household Formation	104.1	125.6	124.1	172.0
Net Replacement Demand	-10.9	- 2.3	10.1	13.0
Vacancies	6.0	9.3	6.2	5.0
Total Demand for New Housing	99.2	132.6	140.4	190.0

<sup>a</sup>Estimated by CMHC

Source: Central Mortgage and Housing Corporation, Canadian Housing Statistics, 1968. p. 54, Table 73.

of the Canadian house building industry.

The statistical categories of dwellings by structural type used by the Dominion Bureau of Statistics in compiling Census figures, and those used by CMHC in publishing housing figures are somewhat different. Table 31 gives the 1966 D.B.S. breakdown with percentages and Table 32 gives CMHC's 1966 breakdown with percentages (pp. 101 and 102).

This study is concerned only with single-detached dwellings and apartment units and while there are minor differences in the figures for these two categories, the percentage figures are the same. Because housing statistics are more readily available from CMHC, I have used their system of categories in this section.

On the basis of the projected requirements for housing units by 1971, a total of 950,000 units will have been added to the housing stock by that time. On the basis of CMHC's 1966 distribution of dwellings by structural type, the projected 1971 housing stock is outlined in Table 33, page 103.

The 950,000 dwelling units to be added by 1971 represents an increase in the total dwelling stock of approximately 18.5%. Of the 950,000 units to be added, 813,200 or 85.6% are single-detached dwellings and apartment units. If only these two categories are considered, the

total dwelling stock will be increased by 15.8%.

TABLE 31  
OCCUPIED DWELLINGS BY STRUCTURAL  
TYPE: CANADA, 1966  
(DBS Census Breakdown)

Type of Dwelling	Number of Dwelling Units		Percentage	
Single-Detached	3,234,123		62.4	
Single-Attached	401,754		7.7	
Double house		238,758		4.6
Other		162,996		3.1
Apartment	1,516,419		29.4	
Duplex		339,941		6.6
Other		1,176,478		22.8
Mobile	28,177		.5	
TOTAL	5,180,473		100.0%	

Source: 1966 Census of Canada, Volume II, "Households and Families, Dwellings by Structural Type and Tenure", Catalogue #93-602, Table 3.

The model population developed initially contained 1,000 persons distributed in 285 households and housed exclusively in apartment units and single-detached dwellings. Applying the percentage increase in single-detached dwellings and apartment units of 15.8% to the 285 original households would increase this figure to 330 dwelling units.

Of the 45 dwelling units added, 33 (73.3%) would be single-detached dwellings and 12 (26.7%) would be apartment units.

TABLE 32  
OCCUPIED DWELLINGS BY STRUCTURAL  
TYPE: CANADA, 1966  
(CMHC Breakdown)

Type of Dwelling	Number of Dwelling Units	Percentage
Single Detached	3,227,229	62.4
Semi-Detached and Duplex	577,799	11.2
Row	162,632	3.1
Apartment	1,176,001	22.8
Mobile	27,881	.5
TOTALS	5,171,542	100.0

Source: Central Mortgage and Housing Corporation, Canadian Housing Statistics, 1968, p. 68, Table 96.

Capital cost figures derived from the two housing models were \$12,130 per apartment unit, and \$19,150 per single-detached dwelling. (see Table 14, page 29) The cost of the addition of 33 houses and 12 apartment units added to this model is \$777,510.

TABLE 33

OCCUPIED DWELLINGS BY STRUCTURAL TYPE: CANADA, 1966  
AND ESTIMATES TO 1971 ON THE 1966 DISTRIBUTION  
BY STRUCTURAL TYPE

Type of Dwelling	1966 Number of Dwelling Units	Percentage	Additions 1966- 1971	1971 Number of Dwelling Units
Single-Detached	3,227,229	62.7	595,650	3,822,879
Semi-Detached and Duplex	577,799	11.2	106,400	684,199
Row	162,632	3.2	30,400	193,032
Apartments	1,176,001	22.9	217,550	1,393,551
TOTALS	5,143,661	100.0	950,000	6,093,661

Source: Table 32, page 102. (Mobile homes are excluded from this table).

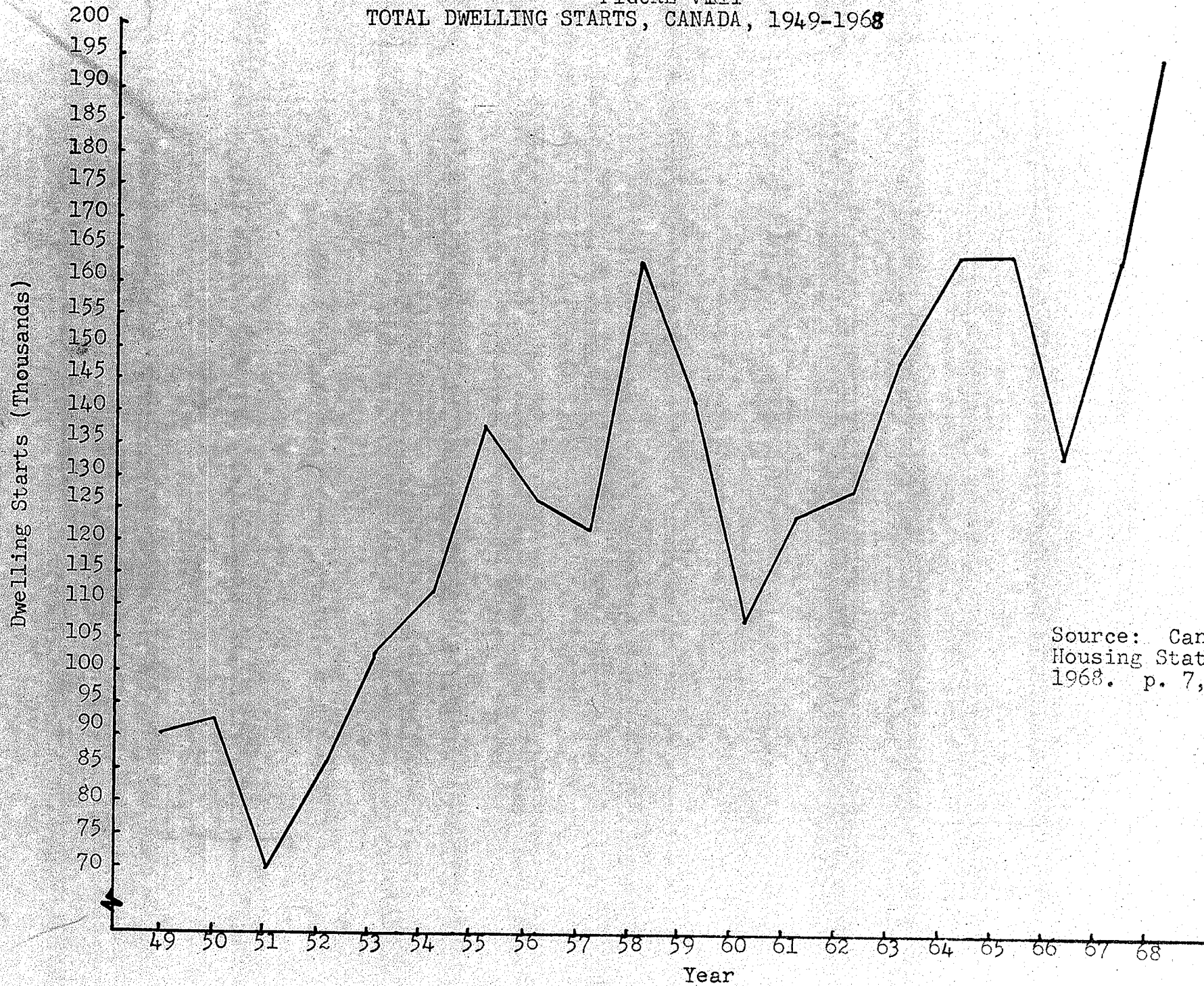
Applying the 1966 distribution as between houses and apartments to the 285 original households would yield 209 single-detached houses and 76 apartment units with a total capital cost of \$4,924,230. The 1971 requirements represent an increase in capital invested in housing of 15.8%.

Case II: Distribution of Households and  
Dwellings by Structural Type in 1971,  
based on a Projected Distribution

For a variety of reasons housing construction is subject to very considerable fluctuations from year to year (see Figure VIII, page 105) as is its composition (see Figure VI, page 91). Unlike most major industries, housing construction is fragmented geographically and organizationally. It calls upon a wide variety of services: various types of builders, materials manufacturers and suppliers, general contractors, subcontractors, labour of various sorts--skilled, semi-skilled and unskilled; unionized and non-unionized; several types of investors; realtors; various classes of mortgage lenders; subdividers; land developers; and government agencies at various levels. Canada's extremes of climate tend to make much construction work seasonal. As a result, unemployment in winter and heavy pressures on resources in summer are characteristic of the industry. Seasonal fluctuations in employment of the magnitude of 40% are not uncommon. However, the introduction

FIGURE VKII

TOTAL DWELLING STARTS, CANADA, 1949-1968



Source: Canadian  
Housing Statistics,  
1968. p. 7, Table 7.

of a winter house building incentive program, by the federal government appears to have significantly dampened these fluctuations, and, while it was discontinued in 1966, indications are that winter house building has continued on a fairly significant scale since that time.

Housing construction is almost wholly dependant on externally supplied long-term credit, and as the availability of this credit fluctuates, so does the output of the industry. The short supply of mortgage funds has been a recurring problem in the post-war period. Until 1966, the maintenance and improvement of mortgage lending terms by the device of maintaining mortgage interest rates at a level lower than the private market would have provided was a priority of federal housing policy, and shortages of supply were met, to a considerable degree, by direct federal lending. Since 1966, greater emphasis has been put upon augmenting the supply of private funds by making mortgage interest rates more competitive with other long-term rates.

At the federal level, housing legislation and policy have been widely used as tools of general economic policy, at the expense of stability in the house building industry. The reasons are fairly clear. The building industry is pervasive, massive, requires a high component of on-site labour, uses large quantities of domestically



produced materials, stimulates private investment, has large joint demand effects, and is widely acceptable as a desirable social objective, and hence, is politically feasible.

Given the nature of the industry and some of its problems, some difficulty arises in predicting its output and the composition of this output.

In the previous section, the annual demand for housing between 1966 and 1971 was estimated at 190,000 units, or a total of 950,000 units for the five year period, and it was assumed that this was within the capability of the industry to produce. This estimate and assumption will be used in this section as well.

Table 30, page 99, estimated the components of housing demand for the period. Total net household formation was estimated at 172,000 households annually, or 860,000 for the five year period. Of this latter total, net family formation accounted for 556,000 households (64.6%), net non-family household formation accounted for 250,000 households (29.1%), and undoubling of families accounted for the remaining 54,000 new households (6.3%). The difference between the 950,000 housing units added and the 860,000 units required by net household formation is due to net replacement demand and vacancies.

The 860,000 dwelling units required by net household formation represents a 16.7% increase in the total dwelling

stock. When applied to the stock of 285 dwelling units required by the model population, it represents an increase of approximately 48 households and dwelling units. The sample of 285 households was made up of 235 family households and 50 non-family households; 82.5% and 17.5% respectively of total households.

If households formed as a result of undoubling are divided equally between family and non-family households, the 48 households added to the model are divided as follows: 33 family households (67.8%) and 15 non-family households (32.2%). When added to the original figures the 48 additional households yield 268 family households (80.5% of the total of 332 households), and 65 non-family households (19.5% of total households).

Approximately one-third of new households seeking dwellings in this period will be non-family households who are fairly heavy demanders of rental accommodation. Of the two-thirds of the households which are family households, the majority will be the result of recent marriages, and newly married couples are also strong demanders of rental accommodation. In fact, the five year estimate for marriages is 874,000, some 67.5% of gross household formation.

It is probable then that the demand for rental apartment accommodation will remain strong in this period.

On the bases of the structure of household formation in the period, and housing start figures available for 1967

and 1968, and also taking into account the general trend toward a greater proportion of apartment units in new housing construction, and the reasons behind this trend. Table 34 presents a projected distribution of the housing stock and additions to it by 1971. (see page 110)

Starts of semi-detached and duplex dwellings have remained fairly steady over the past two decades (see Table 29, page 90) while starts of row dwellings have steadily increased. Both these features are reflected in the estimates in Table 34, page 110. Mobile homes were omitted because of lack of data. However, there are indications that their popularity has grown rapidly in the past few years, especially in provinces where municipal taxation on these dwellings is negligible, as is the case in British Columbia, for example.

For purposes of this study, the figures of significance are those for single-detached dwellings and apartment units. Single-detached dwellings have declined from 62.7% of the housing stock to 58.9%, and apartments have increased from 22.9% to 27.4%. Of the 950,000 dwelling units added in the five year period, 366,873 (38.6%) were houses, and 490,641 (51.6%) were apartment units, a total of 857,514 dwelling units, or 90.2% of the 950,000 units added. If only single-detached houses and apartment units are considered, the dwelling stock is increased by 16.7%.

TABLE 34

OCCUPIED DWELLINGS BY STRUCTURAL TYPE, CANADA 1966; ADDITIONS AND ESTIMATES TO 1971

Type of Dwelling		1966		1967		1968		1969		1970		1971		Total Additions
		Number of Dwelling Units	%	Number of Dwelling Units	%	Number of Dwelling Units	%	Number of Dwelling Units	%	Number of Dwelling Units	%	Number of Dwelling Units	%	
Single-Detached	Added Total	3,227,229	62.7	72 72,534 3,299,763	44.2 62.1	75,339 3,375,102	38.2 61.4	74,500 3,449,602	38.6 60.5	73,000 3,522,602	37.0 59.8	71,499 3,594,101	35.8 58.9	366,872 (38.6%)
Semi-Detached and Duplex	Added Total	577,799	11.2	9,939 587,738	6.1 11.1	10,114 597,852	5.1 10.8	9,000 606,852	4.7 10.7	9,000 615,852	4.6 10.5	9,000 624,852	4.5 10.3	47,053 ( 5.0%)
Row	Added Total	162,632	3.2	7,392 170,024	4.5 3.2	8,042 178,066	4.1 3.2	9,000 187,066	4.7 3.3	10,000 197,066	5.1 3.3	11,000 208,066	5.5 3.4	45,434 (4.8%)
Apartment	Added Total	1,176,001	22.9	74,258 1,250,259	45.2 23.6	103,383 1,353,642	52.4 25.5	100,000 1,453,642	52.0 25.5	105,000 1,558,642	53.3 26.4	108,000 1,666,642	54.2 27.4	490,641 (51.6%)
Total	Added Total	5,143,661	100.0	+ 164,123 5,307,784	100.0 100.0	196,878 5,504,662	100.0 100.0	192,500 5,697,162	100.0 100.0	197,000 5,894,162	100.0 100.0	199,500 6,093,661	100.0 100.0	950,000
Units Removed				- 13,000	- 0.2	- 26,000	- 0.5	- 39,000	-0.7	- 52,000	-0.9	- 65,000	- 1.1	65,000
Net Number of Dwelling Units		5,143,661	100.0	5,294,784	99.8	5,478,662	99.5	5,658,162	99.3	5,842,162	99.1	6,028,661	98.9	

Source: Table 33, page 102; Table 30 page 99; and Table 29, page 90. (Mobile homes are excluded from these figures and estimates)

Applying this percentage increase to the 285 units in the model previously developed, 47.6 or 48 new dwellings would be added by 1971. The 48 units would consist of 20 houses and 28 apartment units.

Capital cost figures derived from the two housing models were \$12,130 per apartment unit and \$19,150 per single-detached dwelling (see Table 14, page 29). The cost of the additional 20 houses and 28 apartments added to the model is \$722,640 compared to \$777,510 using the 1966 distribution of households.

The 285 dwellings in the original model, distributed according to the 1966 Census, had a total capital value of \$4,924,230. The 1971 requirements therefore represent an increase in capital invested in housing of 14.2%.

Comparisons of Cases I and II will be made in the following section.

Comparison of the Differential Impact  
on Housing Resources of  
Case I and Case II

The impact of the two different distributions on housing resources will be dealt with in two ways: first, the affect that this will have on the total dwelling stock; and second, the affect that additions to the dwelling stock will have on housing resources.

Table 35, page 112, compares the 1966 dwelling stock distribution with the two 1971 distributions.

TABLE 35

OCCUPIED DWELLINGS BY STRUCTURAL TYPE, CANADA, 1966;  
1971 BASED ON 1966 DISTRIBUTION; 1971 BASED ON  
PROJECTED 1971 DISTRIBUTION

Type of Dwelling	1966 1966 Census Distribution		Case I		Case II	
			1971 1966 Census Distribution		1971 1971 Projected Distribution	
	Number of Dwelling Units	Percent of Total	Number of Dwelling Units	Percent of Total	Number of Dwelling Units	Percent of Total
Single-detached	3,227,229	62.7	3,822,879	62.7	3,594,101	58.9
Semi-detached and Duplex	577,799	11.2	684,199	11.2	624,852	10.3
Row	162,632	3.2	193,032	3.2	208,066	3.4
Apartment	1,176,001	22.9	1,393,551	22.9	1,666,642	27.4
TOTALS	5,143,661	100.0	6,093,661	100.0	6,093,661	100.0

Source: Table 33, page 103; and Table 34, page 110.  
(Totals are gross. No allowance is made for units removed from the dwelling stock.)

In Case I, houses and apartments account for 62.7% and 22.9% respectively of all dwelling units, for a total of 85.6%. In Case II, the figures are 58.9% and 27.4%, for a total of 86.3%. In terms of the 1971 projected distribution (Case II) three effects emerge: the proportion of single-detached houses has declined by 3.8%; the proportion of apartment units has increased by 4.5%; and the proportion of the total dwelling stock made up of these two dwelling types has increased by 0.7%.

Since this study is concerned only with apartment units and single-detached houses, other dwelling types have been eliminated where reference is made to the model. The percentage of houses and apartment units in new construction was applied to the 285 households in the original model, and the resulting increase was added. While both Case I and Case II added 950,000 units to the dwelling stock, Case II added more apartments and houses than Case I. Hence, the total number of households resulting from additions to the model are different. Case I added 45 units and Case II added 48, as Table 36, page 114 indicates.

In comparing the Case II distribution to the Case I distribution in the model, single-detached houses as a percent of the total dwelling stock have declined by 4.5%, and apartment units have increased by 4.5%.

TABLE 36  
 MODEL DWELLING STOCK BY STRUCTURAL TYPE 1966; 1971 BASED ON 1966 DISTRIBUTION:  
 AND 1971 BASED ON PROJECTED DISTRIBUTION. (SINGLE-DETACHED AND APARTMENT UNITS  
 ONLY) COST COMPARISONS

Item	1966 Census Distribution			1971 Census Distribution			1971 Projected Distribution		
	1966 Census Distribution			1971 Census Distribution			1971 Projected Distribution		
	Single-Detached	Apartments	Total (both)	Single-Detached	Apartments	Total (both)	Single-Detached	Apartments	Total (both)
Number of Dwelling units	209	76	285	242	88	330	229	104	333
Percent of Total	73.3	26.7	100.0	73.3	26.7	100.0	68.8	31.2	100.0
Total Capital Value (\$)	4,002,350	921,880	4,924,230	4,634,300	1,067,440	5,701,740	4,385,350	1,261,520	5,646,870
Average Per Unit Total Cost (\$)	19,150	12,130	17,278	19,150	12,130	17,278	19,150	12,130	16,958
Average Per Unit Construction Cost (\$)	15,650	11,614	14,574	15,650	11,614	14,574	15,650	11,614	14,390
Average per Unit unserviced Land Cost (\$)	760	78	578	760	78	578	760	78	547
Average Per Unit Cost of Land Services (\$)	2,740	438	2,126	2,740	438	2,126	2,730	438	2,021
Average Annual Per Unit Costs (Capital, Interest, Operating) (\$)	2,782	1,989	2,491	2,782	1,989	2,491	2,782	1,989	2,441
Total Serviced Land Required (Acres)	42.6	1.57	43.63	48.70	1.81	50.51	46.08	2.14	48.22
Average Per Unit Land Requirements (sq. ft.)	8,766	898	6,668	8,766	898	6,668	8,766	898	6,309



The total capital required to house the population is lower under Case II than Case I, as are all of the average costs and land requirements. However, since all model figures are based on recent costs, and as much of the real housing stock was built in previous decades, precise cost comparisons within the total dwelling stock are not likely to prove too productive.

Of greater significance are comparisons of the additions to the dwelling stock. These are outlined in Table 37, page 116.

Case II adds 6.7% more dwelling units for 7.0% less capital outlay than Case I. Average per unit costs are all lower for Case II than Case I, particularly the cost of unserviced land and land services. These are 36% and 33% lower respectively. The total acreage of serviced land, required is also 33% lower in Case II.

The models assumed that the per acre land costs for a housing development and an apartment building were the same. If both were built on new suburban land this would be the case, and land cost comparisons made here would be realistic. However, much new apartment construction takes place on central urban land of considerably higher value. Unserviced land accounted for 0.7% of the total cost of the apartment complex, and land servicing, 3.6%. It is unlikely that servicing costs would vary significantly with location, so what variation there would be in land value would apply to only 0.7%

TABLE 37

ADDITIONS TO THE MODEL DWELLING STOCK BY STRUCTURAL TYPE: 1971 BASED ON  
1966 DISTRIBUTION; AND 1971 BASED ON PROJECTED DISTRIBUTION  
(SINGLE-DETACHED AND APARTMENT UNITS ONLY)  
COST COMPARISONS

Item	Case I			Case II			Case II as a percentage of Case I (totals)
	1971 Based on 1966 Distribution			1971 Based on Projected Distribution			
	Single- Detached	Apartment	Total (both)	Single- Detached	Apartment	Total (both)	
Number of units added	33	12	45	20	28	48	106.7
Percent of Total	73.3%	26.7%	100.0%	41.7%	58.3%	100.0%	
Total Capital Value (\$)	631,950	145,560	777,510	383,000	338,640	722,640	93.0
Average per unit total cost (\$)	19,150	12,130	17,278	19,150	12,130	15,375	89.1
Average per unit construction cost (\$)	15,650	11,614	14,574	15,650	11,614	13,579	93.2
Average per unit cost of unserviced land(\$)	760	78	578	760	78	370	64.0
Average per unit cost of land services (\$)	2,740	438	2,126	2,740	438	1,426	67.0
Average Annual Per Unit Costs (Principal, Interest, Operating) (\$)	2,782	1,989	2,491	2,782	1,989	2,190	88.0
Total Serviced Land Required (Acres)	6.64	0.25	6.89	4.03	0.58	4.61	67.0
Average Per Unit Land Requirement (sq. ft.)	8,766	898	6,668	8,766	898	4,265	64.0

of the total cost. If land were ten times as expensive for apartments as the model figure, land would represent about 6.1% of the total cost of an apartment, and this would not be of a magnitude sufficient to outweigh the other cost differentials.

As suitable new suburban land becomes scarcer, more expensive, and further away from central city areas, the fact that Case II requires 33.0% less serviced land than Case I takes on significance.

Total capital invested per dwelling unit is 10.9% lower for Case II than Case I. When interest and other operating costs are added, the average cost of owning or renting a dwelling is 12% lower for Case II than Case I.

#### Comparison of the Differential Impact on Municipal Expenditures of Case I and Case II

In a previous section, the impact on municipal expenditures of different types of housing was examined, and a hypothetical breakdown of municipal expenditures was presented (see Table 20, page 39) to assess this impact. It was assumed that this hypothetical municipality had approximately 70% of its land in residential use, and 30% in commercial and industrial use. It was further assumed that the residential area contained only apartment units and single-detached dwellings and that these were distributed as revealed by the 1966 Census figures (see pp. 40, 41). These assumptions are used in this section.

In assessing the growth in municipal expenditures caused by an increase in population and dwelling units, I have related each item of expenditure to one or more of three variables: population growth; increase in the number of dwelling units; and/or a change in the composition of dwelling units by structural type.

According to household formation figures 860,000 new households will be added between 1966 and 1971. This would mean an addition of 48 households to the model's original 285 (see pp. 107, 108); 33 family households and 15 non-family households. At densities of 3.9 persons and 1.5 persons per household respectively, this would mean an increase in population of approximately 151 persons on the original sample population of 1,000. Therefore, those items of municipal expenditure related to population growth are increased by 15.1%. It is assumed that all industrial and commercial requirements for municipal services will increase by this percentage.

Case I added 45 new dwelling units, a 15.8% increase. Case II added 48 units for an increase of 16.8%. These are applied to those items of expenditure which are related to the number of dwelling units.

There were only three items of municipal expenditure which varied with the structural composition of the housing stock. General Administration, Public Works Maintenance; and Recreation and Community Services. The calculations

used to arrive at the first two are given in Appendix I; the third item was calculated by simple extrapolation.

Table 38, page 120, outlines the impact on municipal expenditures of Case I and Case II.

Total municipal expenditures are 0.85% lower in Case II than Case I.

Comparison of the Differential Impact  
on Municipal Revenues  
of Case I and Case II

In considering municipal revenues, a hypothetical breakdown of these revenues was given in Table 24, page 51. The assumptions made about the bases for levying municipal taxes on land and improvements (see page 51) are also used here.

Two sources of revenue varied with the structural composition of residential areas. These were property and improvement taxes, and government grants. The calculations used to arrive at figures for property and improvement taxes are outlined in Appendix II, page 129.

There was discussion of the British Columbia system of homeowner grants (see pp. 54, 55), and since these serve essentially as educational grants, I have assumed them to be related to population size rather than to housing tenure or structural type. Other government grants are explicitly or implicitly related to population size.

Revenues, other than the two mentioned so far, account

TABLE 38

BREAKDOWN OF MUNICIPAL EXPENDITURES BY  
PERCENTAGE: 1966; CASE I; AND CASE II

Item  of  Expenditure	1966  285 Dwellings by 1966 Census Distribution	1971  330 Dwellings by 1966 Census Distribution	1971  333 Dwellings By Projected Distribution
	Percentage of Total 1966 Municipal Expenditures	Percentage of Total 1966 Municipal Expenditures	Percentage of Total 1966 Municipal Expenditures
General Administration <sup>a</sup>	6.00	6.92	6.86
Public Works Maintenance <sup>a</sup>	7.50	8.66	8.39
Sanitation and Waste Removal <sup>b</sup>	4.00	4.61	4.61
Health and Social Welfare <sup>b</sup>	10.00	11.51	11.51
Education <sup>b</sup>	33.00	37.98	37.98
Recreation and Community Services	9.00	10.42	9.87
Police Protection and Law Enforcement <sup>b</sup>	5.00	5.76	5.76
Fire Protection <sup>a</sup>	4.50	5.20	5.23
Debt Charges <sup>b</sup>	10.00	11.51	11.51
Reserves <sup>b</sup>	2.50	2.88	2.88
Capital and Loan Fund Contributions <sup>b</sup>	6.00	6.91	6.91
Miscellaneous <sup>b</sup>	102.50	112.88	112.88
TOTALS	100.00	115.24	114.39

Source: Table 20, page 39.

<sup>a</sup>See Appendix I<sup>b</sup>Increase linked to population growth.

for about 13% of municipal revenue and these are also assumed to be related to the size of the population.

Table 39, page 122, outlines the impact on municipal revenues of Case I and Case II. Total municipal revenues are 0.6% higher for Case I than Case II.

TABLE 39

BREAKDOWN OF MUNICIPAL REVENUES BY PERCENTAGE:  
1966; CASE I; AND CASE II

Source of Revenue	1966 285 Dwellings by 1966 Census Distribution	1971 330 Dwellings by 1966 Census Distribution	1971 333 Dwellings by Projected Distribution
	Percentage of Total 1966 Municipal Revenues	Percentage of Total 1966 Municipal Revenues	Percentage of Total 1966 Municipal Revenues
Taxation on Property <sup>a</sup> and Improvements	67.00	77.45	76.85
Government Grants <sup>b</sup>	20.00	23.20	23.20
Licences and Permits	4.00	4.61	4.61
Rents <sup>b</sup>	1.00	1.15	1.15
Fines	2.00	2.30	2.30
Service Charges	2.00	2.30	2.30
Miscellaneous	4.00	4.61	4.61
	100.00	115.62	115.02

Source: Table 24, page 51.

<sup>a</sup>See Appendix II, page 129, for the derivation of these figures.<sup>b</sup>It is assumed that all government grants are related to the size of the population.



## CHAPTER 9

### SUMMARY AND CONCLUSIONS

#### Introduction

The aim of this study has been to examine the two types of housing which are predominant in Canada, with a view to comparing various cost differentials involved. Cost differentials were established by developing a model population and fitting it into two different housing models. Because different types of housing have different requirements for municipal services, and make different contributions to municipal revenues, this area was examined. Since single-detached dwellings and apartment units represent quite different modes of housing, consumer attitudes and preferences, and consumer demand for housing was also examined. Finally, the information and analysis was applied to the Canadian housing situation for the period 1966 to 1971.

By using average cost figures in evolving the housing models, and particularly by using residential land of the same value, it was hoped to isolate those cost differentials attributable to structural differences in the two types of housing.

A summary of information and conclusions based on the housing models evolved was presented on pp. 58-62.

A summary of consumer attitudes and preferences was presented on pp. 73-75, and a summary of factors involved in consumer demand was presented on pp. 95-96.

The purpose of this section is to summarize and draw conclusions on material and analysis presented, in the immediately preceding section.

### Conclusions

- a) The impact on housing resources of the projected distribution of housing by structural type in 1971 compared to a 1966 distribution of the 1971 dwelling stock.
  - 1) The proportion of single-detached dwellings in the total dwelling stock will decline from 62.7% to 58.9%, a drop of 3.8%.
  - 2) The proportion of apartment units in the total dwelling stock will increase from 22.9% to 27.4%, an increase of 4.5%.
  - 3) During the period 1966 to 1971, a total of 950,000 new dwelling units will be added to the housing stock: 38.6% will be single-detached houses; 51.6% will be apartment units.
  - 4) Based costs derived from the housing models evolved, 6.7% more dwelling units will be added for 7.0% less capital investment in Case II.
  - 5) The average capital invested per dwelling unit is 10.9% lower for Case II.
  - 6) The average expenditure per household for owning or renting and operating a dwelling is 12.0% lower for Case II.

b) The impact on Municipal Finances of the projected distribution of housing by structural type in 1971 compared to a 1966 distribution of the 1971 dwelling stock.

- 1) Based on a 1966 distribution prevailing in 1971, municipal expenditures would increase by 15.24% and municipal revenues by 15.62%, yielding a surplus of 0.38%.
- 2) Based on a projected 1971 distribution, municipal expenditures would rise by 14.39% and municipal revenues by 15.02%, yielding a surplus of 0.63%.

c) General Conclusions: The differences arising from the analysis of municipal expenditures and revenues are of such small magnitude that it is unlikely that differences in the structural composition of the housing stock per se are likely to affect them significantly, within the scope of the change this composition is likely to undergo between 1966 and 1971.

The greater impact is likely to be felt on housing resources, and if the trend toward a greater proportion of apartment units in new construction approximates the projection made in this study, the savings in capital invested in housing would be of the magnitude of \$1.13 billion in the 1966-71 period.

## APPENDIX I

### 1. Calculations for Selected Items, Table 33, page 103.

- a) General Administration: 6% of total municipal expenditures.

4.5% is related to population growth  
1.5% represents assessment expenditures  
70% of assessment expenditures are for residential areas  
1.05% varies with structural composition or residential area

Assessment costs are 10 times as much per single-detached house as per apartment unit.

#### 1966 Distribution

$$\begin{array}{rcl} 73.3\% \text{ single-detached houses} \times 10 & = & 733.0 \\ 26.7\% \text{ apartment units} \times 1 & = & 26.7 \\ \hline 100.0\% & & 759.7 = 1.05 \end{array}$$

Case I (330 units as a % of 285 units)

$$\begin{array}{rcl} 85.0\% \text{ single-detached houses} \times 10 & = & 850.0 \\ 30.8\% \text{ apartment units} \times 1 & = & 36.4 \\ \hline 115.8 & & 880.8 = 1.22 \end{array}$$

Case II (333 units as a % of 285 units)

$$\begin{array}{rcl} 80.4\% \text{ single-detached houses} \times 10 & = & 804.0 \\ 36.4\% \text{ apartment units} \times 1 & = & 36.4 \\ \hline 116.8 & & 840.4 = 1.16 \end{array}$$

1966 Distribution: all other assessment and administration costs = 4.95% of total municipal expenditure and are related to population growth (15.1%)

1971 (Cases I and II)

$$4.95 \times 1.15 = 5.70$$

## Total Annual General Administration expenses:

1966:  $1.05 + 4.95 = 6.00\%$   
 Case I:  $1.22 + 5.70 = 6.92\%$   
 Case II:  $1.16 + 5.70 = 6.86\%$

b) Public Works Maintenance: 7.5% of total municipal expenditures.

5.25% applies to residential areas  
 2.25% applies to industrial areas

Annual Costs: (see page 43)

Apartment Units \$2.08 per unit  
 Single-detached Houses \$17.27 per unit

1966 annual cost  $\$376,751 = 5.25\%$   
 Case I annual cost  $\$436,238 = 6.07\%$   
 Case II annual cost  $\$417,115 = 5.80\%$

Commercial and industrial costs are related to population growth (15.1%)

1966 annual cost: 2.25%  
 1971 annual cost: 2.59%

Total Annual Public Works Maintenance costs:

1966:  $5.25\% + 2.25\% = 7.50\%$   
 Case I:  $6.07\% + 2.59\% = 8.66\%$   
 Case II:  $5.80\% + 2.59\% = 8.39\%$

c) Fire Protection: 4.50% of total municipal expenditures

3.15% applies to residential areas and is related to the number of dwellings to be protected.

1.35% applies to industrial and commercial areas and is related to population growth.

Residential

1966: 3.15%  
 Case I: (15.8% increase in dwellings) 3.65  
 Case II: (16.8% increase in dwellings) 3.68

Commercial and Industrial

Case I and Case II: (15.1% population increase): 1.55%

Total Annual Fire Protection Expenditures

1966:  $3.15\% + 1.35\% = 4.50\%$   
 Case I:  $3.65\% + 1.55\% = 5.20\%$   
 Case II:  $3.68\% + 1.55\% = 5.23\%$

## APPENDIX II

### Calculations for Selected Items, Table 39, page 122.

1. Municipal property and Improvements Taxation: 67% of Total Municipal Revenue.

Values are based on cost figures derived from housing models. (See Table 14, page 29)

a) 1966 Residential Tax Base

Single-detached (209) Improvements (x .75) =	2,450,000
Land (x 1.00) =	732,000

Apartments (76) Improvements (x .75) =	661,000
Land (x 1.00) =	39,000

Total Tax Base:	<u>3,882,000</u>
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b) Case I: Residential Tax Base

Single-detached (242) Improvements (x .75) =	2,840,000
Land (x 1.00) =	847,000

Apartments (88) Improvements (x .75) =	766,000
Land (x 1.00) =	45,000

Total Tax Base:	<u>4,498,000</u>
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c) Case II: Residential Tax Base

Single-detached (229) Improvements (x .75) =	2,680,000
Land (x 1.00) =	802,000

Apartments (104) Improvements (x .75) =	906,000
Land (x 1.00) =	54,000

Total Tax Base:	<u>4,448,000</u>
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- d) 70% of Property and Improvement Taxation revenue is forthcoming from the residential area. (46.9% out of 67.0%)

- c) 1966 Tax Base:  $\$3,882,000 = 46.90\%$   
 Case I Tax Base:  $\$4,498,000 = 54.40\%$   
 Case II Tax Base:  $\$4,448,000 = 53.80\%$

d) The remaining 20.1% of such revenue comes from commercial and industrial sources and is assumed to be related to population growth.

1966 Commercial and Industrial Tax Base:	20.10
Case I and Case II Commercial and Industrial Tax Base:	23.05

- e) Total Tax Bases:

1966:	$46.90 + 20.10 = 67.00\%$
Case I:	$54.40 + 23.05 = 77.45\%$
Case II:	$53.80 + 23.05 = 76.85\%$



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