THE UNIVERSITY OF MANITOBA

HOUSING MARKET ANALYSIS AND POLICY PLANNING

by

BURTON LEON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATES STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF CITY PLANNING

DEPARTMENT OF CITY PLANNING

FACULTY OF ARCHITECTURE

WINNIPEG, MANITOBA

MAY, 1975

HOUSING MARKET ANALYSIS AND POLICY PLANNING

by

BURTON LEON

A dissertation submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
of the degree of

MASTER OF CITY PLANNING

© 1975

ACKNOWLEDGEMENTS

CONTENTS

PREFACE

This thesis attempts to analyze housing and its markets from the eyes of government housing agencies, private developers and builders, city planning authorities and housing consumers. Methods of evaluating and interpreting the various demand and supply forces at work in the housing market are therefore presented with a view to enabling wide application of the techniques in decision making by all parties concerned. Main emphasis however will be placed on the use of market analysis by government housing agencies and planning departments in formulating their housing and development plans.

In time of a national housing crisis which is characterized by housing shortages and rising prices of land and housing, private and public bodies should see the problem in its proper perspective through housing market analysis. Obstacles to residential construction activities can then be identified and removed, and catalysts to housing supply and consumption introduced.

ONE.   INTRODUCTION

Housing market analysis provides the factual basis and pre-
dictions for decision-making by private enterprises and
public bodies in residential construction and development.

In the public sector, government housing agencies collect
and analyze information on population and housing charact-
eristics, housing stock, economic base, cost and availability
of mortgage money,land,building materials,and labour for the dual
purpose of examining the population's housing condition and
the government's role in direct and indirect provision of
housing. This analytical process serves not only to develop
and/or expand needed housing policies and programs,but also
to evaluate the effectiveness of these instruments and public
investment.

City planning authorities are concerned with meeting present
and future space and servicing requirements of urban develop-
ment. Housing market analysis serves to generate forecasts of
housing requirements, which can then be used in calculating
residential land requirements, the derived demand for muni-
cipal and community services, and the cost involved in the
provision of these services.

Since any tax or monetary incentives to buy or to build
houses lead to consumption of land and municipal services,

city planners must be aware of the influence of government policies and programs on urban development and its space and service requirements. Although Neighbourhood Improvement and Residential Rehabilitation Programs may not require additional land or services, city planners can have a more intimate role to play in improving the quality of residential neighbourhoods.

In the private sector, developers and builders conduct market analysis as a means of investment decision making. Findings of housing market analyses are fed as inputs into other related economic studies, such as feasibility study, highest and best use study, marketability study and investment analysis. Such market analyses may vary in scope and depth as warranted by the size and nature of housing developments. Cost and availability of financing, land, labour and building materials are fully investigated while on-site analysis of the surrounding neighbourhoods is also performed to ensure a profitable return on residential real estate investment.

Prospective housing consumers, be they buyers or renters, do a certain amount of "comparison shopping" before paying for their best choice. Through comparative shopping, the consumers "analyze" the housing markets from a different view point, usually with the help of realtors and rental agencies. However, it is not the way consumers analyze the housing market that is important to planners, but their housing satisfaction and preferences. For those prospective housing con-

sumers who are dissatisfied with their existing housing condition, the sources or causes of their dissatisfaction must be uncovered so that planning of housing and environment can be geared towards accommodating the wishes and changing needs of the people.

TWO.   ECONOMIC BASIS FOR HOUSING ANALYSIS

Before dealing with the methodologies, it is appropriate to outline factors which are of significance in housing market analysis.

1. Housing is the composite of services and amenities rendered by a dwelling unit and its location.

2. There are two types of housing needs :

    (a) Physical housing need is the quantity and quality of housing and its amenities considered necessary to bring the housing condition to a socially acceptable level.

    (b) Financial housing need is the gap between the cost of an adequate housing unit and the proportion of the income that should not be exceeded to pay for it.

    Housing needs should be differentiated from housing demand which expresses the desire for housing, for which people are willing and able to pay.

3. Housing is not an ordinary commodity and many of the distinctive features of the housing market result from its peculiar commodity characteristics. Insofar as they affect economic analysis, the effects of durability, non-homogeneity, spatial uniqueness and market imperfection warrent attention.

    (a) The durability of housing means that it is an investment good, and that a very high proportion of the potential

supply is represented by the existing stock.

(b) The non-homogeneity of housing poses problem of
aggregating demand schedules of individuals entering the
market. The differentiations of housing types and tenure
arrangements also present problems of comparability in
market analysis. 1/

(c) Housing has the attribute, unique amongst consumer
durables, of being fixed in location. Therefore, every
house or at best small groups of houses, are unique goods.
Since spatial relationships of a location and its neigh-
bourhood characteristics often enter people's preference
function with different weights, the phenomenon of spatial
uniqueness introduces analytical problems. 2/

(d) Imperfection in the housing market is attributable
to the non-homogeneity of housing, imperfect knowledge
of market conditions and opportunities of housing and
credit availability, externalities or "neighbourhood
effect", and the intervention by public authorities in
the form of regulations, subsidies, grants, etc.

4. Housing preferences are the choices made (with respect
to housing-type, size, style, tenure, location and expend-
itures) after evaluating other combinations of qualitative
features of housing that are within one's financial reach;
demand is simply the expression of preferences.

1/ See Smith,W.F. Housing : The Social and Economic Elements,
    University of California Press, 1970, p.50.

2/ Kirwan,R.M. and Martin,D.B. "The economic basis for models
    of the housing market", Centre for Environmental Studies,
    London, Wp 62, 1970, p.12.

Housing preferences are revealed in market behavior but may be independent of objective factors such as household characteristics (e.g. income) and market phenomena (e.g. rent). For instance, individuals having the same household characteristics and work-place location may differ only in the value they set on travelling time, and therefore living in different locations.

5. Housing demand and supply are influenced by economic as well as non-economic variables such as social, demographic and institutional factors.

6. The demand for housing other than rental units is made up not only of a demand for shelter but also of an investment demand. Homeownership thus provides shelter as well as a hedge against inflation. The shelter demand is mainly governed by the number, size, age-sex composition and income of households in the study area now and in the future.

Existing housing satisfaction and housing expenditure, cost of living, inflationary expectations, cost and availability of mortgages, government housing policies and programs all have significant influence on effective demand for housing in the market. The additional explanatory factors needed to explain neighbourhood housing demand include employment locations, availability of public services including schools and hospital, environmental quality, accessibility to community facilities, and incidence of property tax.

Investment in a home is made attractive by the Federal
Income Tax Act which exempts the principal residence from
capital gains tax, and by the National Housing Act which
provides mortgage insurance and other aids such as the
Assisted Home Ownership Program. Some provincial govern-
ments also "subsidize" investment in home by making avail-
able home purchase grants. An increasing housing demand
pressure is created by investors/speculators. The result-
ing turnover of residential property for capital gain
objectives only worsen the house price inflation and lead
to compounding of trading costs such as real estate
commissions. 1/

7. The supply of housing consists of vacant units of housing
stock and the flow supply of new and unoccupied units.
Differentiation therefore must be made between resale/
reabsorption of existing units and sale/absorption of new
units. Housing construction in terms of the number of
housing starts is a function of rent and price of new and
existing units; cost and availability of money, land,
labour, and building materials; vacancies, the number of
newly completed and unoccupied units, and units under
construction; and government housing policies and programs.

8. The housing market is a mechanism of allocating housing
to households. It is divided into different sectors. The
major divisions are between the private and public sectors
and between the rental (housing service) and sales (housing

1/ Greater Vancouver Regional District, Seminar on Management
of Growth, February 1974, p.c-4.

stock) sectors.

9.   The housing market is often termed as the submarket of
the (urban) land or real estate market. 1/ However, in
this thesis, housing market is not referred to as a single
market in a classical sense but a series of overlapping
submarkets differentiated by location, type of dwelling,
type of tenure, age, and quality. 2/

10.   A housing submarket is composed of dwelling units which
are close substitutes for one another, and are linked
in a chain of substitution with links of varying length
between them. "Thus, there is a location link, tenure
link, type of structure link, value link, and so on...
The combined distance of the links between the two markets
reflects the degree to which price or rent changes in one
market will not affect the other." 3/
Since the submarkets defined in terms of the objective
characteristics of housing may not reflect the fact that
substitutability exists in the eye of the consumer, they
must be defined in terms of demand groupings rather than
supply groupings. The search behavior of an individual
household seeking accomodation will define a set of sub-
stitutable dwellings. In aggregate the mobility field of
a particular group of households will also define that

1/ Ratcliff,R.U. Urban Land Economics, McGraw-Hill, N.Y. 1949,
   p.295.

2/ Duesenberry,J. Business Cycle and Economic Growth, McGraw-
   Hill, N.Y. 1958, p.135.

3/ Grigsby,W.G. Housing Markets and Public Policy, University
   of Pennsylvania Press, Philadelphia, 1963, p.37.

group's submarket. 1/ Thus, there are two definitions of spatial submarket of housing : "demand" spatial submarket and "supply" spatial submarket. Demand spatial submarket as seen by households may not necessarily be a contiguous area while supply spatial submarket is a contiguous residential area with similar locational characteristics.

11. Most macro-economic models of the housing market deal with aggregate supply and demand relationships, abstracting from the spatial dimension. The models are used to generate econometric estimates of the parameters of the various variables affecting housing and new residential construction. 2/ Elasticities of variables (e.g. housing starts) with respect to other variables (e.g. NHA mortgage rate) are generally calculated, analyzed with past trends, and used for prediction purposes.

12. Von Thunen's theory of location rent differentials (1826) serves as the foundation for today's micro-analytic modelling of the housing market. 3/ Many micro models treat the spatial dimension of the housing market explicitly and attempt to determine residential location in terms of

1/ Berridge,J.D. The Housing Market and Urban Residential Structure : A Review, Centre for Urban and Community Studies, University of Toronto, Research Paper No.51, 1971, p.45.

2/ Two such models can be found in L.B.Smith, Housing in Canada: Market Structure and Policy Performance, CMHC, Ottawa, 1971.

3/ An exposition of Von Thunen's location theory can be found in J.W.Alexander, Economic Geography, Prentice-Hall, 1963, pp.613-616. An example of its application is furnished by M.J.Beckmann, "Application of a Neoclassical Von Thunen Model to the Housing Market", the Annals of Regional Science, June, 1972.

minimizing the journey to work. These models are merely
classical budget constraint models solving, for a given
level of income, the combination of housing space, tran-
sport and all other goods that would maximize an individ-
ual's satisfaction or utility. 1/

Muth's general equilibrium model 2/ presents a comprehen-
sive treatment of the economics of demand and supply in
the housing market which satisfactorily accommodates such
factors as spatial uniqueness, different housing types and
the existence of a stock of houses of different ages and
which accounts for phenomena like the price-distance
function and the density gradient. Since the model de-
monstrates analytically the interactions between market
phenomena such as price, density, occupancy rates and
travel behavior, it provides "a bridge between the analysis
of the determinants of demand and supply behavior at the
margin and the analysis of housing demand and supply in
the aggregate." 3/

13. Society may fail to achieve an efficient allocation of
resources in housing because the indirect benefits and
costs (i.e. externalities) are not considered in private
housing market decisions. When the existence of such

1/ See Alonso, "A Theory of the Urban Land Market", Papers
and Proceedings of Regional Science Association, Vol.VI,
1960, and Location and Land Use, Harvard University Press,1964.
2/ Muth,R.F. Cities and Housing, University of Chicago Press,1969.
3/ Kirwan and Martin, op.cit., p.32.

externalities results in too few housing units being
produced and consumed — too few to maximize net
social benefits, public intervention is justified. 1/

14. It is a futile attempt to operate a housing policy which
is concerned with occupancy rates, rents and prices
independently of a planning policy which is concerned
with the location of jobs and houses and transport
improvements.

1/ Haveman,R.H. The Economics of the Public Sector, John
    Wiley & Sons, N.Y. 1970, pp.33-39.

THREE.   METHODOLOGIES FOR HOUSING MARKET ANALYSIS

Housing market analysis is conducted for the purposes of
investment decision making in the field of housing and related
services. There are, however, several approaches to understand-
ing the structure and performance of the housing market. This
can be explained by the fact that the participants, namely
the government housing agencies, investors, developers/builders,
housing consumers, and city planning authorities, have their
own objectives and criteria of investment, and consequently,
the scope and level of market analysis they undertake.

Before presenting the methodologies, it is appropriate to
introduce two conceptual models of the housing market and its
basic principals and institutions in the housing production
and allocation process. The two flow charts, diagrams 1 and 2,
serve not only to define the interaction of the participants
but also to delineate the scope of data collection for analysis.

The housing production and allocation process involves mainly
the consumers, the three levels of government, and the housing
development industry. Investors, lending institutions, and
professionals such as planners and lawyers also play significant
roles in the supply of housing.

The three levels of government virtually set the framework of
the whole process. The Federal Government, through the Central
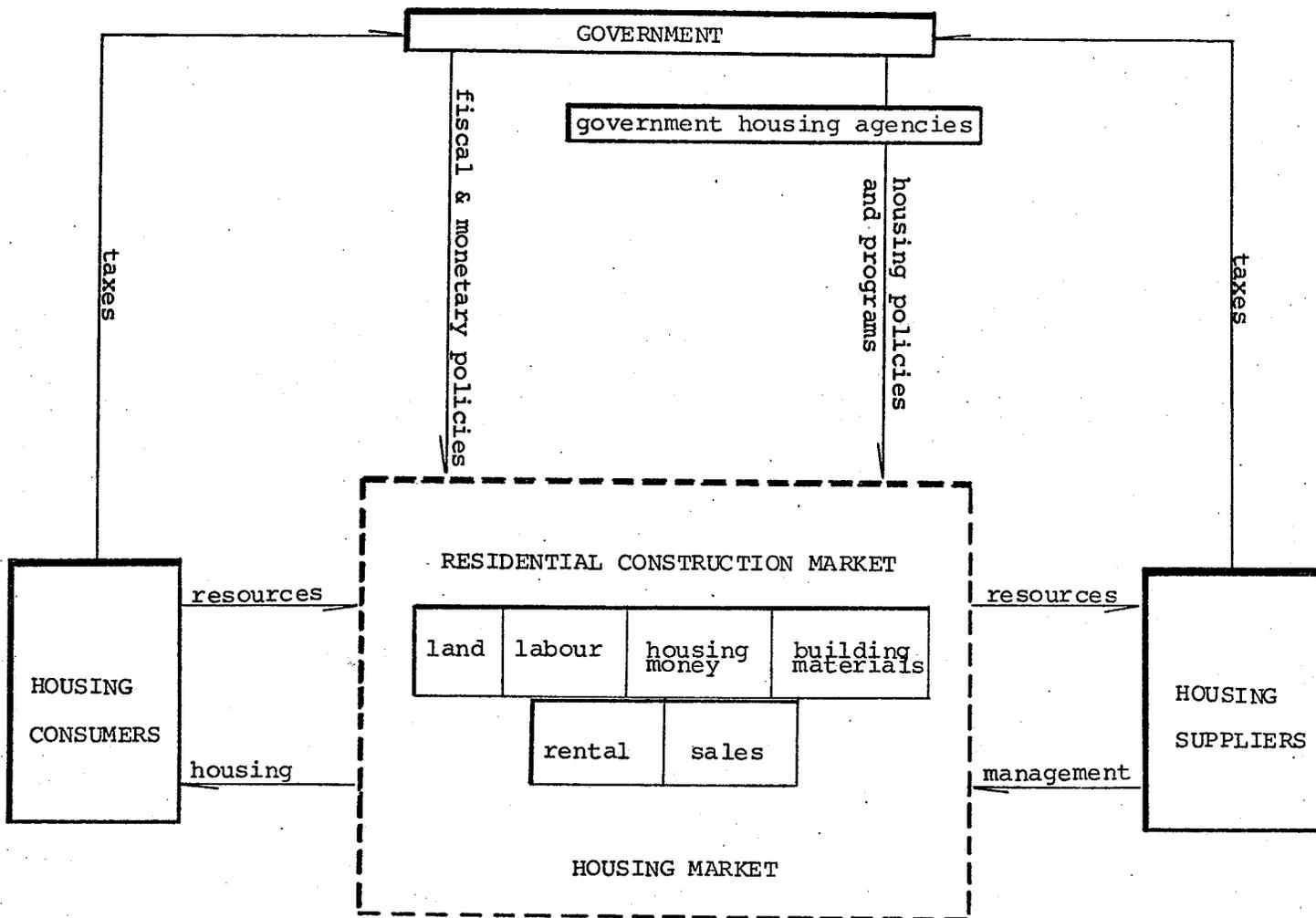
Diagram 1   A CONCEPTUAL MODEL OF THE HOUSING MARKET

GOVERNMENT
fiscal & monetary policies,
housing policies & programs.

MONEY MARKET
cost & availability
of mortgage credit

HOUSING SUPPLIERS
ownership and/or
control of residential
construction inputs,
costs of production

HOUSING CONSUMERS
population,
demographic factors,
income,
consumer preferences

quantity &
qualitative
composition
of supply

quantity &
qualitative
composition
of demand

prices / rents,
absorptions,
vacancies,
density of occupancy,
housing distribution

economic climate

investment opportunities

investment opportunities

housing production

profit margins

economic accessibility

market structure

market performance

housing satisfaction

Diagram 2   MECHANISMS OF HOUSING PRODUCTION AND CONSUMPTION

Mortgage and Housing Corporation, sets building standards, and provides grants and loans to the provinces, municipalities, developers and consumers for the purchase and provision of housing.

The provincial governments may intervene directly or indirectly in the housing field. The N.D.P. government of Manitoba, for example, has established the Manitoba Housing and Renewal Corporation to develop and execute public housing and land assembly programs. Programs directed to relieving Manitobans in particular the lower income group from the high cost of housing include a property tax credit plan and homeownership subsidies of up to $300 a year for qualifying families buying a home under the Federal Government's Assisted Homeownership Program.

The municipal governments regulate and control residential development by zoning and by setting servicing standards, residential densities, and subdivision design criteria. The other participants in the housing field have to operate within the above parameters as defined by the governments.

The development industry includes land developers, developer-builders and builders. In Winnipeg, all the principal participants in the housing industry are developer-builders with varying degrees of vertical integration in the construction and marketing of their housing units. These companies are involved

in all aspects of the housing production process, from land assembly and subdivision design to servicing of the lots, and from design of the houses to their sale or lease to the public. While decisions to build in the private sector are strongly influenced by CMHC programs, the lending institutions, the marketing and financial analysts, and the planning and design teams, the final investment decisions are made by the housing producers.

The following topics are usually included in housing market analyses. In specific situations, however, not all of these may be covered or others may be included.

1. Population and Housing Characteristics

2. Supply of Housing

3. Urban Land Supply and Development

4. Housing Money (Residential Mortgage) Market

5. Economic Base

6. Performance of Housing Markets

7. Consumers' Housing Perferences

8. Government Housing Policies and Programs

9. Cost and Availability of Residential Construction Inputs

10. Neighbourhood and Site Characteristics

All of the above factors must be studied in relation to each other and in relation to past developments. In this manner, both short- and longer-range market trends may be identified and used as the basis for estimating future probable market changes.

Thorough consideration of the range of factors is an imposing
task. It is not surprising, therefore, that much residential
real estate investment analysis is carried on at substantially
less sophisticated levels.

This thesis identifies six approaches to housing market analysis
and the methodologies are discussed in the following pages.
The Stock Flow Approach distinguishes between existing housing
stock and new housing supply in evaluating housing market per-
formance. The Submarkets Approach identifies the various housing
submarkets in a local area, and permits the construction of
income demand schedules for a mix of housing and locations.
The Macro-Micro Approach integrates both the Stock Flow and
Submarkets frameworks to analyze in aggregate and in part,
the structure and performance of the housing markets. The use
of Econometric Models is to simulate the workings of the housing
market for prediction purposes. Other forecasting techniques
such as those used for assessing housing needs or housing
requirements, and those for estimating housing supply and
market performance are presented as the fifth approach. Thres-
hold Analysis which is an assessment of buildable land supply
and capacities of utility systems, provides the basis for
decisions on the supply side of the housing market.

Although these approaches may individually produce results for
housing market analyses with different objectives, any compre-
hensive housing studies undertaken by governments and their

housing agencies should incorporate all of the above approaches
so that the housing policies and programs developed will be
effective and will not impede the supply of housing by the
private sector.

All of the aforementioned approaches rely, to a varying degree, on
information supplied by Statistics Canada on population, housing,
employment and incomes. A great deal of housing market data is
also furnished by the Central Mortgage and Housing Corporation
which publishes monthly, quarterly and annual statistics related
to housing construction and lending activity under the National
Housing Act. To make housing market analyses easier, various
federal and provincial departments and agencies provide
statistics on general economic trends, population projections,
employment levels, etc. Most first hand information on the
existing housing stock, building permits issued, community
facilities, utilities, and development plan are made available
by the municipalities. However, inadequacies of available
information exist, for example, household income cross-class-
ifying type and tenure of accomodation. Moreover, there are
statistical gaps which have to be filled, such as the lack of
statistics at the neighbourhood level. Even when data are
available, caution must be taken to assure comparability between
the different data sources.

I. STOCK FLOW APPROACH

The Stock Flow Approach distinguishes between occupied housing
stock and newly completed and unoccupied units in the account-
ing of total housing stock and housing supply. This enables
market analysts to see how significant the flow supply is in
responding to the demand pressures as manifested by the inade-
quacies of the housing stock in housing the growing population.

Diagram 3 shows the dividing line between the flow supply and
the housing stock. Absorptions of newly completed units in the
new sales and rental markets "turned" flow into stock, and
these newly occupied units became additions to the existing
housing stock.

Housing units may have different "labels" attached to them
during their stay in the housing market. These labels such as
vacancies are used to identify one group of housing units from
the others in evaluating the performance of the housing markets.
The terminology of housing statistics is partially presented
here in the following housing supply flow-chart. Other terminology
can be found in Chapter Four when characteristics of housing
units and market indicators are employed in an analysis of
the Winnipeg housing market, 1961 - 1973.

In diagram 4, only the supply side of the housing market is
shown to facilitate understanding of the stock flow concept.

housing starts

under construction

completions   newly completed & unoccupied

new sales and rental markets

absdirptions

FLOW SUPPLY OF HOUSING

STOCK SUPPLY OF HOUSING

occupied housing stock

resales market

sales

vacancies

reabsorptions

existing rental market

listings

conversions

unoccupied housing stock

net additions

change in use
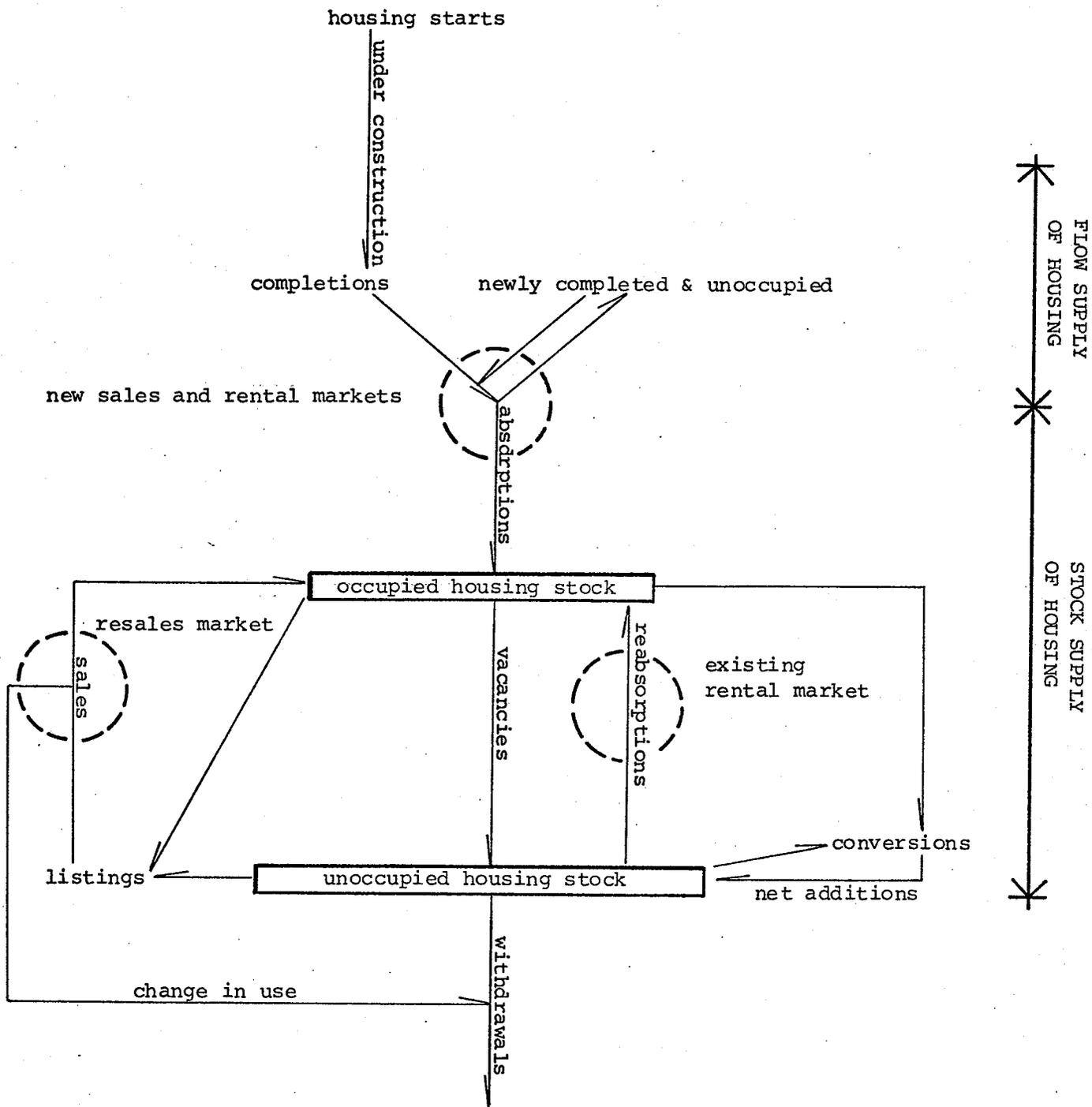
withdrawals

Diagram 3'   HOUSING SUPPLY AND MARKETS

P

S_1 S_2 S_3

market clearing
price/rent structure

stock supply

0

W

occupied housing stock

Q
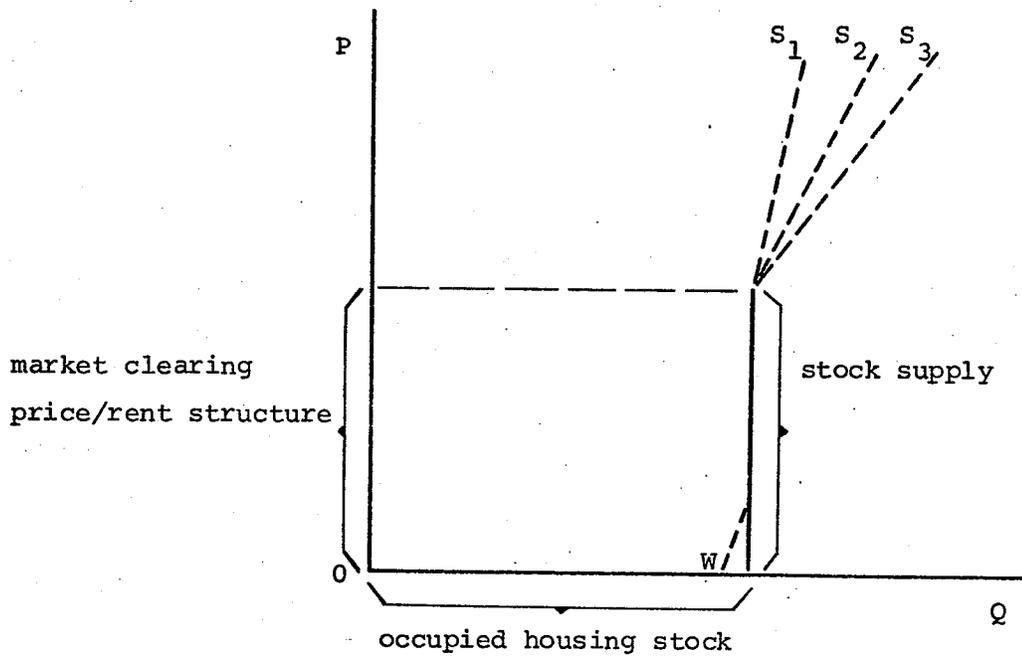
W = withdrawals

S_1 = flow supply of housing

S_2 = flow supply + listings

S_3 = flow supply + listings + vacancies

Diagram 4   FLOW AND STOCK SUPPLY OF HOUSING

The vertical portion of the supply curve points to two things
in the market : the quantity of occupied housing stock (i.e.
aggregate of the quantitative and qualitative housing mix)
and the market clearing price/rent structure. Flow supply is
represented by the dotted line extending from stock supply to
S_1. When listings or units waiting to be resold are added to
the flow supply, S_1 becomes S_2. Similarly, S_3 takes into account
S_2 and vacant units in the existing rental market, and it re-
presents the total housing supply in the market for absorptions,
resales and reabsorptions.

The dotted line extending from the stock supply to point W on
the horizontal axis indicates the number of housing units to
be demolished or withdrawn from the market. Redevelopment,
change in land use, and change in dwelling use usually follow
changes in real property value, and they account for reductions
in the housing stock. The housing units involved in the process
of withdrawal are those which can command only meagre rentals,
and those which are dilapidated and their rather low replace-
ment cost plus current value offer profitable returns on
redevelopment.

This approach offers a systematical way of keeping track of not
only additions to and reductions in housing stock, but also
turnovers or activities in the housing market. The use of stock
flow concept is basic to any presentation of housing statistics.
An example of its application is provided in Chapter Four.

II. SUBMARKETS APPROACH

The purpose of analyzing housing market at the micro level is
to deepen our understanding of the functional structure of
housing submarkets in order that selective housing policies
and programs could be formulated to maximize the efficiency
and effectiveness of government's involvement in the field
of housing.

The Submarkets Approach is an attempt to fill the need for
"some form of matrix analysis which will enable us to see at
one time the aggregate market, the individual parts, and the
interrelationships of these parts." 1/ It involves the appli-
cation of the concept of consumer's surplus to the construct-
ion of a housing survey questionnaire. Given the assumptions
underlying the concept, the survey results are used to derive
housing demand curves of income groups in each submarket which
is defined by house type, size, tenure and location.

Interrelationships among household and dwelling characteristics,
housing satisfaction and residential mobility are then analyzed
in conjunction with existing housing market phenomena (such as
rent, price, mortgage financing, size, density, quality, locat-
ion, turnover and vacancy rate of housing) to help illuminating
the interdependency of or linkages between submarkets as indicated
by coefficients of consumer's surplus.

1/ Grigsby,W.G. Housing Markets and Public Policy, University
     of Pennsylvania Press, Philadelphia, 1963. p.32.

A. METHODOLOGY

Since housing policies and programs must be geared to the needs
and aspirations of the people they affect, an investigation
of the demand side of the housing market is essential. This
calls for the design of a survey questionaire that can extract
information necessary to identify the various housing submarkets
(defined by the characteristics of housing as well as that of
the inhabitants) so that selective demand and supply policies
and programs could be devised accordingly.

The methodology presented here is not simply a survey method-
ology applying conventional statistical techniques to housing
behavior analysis, it is an attempt to derive housing demand
schedules of income groups in each of the housing submarkets.
By aggregating an income group's demand curves for a certain
mix of house type, size and tenure in all loclities, a total
market demand curve of the income group for that certain
housing package in the study area can be derived. A comparison
of the demand curves of all income groups for a certain housing
package in a locality or in the whole study area can then be
made, thus satisfying the need for seeing at one time the
aggregate market, its submarkets and the interrelationships
of these submarkets.

The derivation of submarket demand curves involves the
application of Marshall's concept of consumer's surplus to the

formulation of the survey questionnaire. The concept emphasizes
that a consumer receives a greater amount of utility than he
pays for, and the definition can be used as a device to measure
this surplus of utility (i.e. total utility minus effective
utility). Marshall 1/ defines consumer's surplus as the
difference between the sum a consumer has to pay for a quantity
of goods and the sum he would be willing to pay. Graphically,
it can be equated with the roughly triangular area lying under
a demand curve and above the rectangle which represents actual
money expenditure. (See Diagram 5) 2/ In a later note, Marshall
adds that the concept assumes that the marginal utility of
money is constant, so that the income effect resulting from
a price change is neutralized.

Since there is no price-quantity movement along the housing
demand curves, the assumption can be relaxed in this respect.
To make an income group homogeneous, however, the assumption
of constant marginal utility of money for goods and services
has to be applied to every individual or household in that
income group.

To complete the list of assumptions made with respect to the

1/ See Blang,M. Economic Theory in Retrospect, Richard D.
   Irwin Inc., Illinois, 1962, pp.335-351; and Bishop,R.L.
   "Consumer's Surplus and Cardinal Utility", Quarterly
   Journal of Economics, May,1943, pp.421-449.

2/ Whitebread and Bird defined consumer's surplus as the positive
   differential between a household's reservation price and the
   rent in its existing dwelling. See "Rent, Surplus and the
   Evaluation of Residential Environments", Regional Studies,
   Vol.7, 1974, pp.194-196.

Diagram 5

price

consumer's surplus (Marshall)

P_1

demand

0

Q_1 quantity

cash

RP

reservation price (Whitebread & Bird)

R   rent

0

time

rent
$

demand for two bedroom apartments in
location A by income group X

150

140

consumer's surplus (Submarkets Approach)

130

120

number of respondents
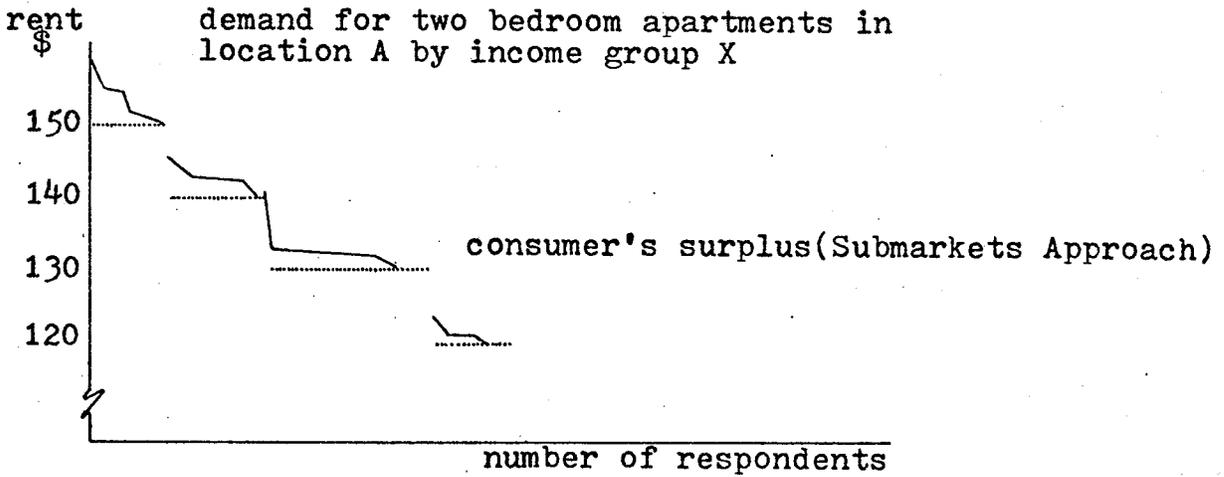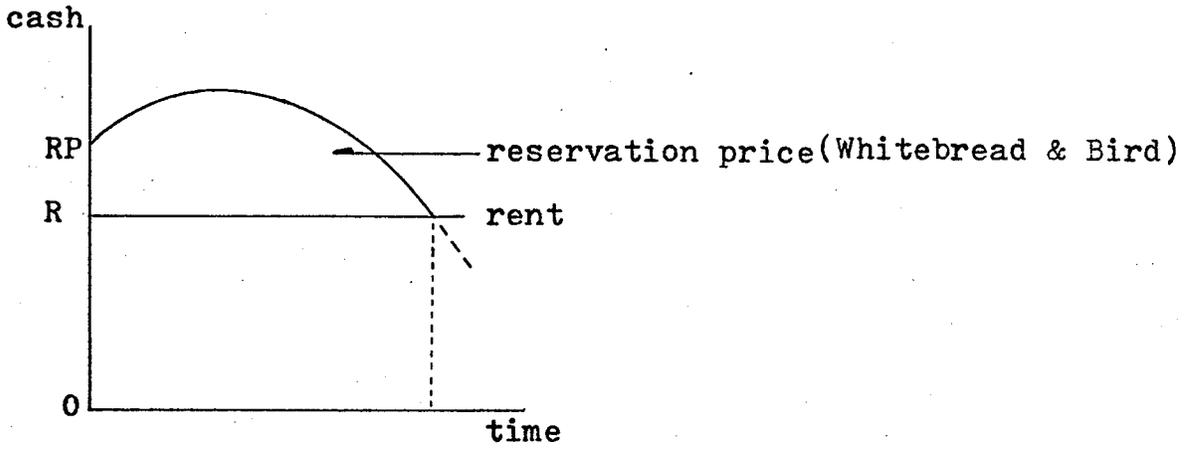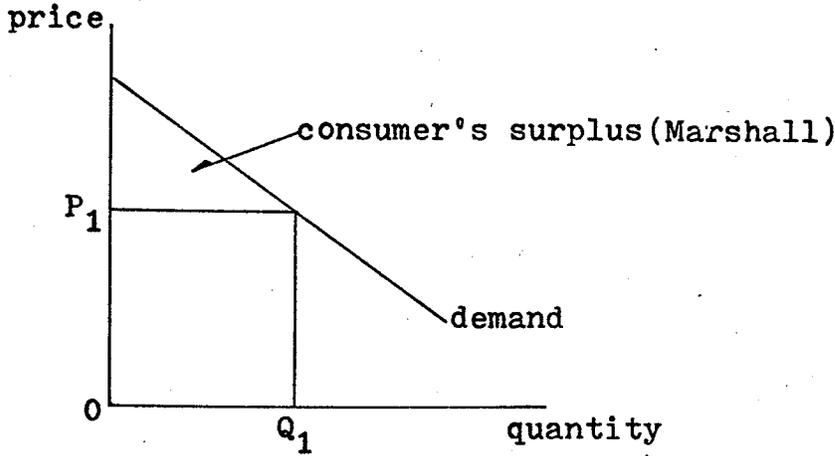
derivation of housing demand curves, homogeneity of all dwell-
ing units in a housing category, and knowledge on the part of
the consumers of the housing market are included.

The construction of the demand curves adopts Marshall's extra-
expenditure method, however, if we put Marshall's question,
and ask how much more a consumer would be prepared to pay
rather than go without his present housing, we could not get
a sensible and unambiquous extra-expenditure. Modification of
the question is therefore necessary. A consumer is asked to
express his consumer's surplus in terms of the extra monthly
housing expenditure if he is satisfied with his present housing,
and prefers staying rather than moving to other physically
similar dwelling in the study area. The submarket demand schedule
of an income group for housing can then be derived by arraying
consumers' surplus (on housing of a certain mix of house type,
size and tenure in a certain locality) in descending order
above their respective levels of housing expenditure on a two
dimentional plane with housing expenditure on the Y-axis and
quantity of housing on the X-axis. (See Diagram 5)

Regression lines for consumers' surpluses above their respect-
ive housing expenditure intervals are constructed. The combin-
ation of these regression lines form the effective demand curve
of an income group for housing of a certain mix of house type,
size and tenure in a locality. Slopes of these housing demand
curves can then be computed for comparison. Since demand elast-

icities decline along a linear demand curve, they cannot be used for comparing housing demand curves of income groups. A uniform basis for intra-income group or inter-rental group comparisons is offered by a coefficient of consumer's surplus, i.e. average consumer's surplus experienced by an income group.

Potential housing demand curve are derived in a similar way as the effective demand curves. They express the extra-expenditures households are willing to pay for housing in other localities because of housing dissatisfaction. As housing satisfaction is measured by consumer's surplus, the reciprocal of the coefficient of consumer's surplus thus provides a relative measure of residential mobility potential.

Since the slope of a housing demand curve depends heavily on the income and housing composition of the selected sample of households, a sample accurately representing the population in the market area is required. This calls for firstly the subdivision of the housing market area into localities or supply spatial market; secondly, a breakdown of the population in each of the localities by income, tenure and housing expenditure; thirdly, a breakdown of the housing stock in each of the localities by type and size. A random sample can then be systematically selected.

Turning back to the survey questionnaire, five interrelated aspects of housing behavior, namely, household characteristics,

dwelling characteristics, housing satisfaction, housing
preferences and residential mobility are covered. The questions
formulated serve to indicate the scope of housing analysis
that can be undertaken.

B. <u>SURVEY QUESTIONNAIRE</u>

1. <u>Household Characteristics</u>

members by relation-ship or connection to Head of household	family unit member	marital status *	Sex	age	level of education	employment status **
Head						
roomer (if any)						

occupat-ion or school	distance to work or school	average travel time to work or school	means of transportation to and from work or school	ethnic back-ground

*	a.	single		**	a.	full-time
	b.	married			b.	part-time
	c.	seperated			c.	self-employed
	d.	divorced			d.	unemployed
	e.	widowed			e.	unemployed, but not looking for employment
					f.	retired

Annual household income to the closest thousands (before taxes):
$_____

Major sources of income: a._____
                               b._____
                               c._____

2. Dwelling Characteristics

Address : _____
number   street   (apartment no.)   community   postal code

Name the two streets at the intersection closest to your
residence : _____ and _____

How long have you been staying at your present address? _____

Structural type of dwelling unit : (check one)

detached single family house   _____
duplex   _____
row or townhouse   _____
walk-up apt.(3 storeys or less)   _____
highrise apt.(4 storeys or more)   _____
other   _____   please specify _____
if converted   _____   please indicate original
                                             type _____ and number of
                                             self-contained suites____

total floor area of dwelling unit in square feet

lot size in acreage or square feet

number of bedrooms

average floor area of bedrooms

is dwelling furnished by you?

monthly rental

realty tax payment (excluding school tax)

present market value of entire property

date of construction

age of dwelling

To be answered by homeowners with clear title to their property -
If you got clear title within the past 5 years, please give :
a) date of purchase   c) amortization period
b) down payment   d) principal plus interest per month

How much would you have to pay for rent if you rented your house?
To be answered by home owners with outstanding mortgage:
please give : a) date of purchase
              b) downpayment
              c) amortization period
              d) principal plus interest per month
              e) outstanding mortgage
              f) details of second mortgage, if any.

3. <u>Housing Satisfaction</u>

Are you satisfied with your present housing condition? _____

If not, what are the reasons for your dissatisfaction?
(check where appropriate, and then number those you checked
in order of priority or significance)

a. interior and/or exterior of building need(s) repair. ___ ___
b. inadequate utilities (such as hot water, shower, etc.) ___ ___
   please specify _____
c. not enough bedrooms. ___ ___
d. not enough bathrooms. ___ ___
e. not enough space for children. ___ ___
f. not enough light and/or ventilation. ___ ___
g. lack of privacy. ___ ___ in what way? _____
h. inconvenient location. ___ ___
i. rent or P.I.T. is too high. ___ ___
   is it over one-third of your monthly income (before taxes)? ___
j. neighbourhood considerations. ___ ___
k. Other _____ please specify _____

Please check those statements that fit your description of
the neighbourhood environment :

a. noisy, heavy traffic _____
b. dirty, crowded _____
c. too many children _____
d. undesirable neighbours _____
e. little or no prestige in the city _____
f. lack of community activities _____
g. no one seems to care what the neighbourhood look like _____
h. conditions of buildings are generally poor _____
i. remote from community facilities (such as school and shops) _____
j. poor public transit service _____
k. encroaching industrial activities _____
l. residents are in roughly the same social-economic class _____
m. I feel very much I belong here _____
n. I think building a new home in this neighbourhood would be
   a wise investment _____
o. other _____

All in all, would you say you like this neighbourhood very much,
like it moderately well or dislike it?

a. like it very much _____
b. like it moderately well _____
c. dislike it _____

4. Housing Preferences

If you are satisfied with your present housing, and if you do not expect to move within the coming 12 months, how much more per month would you be willing to pay to remain staying in your present dwelling ?

How much would you be willing to pay per month to stay rather than move to : locality A? locality B? locality C? locality D?

If you are not satisfied with your present dwelling, please specify your preferred house type, size in terms of number of bedrooms, tenure and location.

To be answered by those who prefer rental housing -- How much rent per month would you be willing to pay for your preferred dwelling, if it is unfurnished? if it is furnished?

To be answered by those who do not own their homes and prefer home ownership -- How much downpayment and P.I.T. per month would you be willing and able to pay for your preferred house? For how long? (i.e. length of amortization period) 10 years or less, 15 years, 20 years, (check one)

To be answered by those who are homeowners with outstanding mortgage -- providing that the equity in your home is transferred for the purchase of your preferred dwelling, how much P.I.T. would you be willing to pay per month? For how long? i.e. length of amortization period, 10 years or less, 15, 20, 25, (check one).

To be answered by homeowners with clear title to their property -- providing that you sell your house in exchange for your preferred dwelling, would you have clear title to it?
If not, how much more in aggregate would you be willing to pay? Please give details of desired mortgage financing, if required.

Do you think you can acquire your preferred housing at the price (rent or P.I.T.) you are willing and able to pay in the City of Winnipeg? If not, why not?

If you were to pay the same rent or P.I.T. for a dwelling unit that is physically similar to yours in another locality, how much more per month would you be willing to pay to live in : locality A? locality B? locality C? locality D?

Would you be willing to pay the same rent or P.I.T. for a smaller dwelling unit in your preferred locality? yes _____ no _____
If yes, how many bedrooms in your present dwelling or how much floor space (in square feet) would you be willing to sacrifice for a smaller dwelling unit in your preferred locality?
bedrooms _____ or floor area _____ square feet.
If you are buying or owning your house, would you be interested in renting a physically similar house in your preferred location?

5. Residential Mobility

Did you move in the past 3 years ?

If yes, how many moves did you make ?

name the two streets at the intersection closest to your former residence, start with the most recent move	tenure a. renting b. buying, outstanding mortgage c. own outright, clear title	house type a. single family b. duplex c. townhouse d. walkup apt. e. highrise apt.	number of bedrooms

is dwelling furnished by you ?	travel time to work or school	monthly payment of rent or P.I.T. (please include information on the amount of equity and outstnding mortgage & terms of payment)	reason for moving a. change in family size b. change in income c. other, specify

Do you expect to move within the next 2 years ?

no ___ not likely ___ probably ___ yes ___ undecided ___

If yes, what would be the reasons for moving ?

a. a change in property value ___ increase or decrease ? ___
b. a change in family size ___ increase or decrease ? ___
c. a change in income ___ increase or decrease ? ___
d. job relocation ___
e. housing dissatisfaction ___
f. in exchange for another house ___ please specify house type, size in terms of number of bedrooms, tenure and location if it is not your preferred housing. _____
g. other, please specify _____

Would you move to a location a. closer to the city centre ?
b. just where you are ? or c. farther from the city centre ?

Please give two reasons for your decision : a. _____ b. _____

On the enclosed map of Winnipeg, a. Outline your preferred locality (ies); b. Mark your present address with #; c. mark your former addresses with + and number them chronologically. e.g. +'70, +'72$_a$, +'72$_b$.

C. PRESENTATION AND ANALYSIS OF SURVEY FINDINGS

Besides the derivation of housing demand curves, the survey findings provide answers to questions, and illuminate relationships, such as those listed below.

- whether there is a housing problem or an income problem ? relationship between need and demand.

- relationships between effective and potential demand for housing (by income group, housing characteristics and location).

- whether housing needs are to be filled with new stock because of overcrowding, or rehabilitation because of poor housing quality, or improvements on municipal utilities, etc.?

- what are the housing characteristics of the various socio-economic groups?

- what are the consumers' housing preferences?

- what are the characteristics of those who cannot afford their preferred housing?

- what are the characteristics of the preferred locations?

- relationship between travel time and income of the households.

- what are the reasons for residential mobility?

- to what extent is geographic mobility related to socio-economic mobility : a different job, or a change in social status?

- what are the linkages between housing submarkets?

Survey findings can be tabulated and/or presented graphically as follows :

variables

```
┌─────────────────────────┐
│                         │
│                         │
│      correlation        │  variables
│        matrix           │
│                         │
│                         │
└─────────────────────────┘
```

mix of housing services

```
┌─────────────────────────┐
│                         │
│                         │
│      coefficients of    │
│   consumer's surplus    │  localities
│    by income group      │
│                         │
│                         │
└─────────────────────────┘
```


number of
dwellings

locality A

locality B

house types

average house size
(no. of bedrooms)

socially acceptable
level of occupancy
density

overcrowding

locality A

locality B

average
household
size

house
types

locality A

locality B

renters

owners

buyers

number of
households

The next step in the analysis consists of comparing existing
housing market statistics with survey findings, and using cor-
relation matrix as a means of analyzing interrelationships
among selected household and housing variables. Multiple re-
gression equations (such as residential mobility = function
of housing dissatisfaction, job relocation, change in income...)
may be formulated to identify acceptable and significant ex-
planatory variables for prediction purposes.

One of the desirable final products of analysis is the delineat-
ion on the map, of housing submarkets according to the degree
of housing substitutability in terms of price, rent, P.I.T.,
type, size, tenure and location. If the methodology proves to
provide a valid and enlightening framework for housing analysis,
periodic surveys would serve to check the accuracy of the pre-
dictions, and establish a basis for intertemporal comparisons,
thus converting the rather static analytical framework into a
dynamic housing market model.

III. MACRO-MICRO FRAMEWORK

The Macro-Micro Framework is an integration of both the Stock
Flow and Submarkets Approaches in an attempt to analyze, in
aggregate and in part, the structure and performance of the
housing markets. This approach is rather comprehensive and its
methodology is premised upon maintaining a balanced demand-
supply relationship.

The total housing picture is abstracted graphically into four
interrelated sectors. Statistics on population and housing
characteristics are presented in the format as shown in Diagram 6.

The demand "quadrant" shows the income distribution of house-
holds which are classified by age of household head, type of
household, incidence of overcrowding, type of tenure, and ratio
of housing cost to income. Housing conditions of an income group
are evaluated and the extent of physical and/or financial needs
are assessed in the manner as depicted in Diagram 7.

The ability to pay "quadrant" 1/ compares the existing rent/P.I.T.
(principal, interest and taxes) to income ratios (R/Y) of the
income groups with the socially acceptable or politically

1/ The ability to pay notion must be differentiated from will-
ingness to pay as discussed in the section on the Submarkets
Approach. Some households may prefer better housing (e.g. home-
ownership) to luxurious automobiles and are therefore willing
to spend more than say 30% of their income on housing.

number of
households

number of
households

demand = supply

MARKET

DEMAND

45°

number of dwelling units

gross annual income

rent,
P.I.T.

rent,
P.I.T.

R/Y = 25%

R/Y

SUPPLY

ABILITY TO PAY

number of dwelling units

gross annual income
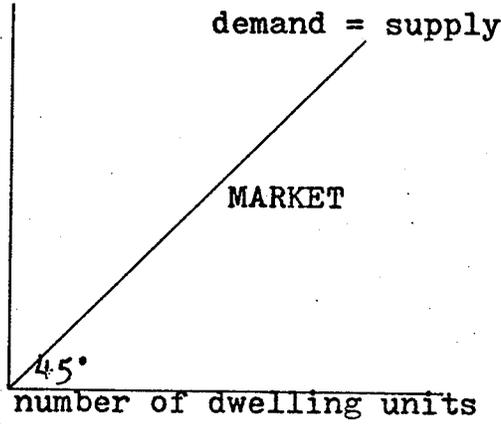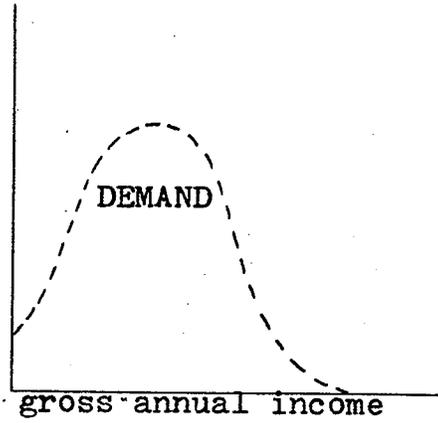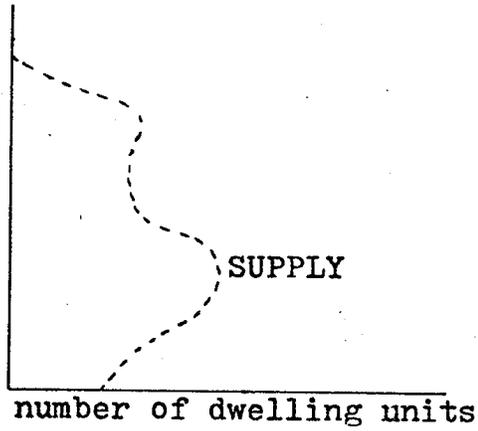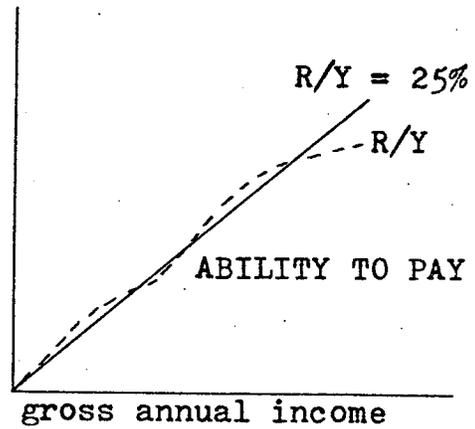
Diagram 6   MACRO-MICRO FRAMEWORK

Diagram 7

number of
households

DEMAND

X   gross annual income

income group 'X'

1	2	3	4	5
64+	F		o r	
	N		r	
50-64	F		o r	
	N		r	
40-49	F		o r	
	N		o r	
30-39	F		o r	
	N		o r	
20-29	F		o r	
	N		o r	
under 20	F		r	
	N		r	

financial
housing need

physical
housing need

number of
households
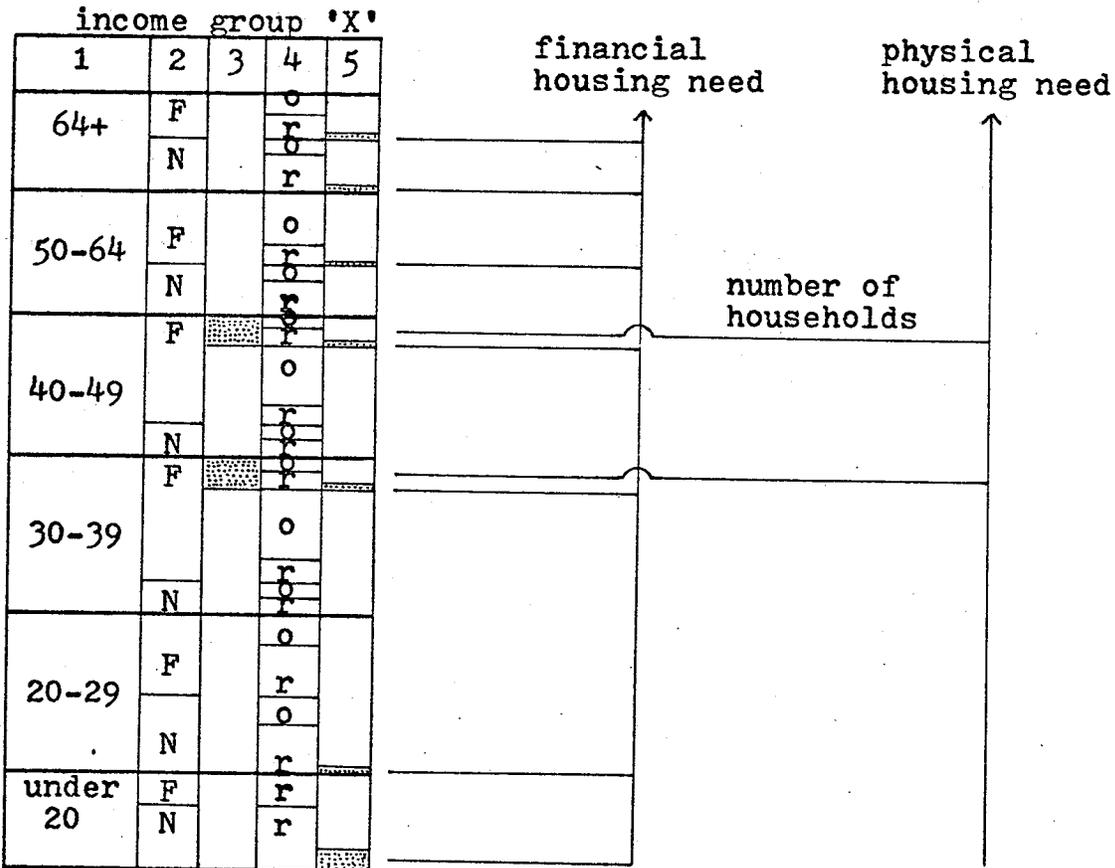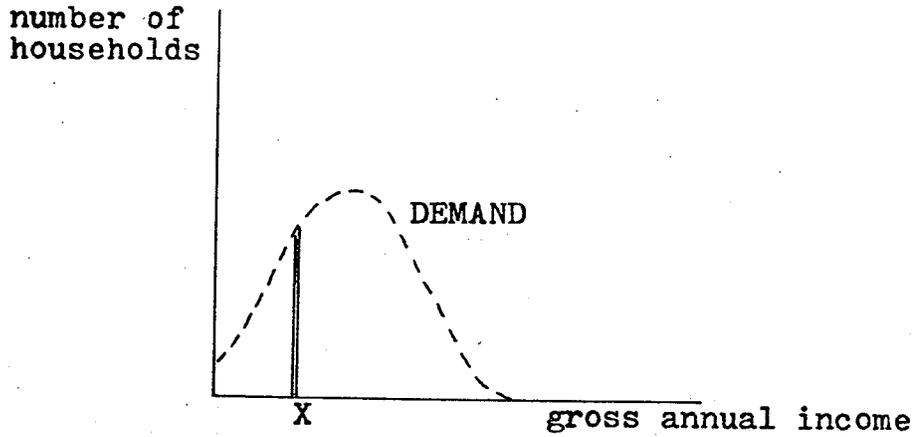
Key: 1 — age of household head
      2 — type of household (F--family or N--non-family)
      3 — incidence of overcrowding (over 2 persons/bedroom or
          doubling up)
      4 — type of tenure (o--owned or r--rented)
      5 — ratio of housing cost to income (R/Y 25%)

Note: Housing indicators 3 and 5 are similiar to the "crowding
      index"(number of persons per room) and "rent(or value) per
      room as a percentage of household income" as proposed by the
      Economic Council of Canada in its 7th Annual Review, 1974.

determined level. This reasonable level of R/Y usually lies
somewhere between 22% and 30% of one's gross income, depend-
ing on his income level and the cost of living in his community.
Any divergence between the existing R/Y and the ideal R/Y at the
upper income levels, however, should not warrant as much attent-
ion as the R/Y gaps at the lower end of income scale. Since the
progressive income tax structure leaves more disposable income
for families with children than families with no dependent in
the same income group, R/Y will not be adjusted for variations
in family size.

The supply "quadrant" displays the number of existing housing
units by rent/P.I.T. (price), tenure, type, size, quality and
location. 1/ The mix of housing is illustrated in Diagram 8.
When the availability of housing is analyzed with the demand
and the ability to pay for housing, shortages of housing if
any at affordable levels of rent/P.I.T. for some income groups
will surface. There may be a surplus of housing at certain
higher rent/P.I.T. levels, however they are useless in over-
coming shortages in the lower end of the shelter cost scale.

If it is assumed that both financial and physical needs can be
fulfilled and eliminated by increasing the households in need
their ability to pay for housing, the rent/P.I.T. structure of
the housing mix by geographical area is the only significant

1/ An index measuring the quality of Canada's housing stock
   is contained in Patterns of Housing Quality by J.S.Kirkland
   of C.M.H.C., 1972.

rent,
P.I.T.

SUPPLY

A

number of dwelling units in locality A

housing mix

owned or rented

publicly assisted   private

flow   stock   flow   stock

sf mf   sf mf   sf mf   sf mf

2,3,4 1,2,3 2,3,4 1,2,3   2,3,4 1,2,3 2,3,4 1,2,3
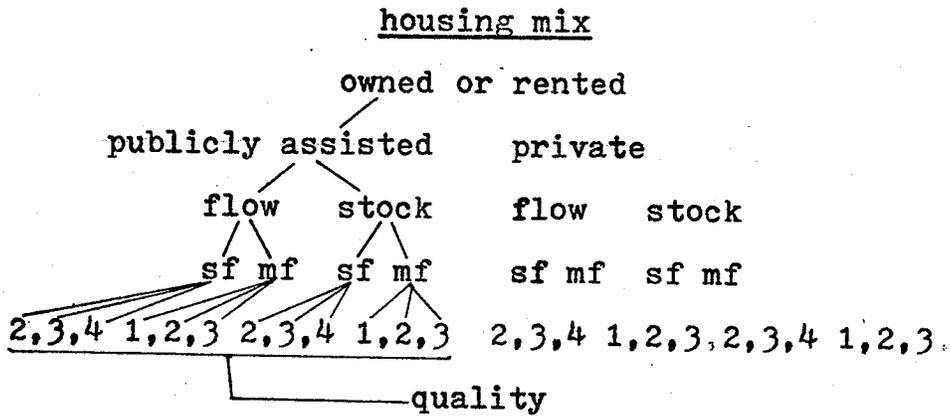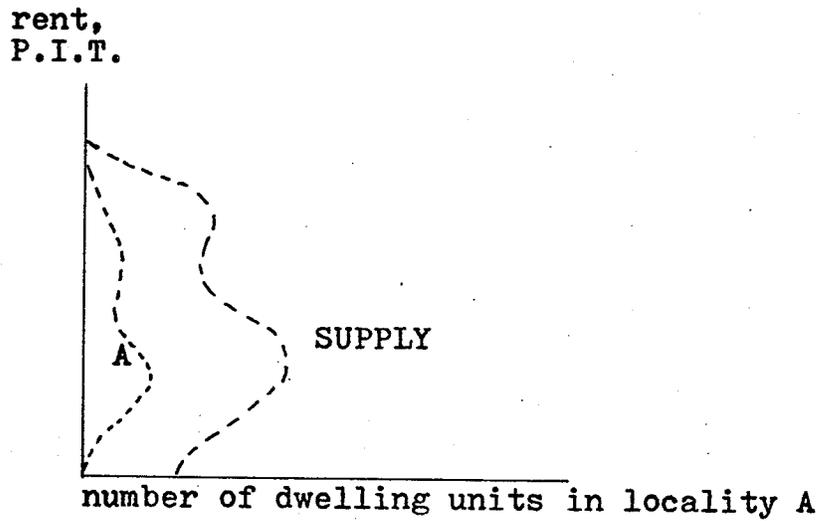
quality

Key: sf — single family house types
     mf — multiple family house types
    2,3 — number of bedrooms

Note: housing quality is ranked by characteristics of safety,
      health, convenience and comfort under three major head-
      ings, housing facilities, structural condition, and
      neighbourhood environment.

Diagram 8   QUANTITATIVE & QUALITATIVE MIX OF HOUSING

variable in the supply quadrant. Cross-classification of house-
hold characteristics by dwelling characteristics can therefore
be abstracted.

The market "quadrant" matches the total demand against the
total supply of available housing units. Demand equals supply
when they meet along the 45° line. In order to allow for house-
hold formation, undoubling, residential mobility and replacement
of demolitions, the point of junction of demand and supply
should ideally be located to the right of the 45° line.

This Macro-Micro Framework, as its name suggests, can be applied
to analyze a housing market of any size. Statistics at the neigh-
bourhood or micro level can be aggregated for an overall view
of the total housing market condition, thus satisfying Grigsby's
requirement for housing market analysis — to see the whole
and its parts at the same time.

By examining the four sectors of this housing model, physical
as well as financial housing needs and the target groups can
be identified. The model thus provides a rational basis for
the formation of government housing policies and programs, and
for the allocation of funding.

In the event that effectiveness and impact of the housing pro-
grams have to be evaluated, statistics on the number of house-
holds classified by income and by government housing programs

is required for the demand quadrant. Other pertinent informat-
ion needed are income qualifications or cost of housing to
income ratios under the various programs in the ability to pay
quadrant; the number and characteristics of public and publicly
assisted housing in the supply quadrant; and the volume of
public and publicly assisted housing in the market quadrant.
See Diagram 9. Effectiveness of the housing programs or im-
provement of the target groups' housing condition can then be
assessed by reviewing the number of households occupying the
public housing stock and the target groups' R/Y ratios a year
or two after implementation of the programs.

The success of this framework in housing market analysis de-
pends on the availability of population and housing statistics
in the specified format. Unfortunately the inadequacy of housing
data and the insufficient depth in cross-tabulating household
characteristics have thwarted application of this approach.

A somewhat simplified version of this framework was introduced
by the Vancouver City Planning Department in its Quarterly
Review, May, 1974. The sales sector of the Vancouver housing
market as shown in Diagram 10 is represented by two distribut-
ion curves, one showing house price and the other, household
income expressed in terms of a 25 year, 10% mortgage (if one-
quarter of income is for mortgage payments). The superimposition
of these two curves determines the number of households that
are able to buy houses and the number that are not able to

number of
households

number of
households

D = S

MARKET

NHA

45°

number of dwelling units

DEMAND

NHA

gross annual income

rent,
P.I.T.

rent,
P.I.T.

ph ld ahop

R/Y = 25%

R/Y

ABILITY TO PAY

SUPPLY

NHA

number of dwelling units

gross annual income
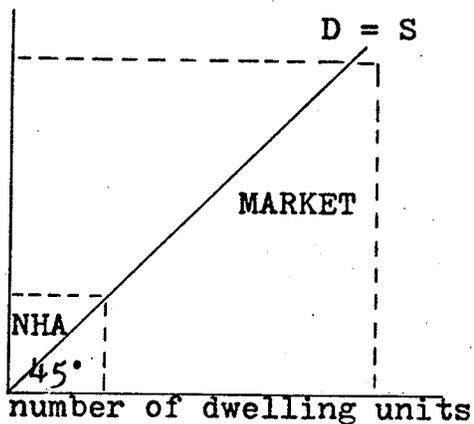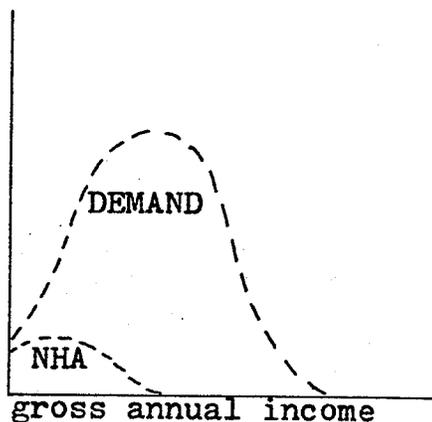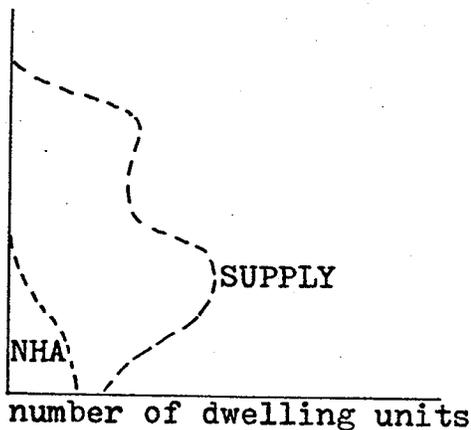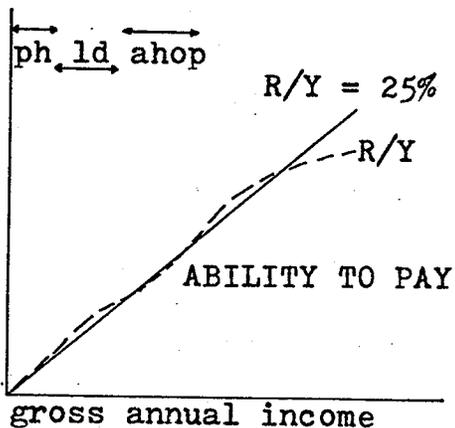
Key: ph — public housing
     ld — limited dividend
   ahop — assisted home-ownership

Diagram 9 GOVERNMENT HOUSING POLICIES AND PROGRAMS AT WORK

enter the sales market. These households occupy the areas labelled C and A in the diagram.

Diagram 10
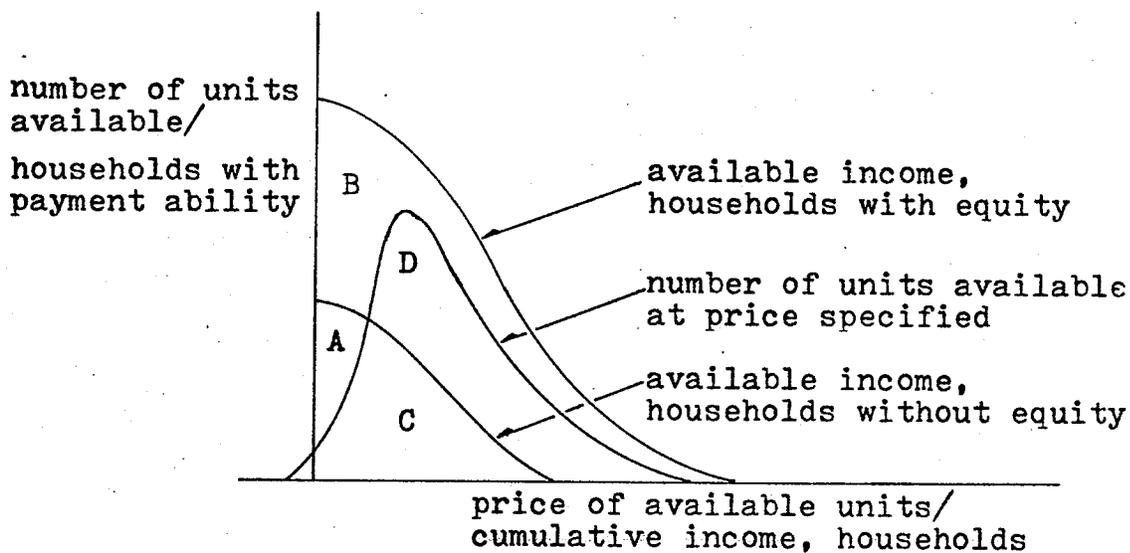
Source: Vancouver City Planning Department,
Quarterly Review, May,1974, p.19.

As house prices increase, the house price distribution curve will shift to the right. If household incomes increase at a lesser rate, the area of superimposition of the two curves will become smaller. This means that fewer families will be able to buy a home. Those who can barely afford a house must then buy one with less value, relative to the whole distribution of available dwellings.

For people entering the sales market for the first time, there

is the problem of down payment required, especially in time
of tight money supply. That is why so many households are
being priced out of the sales market by the decreasing loan
to value ratio and the increasing downpayment requirement.

The curve of available income of households with equity theo-
retically takes into account also the equity in the sold pro-
perty. The Vancouver City Planning Department is attempting
to quantitatively describe this curve by assigning particular
equities in properties known to have been sold to the income
group of the household who, in all probability, sold it. When
this curve is superimposed on the curve of available units by
price, it defines area B and D which represent the potentially
unsatisfied market to households even with equity, and the
market only accessible to households with equity at the time
of purchase, respectively.

Although this approach can produce an abstraction of the over-
all sales market in an urban area, policy implications are
vague and attempts are being made by the staff of the depart-
ment to define or identify those groups of people who are
affected by rising dwelling prices, from those affected only
to a small extent to those being excluded from the housing
market altogether.

IV. ECONOMETRIC MODELS

Econometric models are economic models using statistical
methods to quantify relationships between variables. With the
growth in computer technology and the availability of ready-
made "debugged" programs, many econometric models are devel-
oped to test the practicability of theories explaining the
workings of housing markets. Relevance or significance of
explanatory factors (or independent variables) are determined
in the testing process. Responsiveness of dependent variable
to a change in an independent variable is also calculated for
prediction purposes.

Whenever several variables act in common to produce a single
result, multiple regression can help to disentangle their
seperate effects. It is therefore the most commonly used
technique in econometric models. A multiple regression equation
is usually presented in the following form :

$$Y = a + b_{Y1.23}X_1 + b_{Y2.13}X_2 + b_{Y3.12}X_3$$

Where a is the constant or Y intercept and $b_{Y1.23}$, $b_{Y2.13}$,
and $b_{Y3.12}$ are the regression coefficients. In this equation
there are four variables —— one dependent (Y) and three in-
dependent (X_1, X_2, X_3). The regression coefficients indicate
the unit change in Y associated with a unit change in X, all
other independent variables included in the analysis being
held constant. This is implied by the subscripts associated
with each regression coefficient, for $b_{Y2.13}$ means "the slope

between Y and X_2 with X_1 and X_3 held constant". A multiple regression coefficient (R) can be calculated, and a multiple coefficient of determination (R^2), to show the closeness of the relationship between the dependent variables and independent variables taken together.

Since it is the validity of this method or approach that is relevant to us, one of L. B. Smith's models of the Canadian housing market is presented here. 1/ However it should be noted that econometric results of his other model 2/ complement findings of the stock adjustment model as presented below.

STOCK ADJUSTMENT MODEL

The general form of the housing stock adjustment model constructed by L. B. Smith is as follows :

$$(HS/fam)_t = Nf(Yd/fam, Pn/Pgne, rm, rm - rb, CMHC)_t - N(Sh/fam)_{t-1}$$

The per family demand for new housing starts $(HS/fam)_t$ is satisfied in any quarter t if the desired stock in quarter t equals the actual stock $(Sh/fam)_{t-1}$ at the beginning of any quarter. It is the stock adjustment required to eliminate the gap between the desired and actual stock of houses. The desired stock is expressed as a function of per family permanent real disposable income (Yd/fam), the price of new houses relative

---

1/ Smith,L.B. <u>Housing in Canada : Market Structure and Policy Performance</u>, CMHC, Ottawa, 1971, pp.50-53, pp.55-63.

2/ Smith,L.B. <u>Housing and Mortgage Markets in Canada</u>, Bank of Canada Staff Research Study No.6, Ottawa, 1970.

to the price of alternative goods and services (Pn/Pgne), the cost of mortgage credit (rm), the availability of private mortgage credit, represented by the yield spread between mortgages and bonds (rm - rb), and the volume of direct CMHC mortgage lending (CMHC).

The estimated housing start regressions are presented in the following equations using quarterly observations, 1957-1967.

$$(HS/fam)_t = .089 - .0050S_1 + .0017S_2 + .0023S_3 + .0019WW$$
$$(3.72)\ (11.85)\quad (4.13)\quad (5.02)\quad (2.48)$$

$$- .00286rm_{t-1} + .00174(rm-rb)_{t-1} + .0000034(\frac{CMHC}{Ph})_t$$
$$(5.45)\quad\quad (2.91)\quad\quad (.97)$$

$$+ .0000063(\frac{CMHC}{Ph})_{t-1} + .032(Yd/fam)_{t-1} - .021(Pcn/Pgne)_{t-1}$$
$$(1.78)\quad\quad (3.74)\quad\quad (3.25)$$

$$- .082(Sh/fam)_{t-1}$$
$$(3.03)$$

$$1Q57 - 4Q67,\ R^2 = .94,\ \bar{\bar{R}}^2 = .74,\ SEE = .00079,\ DW = 2.31$$

$$(HS/fam)_t = .054 - .0051S_1 + .0016S_2 + .0019S_3 + .0020WW$$
$$(2.18)\ (11.03)\quad (3.44)\quad (3.80)\quad (2.25)$$

$$- .00199rm_{t-1} + .00174(rm - rb)_{t-1} + .0000028(\frac{CMHC}{Ph})_t$$
$$(3.08)\quad\quad (2.55)\quad\quad (.70)$$

$$+ .0000111(\frac{CMHC}{Ph})_{t-1} + .019(Yd/fam)_{t-1} - .013(Ph/Pgne)_{t-1}$$
$$(3.23)\quad\quad (2.14)\quad\quad (1.41)$$

$$- .044(Sh/fam)_{t-1}$$
$$(1.59)$$

$$1Q57 - 4Q67,\ R^2 = .93,\ \bar{\bar{R}}^2 = .68,\ SEE = .00089,\ DW = 1.93$$

HS   - Total housing starts in thousands of units

fam   - Number of families in thousands

t   - Time period

Yd/fam - Permanent real family disposable income in mill-

ions of dollars per thousand families

Pn - New NHA home price index (1957 = 100) calculated

as the average selling price of new NHA single

detached, semi-detached, and row dwellings for

owner occupancy

$Pgne$ - Implicit private GNE deflator (1957 = 100)

rm - Average mortgage interest rate

rb - Average bond interest yield

CMHC   - Volume of direct CMHC lending in millions of dollars

Sh - Total stock of housing units in thousands

Pcn - Index of the cost of new NHA homes (1957 = 100)

for new single detached NHA dwellings

Ph - Housing price index (1957 = 100) calculated as an

average of an index of multiple listing service

sales and an index of the cost of new NHA houses

S_1, S_2, S_3 - Seasonal dummy variables for the first second, and

third quarters respectively

WW   - Winter housebuilding incentive program dummy

variable, taking the value one in the last quarters

of 1963 to 1965 and zero elsewhere

After calculation of housing stock adjustment or stock demand

elasticities 1/ with respect to 1) permanent family disposable income, 2) relative price of houses, 3) mortgage rate and, 4) credit availability proxy, Smith stated his conclusions in summary form as follows : 2/

1. If one accepts a stock adjustment model as appropriate (that is, a constant speed of adjustment), housing stock has a speed of adjustment of between .17 and .29 (an average of approximately .23). This means that sufficient housing starts to eliminate half the gap between the desired and actual stock of houses occur in approximately two and three-quarter years. If we assume an average construction period from start to completion of just over six months, approximately three and one-quarter years are required to reduce half of the discrepancy and just under six years are required to reduce three-quarters of the discrepancy between the desired and actual stock of houses.

2. The equilibrium per family stock demand elasticity for houses with respect to permanent family disposable income is approximately .50, and the impact elasticity (one-quarter) is approximately .04.

1/ Elasticity refers to relative responsiveness of one variable (e.g. housing stock demand) to change in another variables (e.g. mortgage rate); in other words, the percentage change in the former variable resulting from a 1 percentage change in the latter. When the coefficient of elasticity equals one, demand has unity elasticity. If the coefficient is greater than 1, demand is said to be elastic. Finally, if the coefficient is less than 1, demand is inelastic.

2/ Smith,L.B. Housing in Canada : Market Structure and Policy Performance, op.cit. pp.62-63.

3. The equilibrium per family stock demand elasticity for
    houses with respect to the relative price of houses
    (Ph/Pgne) is approximately -.25 and the impact elasticity
    (one-quarter) is approximately -.016.

4. The equilibrium per family stock demand elasticity with
    respect to the mortgage rate is between -.21 and -.27,
    and the impact elasticity (one-quarter) is between -.012
    and -.017.

5. The equilibrium per family stock demand elasticity with
    respect to the credit availability proxy (the mortgage-
    bond yield differential) is between .027 and .050, and
    the impact elasticity (one-quarter) is .0022.

These regression coefficients and the coefficients of elast-
icities are estimates of the relationship between variables
and provide the basis for predictions, for example of the
effect of mortgage rate variations on housing starts. This
kind of econometric model is therefore particularly helpful
in formulating and evaluating housing policies.

V.   FORCASTING TECHNIQUES

In addition to regression analysis and coefficients of elasticities, there are other techniques and indicators which may be used for purposes of forecasting housing demand, housing supply and performance of housing market. In what follows, objectives and procedures of some major forecasting techniques are outlined.

Forecasts of housing demand and supply may have many purposes depending on their use by the various organization and individuals having an interest in housing as consumers, public authorities, investors, building industry, and firms producing equipment and facilities for dwellings.

A.   HOUSING DEMAND

In the case of housing demand forecasts, information on probable demand behaviour of households and their housing preferences can be used by producers and investors in their decisions regarding the volume of house building, and by public authorities for taking measures to regulate the housing market in accordance with their housing policies. [1]

The basic components of housing demand for forecasting are population, net household formation, household characteristics

[1] United Nations, Economic Commission For Europe, Housing Requirements and Demand : Current Methods of Assessment and Problems of Estimation 1973.

(e.g. age of head, family size), and household income.
Projections of these components (under a certain set of
assumptions of future rents/prices, housing supply, price
elasticity of housing demand, and general economic conditions)
may indicate the quantitative and qualitative housing require-
ments at various income levels.

Current methods of projection applicable to an area experienc-
ing growth in population include : extrapolation of past trends
of population growth, lines of extrapolation may be modified
according to basic assumptions on socio-economic determinants
of the population growth; cohort analysis (i.e. estimation of
future age-sex composition of population on the basis of
current age-specific survival rates and fertility rates); and
extrapolation of marriage rates, growth rates of non-family
households and net migration as a basis for estimation of
net household formation during a certain time period. 1/ Since
recent trends of family size and non-family
household size in major population centres indicate a steady
decline, the current average household sizes are usually
considered acceptable for calculating future dwelling size mix.

Estimation of distribution of households by income intervals
and size, and by age of household head at a certain date in

1/ For estimates of household formation at sub-national levels,
   see Kirkland, J.S. Demographic Aspects of Housing Demand to
   1986, Staff Study, CMHC, 1971.

the future involves first of all, estimation of total income
of all households in a city under study on the basis of the
basic or export activities of the local economy, and then an
examination of past household income distribution patterns.
In the short-run, income distribution is a rather stable
phenomenon, although a gradual process of income redistribution
is going on, leading to the decrease of the proportion of the
lowest and highest income groups.

The statistics on households by size, and income combined with
assumptions on the ability to pay for housing, are then used
in forecasting the effective future demand for housing. The
extent of ineffective demand is also estimated in the process.
Income elasticity of demand for housing obtained from regression
analysis of historic data can be used to improve the reliability
of these demand estimates. The complexity of estimating future
housing demand is systematized by the following flow chart of
the basic parts in demand forecasting. See Diagram 11.

Estimates of future housing demand derived from applying the
above methodology should also include allowance for residential
mobility, existing housing shortages, and replacement demand
created by the number of dwellings which will become unfit
for occupation.

B. HOUSING SUPPLY

Forecasts of residential construction activities rely mainly

Diagram 11

Forecasts of the number of deaths of single, widowed and divorced men and women

Estimates of the number of elderly householders going to live as part of another household

Estimates and forecasts of flows between tenures

Dwellings being vacated by households due to death or other causes

Dwellings vacated by households that emigrate

Dwellings vacated by households moving from one house to another

New dwellings built

Total supply of dwellings in different types of tenure
1. Owner-occupied dwellings
2. Public rented dwellings
3. Private rented dwellings

Dwellings demolished for slum clearance, etc.

Vacancies

Total demand for different types of tenure
1. Owner-occupied dwellings
2. Public rented dwellings
3. Private rented dwellings

General level of rents and mortgage interest rates

New households formed

Households coming into the country

Households moving from one house to another

New households formed by marriage or remarriage

Decline in the number of married couples living as part of another household

New households formed by other processes, e.g. formation of one-person households by young people, divorced, etc.

Estimates of flows between tenures

Estimates of flows within the same sector, mostly for better accommodation

Rate of slum clearance

Changes in incomes

Changes in prices of accommodation

Improvements of houses

Income elasticities

Price elasticities

Source: United Nations, Economic Commission for Europe, Housing Requirements and Demand: Current Methods of Assessment and Problems of Estimation, 1973, p.32.

on econometric analysis of effects of variables such as mort-
gage interest rate on housing starts. However, econometric
models which are so time and energy consuming may not be
appropriate forecasting tools for builders and small planning
departments. A few simple "rules of thumb" are presented here
as aids to estimation of housing starts and housing completions.

"Since shifts in housing starts have both an immediate impact
on earnings and a delayed reaction on shelter standards," 1/
research attempts were made at the Prairie Regional Office of
the Central Mortgage and Housing Corporation to come up with
proven procedures for forecasting housing starts and complet-
ion in the five major prairie centres (namely Winnipeg, Sask-
atoon, Regina, Edmonton and Calgary). Successful and reliable
forecasting will certainly lead to more effective policy
planning in the field of housing.

After examination of historic data on the flow supply of
housing, it was discovered that the housing inventory of
builders (i.e. total number of units under construction and
units newly completed and unoccupied) at time t is inversely
related to the number of housing starts registered in the
same time period. An explanation for this relationship is that
builders may require sale of units built before they can re-
finance construction of more new units. In periods of

1/ Maisel,S.J. "A Theory of Fluctuation in Residential Con-
   struction Starts", American Economic Review, June, 1963,
   p.360.

exceptionally tight money and/or economic recession, absorption of newly completed housing units however may not lead to housing starts at a level as indicated by the past trends or the inventory-starts relationship. It is therefore concluded that the use of this rule of thumb requires also knowledge of the state of the economy, and of the trends in city planning.

In time of housing shortages, what most politicians and public officials concern about in housing is the volume of housing starts. "Once the start has commenced, concern ends" [1] Seldom does the length of housing construction or the number of completions receive the same amount of attention except when prolonged material shortages or strikes are making headlines in the news. Since forecasts of housing market performance require estimation of housing supply, ways of estimating number of completions are investigated.

Completions of single detached, semi-detached and duplex units can be assumed to be an exact function of starts six months earlier. Although housing units started in winter months generally take longer time to finish, six months appear to be the average length of construction for this type of housing. Completions of row and apartment units can be estimated on the basis of the size of the project, i.e. the more units are

[1] Dennis and Fish, _Programs in Search of a Policy_, Hakkert, Toronto, 1972. p.4.

involved, the longer the length of construction will be. This correlation between size and length of construction can be extracted from the registry of dates of starts and completions of multiple family housing projects already on the market. 1/

A simpler way to forecast completion of one and two family units is to shift the curve showing number of housing starts six months forward to the right on the time axis to indicate monthly completions in the coming six months. If ten to fifteen months appear to be the average length of construction for multiple family units, then the curve showing row and apartment starts can similarly be shifted ten to fifteen months forward to show monthly or quarterly volume of completions within that period.

C. HOUSING MARKET PERFORMANCE

There are a few housing market indicators that govern the rate of residential construction. An example is the apartment vacancy rate. A decrease in the vacancy rate (multiplied by the apartment vacancy survey universe) indicates reabsorptions of existing unoccupied units, while an increase in vacancy rate means more vacant units of the existing stock and the newly completed and unoccupied units that are more than six months old. Normally, housing starts will increase if the housing market is tight, and slacken when the vacancy rate is high.

1/ Advancements in building technology have not shorten the
   length of construction of single family homes to a notice-
   able extent.

If housing demand as indicated by the current low vacancy
rate is confronted with little or no completions (i.e. flow
supply), an even lower vacancy rate can be expected. More
reabsorptions in the existing rental market will take place
as there will be limited flow supply in the new rental mar-
ket. Statistics on absorptions and reabsorptions in the five
prairie centres indicate an inverse relationship between
absorptions and reabsorptions. In other words, high levels of
absorption are associated with low levels of reabsorptions
and low levels of absorptions are compensated by high levels
of reabsorptions. See Diagram 12. The line YY (budget line)
and II (indifference curve) in the diagram need to be researched
further before their use in housing market forecasts can be
finalized.

Diagram 12
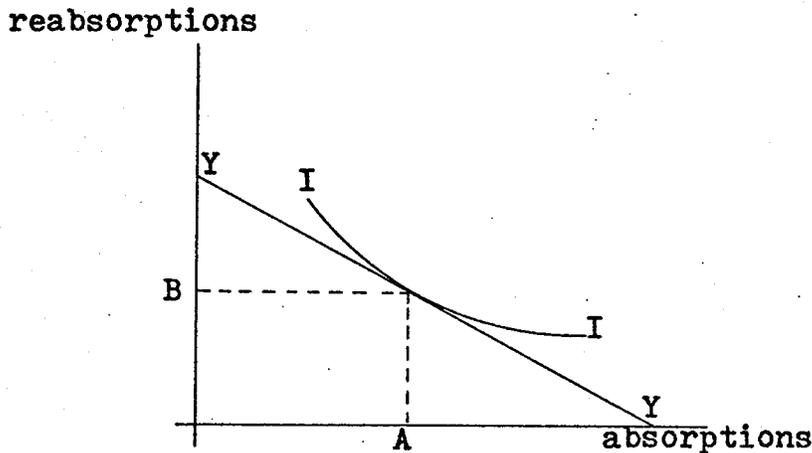
A + B = total demand for apartments
    YY - "community's budget line for apartment consumption"
    II - "community's decision or preference"

If the current level of effective housing demand in the apartment rental sector as represented by the vacancy rate is known, the number of new units to be put on the market during the coming six months will serve to indicate the level of vacancies at the end of the six month period. Predictions of vacancy rates can then be incorporated into estimation of housing starts to enhance the reliability of the whole forecasting procedure.

VI. THRESHOLD ANALYSIS

The preceeding methodologies deal mainly with housing demand and supply and the housing condition of the population, and little has been said about the physical limitations to the supply of housing. Threshold analysis is concerned with such limitations to housing developments. [1]

Housing supply is generally expressed as a function of cost and availability of money, land, labour and building materials. However, threshold or maximum capacity of a municipal service, such as water supply or sewage treatment, can exert pressure thwarting residential construction when the water or sewage treatment plant in question is already operating at full capacity. Capital investment and time are needed for the expansion of the plant before the service can be provided to the marginal subdivision. It is therefore necessary for developers/builders to find out in the planning stages if their servicing requirements can be met by the municipality in which housing developments are to be located.

Since it is the responsibility of city planning authorities to forecast future demand for developable land and municipal

---

[1] See Hughes, J.T., and Kozlowski, J. "Urban Threshold Theory and Analysis", Journal of the Town Planning Institute, Vol.53, 1967, pp.55-60. and "Threshold analysis — An Economic Tool for Town and Regional Planning" Urban Studies, Vol.5, 1968, pp.132-43.

utilities and to make steps to meet those needs, threshold analysis provides the analytical framework necessary for urban development planning.

This method calls for firstly, identification of the physical limitations to urban development and secondly, calculation of the costs required for expansion of public services and utilities. It may be necessary for planning authorities to compare the costs of improving the infrastructure with the benefits of urban growth so that planning of new residential development can be made to conform to the criteria of optimal city size, 1/ and any adopted regional development plans.

Fiscal squeeze at the municipal level of government is a manifestation of the onset of development threshold. As municipal revenues cannot keep abreast with rising expenditures on municipal services, a readily available solution is to slow down or to restrict urban growth. This causes delays in the approval of proposed housing developments, and contributes to escalation of housing costs and land prices. Threshold analysis

1/ An optimal city size is the population level where marginal socio-economic benefits (of agglomeration economies) are equal to marginal socio-economic costs of urban problems. See Duncan, O.D. "Optimum Size of Cities" in Hatt & Reiss, eds. Reader in Urban Sociology, for a list of criteria used in determining an optimum city size. A comprehensive summary of studies investigating the existence of economies of scale in cost functions for local public services (such as education, police and fire protection, gas, electricity, refuse collection, and sewage plants) is provided by W.I.Hirsch "The Supply of Urban Public Services", in Perloff & Wingo Jr. (eds.) Issues in Urban Economics, Johns Hopkins, 1968.

thus offers insights into the obstacles to housing supply,
and it may well be a more realistic approach to forecasting
housing supply and the maximum number of housing units that
can generate enough tax revenues to justify their development. 2/

2/ See Sternlieb, G. et.al. Housing Development and Municipal
  Costs, Center for Urban Policy Research, Rutgers University,
  N.J. 1973.

FOUR. A HISTORICAL PERSPECTIVE OF THE STRUCTURE AND
       PERFORMANCE OF THE HOUSING MARKET IN WINNIPEG,
       1961 - 1973

The following is a housing market profile of Metropolitan
Winnipeg, prepared for the Prairie Regional Office of CMHC
in the summer of 1973. Given the statistics that were available,
the structure and performance of the housing market in Winnipeg
from 1961 to 1973 were analyzed within the stock flow frame-
work. Housing market indicators were developed to show the
relationships between demand and supply of housing. However,
analysis of aggregate data seldom can develop the needed hou-
sing policies and programs at the neighbourhood level.

I. POPULATION AND HOUSING CHARACTERISTICS

Metropolitan Winnipeg comprises 54.7% of Manitoba's total
population in 1971 compared to 51.6% in 1961. Total population
for the Metropolitan area has increased in absolute terms at
a near constant rate during the census period from 1961 to
1971 (1961 - 1966 = +32,770; 1966 - 1971 = +31,503). See
Table 1.1. As indicated by the total provincial growth rate
of 41,380 and 25,181 for the same time periods, Winnipeg is
continuing to be a major growth centre in Manitoba.

The process of urbanization, i.e. the shift of population from
rural areas or smaller centres to metropolitan areas, together

with the post-war baby boom which is now having its greatest
impact in the housing market, have contributed to an accele-
rated demand for new housing space. As shown in Table 1.1
and its corresponding Charts 1.1.1 and 1.1.2, the age groups
which have been growing more rapidly are the younger married,
the single, and the senior citizens of the population.

The number of family formations in Winnipeg was 10,120 between
1961 and 1966, and 12,228 from 1966 to 1971. It includes new
families formed by marriages, undoubling and in-migrated fam-
ily households. The number of non-family households formed
showed a higher rate of increase from 7,208 in the 1961-1966
period to 11,510 in the 1966-1971 period. The number of family
households as a percentage of the total number of households
declined from 86.2% in 1961 to 78.2% in 1971. Moreover, dur-
ing the inter-census period of 1961-1971, the average size of
family households decreased from 3.9 to 3.5 persons while that
of non-family households showed a reverse trend, 1.5 to 1.8.
(See Charts 1.1.3 and 1.1.4) All this explains partly the
growing preference of the housing population for rental
accomodation as indicated by the rising ratio of rental occu-
pancy to homeownership in Chart 6.1.3.

Housing statistics of the 1971 Census indicate a general
improvement of housing condition over 1961 and 1966. This is
evidenced by a decrease in the number of households sharing
accomodation and/or household facilities with other households,

overcrowded dwellings and the average number of persons per room. (See Table 1.1) Because of the ambiguity and subjectivity involved in the evaluation of the structural condition of dwellings by the occupants themselves, Census statistics on the quality of housing are not included.

Maps showing housing conditions can be found in the Detailed Area Plans. They were prepared by the Planning Department of Winnipeg on the basis of survey findings of exterior dwelling condition and realty tax assessment figures. Attempts to update these maps are being made by both the Planning Priorities Committee of Cabinet and the Planning Department of the City.

II.   SUPPLY OF HOUSING

A.   Flow Supply of Housing

On the supply side, annual new additions (or flow supply) of single family dwellings to the housing stock have been proportionately less than that of apartments (see Charts 2.1.1 and 2.1.2). The relatively inelastic supply of single family housing has been driving up prices in the rather tight sales market, making homeownership more difficult for an increasing number of family households.

Structural changes on the supply side, such as the artificial scarcity of serviced land and the resulting land price inflation, rising construction cost and the general inflation, have

thwarted private housing production of a qualitative composition and at a scale that could alleviate the demand pressure in the housing market, especially the sector of low cost housing for homeownership.

Table 2.2 shows the rising trends of the consumer price index and its housing component (which includes rental shelter and household operation only). From its base of 100 in 1961, the general consumer price index climbed to 135.5 in 1972, while the housing component index rose to 120.6 in 1972 from 100 in 1961.

The annual average selling price of new single detached dwellings financed under N.H.A. and sold by builders has been in the neighbourhood of $22,000 for the last five years. The annual average resale price of existing houses, however, has increased from $13,878 in 1967 to $19,579 in 1972. See Table 2.2. Prices of new dwellings for sale in the private market are not available for comparison, however recent experiences indicate prices are skyrocketing and most houses were sold in the range of $25,000 to $40,000.

The average down payment on new NHA single detached dwellings dropped from the 1969-1970 level of $4,300 to $3,400 in 1971 and 1972 (see Table 2.2) while the average gross debt service remained in the neighbourhood of $2,300. These cost movements are accounted for by the lowering of the NHA mortgage interest

rate (Chart 2.2.8) together with the 1972 amendments to the
National Housing Act.

In August 1972, the maximum NHA loan for single-detached, semi-
detached and family row-housing units was raised from $25,000
to $30,000 for new construction. The loan ratio was set at
95% of lending value. In addition, the calculation of a
borrower's income now includes a portion or all of the spouse's
income in order to establish a gross debt service ratio of
30%, up 3% from the previous GDS ratio.

Since there is no residential construction input price index
for census metropolitan areas, average cost of new NHA financed
single detached dwellings as estimated by loan applicants,
either owners or builders, is used to show the rising trend
of land and construction costs (see Table 2.2). The average
estimated dwelling cost rose by $4,000 from $19,674 in 1968
to $23,691 in 1972, although there had been a reduction in
the average floor area of the units in response to a decline
in family size of the average NHA home purchaser. The average
land cost estimate increased from $4,160 to $5,190 in the
same time period while construction costs on a square foot
basis rose from $13.93 to $17.00. (See Explanatory Notes of
Table 86 on Page 98 of the Canadian Housing Statistics, 1972)
Land cost as percentage of the total dwelling cost estimate
however remained in the neighbourhood of 21% during the past
five years, indicating a rather constant relationship between

the two cost components, land and building.

B. Stock Supply of Housing

The lack of statistics of stock adjustment on an annual basis, i.e. the number of net additions to stock by conversions, poses a problem in calculating annual housing stock and consequently restricts stock flow analysis and market performance evaluation to be conducted only on an intercensual basis — 1956-1961, 1961-1966 and 1966-1971.

The following table outlines the different cases which may or may not require a conversion permit from the Planning Department. It can be seen that the registration of a conversion does not necessarily result in an addition to or a reduction in the housing stock.

III. HOUSING MONEY MARKET

The prices of money and alternative investment opportunities (with higher yield, shorter maturity and more liquidity) affect the cost and availability of mortgage credit to both the housing suppliers and consumers, and subsequently housing starts.

Mortgage interest rates, as well as bank rates and bond yields surged upward in the latter half of 1969 as a result of anti-inflationary policies, and reached their highest peaks in the

Dwelling Type	Activity	Converted Dwelling Type	Conversion and Building Permits	Census Definition	Change in Housing Stock
single detached	doubling up	single detached	no	1 dwelling unit — 1 household with 2 families	0
single detached	structural conversion	duplex	yes	2 dwelling units, 2 households	+
commercial building	dual use : commercial + residential	no change	yes	1 dwelling unit	+
any	dual use : residential + commercial	no change	yes	1 dwelling unit	0
rooming house	repossession by owner	single detached	no	1 dwelling unit	0
duplex	repossession by owner	single detached	no	1 dwelling unit	−

1969-1970 period. (See Table 3.1 and Charts 3.1.1-3.1.4) The rather tight money market situation depressed all types of housing starts except row and semi-detached units which in aggregate climbed to its all time high of 1,635 starts in 1970.

In times of general price inflation, restrictive fiscal and monetary policies appear to be incompatible with an expansionary housing policy which aims at stimulating housing demand and supply by extending easy and relatively low cost credit to both housing consumers and producers. However, the co-existence of high unemployment and inflation may require a selective control of credit, i.e. to curb excess demand and consumption of some other goods and services while ensuring adequate funds available at low enough interest rates for housing production and consumption.

With the expansion of the Assisted Home-Ownership Program which provides to those who qualify, an annual grant of $300 and a 95% loan to amortize in 35 years at 7 5/8% interest rate, the social-economic pressure for low cost mortgage loans and the rather tight housing money market can be relieved.

The role of government in the financing of new housing through CMHC is indicated by the ratio of NHA financed housing starts to conventionally financed housing starts (see Table 3.2). Non-NHA lenders had been responsible for a large position of new residential construction prior to 1970. The introduction

of four special housing programs by CMHC during 1970-1971 is
reflected by the ratio which rose from 0.63 in 1969 to 4.59
in 1972.

IV. URBAN LAND SUPPLY AND DEVELOPMENT

The map showing historical growth pattern in the Metropolitan
Winnipeg Development Plan serves to illustrate the spatial
configuration and age composition of all buildings and
structures established up to 1966. Land developments from
1966 to 1973 can be seen by comparing the aforementioned map
with the 1973 map of Winnipeg (prepared by Surveys, Mapping
and Lands Branch, Department of Mines, Resources and Environ-
mental Management, Winnipeg).

The ownership and availability of serviced or developable
land influence to a large extent the volume of new residen-
tial construction and price/rent structure of the new units.
The Planning Department has designated areas which will be
available for residential development in the next five years
as "A Areas", and areas that will be ready between 1978 and
1985 as "B Areas". Total acreage amounts to 2,170 in A Areas
and 8,450 in B Areas, making up a grand total of 10,620 acres.
A map showing the distribution of A and B Areas can be obtained
from the Planning Department.

The land ownership pattern is strongly in favour of large

developers/builders who hold 54% of A Areas and 24% of B Areas, while the city own 19% of A Areas and a meager 1% of B Areas. (See Table 4.1) In aggregate, large developers/builders control 30% of the residential land supply in the next ten years while the city commands only 5% of this land inventory.

The number of residential lots in January 1973 plus the number of serviced lots that are expected to be coming on the land market in 1973 yield a total of 3,380 lots, and they are selling in the range of $95 to $135 a frontage foot.

V.   ECONOMIC BASE

The measures in Table 5.1 are selected to indicate the performance of the local economy as it relates to demand for construction and residential development. In order to determine whether the local economy has been conducive to new residential construction and perhaps renewal activities, the following factors must be considered together with the cost and availability of land, building materials and money as discussed in previous sections.

1. The role and efficiency of the municipal government in the provision of services to new subdivisions;
2. The size of labour force and the rate of unemployment;
3. The level and distribution of household incomes.

An attempt was made to forecast future housing demand by

relating population growth to a 0.1 rise in the employment
index (of firms with 20 or more employees). If the 1966-1971
trend were to continue, an increase of 0.1 in the employment
index would represent a population growth of 543 people. How-
ever, a change in the mix of economic activities and demo-
graphic characteristics, e.g. population mobility, may in-
validate this method of housing demand projection.

VI.   PERFORMANCE OF HOUSING MARKETS

The strength of housing demand and the responsiveness of
housing supply in meeting demand are measured by the follow-
ing indicators:

1. Absorption Rate - defined as the number of new sales and
   rental units absorbed as a percentage of flow supply in a
   time period. The formulas for calculating absorption rate
   on a monthly, quarterly or annual basis are:

   a) Monthly Absorption Rate

   $$FS_2 = NC \text{ \& } U_1 + C_2$$

   $$A_2 = FS_2 - NC \text{ \& } U_2$$

   $$AR_2 = \frac{A_2}{FS_2} \times 100\%$$

   where FS = Flow Supply
         NC & U = Newly completed and unoccupied
         C = Completions
         A = Absorptions
         AR = Absorption Rate
         2 = of month 2

b)   Quarterly Absorption Rate

$$FS_{4,5,6} = NC \ \& \ U_3 + C_{4,5,6}$$

$$A_{4,5,6} = FS_{4,5,6} - NC \ \& \ U_6$$

$$AR_{4,5,6} = \frac{A_{4,5,6}}{FS_{4,5,6}} \ X \ 100\%$$

where 4,5,6 = of months 4,5, & 6

c)   Annual Absorption Rate

$$FS = NC \ \& \ U_{12 \ of \ y-1} + C_y$$

$$A_y = FS_y - NC \ \& \ U_{12 \ of \ y}$$

$$AR_y = \frac{A_y}{FS_y} \ X \ 100\%$$

where y = year y

12 of y-1 = of month 12 in a year prior to y

2.   <u>% Sales/Listings</u> - defined as the number of sales as a percentage of listings in a time period. The formulas for calculating the rate on a quarterly or annual basis are:

a)   Quarterly % Sales/Listings = $S_{4,5,6}/L_{4,5,6}$ X 100%

$$U_3 = L_3 - S_3$$

$$NL_4 = L_4 - U_3$$

$$L_{4,5,6} = U_3 + NL_{4,5,6}$$

where U = Unsold listings
      L = Listings
      S = Sales
      NL = Additions to Listings
      3 = of month 3
      4,5,6 = of month 4,5, & 6

b) Annual % Sales/Listings = S_y/L_y X 100%

$L_y = U_{12 \text{ of } y-1} + NL_y$

where y = year y

12 of y-1 = of month 12 in a year prior to y

It should be noted that not all houses are resold through the multiple listing service; some are sold through exclusive listings while others are transferred without going through real estate agents. The number of listings entered into the resales market may be reduced by being delisted, thereby lowering the number of net additions to the multiple listings service. Furthermore, sales of existing houses for redevelopment or other non-residential uses have to be taken into consideration when interpreting the sales/listings percentages.

3. <u>Quarterly Housing Market Transaction Rate</u> - defined as the total of absorptions and sales as a percentage of flow supply and listings over a three month period to measure the aggregate performance or tightness of the resales, new sales and new rental markets.

The above indicators are meaningful only when they are interpreted in conjunction with their base figures, i.e. total flow supply or listings in absolute terms. In other words, a high percentage does not necessarily infer a large volume of absorptions or sales.

4. <u>Apartment Vacancy Rate</u> - expressed by

$$\frac{\text{Vacancies}}{\text{Publicly \& Privately Initiated Apartments}} \times 100\% \text{ to indicate the tightness of the rental market.}$$

5. $\triangle$Starts /$\triangle$1000 Population - change in starts per 1000 increase in population between two census years.

6. $\triangle$Starts /$\triangle$1000 Households - change in starts per 1000 increase in households between two census years.

7. $\triangle$Completions /$\triangle$1000 Population

8. $\triangle$Completions /$\triangle$1000 Households

9. $\triangle$Absorptions /$\triangle$1000 Households

For market performance indicators (5)-(9), cumulative starts between, say 1961 and 1966, is calculated by adding one half of starts in 1961 and 1966 to starts between 1962 and 1965. Mobile units of the housing stock are not included in the calculations. The difference between values for indicators (8) and (9) yields the ratio of $\triangle$Newly Completed & Unoccupied /$\triangle$1000 Households for the same inter-census period.

The following ratios are attempts to quantify physical housing need on the assumption that each household should possess one dwelling unit. Overcrowding and the quality of housing are not considered because of the risk of double-counting and the lack of meaningful measures for housing quality.

10. <u>Occupied Dwellings/Households</u> - ratio of occupied
dwellings to number of households (derived by undoub-
ling households with two or more families).

11. <u>Housing Stock/Households</u> - ratio of total housing stock
to number of households.

In order to allow for household formation, undoubling, re-
sidential mobility and replacement of demolitions, market
indicators (6), (8) and (9) must show a value well above 1000,
while indicators (10) and (11) must be considerably higher
than 1.

12. <u>Rented/Owned</u> - ratio of rental occupancy to homeownership.

13. <u>Public Stock/Private Stock</u> - ratio of public to private
stock of housing.

Indicators, in particular (8), (9), (11) and (12) together
with the charts showing average prices of new and used houses,
household income distribution and the qualifying incomes under
the various government housing programs can explain to a large
extent the affordability or economic accessibility of housing.

As shown in Table 6.1, annual flow supply increased from 3552
units in 1967 to the record high of 8841 units in 1971 while
annual absorptions rose from 2945 to 8228 in the same period.
Although the flow supply of housing declined from its peak in
1971 to 7700 in 1972, the number of absorptions (7153) was

high enough to yield an annual absorption rate of 92.9%.
Since about half of the annual flow supply had been made up
of apartments prior to 1972 (see Table 2.1), absorptions in
the last four or five years were mainly that of apartments
in the rental market.

The number of listings entered into the resales market has
been on the increase for the last few years, from 3829 in
1968 to 5811 in 1972, signalling a combination of filtering
down, residential mobility, speculative profiteering and a
tight new sales market (see Table 6.2). Annual sales also
experienced a rising trend, up from 3662 in 1968 to 5520 in
1972. The fact that annual sales as a percentage of annual
listings remained in the neighbourhood of 95% indicates that
the resales market was rather tight during the 1968-1972 per-
iod. The new rental, sales and resales markets combined also
showed similarly high rates of housing market transaction,
around 95% during 1968-1972 except for 1970 when there was
a sharp increase in the flow supply.

The apartment vacancy rate stood at 1.5% between 1967 and 1969.
The tightness of the rental market prompted the supply side
to respond with a large injection of housing starts, particu-
larly of apartments which amounted to 6180 units or 68.44%
of all starts in 1969 (see Tables 6.1 & 2.1).

As shown by indicators (5) - (8) in Table 6.3 and Charts 6.3.2.

- 6.3.5, flow supply of housing increased at a faster rate than population growth and household formation over the two inter-census periods. The number of completions per 1000 increase in population during 1961-1966 was larger than that of the 1966-1971 period, suggesting a larger volume of household formation and dwellings under construction in the latter period.

Indicators (10) and (11) show improvement of housing supply in satisfying physical housing need (as defined earlier) between 1961 and 1971 (see Table 6.3) while the rising ratios of indicators (12) and (13) offer a partial explanation to this improvement of supply relative to physical housing need.

TABLE 1.1 — POPULATION AND HOUSING CHARACTERISTICS

		1961		1966		1971	
Total Population, Metro Area		475,989		508,759		540,262	
Province		921,686		963,066		988,247	
Sex		Male	Female	Male	Female	Male	Female
Age Group:	0–4	27,065	25,807	26,017	24,535	21,950	21,270
	5–9	24,672	23,536	26,208	25,271	25,430	24,360
	10–14	21,310	20,971	24,266	23,271	25,370	24,610
	15–19	16,119	17,267	21,628	23,144	25,185	25,690
	20–24	15,862	17,608	18,848	20,376	25,720	27,290
	25–29	16,851	16,286	15,547	16,015	20,390	19,995
	30–34	16,637	17,041	15,602	15,465	15,845	15,655
	35–39	17,005	18,562	15,563	16,519	15,255	14,980
	40–44	15,192	16,054	16,195	17,783	14,815	15,610
	45–49	14,044	14,977	14,532	15,599	15,465	17,145
	50–54	11,754	12,513	13,493	14,654	13,550	14,890
	55–59	9,599	9,948	11,076	12,048	12,670	14,320
	60–64	7,967	8,440	8,835	9,720	10,080	11,450
	65–69	6,799	7,587	6,855	8,012	7,810	9,345
	70–74	6,259	6,664	5,647	7,215	5,450	7,190
	75–79	4,383	4,554	4,403	5,282	4,090	5,795
	80–84	2,108	2,280	2,677	3,221	2,750	3,960
	85–89	794	921	1,071	1,363	1,455	2,150
	90–94	190	276	250	421	380	640
	95+	27	60	44	88	75	155
Population		234,637	241,352	248,757	260,002	263,750	276,512

	1961	1966	1971
Single Persons	223,480	244,666	251,245
Single Persons Aged 15+	80,119	95,098	108,250
Married	226,000	233,728	253,700
Widowed	24,419	27,801	29,195
Divorced	2,090	2,564	6,125
Average Number of Children (Family)	1.5	1.6	1.5
Average Number of Persons (Family)	3.9	3.9	3.5
Average Number of Persons (Non-Family Household)	1.5	1.4	1.8
Average Number of Persons (Household)	3.6	3.4	3.2
Total Occupied Dwellings	128,530	143,710	166,480
Single Detached	90,412	97,175	105,565
Single Attached	6,271	5,901	8,100
Apartment	31,666	40,442	52,465
Mobile	181	192	350
Owned	85,831	91,007	98,375
Rented	42,699	52,703	68,105
Total Households	128,532	143,710	166,665
Non-Family	17,692	24,900	36,410
One Family	105,597	115,717	127,945
Two or More Families	5,243	3,093	2,315
Average Number of Rooms/Dwelling	4.9		5.1
Average Number of Bedrooms/Dwelling	2.4		
Average Number of Persons/Room	0.73		0.62
Households with Exclusive Use of Flush Toilets	111,377		160,785
Households with Exclusive Use of Bath Or Shower	113,791		158,835

Chart 1.1.1   POPULATION AND AGE GROUPS

Population
(000)

Total
Population

500 —

400 —

300 —

200 —

0-19

20-3
40-6

100 —

65+

0 —

          61   66   71

CHART 1.1.2   AGE - SEX PYRAMID

| 95+ |
| 90-94 |
| 85-89 |
| 80-84 |
| 75-79 |
| 70-74 |
| 65-69 |
| 60-64 |
| 55-59 |
| 50-54 |
| 45-49 |
| 40-44 |
| 35-39 |
| 30-34 |
| 25-29 |
| 20-24 |
| 15-19 |
| 10-14 |
| 5-9 |
| 0-4 |
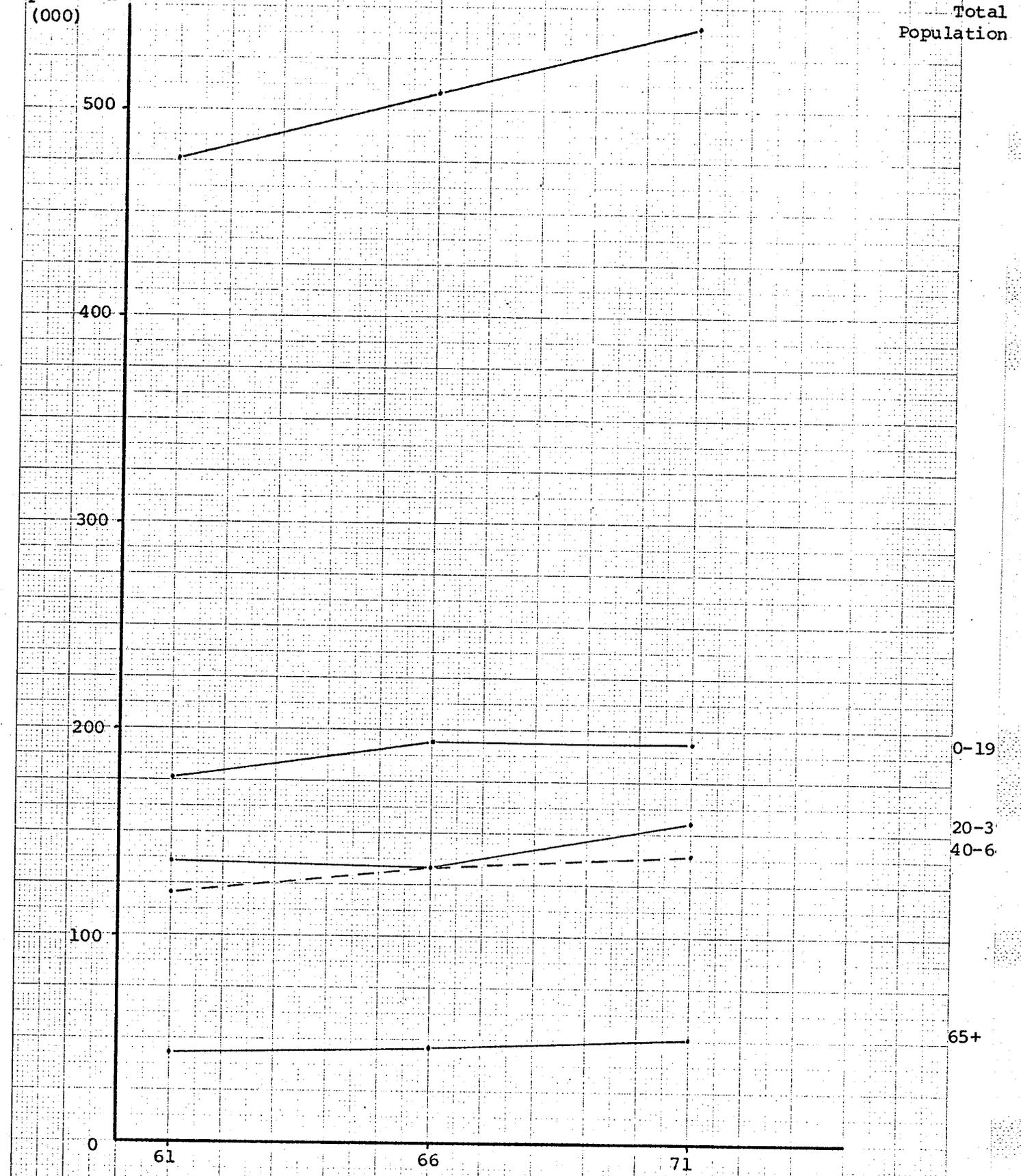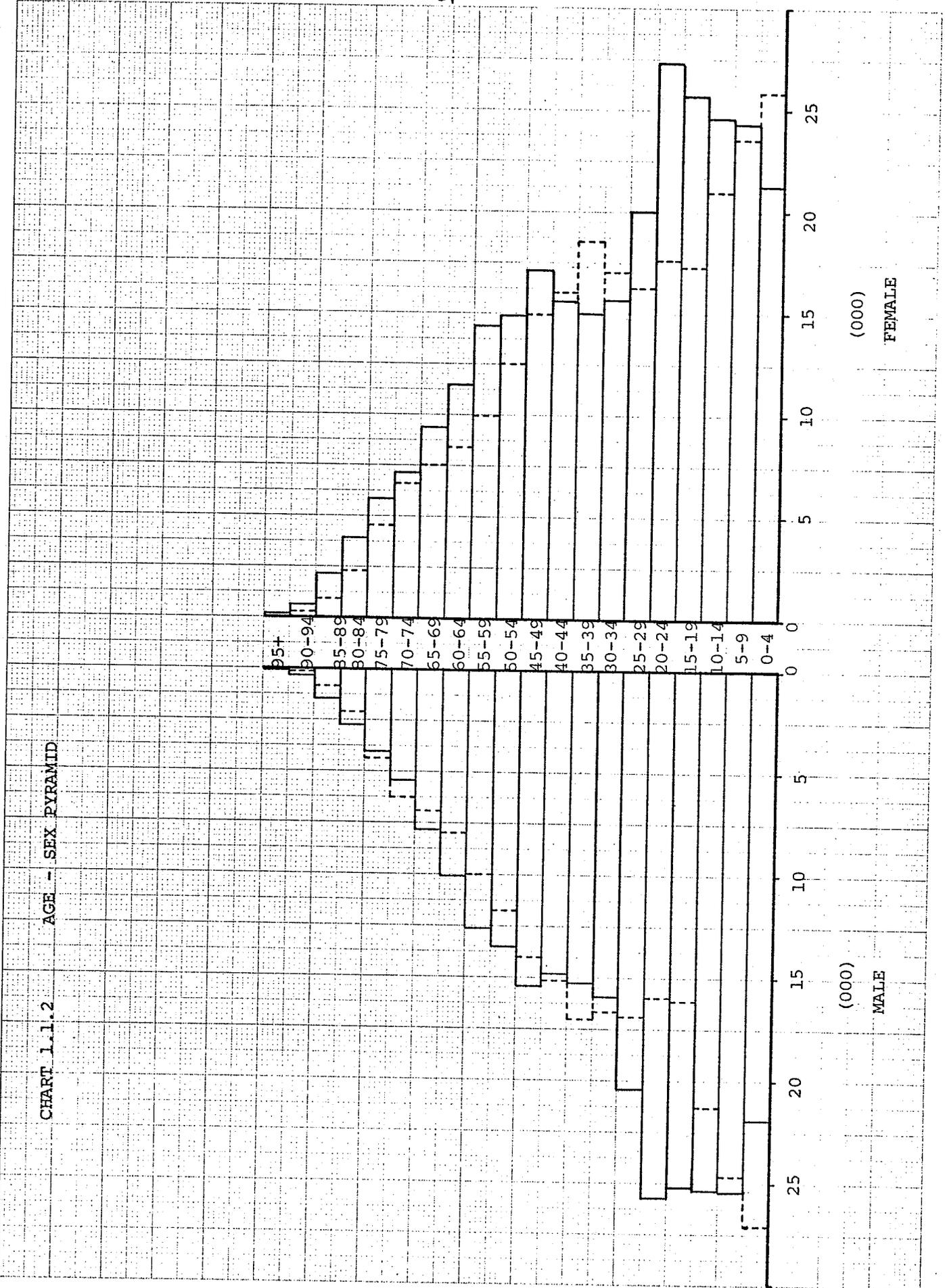
(000)
MALE

(000)
FEMALE

No. of
Households
(000)

Chart 1.1.3   HOUSEHOLDS BY TYPE

200

180

160   • Total Households

140   •

120   • One Family Households
                       •

100 •

80

60

40

                                                       • Non-Family Households
20   •   •

0   •   •   • Two or More Family House-
     61   66   71   holds
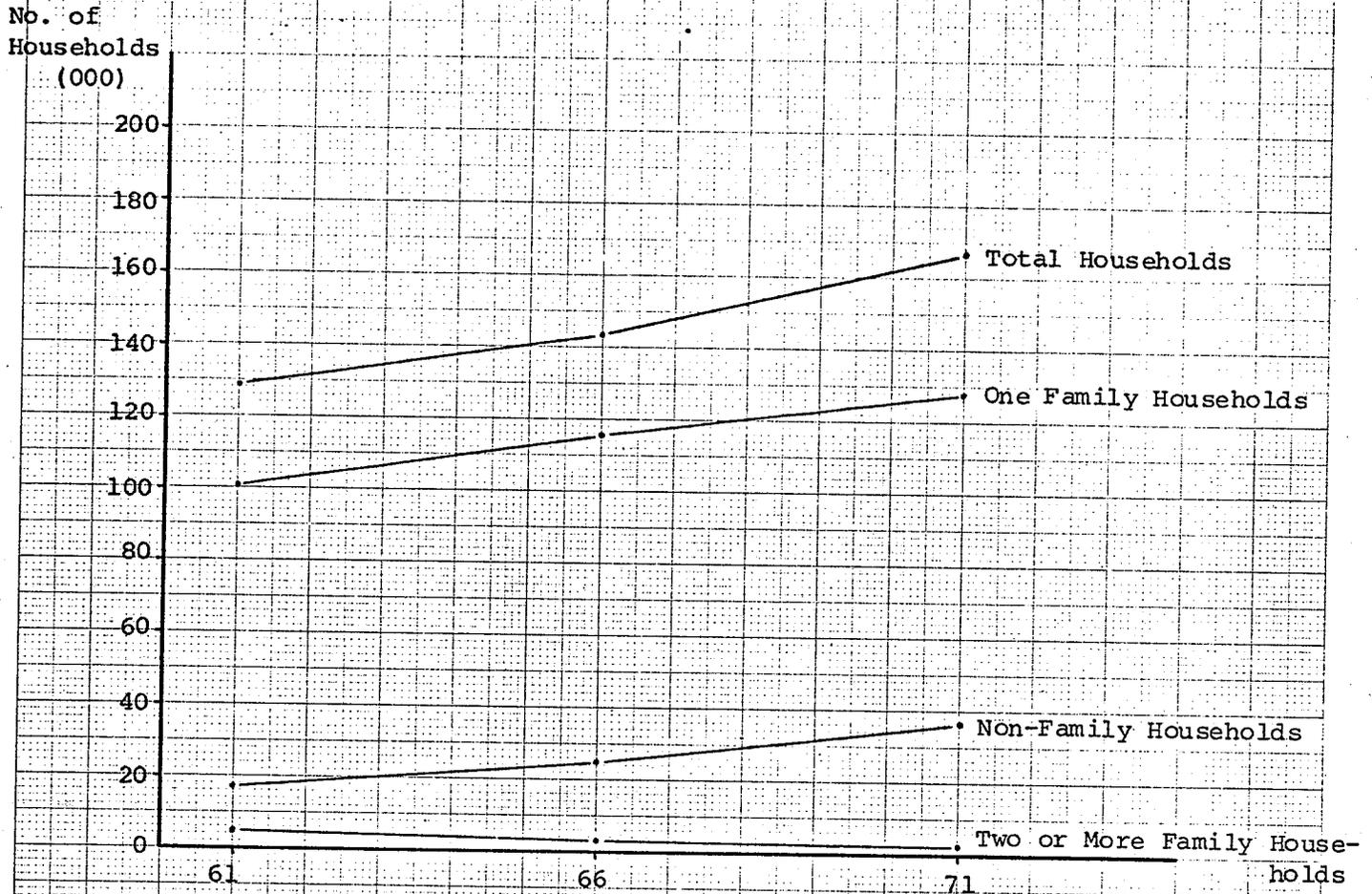
Chart 1.1.4   SIZE OF HOUSEHOLDS

No. of
Persons

5

4   •   •   Persons Per Family
     •   •   Households
                                           •   Persons Per Household
3   •

                                               Persons Per Non-Family
2   Household
                                           •
     •   •   •   Children Per Family
1

0
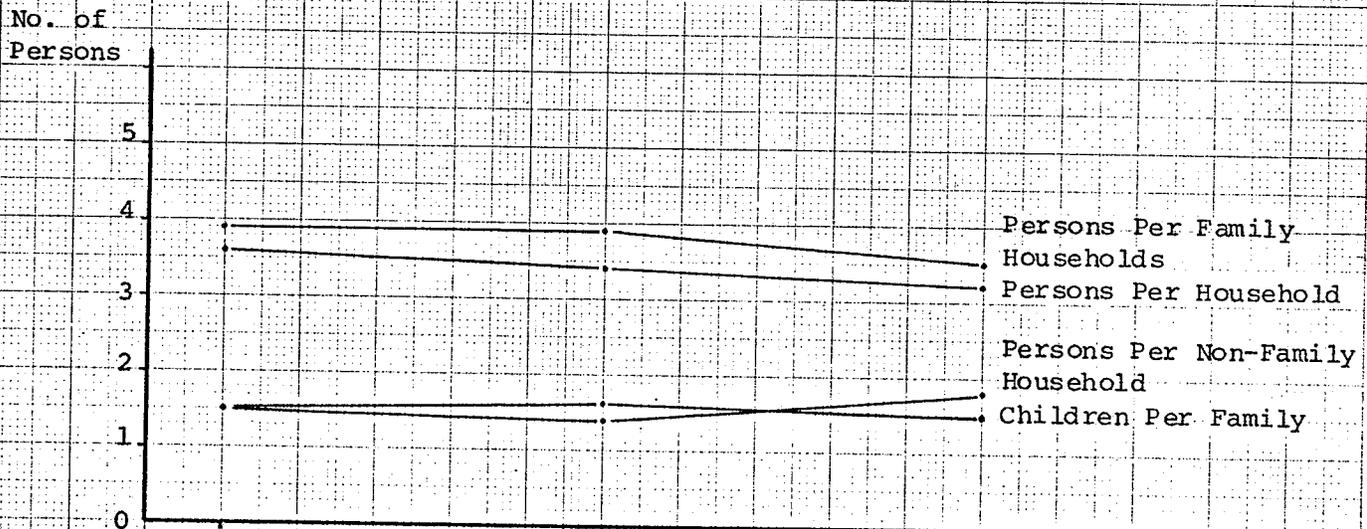
CHART 1.1.5   HOUSEHOLDS WITH EXCLUSIVE USE OF FACILITIES

Total Households
Flush Toilets
Bath or Shower
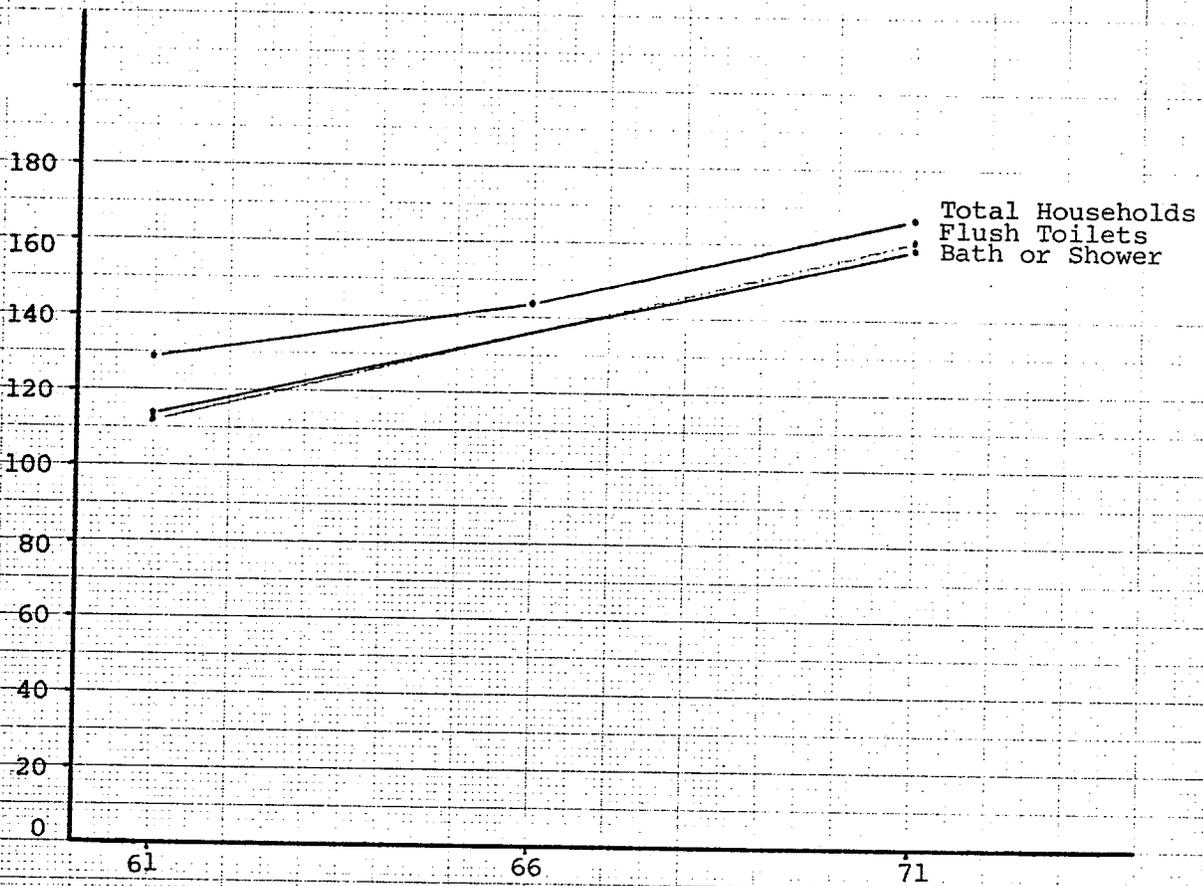
CHART 1.1.6   HOUSING CHARACTERISTICS

Rooms Per Dwelling

Bedrooms Per Dwelling

Persons Per Room
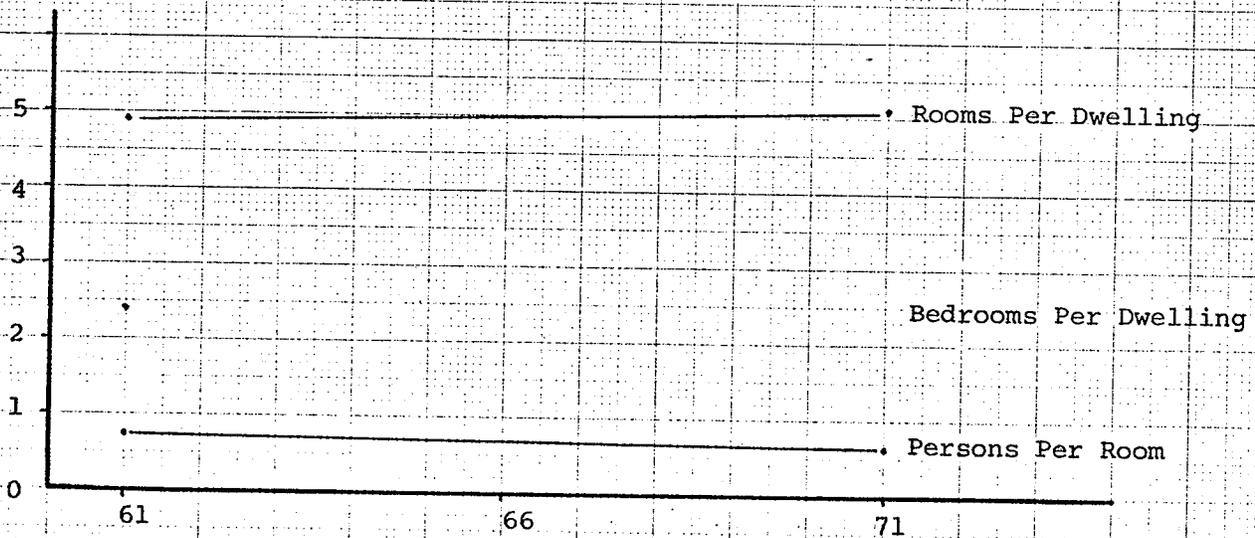
Chart 1.2.1   HOUSEHOLD INCOME DISTRIBUTION

data not available

2   4   6   8   10   12   14   16   18   20   22   24   24+

Chart 1.2.2   HOUSING EXPENDITURE

data not available

Table 2.1

HOUSING SUPPLY

|	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
TOTAL STARTS	4,187	2,857	4,519	4,189	3,898	2,992	3,216	4,739	9,030	6,661	7,726	9,134	
Detached	2,345	1,771	2,056	2,176	1,849	1,435	1,298	1,533	2,134	1,685	2,129	2,925	
Semi-Detached	244	166	172	194	220	168	190	157	355	767	666	788	
Row	41	105	177	237	69	11	305	143	361	868	696	236	
Apartment	1,557	815	2,114	1,582	1,760	1,378	1,423	2,906	6,180	3,341	4,235	5,185	
TOTAL COMPLETIONS	4,229	3,129	3,128	4,408	3,952	3,410	3,196	3,615	5,635	6,897	7,461	7,187	
Detached	2,624	1,924	1,644	2,096	1,923	1,653	1,463	1,523	1,916	1,793	1,787	2,447	
Semi-Detached	300	176	136	200	194	200	196	139	298	404	790	724	
Row	65	8	180	144	76	204	48	254	210	395	803	611	
Apartment	1,240	1,019	1,168	1,968	1,759	1,353	1,489	1,699	3,211	4,305	4,081	3,405	
TOTAL UNDER CONSTRUCTION		1,595	2,951	2,730	2,676	2,249	2,107	3,202	5,882	5,497	5,642	6,952	
Detached		627	1,034	1,110	1,027	809	648	648	895	681	952	1,407	
Semi-Detached		72	108	104	130	98	92	102	164	525	392	450	
Row		105	102	200	193	—	231	120	271	744	636	261	
Apartment		791	1,707	1,316	1,326	1,342	1,136	2,332	4,582	3,547	3,662	4,834	
DEMOLITIONS (Withdrawls)		25	9	41	27	.19	8	8	.19	30	8	3	
CONVERSIONS (Net Additions)													
TOTAL STOCK	132,010					148,985					173,790		
PUBLIC STOCK													
Detached													
Semi-Detached													
Row													
Apartment													
Family													2,043
Senior Citizens													3,180
Non Profit													2,652
Limited Dividend													4,698
Assisted Homeownership													

CHART 2.1.1 — HOUSING STARTS BY STRUCTURAL TYPE

CHART 2.1.2 — COMPLETIONS BY STRUCTURAL TYPE

CHART 2.1.3   HOUSING STOCK

data not available

CHART 2.1.4   HOUSING STOCK BY STRUCTURAL TYPE

data not available

CHART 2.1.5   PRIVATE AND PUBLIC HOUSING STOCK

data not available
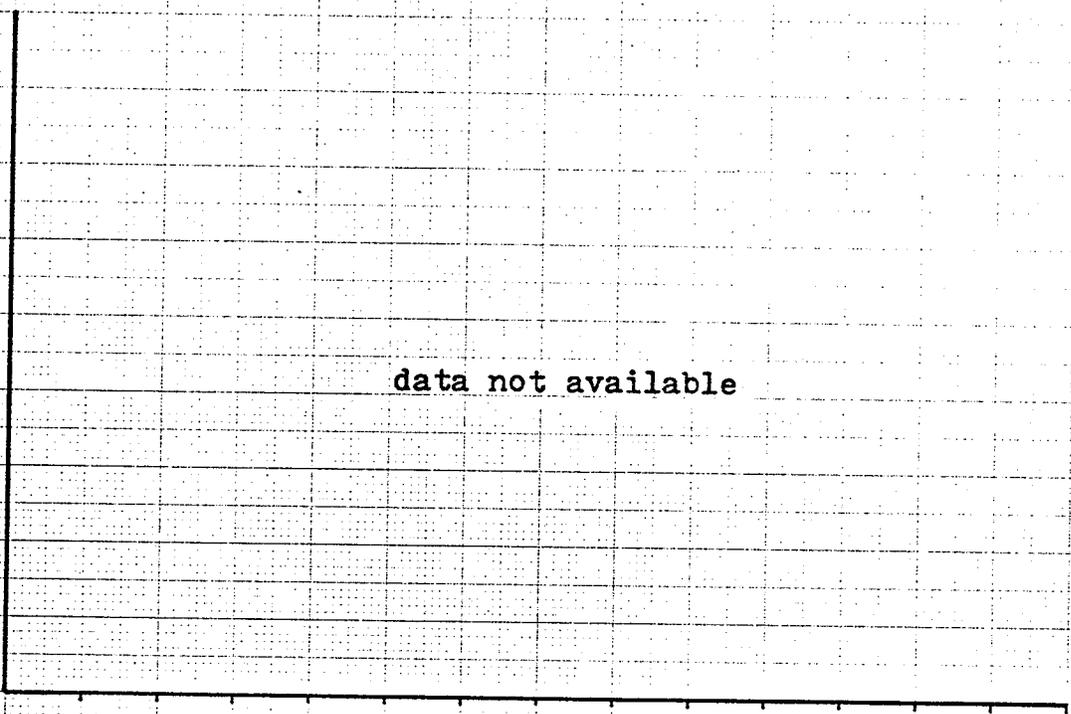
CHART 2.1.6   PUBLIC STOCK BY THE TYPE OF PROGRAM

data not available

CHART 2.1.5   PRIVATE AND PUBLIC HOUSING STOCK
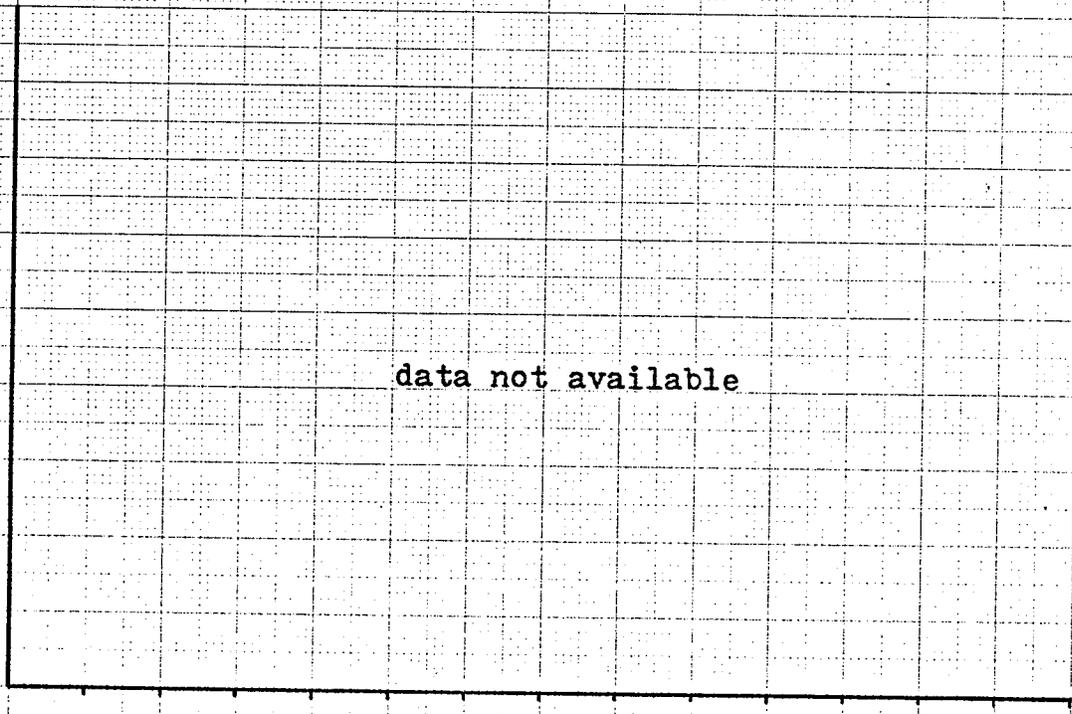
Table 2.2

HOUSING COSTS

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Consumer Price Index (All Items)	100.0	101.3	102.2	103.8	106.1	109.3	113.3	118.2	123.1	127.0	128.6	133.5	
Housing Component	100.0	100.7	100.3	100.5	101.6	102.3	104.8	108.2	112.?	115.5	117.8	120.6	
Construction Labour Wage Index	100.0	101.0	103.0	104.2	110.1	117.8	128.5	141.9	156.3	175.9	193.4	215.2	
Average Price of NHA SD Dwellings Sold By Builders							19,947	21,416	21,325	22,606	21,597	21,532	
Average Sale Price of Listings							13,878	14,895	16,469	17,470	18,452	19,579	
No. of Listings							7,711	7,048	7,419	8,789	9,886	10,425	
No. of Sales							3,380	3,662	4,000	4,235	4,950	5,520	
% Sales/Lisings							43.8	52.0	53.9	48.2	50.1	52.9	
Average NHA Mortgage Interest Rate									9.39	10.13	9.23	8.99	
Average NHA S.D. Dwelling Cost (CMHC Appraised Value)									21,136	22,543	21,748	21,670	
Average Down-Payment									4,300	4,361	3,433	3,385	
Average GDS									2,156	2,392	2,332	2,257	
Average Total Cost Estimate of NHA S.D. Dwellings by Loan Applicants	15,332	15,617	15,720	16,602	17,164	18,297	18,622	19,674	22,489	23,041	21,672	23,691	
Average Land Cost Estimate	2,686	2,831	2,921	3,211	3,241	3,095	3,111	4,160	4,525	4,584	4,573	5,190	
Construction Cost Per Sq. Ft.	10.41	11.44	11.30	11.46	11.73	12.58	13.35	13.93	15.27	15.95	15.79	17.00	

Chart 2.2.1   CONSUMER PRICE INDEX
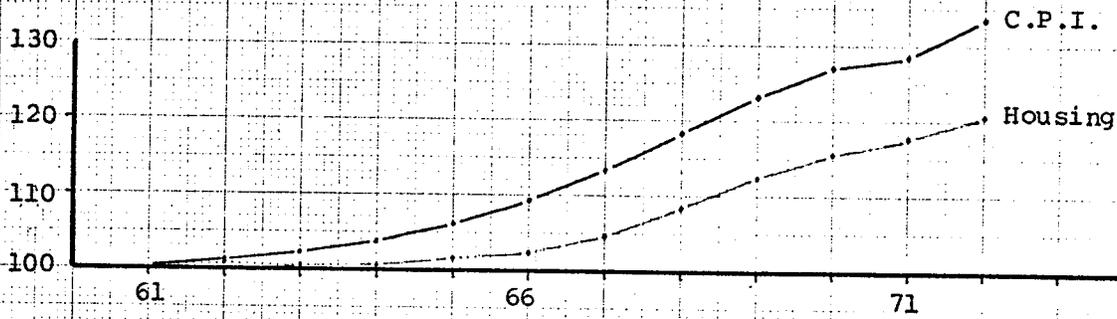
Chart 2.2.2   CONSTRUCTION LABOUR WAGE INDEX
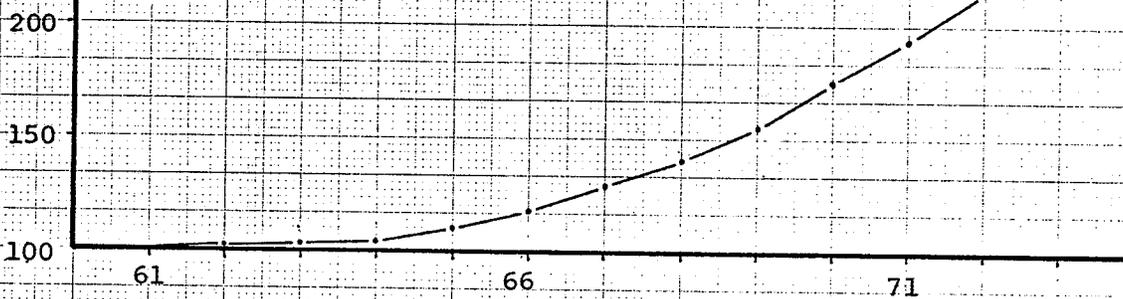
Chart 2.2.3   AVERAGE TOTAL COST ESTIMATE OF NHA SINGLE-DETACHED DWELLINGS
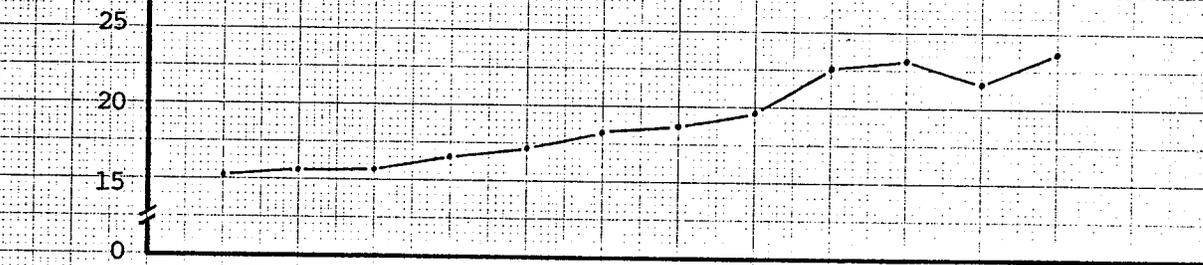
Office ⟶|⟶ Area

Chart 2.2.4   Average Land Cost Estimate

Office ⟶|⟶ Area
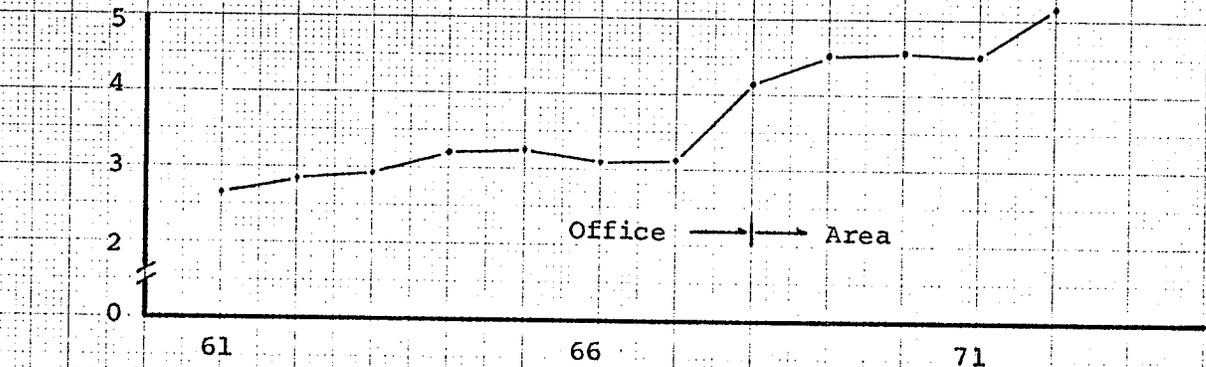
Chart 2.2.5   CONSTRUCTION COST

$/Sq.Ft.
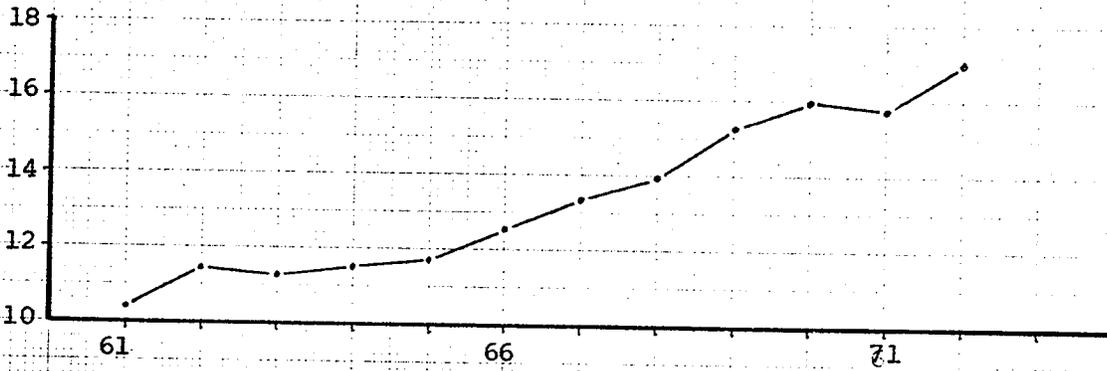
Chart 2.2.6   AVERAGE SALE PRICE

$
(000)

NHA S.D. Dwellings
Sold by Builders
Listings
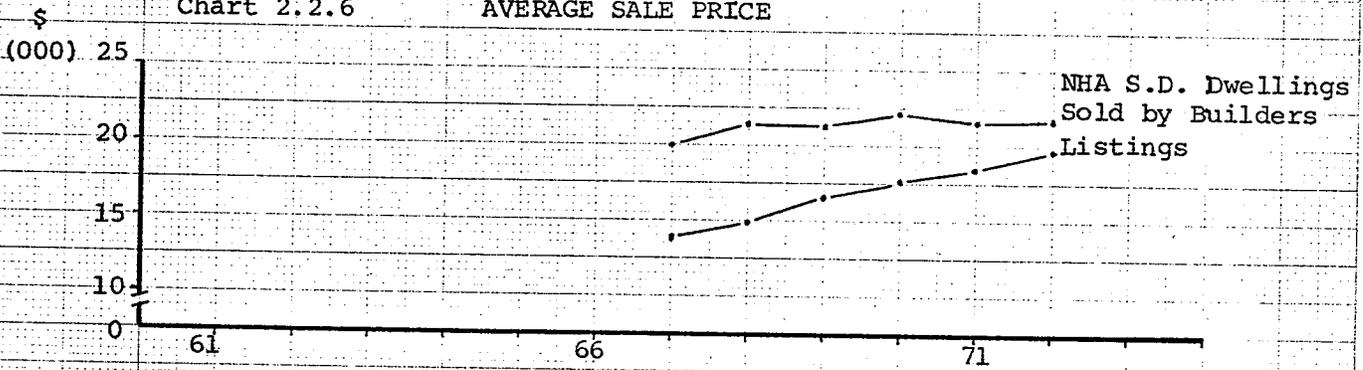
Chart 2.2.7   MORTGAGE FINANCING OF NHA SINGE-DETACHED DWELLINGS

$
(000)

Average Down Payment

Average G.D.S.
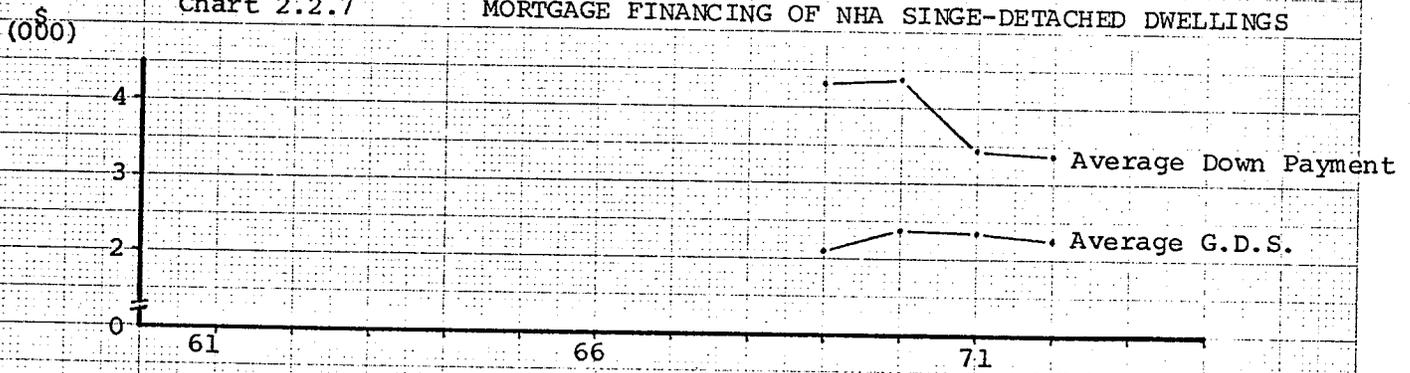
Chart 2.2.8   AVERAGE ANNUAL NHA MORTGAGE INTEREST RATE

%
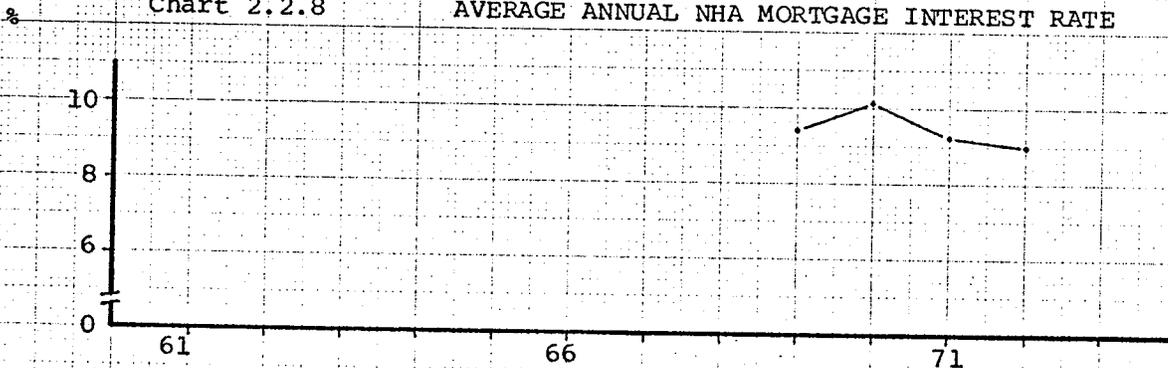
Table 3.1

HOUSING MONEY MARKET INDICATORS

	1966				1967				1968				1969				1970			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Conventional Mortgage Interest Rate	7.43	7.52	7.77	7.91	7.88	7.82	8.06	8.51	8.88	9.2	9.1	9.07	9.46	9.56	10.0	10.54	10.57	10.57	10.38	10.26
NHA Mort. Interest Rate (Rental)	6.75	6.75	6.75	7.08	7.25	7.0	7.25	8.09	8.43	8.73	8.79	8.53	9.11	9.14	9.56	9.7	10.0	10.17	10.34	10.27
NHA Mort. Interest Rate (Homeownership)	6.75	6.75	6.75	7.08	7.25	7.0	7.25	7.88	8.34	8.82	8.78	8.61	8.97	9.12	9.57	9.92	10.18	10.27	9.98	9.83
Bond Yield 10 yrs.	5.53	5.62	5.81	5.79	5.57	5.72	6.02	6.44	6.72	6.74	6.51	7.03	7.19	7.42	7.62	8.1	8.12	8.12	7.93	7.48
Bank Rate	4.91	5.25	5.25	5.25	5.0	4.5	4.67	5.67	7.17	7.5	6.33	6.17	6.67	7.17	8.0	8.0	8.0	7.5	6.83	6.17
Bond Yield 3-5 yrs.	5.33	5.38	5.8	5.68	5.04	5.3	5.99	6.23	6.81	6.91	6.3	6.69	7.9	7.55	7.8	8.21	7.85	7.27	7.1	6.21
Chartered Banks - Business Loans Lending Rate	6.0	6.0	6.0	6.0	6.0	5.75	5.75	6.17	6.83	7.17	6.92	6.75	7.17	7.67	8.5	8.5	8.5	8.5	8.0	7.67
U.S. Bank Rate									4.67	5.5	5.3	5.3	5.5	6.0	6.0	6.0	6.0	6.0	6.0	5.75
Bond Yield 3-5 yrs.									5.62	5.84	5.31	5.72	6.2	6.48	7.32	7.74	7.57	7.87	7.36	6.26
Banks Prime Lending Rate									6.0	6.5	6.42	6.42	7.17	7.83	8.5	8.5	8.33	8.0	7.83	7.08

Table 3.1

HOUSING MONEY MARKET INDICATORS

	1971				1972				1973			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Conventional Mortgage Interest Rate	9.65	9.26	9.51	9.3	8.98	9.19	9.4	9.29	9.06	9.32		
NHA Mort. Interest Rate (Rental)	9.89	9.19	9.3	9.33	8.99	8.89	9.11	9.14	9.02	8.97		
NHA Mort. Interest Rate (Homeownership)	9.36	8.82	8.97	9.02	8.79	8.86	9.05	9.08	9.03	9.11		
Bond Yield 10 yrs.	6.76	7.22	7.20	6.61	6.96	7.35	7.46	7.15	7.22	7.62		
Bank Rate	5.5	5.25	5.25	4.75	4.75	4.75	4.75	4.75	4.75	5.75		
Bond Yield 3-5 yrs.	5.37	5.8	6.03	5.02	5.88	6.55	6.61	5.99	6.35	7.09		
Chartered Banks - Business Loans Lending Rate	6.83	6.5	6.5	6.08	6.0	6.0	6.0	6.0	6.0	7.08		
U.S. Bank Rate	4.83	4.75	5.0	4.75	4.5	4.5	4.5	4.5	5.33	6.0		
Bond Yield	5.18	6.13	6.32	5.51	5.64	5.8	6.03	6.08	6.66	6.82		
Banks Prime Lending Rate	5.67	5.5	6.0	5.46	4.69	5.1	5.44	5.83	6.25	7.21		

CHART 3.1.1   MORTGAGE INTEREST RATES AND BOND YIELD

Conventional
NHA Rental

NHA Home-
Ownership
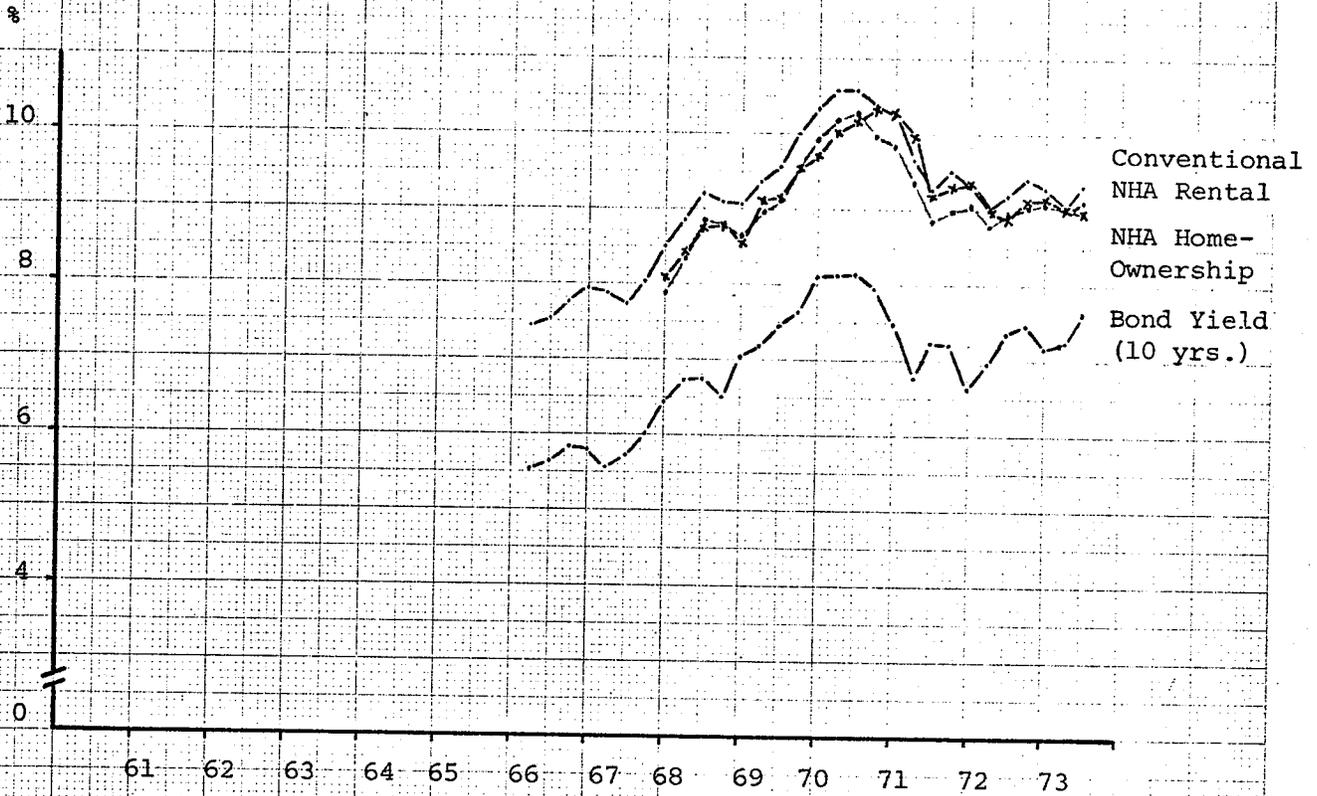
Bond Yield
(10 yrs.)

CHART 3.1.2   BANK RATES

USA
Canada
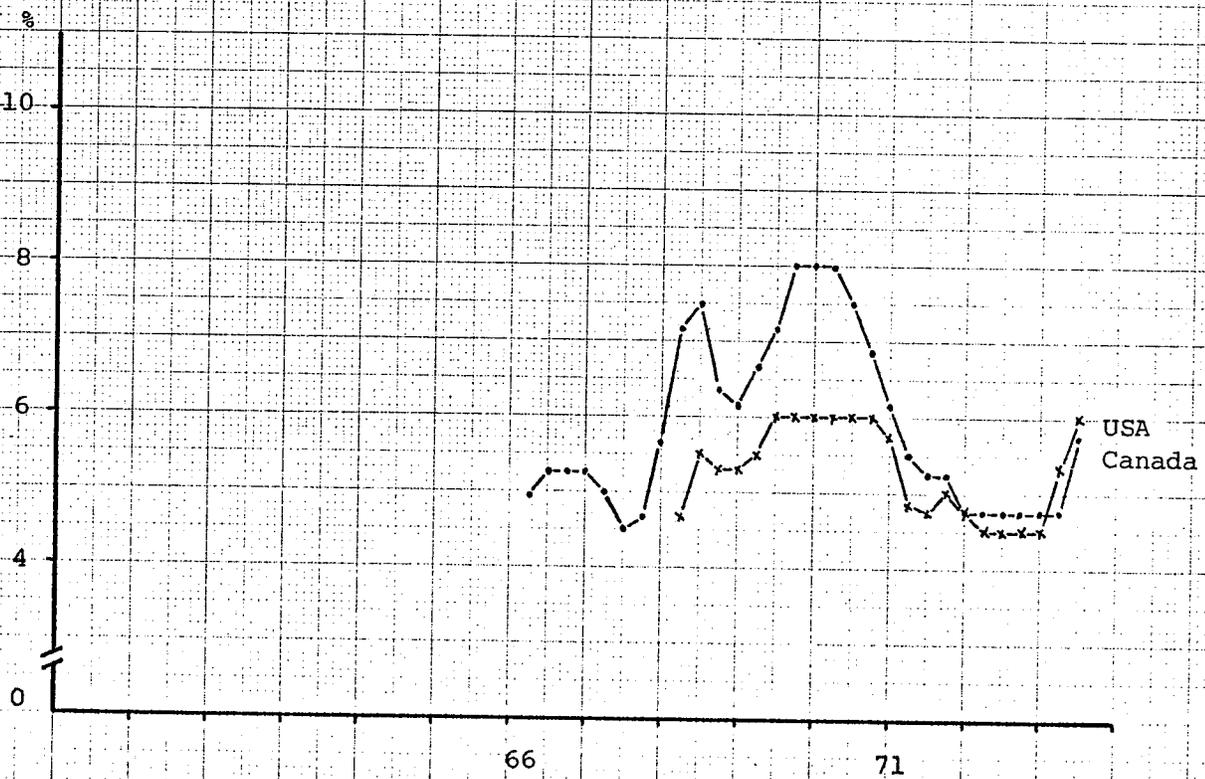
Chart 3.1.3   BOND YIELD (3-5 YEARS)

Canada
U.S.A.
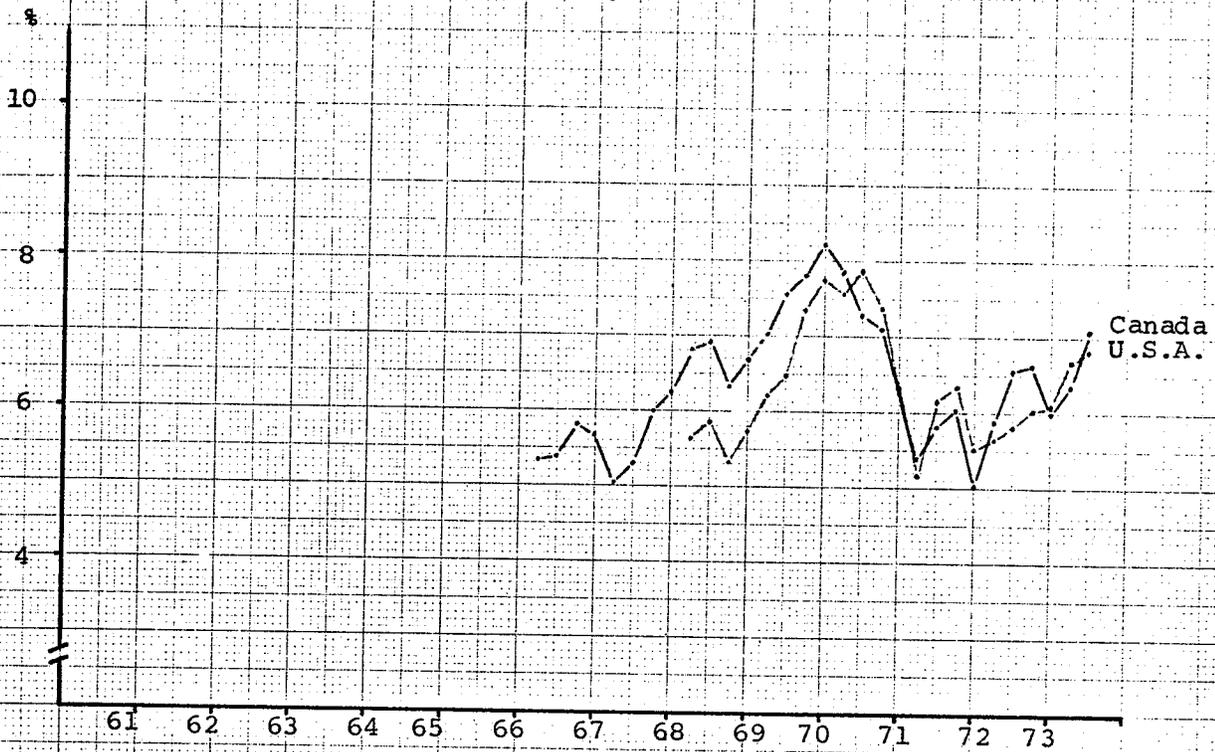
Chart 3.1.4   CHARTERED BANK LENDING RATES

U.S.A.
Canada

Table 3.2

MORTGAGE FINANCING OF HOUSING STARTS

	1961	1962	1963	1964	1965	1966
Starts	4,187	2,857	4,519	4,189	3,898	2,992
Non-NHA	2,283	1,475	2,789	1,877	2,172	1,753
N.H.A.	1,904	1,382	1,730	2,312	1,726	1,239
NHA to Non-NHA Ratio	0.83	0.94	0.62	1.23	0.79	0.71

	1967	1968	1969	1970	1971	1972
	3,216	4,739	9,030	6,661	7,726	9,134
	2,191	3,129	5,544	2,285	1,874	1,633
	1,025	1,610	3,486	4,376	5,852	7,501
	0.47	0.51	0.63	1.91	3.12	4.59

Chart 3.2.1   RATIO OF NHA TO NON-NHA HOUSING STARTS

Chart 3.2.1   RATIO OF NHA TO NON-NHA HOUSING STARTS
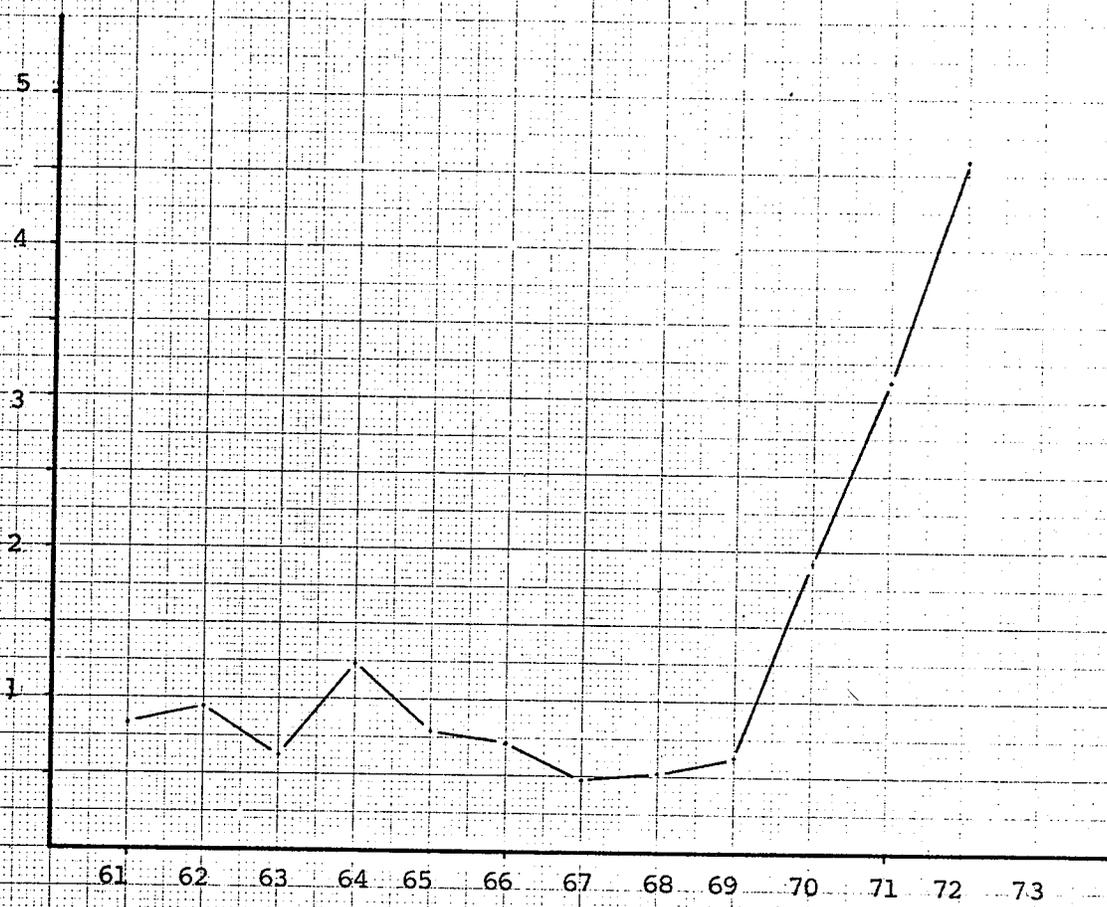
LAND OWNERSHIP
(in acres)

'A' AREAS

Committees	Quality Ladco	Metro Home Int'l Dev.	B.A.C.M.	Total
Assiniboine Park	20			20
Fort Garry	28			28
St. Vital				
St. Boniface	350			350
Transcona		265		265
East Kildonan		45	260	305
West Kildonan			94	94
Lord Selkirk	100			100
Total	498	310	354	1,162

'B' AREAS

Committees	Quality Ladco	Metro Home Int'l Dev.	B.A.C.M.	Total	Grand Total
Assiniboine Park	58			58	78
Fort Garry	302			302	330
St. Vital	144	54		198	548
St. Boniface	258	543		801	801
Transcona		55		55	320
East Kildonan	131			131	436
West Kildonan			469	469	563
Lord Selkirk					100
Total	893	652	469	2,014	3,176

105 -

LAND OWNERSHIP
(in acres)

'A' AREAS

Committees	Large Developers/ Builders		Investors Speculators Contractors		Institutions Churches, etc.		Residents & Non-Residents		City or R.M.		Total
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
Assiniboine Park	20	3	316	41	20	3	25	3	386	50	767
Fort Garry	28	53					25	47			53
St. Vital					5	16	14	45	12	39	31
St. Boniface	350	100									350
Transcona	265	100									265
East Kildonan	304	82	20	5	18	5	12	3	16	5	370
West Kildonan	95	55	35	20	36	21	6	4			172
Lord Selkirk	100	62	40	25	11	6	11	7			162
TOTAL:	1,162		411		90		93		414		2,170
PERCENTAGE:	54%		19%		4%		4%		19%		100%

LAND OWNERSHIP
(in acres)

'B' AREAS

Committees	Large Developers/ Builders		Investors Speculators Contractors		Institutions, Business Canada - Crown		Residents & Non-Residents Farmers & Others		City or R.M.		Total
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
Assiniboine Park	58	6	337	35			573	59			968
Fort Garry	302	63	95	20	68	14	15	3			480
St. Vital	214	13	134	8	30	2	1,220	73	65	4	1,663
St. Boniface	801	59			296	22	243	18			1,340
Transcona	55	8	220	33			380	59			655
East Kildonan	131	10	668	51			504	38	7	1	1,310
West Kildonan	469	33	568	40			358	26	10	1	1,405
Lord Selkirk			105	17			520	83	4	1	629
TOTAL:	2,030		2,127		394		3,813		86		8,450
PERCENTAGE:	24%		25%		5%		45%		1%		100%

LAND OWNERSHIP

(in acres)

SUMMARY 'A' & 'B' AREAS

Committees	Large Developers/ Builders	Investors Speculators Contractors	Institutions Churches, etc.	Residents & Non-Residents	City or R.M.	Total
Total 'A'	1,162	411	90	93	414	2,170
Total 'B'	2,030	2,127	394	3,813	86	8,450
Grand Total	3,192	2,538	484	3,906	500	10,620
Percentage	30%	24%	4%	37%	5%	100%

Table 5.1

ECONOMIC BASE

	1961	1965	1966	1967	1968	1969	1970	1971	1972	1973
Value of Residential & Non-Residential Building Permits ($000)	83,543		93,621	95,594	148,861	156,000	138,267	151,659	190,883	
Retail Sales ($000)	493,139		6,244,725						925,000	
Employees in Manufacturing		38,939	38,939	39,635	38,804	39,977				
Employees in Services										
Employees in Retailing			24,209							
Total Employed										
Employment Index (1961=100)	100.0	107.4	114.4	117.3	116.9	121.2	121.2	120.1	120.2	
Basic Employment										
Non-Basic Employment										
Labour Force	194,320									
Population (15-64 years)	289,726		312,642					346,000		
Labour Force Participation Rate (Labour Force/Pop. 15-64) %				57.1	58.7	58.8	59.1	58.6	58.6	
Unemployment Rate (%)				2.7	3.7	2.8	4.8	5.2	4.8	
Taxable Income Tax Returns		180,700	195,838		214,341		231,859			
Total Income, All Returns ($000)		894,724	1,012,999	1,107,684	1,220,793	1,349,054	1,468,416			
Total Income Tax ($000)		98,698	113,848	144,240	168,388	216,246	255,966			
Corporation Income ($000)										
Gross General Revenue ($000)				107,555	166,503	192,277	201,184	221,810		
Public Works				20,408	10,114	23,043	18,411	22,448		
Sanitation & Water Works				8,436	19,243	22,153	16,775	22,660		
Per Capita Revenues										
Change in Pop./Change of 0.1 in Employment Index	1961 - 1966 229				1966 - 1971 543					
Assessment ($000)										1,300,000

CHART 5.1.1　　　　　LABOUR FORCE

data not available

CHART 5.1.2　　　　　LABOUR FORCE

%

80

60 — Labour Force
Participation Rate

40

20

0 — Unemployment Rate

61　　　　　　66　　　　　　73
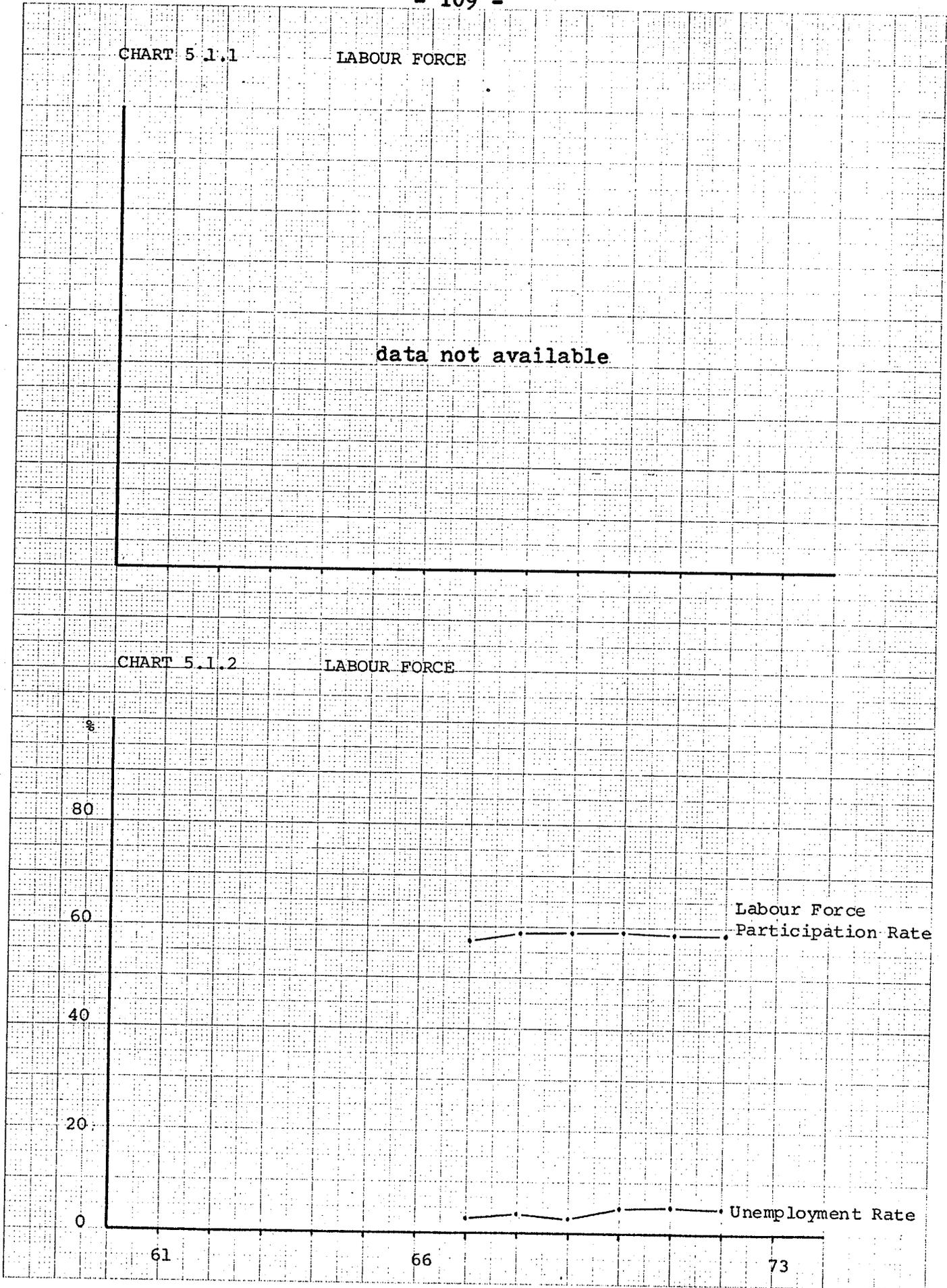
CHART 5.1.3   VALUE OF ALL BUILDING PERMITS

$ (000)

```
200 ┤

150 ┤

100 ┤

 50 ┤

  0 ┤
```
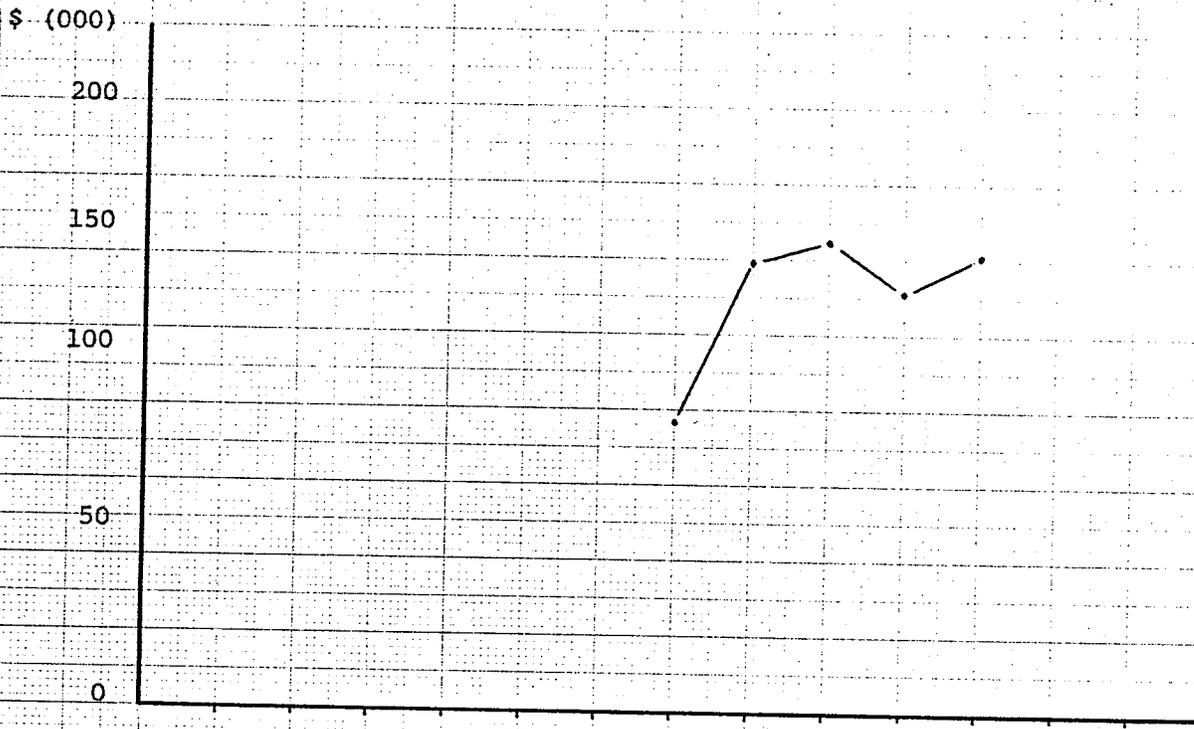
CHART 5.1.4   TOTAL PERSONAL INCOME

$(Million)

```
2000 ┤

1500 ┤                                        Personal Income

1000 ┤

 500 ┤                              Income Tax

   0 ┤
                    66                    71
```
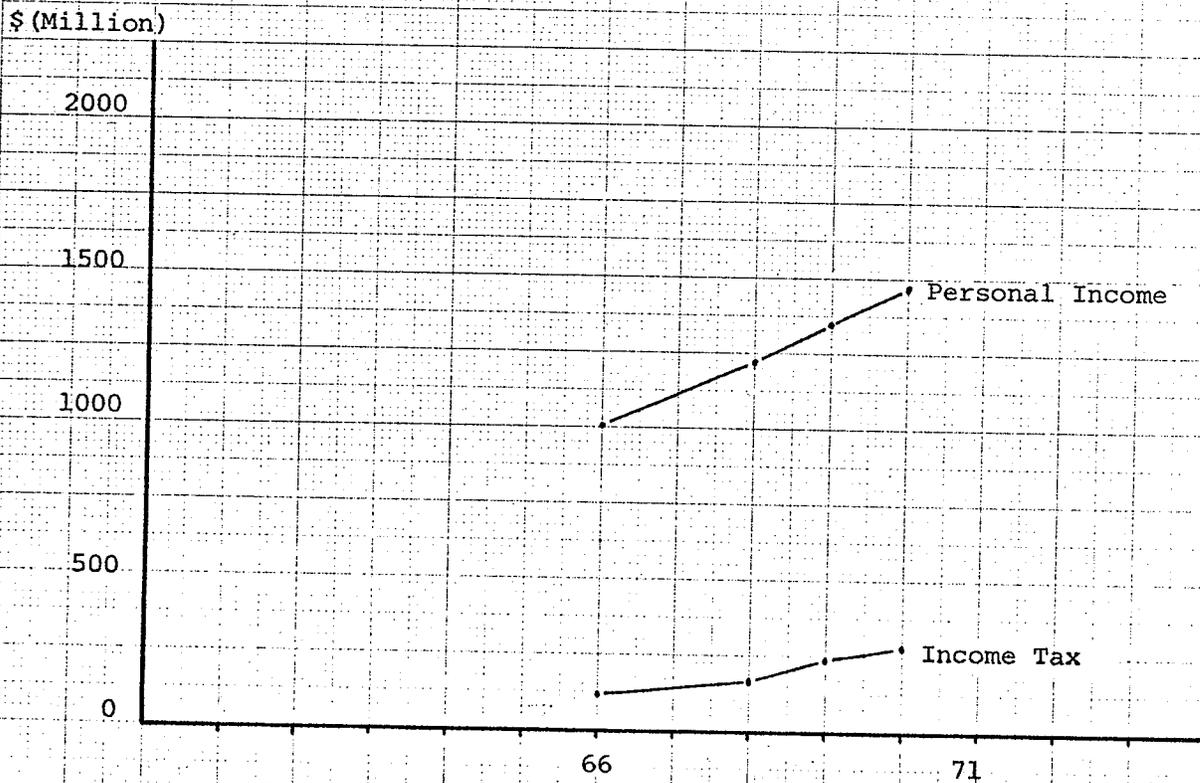
Table 6-1

ABSORPTION RATES & APARTMENT VACANCY RATES

Year	Quarter	Flow Supply	Absorptions	Absorption Rate %	Publicly and Privately Initiated Apartment Vacancy Rate June (Dec.)
1963					3.8
1964					5.6
1965					4.9
1966		3,878	3,522	90.82	
	I	1,392	761	54.67	
	II	1,972	1,061	53.80	4.1
	III	1,356	904	66.67	
	IV	1,152	796	69.10	
1967		3,552	2,945	82.91	
	I	605	284	46.94	
	II	907	564	62.18	1.5
	III	1,159	895	77.22	
	IV	1,809	1,202	66.45	
1968		4,222	4,028	95.41	
	I	1,269	928	73.13	
	II	1,310	891	68.01	1.5
	III	1,488	1,205	80.98	
	IV	1,198	1,004	83.81	
1969		5,829	5,590	95.90	
	I	1,538	1,226	79.71	
	II	1,413	957	67.73	1.5
	III	1,776	1,623	91.39	
	IV	2,023	1,784	88.19	(1.6)
1970		7,236	5,856	80.93	
	I	1,272	708	55.66	
	II	1,318	865	65.63	2.5
	III	3,259	2,113	64.83	
	IV	3,550	2,170	61.13	(3.3)
1971		8,841	8,228	93.07	
	I	3,607	1,927	53.42	
	II	2,781	1,618	58.18	3.4
	III	3,020	2,482	82.18	
	IV	2,814	2,201	78.22	(5.5)
1972		7,700	7,153	92.90	
	I	1,817	1,119	61.58	
	II	2,115	1,488	70.35	5.1
	III	2,681	2,075	77.40	
	IV	3,018	2,471	81.87	(4.2)
1973					
	I	2,612	1,994	76.34	
	II				
	III				3.9
	IV				

Chart 6.1.1   FLOW OF SUPPLY AND ABSORPTIONS
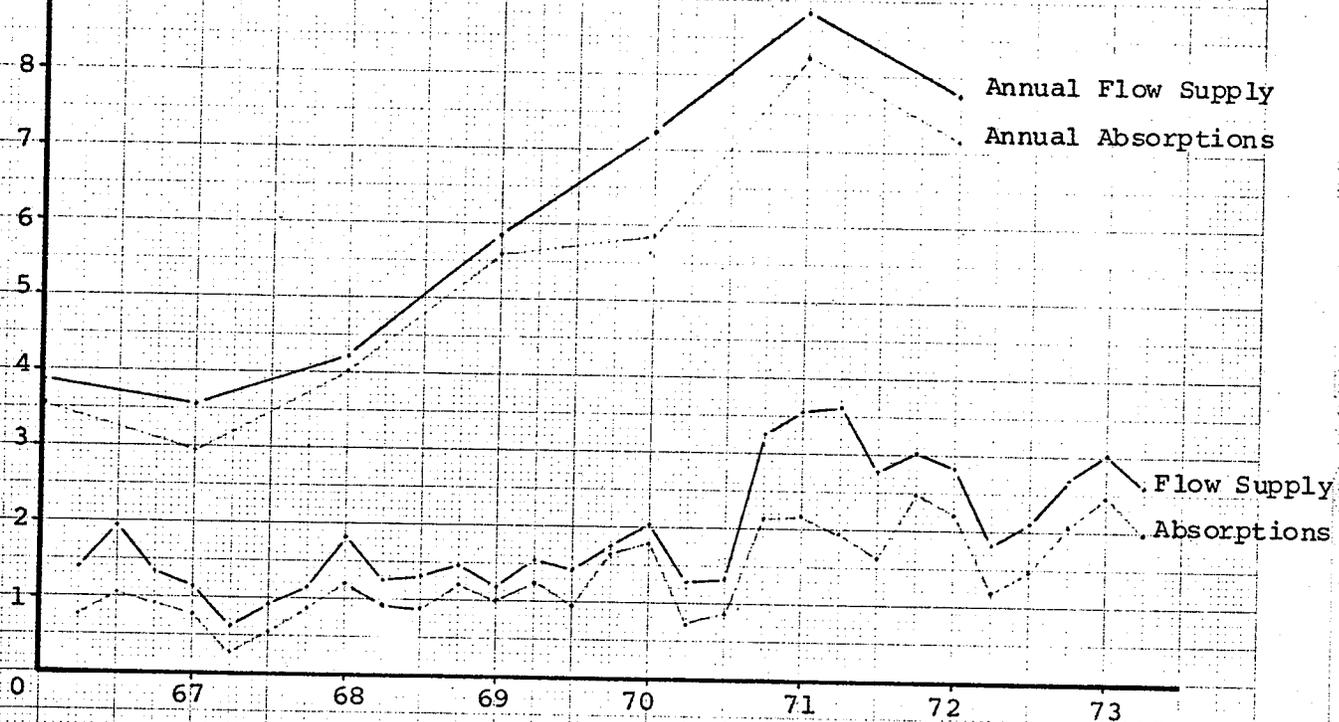
Chart 6.1.2   ABSORPTION RATES
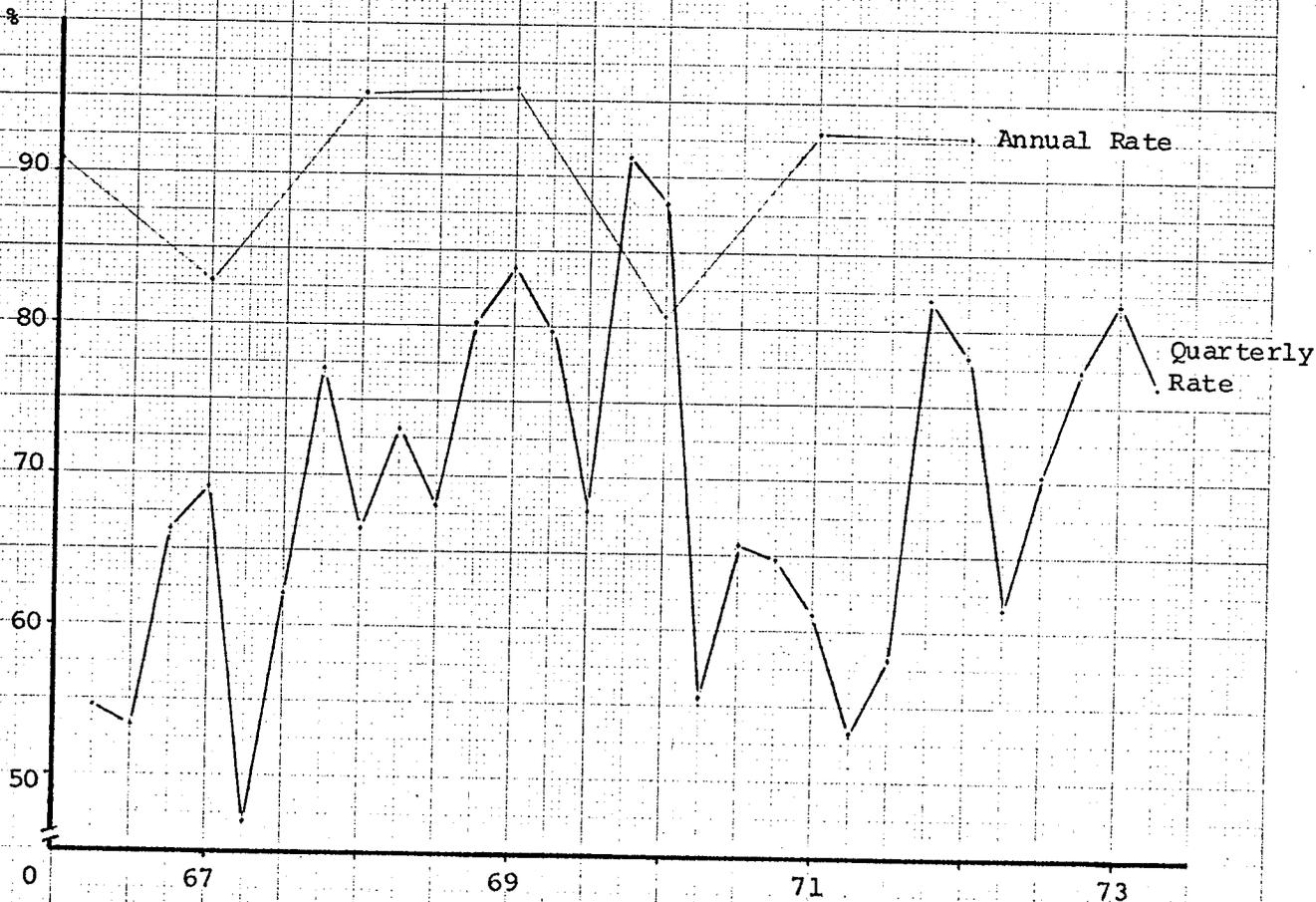
Table 6.2

% SALES/LISTINGS AND HOUSING MARKET TRANSACTION RATES

Year	Quarter	Sales	Listings	% Sales/ Listings	Sales & Absorptions	Listings & Flow Supply	Housing Market Transaction Rate %
1967		3,380			6,325		
	I	630			914		
	II	1,118	1,498	74.63	1,682	2,405	69.94
	III	1,003	1,436	69.85	1,898	2,595	73.14
	IV	629	804	78.23	1,831	2,613	70.07
1968		3,662	3,829	95.64	7,690	8,051	95.52
	I	775	1,067	72.63	1,700	2,336	72.77
	II	1,097	1,426	76.93	1,988	2,736	72.66
	III	1,029	1,300	79.15	2,234	2,788	80.?3
	IV	761	928	82.00	1,765	2,126	83.02
1969		4,000	4,148	96.43	9,590	9,977	96.12
	I	873	1,218	71.67	2,099	2,756	76.16
	II	1,279	1,503	85.10	2,236	2,916	76.68
	III	1,108	1,414	78.36	2,731	3,190	85.61
	IV	740	888	83.33	2,524	2,911	86.71
1970		4,235	4,448	95.21	10,091	11,684	86.37
	I	1,902	1,268	71.14	1,610	2,540	63.39
	II	1,173	1,699	69.04	2,038	3,017	67.55
	III	1,261	1,730	72.89	3,374	4,989	67.63
	IV	899	1,112	80.84	3,069	4,662	65.83
1971		4,950	5,117	96.74	13,178	13,958	94.41
	I	1,113	1,663	66.93	3,040	5,270	57.69
	II	1,561	1,958	79.72	3,179	4,739	67.08
	III	1,358	1,830	74.21	3,840	4,850	79.18
	IV	918	1,085	84.61	3,119	3,899	79.99
1972		5,520	5,811	94.99	12,673	13,511	93.80
	I	1,219	1,661	73.39	2,338	3,478	67.22
	II	1,720	2,171	79.23	3,208	4,286	74.85
	III	1,606	2,001	80.26	3,681	4,682	78.62
	IV	975	1,239	78.69	3,446	4,257	80.95
1973							
	I	1,451	1,881	77.14	3,445	4,493	76.67
	II	1,718	1,969	87.25			
	III						
	IV						

Chart 6.2.1

No. of
Dwelling Units
(000)

Annual Listings &
Flow Supply

Annual Sales
Absorptions

Annual Listings
Annual Sales

Listings &
Flow Supply

Sales &
Absorptions

Listings
Sales

Chart 6.2.2

Annual % S/L
Annual HMTR

% S/L

H.M.T.R.
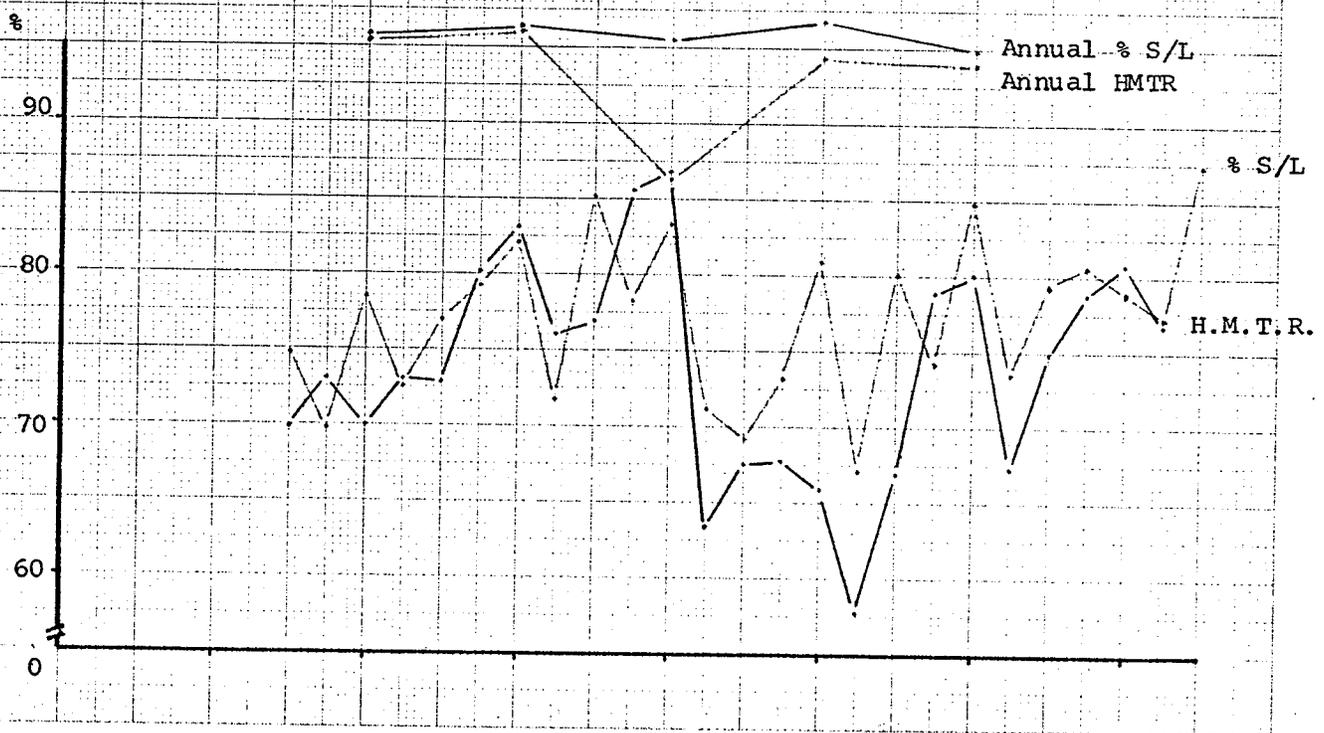
Chart 6.3.1   RATIO OF RENTAL OCCUPANY TO HOMEOWNERSHIP
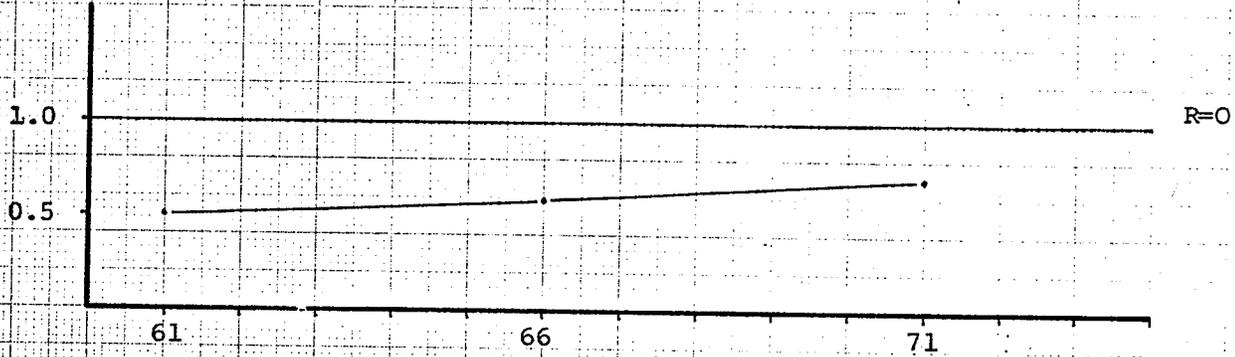
Chart 6.1.3   APARTMENT VACANCY RATES
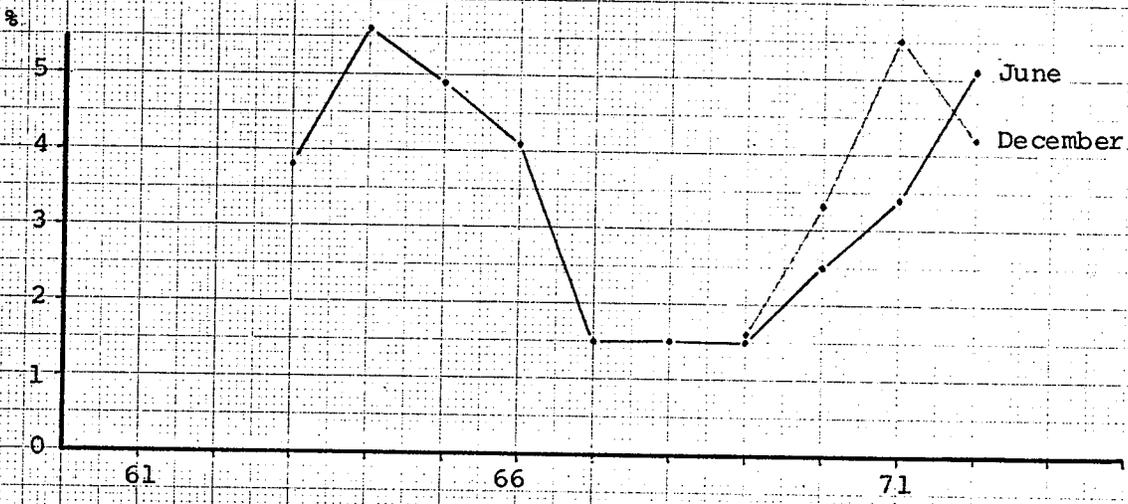
Table 6.3

MARKET PERFORMANCE INDICATORS

	1961	1956-1961	1966	1961-1966	1971	1966-1971
Rented Dwellings/Owned Dwellings	0.50		0.58		0.69	
Public Stock/Private Stock						
Change in Starts/Change in Population		305		581		920
Change in Starts/Change in 1,000 Households		939		1,255		1,263
Change in Completions/Change in 1,000 Population		316		562		786
Change in Completions/Change in 1,000 Households		976		1,214		1,079
Change in Absorptions/Change in 1,000 Households						1,067
Occupied Dwelling/Households	0.959		0.978			
Stock/Households	0.985		1.014			

No. of
Dwelling Units

Chart 6.3.2   HOUSING STARTS/ CHANGE IN 1,000 POPULATION

1,000

0
    56-61   61-66   66-71

No. of
Dwelling Units

Chart 6.3.3   HOUSING COMPLETIONS/ CHANGE IN 1,000 POPULATION

1,000

0
    56-61   61-66   66-71

No. of
Dwelling Units

Chart 6.3.4   HOUSING STARTS/ CHANGE IN 1,000 HOUSEHOLDS

1,000

0
    56-61   61-66   66-71

No. of
Dwelling Units

Chart 6.3.5   HOUSING COMPLETIONS/ CHANGE IN 1,000 HOUSEHOLDS

1,000

0
    56-61   61-66   66-71

No. of
Dwelling
Units

Chart 6.3.6   ABSORPTIONS/CHANGE IN 1,000 HOUSEHOLDS

1,000

500

56-61   61-66   66-71

Chart 6.3.7   RATIO OF OCCUPIED DWELLINGS TO TOTAL HOUSEHOLDS

1.0

0
   61   66   71

Chart 6.3.8   RATIO OF STOCK TO TOTAL HOUSEHOLDS

1.0

0
   61   66   71

FIVE.　　PLANNING OF GOVERNMENT HOUSING POLICIES AND PROGRAMS

When the housing market fails to take into account spillover
benefits of housing production 1/ and produces insufficient
volume to meet society's needs, 2/ government action becomes
necessary to adjust the non-optimal output levels generated
by the imperfectly operating free market. This requires first
of all an assessment of the housing gaps, and then derivation
and selection of policies and programs that can effectively
close the gaps.

What the federal government hopes to achieve in the field of
housing is "to ensure that every Canadian is able to exercise
... his social right — the right to good housing at a
reasonable cost in a decent community environment." 3/ It
goes without saying that this national housing objective can
be attained by making adequate housing available, at reason-
able cost, in required variety, at a suitable quality, and
at desirable locations.

The market analysis stage of the housing planning process as
discussed in the first half of this thesis helps to identify

1/ Examples of social benefits are employment effect, income
effect (or multiplier effect) and other non-quantifiable
environmental effects.
2/ In particular the need for low-income housing.
3/ Hon. Ron Basford, speech to Regional Tri-level Conferences,
Peterborough, May 28, 1973.

the kinds of housing that are insufficient, the groups who
are in need, and the localities where the needs exist. With
the aid of policy-oriented methodologies, such as the Macro-
Micro and Submarkets Approaches, existing housing policies
and programs can be evaluated and new ones developed within
the analytical frameworks.

I. AN OVERVIEW OF HOUSING POLICIES AND PROGRAMS

It should be noted that no one program offers the solution.
Programs are simply instruments employed singly or in com-
bination to achieve certain housing objectives. However "...
without better market understanding, there is danger that
public actions will be frequently blunted in their intended
effects, that some of the results may be the reverse of those
intended, or that 'side effects' will create new and difficult
problems requiring further public attention." 1/

A good example of conflicts or unwanted effects of housing po-
licies is rent control, which stabilizes rent increases for the
benefits of the lower-income renters on one hand, and discourages
the supply of new rental units on the other. Rent control in the
province of British Columbia has contributed to severe apartment
shortages in Vancouver (a vacancy rate of 0.1% was recorded in
December, 1974). It is therefore important to understand the

1/ Sternlieb,G. The Tenement Landlord, Centre for Urban Policy
    Research, Rutgers University , N.J. 1966, p.3.

nature and purpose of individual programs so that when existing instruments are applicable, an appropriate mix can be structured to fit the time and the circumstance.

There are basically two kinds of programs : demand strategies and supply strategies. Programs that have a direct effect of increasing the housing consumption power are demand-support strategies, while programs that stimulate and generate more housing supply are supply-expansion strategies. These strategies or programs are classified and summarized in the following table form. 1/ Their main objectives and financial implications are also identified.

Demand strategies and supply strategies are equally important in stabilizing the cost of housing. There must be _timing_ and _balance_ between the two kinds of market intervention in order that one complements the other to produce the desired levels of housing supply, housing consumption and housing cost. For example, if the housing gap were to be narrowed by making direct payments to low-income families without increasing the supply well in advance, the sudden increase in effective demand would merely drive up the general level of rents to the benefit of the rental property owners.

1/ Based on the Chart "Prelimary Housing Program Analysis" in
   Working Papers : Volume 1 by the Ontario Advisory Task
   Force on Housing Policy, 1973, pp.13-17.

DEMAND-SUPPORT STRATEGIES		OBJECTIVE			IMPLICATIONS			
PROGRAM TYPE	DESCRIPTION	1	2	3	F	S	A	REMARKS
A. INCOME REDISTRIBUTION								
1) Shelter Cost Rebate	To allow deduction of rent or mortgage payments in accordance with some tax rebate formulas on income tax returns.	X	X	X				1) It has advantages of administrative simplicity and universal participation. However, the tax rebate may not be spent for better housing.
2) Guaranteed Annual Income	To assure a minimum income and allow low-income people to decide for themselves how much they want to spend on housing.		X	X				2) Freedom of choice by low-income people may invalidate the rent to income ratio as an indicator of ability to pay.
B. MORTGAGE MONEY								
1) Mortgage Insurance	To insure the approved lenders against loses associated with mortgage lending	X					X	
2) Liberalized Lending Terms	To increase the minimum loan to value ratio, the loan maximum and amortization period so that downpayment requirement and monthly carrying charges are reduced.	X	X	X				2) When construction is limited by lack of materials, labour or building capacity, liberal credit is more likely to push up costs and prices than increase production.
3) Interest Subsidy	To lower the cost of borrowing, and hence housing cost to buyers and renters.	X		X				3) The net effect of the subsidy in time of inadequate supply may simply increase the effective demand for housing, and thereby bid up prices.
4) Direct Lending	To provide first or second mortgages below market rate to home buyers.	X	X		X			
5) Assisted Homeownership	To provide families with low cost mortgages plus direct assistance (according to family income) to meet mortgage payments and taxes.		X	X	X			
C. GRANT								
1) Universal Capital Grant	To lower the cost of purchasing new housing units by means of a lump sum grant to buyers.	X		X				It is questionable whether the grants have the effect of reducing the end price of the home to the purchaser.
2) Selective Capital Grant	To lower the cost of homeownership for special groups		X	X				
D. RENT SUPPLEMENT	To subsidize renters directly the difference between their normal rent and geared-to-income rent.		X	X				A short-run measure in time of adequate supply of rental units.
E. RENT CONTROL	To establish ceilings on rent increases.	X	X				X	A short-run measure; extended rent control leads to restricted supply and degrading housing quality.
F. TAXATION								
1) Property Tax Reduction	To reduce property tax.	X		X				1) A property tax credit plan or rebate scheme that is tied to income will have more desirable income redistributive effects.
2) Tax Incentive (Registered Homeownership Savings Plan)	To allow deductions under the plan of up to $1000 annually from taxable income to a maximum of $10,000 per tax payer, for the purchase of his first home.	X					X	

SUPPLY-EXPANSION STRATEGIES   OBJECTIVE   IMPLICATIONS

PROGRAM TYPE	DESCRIPTION	1	2	3	F	S	A	REMARKS
A. MORTGAGE LENDING								
1) Non-profit Housing (Limited Dividend)	To provide non-profit organizations (or builders) with long-term and low cost loans to build rental housing units for low-income, elderly, or handicapped persons.	X		X	X			
2) Co-operative Housing	To provide building and continuing housing co-operatives with low cost loans.	X		X	X			2) It may not be easy for interested persons to get the necessary organization and managerial skills.
B. PUBLIC HOUSING	To provide loans and grants to provinces for the development of public housing.	X		X	X			Public housing projects require special consideration of their size, location, design and community facilities.
C. MUNICIPAL SERVICES	To provide loans and grants to municipalities to help provide services, schools, etc.	X			X			
D. PUBLIC LAND ASSEMBLY AND LAND BANKING ASSISTANCE	To provide loans at a preferential interest rate to provinces and municipalities for assembling and servicing land.	X	X	X	X			Outright competition with the private sector in land assembly will bid up land prices.
E. PLANNING CHANGES								
1) Development Approval	To speed land development approval process.	X					X	
2) Change in Standards	To reduce land development standards.	X					X	2) Provincial intervention is required for setting minimum standards.
F. IMPROVING EXISTING STOCK								
1) Rehabilitation Assistance	To provide funds to renovate inadequate and substandard housing.	X	X					
2) Neighbourhood Improvement	To provide grants and loans to municipalities for upgrading their older residential neighbourhoods.	X	X	X				
G. TAX INCENTIVES								
1) Building Material Tax	To reduce or remove the building material tax.	X			X			1) A grant to first-time buyers of reasonably priced new houses is an alternative
2) Depreciation Allowance	To increase the tax shelter of investments in rental accomodation.	X			X			
H. RESEARCH GRANTS	Research grants are made available to individuals and organizations undertaking research or developmental work which aimed at improving housing and urban affairs	X			X			

Key:
1. To meet physical housing need
2. To meet general financial housing need
3. To meet financial housing need of special groups
F. Program with financial implications
S. Program with financial implications, but self-supporting or income producing
A. Administrative action only.

Since it takes time for the housing supply to respond to changes in demand, both the short-term and long-term effects of government intervention in the housing market have to be considered. For example, to implement rent control without increasing supply may benefit renters in the short run, but will restrict supply of rental units and decrease housing quality in the long run. 1/

Planning of programs for poorly housed low-income families may require additional research efforts. The Submarkets Approach is most appropriate in this direction of enquiry. Since the housing problem of low-income families is one dimension of the multifaceted problem of poverty, "it seems essential that we learn more about the kinds of families who are most likely to experience housing problems; the specific nature of the kinds of housing problems from which they suffer; the ways in which particular non-housing or housing related problems are likely to minimize the success of solving their problems through direct housing measures; and finally, how some housing problems might be best dealt with indirectly through non-housing means." 2/

Grigsby has identified twelve dimensions of the housing problems of low-income families and a typology consisting of nine problems typically associated with occupancy in substandard

1/ Controlled rents below the market price (and therefore cost) of housing will lead to deterioration of the rental units.

2/ Stegman,M.A. (ed.) Housing and Economics, The American Dilemma, M.I.T. Press, Cmabridge, Mass. 1970, pp.201-202.

housing. 1/ A "housing problem — population matrix"
similar to what Grigsby has suggested can be constructed as a
supplementary basis for program development. See Diagram 13.
If these problems had not been satisfactorily explored before
solutions were proposed, our so-called housing experts would
merely have, according to Grigsby, "accumulated a kit of tools
which they are trying to fit and refit to a changing problem." 2/

1/ Grigsby,W.G. Mimeographed outline for seminar on housing,
University of Pennsylvania, 1969, p.1.

2/ Grigsby,W.G. "Housing Aspects of Poverty," mimeographed
memorandum, University of Pennsylvania, 1965.

Diagram 13

HOUSING PROBLEM — POPULATION MATRIX

Dimensions of the low-income housing problem

Types of
low-income
families
experiencing
housing
problems

```
A ————————————————————— L
1



9
```
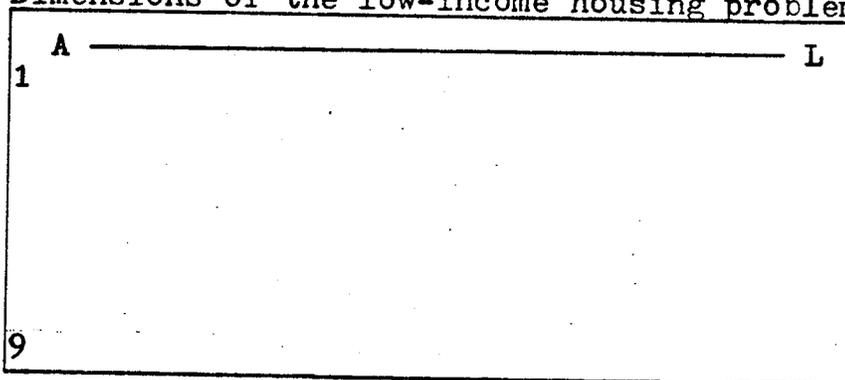
FAMILIES

1. Non-white

2. Large families, especially
   female-headed

3. Welfare families

4. Families experiencing
   interruptions in income

5. Families with particularly
   high nonhousing expenses

6. Single males

7. Mentally or physically
   handicapped

8. Families who are bad
   tenants either because of
   irregularity of rent pay-
   ments, failure to keep
   quarters reasonably clean,
   or abusive behavior

9. Recent immigrants with no
   credit rating, etc.

PROBLEMS

A. Lack of adequate quality,
   including equipment and
   services

B. Lack of adequate space

C. Lack of adequate
   furnishings

D. Poor neighbourhood
   environment

E. Excessive housing costs
   relative to income

F. Excessive housing costs
   relative to quality, space
   and neighbourhood environment

G. Lack of tenure choice

H. Lack of locational choice

I. Racial discrimination

J. Involuntary mobility

K. Stigmatizing way in which
   housing services are provided

L. Lack of housing-related
   services, e.g. meals, for
   the partially handicapped

II. HOUSING PLANNING AND ECONOMIC PLANNING

Fiscal and monetary policies are the tools of the government
for regulating economic activities. In a mixed economy such
as ours, manipulation of these tools is generally what econo-
mic planning is all about. For example, a combination of de-
creases in taxes and interest rate with increases in government
expenditures and money supply will stimulate increases in con-
sumption and employment and thus income and economic growth.

Although monetary policy is not formulated especially to
influence the level of residential construction, the adoption
of restrictive monetary policies 1/ by the federal government
in combating inflation has the effect of increasing mortgage
interest rates and reducing the availability of funds for
residential construction and consumption. National housing
policies and programs therefore have to be formulated within
the general framework of economic planning.

Planning of income redistribution at the macro level involves
also redistribution of resources in the field of housing for
the attainment of housing and other economic objectives, such
as full employment and price stability. Most housing policies
and programs do have positive employment effects and income

1/ In time of inflation, government may restrict the flow and
   supply of money through open market operation, i.e. selling
   bonds to the public; increasing bank rate; or increasing
   legal reserve ratio of chartered banks.

redistributional results. However the mix of housing programs should ideally serve the dual purpose of increasing residential construction and promoting economic stability, because without a clearly defined set of priorities, housing programs that are pro-cyclical (or highly inflationary in time of rising prices) will have to be sacrificied for economic stability, According to L. B. Smith: "Unless the nation is experiencing a severe housing shortage, the social benefits of general stabilization will probably outweigh those of additional housing expenditures." 1/.

In addition to policies and programs which directly redistribute income for housing assistance purposes, there are housing program that operate through the mortgage market. These programs exert their influence on the flow of funds for housing production and consumption by altering lending terms 2/ of government insured mortgage credit (thereby altering relative yields on other financial investments) and advancing mortgage funds directly to the private sector.

The supply of mortgage credit from private financial institutions depends upon the desirability of mortgages as an invest-

1/ Smith,L.B. "The Housing Market, the Housing Problem, and Government Policy" in Officer and Smith (eds.), Canadian Economic Problem and Policies, McGraw-Hill, Toronto, 1970. p.256.

2/ Interest rate, maximum loan amount, minimum loan-to-value ratio, amortization term, and the relationship between the borrower's income and the gross debt service.

ment compared with other investment alternatives. The loan insurance program provides such desirability by making mortgage lending a virtually risk-free investment. By varying lending terms of the government insured mortgages, the volume of new residential construction can be decreased to curb inflation or increased to combat unemployment and to put housing within the reach of more families. It should be added here that "the loan maximum may be used as a policy tool for other than stabilization purposes, since variations in the relative loan maximums per unit for single and multiple dwellings can substantially affect the single and multiple mix of construction." [1]

Direct lending is to make residential-construction loans out of public funds to stimulate building activity when private credit gaps arise or when mortgage funds are scarce. Under the National Housing Act, direct loans can be made by CMHC under a variety of programs —— Limited Dividend, Low Rental, Non-Profit, Public Housing, Student Housing and so on —— and to persons unable to obtain private mortgage credit on NHA terms.

Since the NHA terms are usually much more favourable to the borrower than conventional terms, it is likely that the increased availability of loans on NHA terms reduces the

[1] Smith, L.B. Housing in Canada : Market Structure and Policy Performance, op.cit. p.77.

demand for conventional mortgages, and consequently, the volume of conventionally financed housing starts. On the other hand, it may be argued that CMHC participation increases the total flow of funds, thereby reducing the conventional mortgage rate and stimulating conventional housing starts. But the additional government demand for funds for CMHC lending may raise bond rates and result in a reduction of mortgage availability. 1/ The method of funding a direct lending program therefore warrants the attention of economic planners.

If funds are raised by selling government securities to financial institutions, the ability or willingness of these institutions to invest in mortgages may be diminished for security sales tend to raise bond yields relative to mortgage rates. If funds are raised by security sales to the central bank, the money supply in the economy will be increased. Finally, if funds come out of additional tax revenues or reduced spending on other programs, the incidence of the tax or nature of the foregone expenditure will determine the extent of the offset in the housing sector. 2/ In times when restrictive policies are needed, sale of securities to the central bank would appear not to be an appropriate way of funding direct-lending programs.

1/ Smith,L.B. Housing in Canada : Market Structure and Policy Performance, op.cit. p.79.

2/ Smith,L.B. "The Housing Market, the Housing Problem, and Government Policy." op.cit. p.256.

Because of the influence new housing has upon the consumer
appliances and furnishing industries, public utilities and
community facilities, economic planning and housing planning
have to be coordinated to come up with a desirable combination
of monetary, income redistribution, direct lending and credit
term policies for the achievement of both economic and housing
objectives.

III. EVALUATING HOUSING PROGRAMS

Since no society has an unlimited capacity to redistribute
income, the various government programs which involve redis-
tribution have to compete with one another for funding.

When the housing priority is determined and a budget is approved
for direct provision of housing, allocation of the limited re-
sources among the various sectors of needs should comply with
findings of housing market analyses. If we want to achieve effec-
tiveness and efficiency in the use of the housing dollars,
evaluation of program alternatives on the basis of some
objective selection criteria is required.

A. P. Solomon suggested the following list as a basis for
policy choices : 1/

1/ Solomon, A.P. Housing and Public Policy Analysis, Working
Paper No.12, Joint Center for Urban Studies of M.I.T. and
Harvard University, 1972, pp.3-4.

1. Maximize aggregate housing consumption;
2. Promote equal residential opportunities (freedom of choice);
3. Close the housing gaps in the most cost effective manner;
4. Redistribute housing consumption equitably.

The first criterion in program selection is to determine which program combination will contribute most to the overall consumption of housing. This requires information on the responiveness of housing supply to a shift in housing demand. If the supply of housing services is perfectly inelastic and the market does not respond to a change in housing demand, a demand strategy e.g. rent supplement program will simply cause rent increases without commensurate improvements in housing quality. The existence of a perfectly inelastic supply therefore signals the use of supply-oriented strategies in increasing housing supply to meet the market demand. On the other hand, if housing supply is perfectly elastic and responsive to changes in demand, adoption of supply strategies will have no effect on the equilibrium price or the quantity of housing consumption. Under such a condition, demand strategies will be required to increase housing consumption power in order to bring about more housing consumption.

Both supply and demand strategies, when appropriately applied, will create housing consumption benefits, Solomon suggested the dollar amount of the government's subsidy as the measure of such benefits. However calculation of these benefits may not be easy if benefits other than monetary are included.

The housing consumption benefit for public housing is the difference between the tenant's rental payment and the estimated rent for comparable housing on the private market. Similarly, the portion of the market rental paid by the government under a rent supplement program gives the value of the consumption benefit. A comparison of these dollar values under all tentative programs complete the selection process according to the first criterion. 1/

The second criterion concerns with consumer sovereignty, i.e. the choice of location, structural type and design of housing unit. In contrast with public housing tenants who may have little or no freedom of choice, NHA participants under the Assisted Home-Ownership Program could enjoy as much freedom as home buyers without public assistance. Housing programs can be ranked in order of how well they comply with this performance standard.

The third criterion is cost-effectiveness which can be measured by estimating the number of households moving to standard housing for a given expenditure. A comparison of programs according to this efficiency or least cost principle will involve calculation of the capital, operating and administrative costs of each program for a standardized dwelling unit. A uniform measure

1/ If the housing programs are designed to achieve housing objectives as well as other economic objectives, evaluation of program benefits will have to include social economic benefits such as employment and income effects.

such as total costs per unit per month may be helpful in determining the most cost effective approach to closing the housing gaps.

The fourth criterion concerns with both vertical and horizontal equity in redistributing housing and housing subsidies. Before federal housing aid reaches the target population, it must pass through several intermediaries such as provincial housing agencies, developers/builders, and property owners. This criterion stipulates that the amount of resources deflected to these intermediaries should be minimal. An analysis of the allocation of benefits under the various programs will point to the program that delivers the highest proportion of the housing dollars to the target population. Demand strategies, e.g. rent supplement, will score high on this scale of vertical equity.

The second measure of redistributive efficiency is horizontal equity, i.e. equal assistance to those with equal needs. A comparison of potential market rental of public housing units with the mean rent for "standard" private dwellings paid by other low-income households in the same area will show how successful public housing programs are in meeting this criterion.

Many program performance criteria, such as universality, may

be added to the above list. 1/ However, as the saying goes,
too many cooks spoil the broth. Even when the criteria are
quantifiable, they may not be commensurable. If all the above
four criteria are used in program evaluation, we may have to
assign weights to each criterion to reveal society's preferences,
so that the programs selected will attain the housing objective
in the most efficient and effective manner.

1/ A similar set of criteria can be found in Grebler,L.
   "Criteria for Appraising Government Housing Programs",
   American Economic Review, May, 1960, pp. 321-332.

SIX. DECISION-MAKING IN PRIVATE HOUSING DEVELOPMENT

Housing market analysis is essential to sound decision-
making in housing production. The profit motivated developers/
builders may analyze the market conditions and find answers
to the following questions : Are housing demand and supply
in balance? Are there profit-making opportunities in housing
production? What is the house type that is in demand and
that offers the highest rate of return? What will the future
demand be? What are the market effects of government inter-
vention? What are the competitors' market shares and their
production schedules? For whom are the dwellings built?

With these questions in mind, developers/builders or their
economic consultants will consider the relevant demand and
supply factors as well as the neighbourhood and site charac-
teristics if land for development is available. The amount
of information to be collected and analyzed will depend on
the level of risk associated with real estate investment.
Because of the size of capital investment involved, large-
scale subdivision or high-rise developments usually call for
comprehensive market studies.

One may question the need for market studies when the housing
market is tight, and is ready to absorb an increase in supply.
It is true that market analyses are superfluous under such
market condition for small, single purpose projects with

relatively short-term goals. But for complex, long-term
and large-scale projects, forecasts of demand and possible
government actions together with neighbourhood and site
analyses are indispensable. Since housing investment must
compete with other forms of investments, and must offer
comparable prospects of return, "housing market analysis" or
rather prospecting is almost a daily routine for developers/
builders. 1/

While general information on the housing market can be ob-
tained from Statistics Canada, government housing agencies
and city planning departments, developers/builders need to
conduct their own neighbourhood and site analyses before
feasibility of the proposed developments can be determined.
W. N. Kinnard recommends the following list of factors re-
quiring consideration in neighbourhood and site analyses. 2/

A. Factors of Neighbourhood Analysis

1. Stage in Life Cycle : comparison with competition, ac-
    tual versus effective age;

2. Stability : conformity or compatibility of uses and users,
    zoning, codes, other use regulations;

1/ Since land capital, labour and building materials can have
   alternative uses, developers/builders may turn to greater re-
   venue-producing projects i.e. commercial and office build-
   ings when the costs of land and money are high.

2/ Kinnard,Jr.W.N. A Guide to Appraising Apartments, Society
   of Real Estate Appraisers,Chicago, 1965.

3. Access : transportation, shopping, employment facilities;

4. Value Level : protection, distribution;

5. Proximity of Cultural Facilities : schools, churches, libraries, parks, playgrounds, theatres;

6. Community Services : garbage and rubbish removal, police and fire protection, utilities;

7. Population : typical income spread, ethnic characteristics, area density, transiency, family size and makeup;

8. Physical Characteristics : topography, possible hazards (landslides, floods, subsidence), natural and man-made barriers;

9. Nuisances : odours, smoke, city traffic, noice.

B. Factors of Site Analysis

Most of the above factors apply here, with addition emphasis on:

1. Physial Characteristics : size, shape, dimension, topography, bearing capacity;

2. Zoning : use restrictions, structural restrictions, set back requirements, height limitations, on-site parking requirements, population density limitations;

3. Title Limitations : lines, easements, special assessments, convenants;

4. Access : transit, highways, visual access;

5. Community Service : water, sanitary sewer, storm sewer,

gas, fire and police, trash and garbage collection,
sidewalks, street lights;

6. Proximity to Shopping Facilities;
7. Proximity to Centres of Employment;
8. Land Availability : price, financing terms.

Subsequent to housing market analysis, a building firm requiring
mortgage financing may commission an appraisal before making
its go-no-go decision. Since the mortgage loan is directly
related to the appraised value (or expected income) of the
project, 1/ an appraisal will serve to indicate the maximum
loan amount the project can qualify. In an appraisal for a
high-rise apartment for example, the appraised market value
or capitalized value can be calculated by the following
formula :

$$\text{Capitalized Value} = \frac{\text{Annual Gross Rent - Annual Operating Expenses}}{\text{Capitalization Rate}}$$

The major factor in determining an acceptable capitalization
rate is the mortgage interest rate —— the higher the interest
rate, the higher the capitalization rate. Since the capitalized
value is inversely proportional to the capitalization rate,
the effect of high interest rates is to reduce capitalized

1/ For an income-producing property, the most rational method
of appraisal is the income method. The other two appraisal
methods — replacement cost and comparable sales — may be
helpful as a check. See Stewart,J.I.Real Estate Appraisal
in a Nutshell, University of Toronto Press, 1972, for a
description of the three approaches.

value and the maximum loan amount of the project. This in
turn raises the cash investment required from the developer/
builder and lowers his financial leverage or profit-equity
ratio. 1/ High interest rates thus have the effect of depres-
sing a development project's investment prospects by reducing
the mortgage loan amount for which the project qualifies and
by raising the owner's operating expenses. 2/

When the project's mortgage terms are known, the builder/
developer can decide on the feasibility of the project. If
it can be built within the budget, and is expected to yield
an acceptable rate of return on equity investment, then the
project is feasible.

In apartment house investments, tax considerations are of
major concern as financing terms. It is therefore important
for the developer/builder to be knowledgeable in how taxes
affect cash flows. Depreciation is one of the tax advantages
for real estate investment. It can be computed "straight line"
or "accelerated" to reduce the amount of taxes payable. 3/

1/ Leverage is a measure of the relationship of the amount of
   funds put in the venture by the owner as compared to the
   amount supplied by lending institutions. If a project yields
   a $10,000 net annual return on a $10,000 cash investment,
   it has ten times the leverage of a $10,000 return on a
   $10,000 cash investment.

2/ Griffin,L.W. Development Building : The Team Approach,
   The American Institute of Architects, 1972, pp.31-35.

3/ The different depreciation methods are discussed in
   Wendt,P.F. and Cerf,A.R. Real Estate Investment Analysis
   and Taxation, McGraw-Hill, N.Y. 1969, pp.81-91.

Although real property can often be depreciated at accelerated rates during its early years, its actual value often apprepriates during these years because of inflating land and construction costs.

When the depreciation deduction fails to provide shelter to taxable income from the project, the developer/builder may decide to sell (or refinance) his property. The sale-leaseback and variations on its basic theme have become increasingly popular. However, discussion of all factors entering such a decision is beyond the scope of this thesis.

SEVEN.   CITY PLANNING

Since housing is the largest user of urban space, and is
the major determinant of the quality of urban life, housing
market analysis is an integral part of the city planning
process.

I.   RESIDENTIAL SPACE AND MUNICIPAL SERVICE REQUIREMENTS

The housing analysis techniques as discussed in the previous
chapters can be used by planners to generate housing data at
the neighbourhood level, and to produce projections of future
housing needs and housing requirements. 1/ Given prevailing
standards of or realistic assumption on residential densities
and housing types, future housing unit requirements can be
translated into residential land requirements, demand for
municipal services, 2/ and location and space requirements
for related commercial and community facilities. 3/

The space and service requirements are then matched against
the land supply and capacities of the various municipal services

1/ For example, the estimated population under age 19 divided
   by the average number of children per family gives the
   minimum number of single family units required.

2/ Education, police and fire protection, public works, sani-
   tation and waste removal, recreation and community services.

3/ See Chapin Jr., Urban Land Use Planning, University of
   Illinois Press, Urbana, 1965, pp.422-440.

such as sewage treatment plant and water supply system to see
if and when extention and expansion of services are required.
The subsequent allocation of future housing additions to the
different parts of the city together with their requirements
for services and community facilities then form the basis for
developing urban growth policies, and for drawing up or revi-
sing community development plans. See Diagram 14.

With property tax as their major revenue source, municipalities
are responsible for provision of the necessary services to all
property owners/occupants. Since some housing developments can
generate enough tax revenues to cover costs of services while
others cannot, municipalities tend to favour developments with
positive fiscal impact, 1/ with the notion that the surplus
revenues could be used either to improve existing services at
current property tax rate or to reduce the tax rate while
maintaining the same level of services.

Municipal revenues are quite often insufficient to meet grow-
ing costs of services because the property tax base does not
grow rapidly enough to support development. When a municipality

1/ See Sternlieb,G. et.al. Housing Development and Municipal
   Costs, (Rutgers University, New Jersey) for a study of the
   fiscal impact on both a municipality's operating budget and
   educational expenditures of housing developments character-
   ized by various configurational and demographic patterns.

Diagram 14

HOUSING MARKET
ANALYSIS
existing
housing
inadequacies

POPULATION FORECAST
number of households,
household (family) size,
age composition

HOUSING REQUIREMENTS
number of dwelling units,
type and size mix

LAND SPACE REQUIREMENTS

DEMAND FOR
MUNICIPAL
SERVICES

DEMAND FOR
COMMUNITY
FACILITIES

THRESHOLD ANALYSIS
space and service
requirements vs.
limitations to
development

OTHER INPUTS
economic base,
traffic flow,
municipal cost-
revenue figures,
regional planning
of population
distribution, etc.

URBAN GROWTH POLICIES
(DEVELOPMENT PLAN)
staging of servicing
land, municipal service
expansion, zoning

is faced with fiscal squeeze, 1/ and is reluctant to increase property taxes, 2/ it will try to slow down or stop residential growth by : a) delaying servicing land, b) "exclusionary" zoning, c) lengthening the development approval process. These delays in turn restrict housing supply and contribute to rising land values and housing prices. What these measures mean to the new residents is that in addition to the average cost of urban growth, i.e. property taxes, they have to pay the "artificially created marginal costs of urban growth" in form of higher housing prices.

If housing planning and physical planning are to be integrated, planners should not be mainly concerned with municipal cost-revenue balance of new housing developments, and ignore the socio-economic effects of inadequate housing such as crime and fire hazards. According to Benjamin Disraeli : "The best security

1/ As pointed out by Netzer,D. in Impact of the Property Tax: Effect on Housing, Urban Land Use, Local Government Finance, Research Report No. 1 to the National Commission on Urban Problems, Government Printing Office, Washington,D.C., 1968, the principal remedies for fiscal squeeze must take the form of some reduction in the reliance on the property tax for the financing of urban public services. Among his suggestions are: an increase in cost sharing with senior levels of government; and a new base for property taxation, i.e. land value increments. This kind of tax is aimed at recapturing for the government a higher proportion of what economists called the unearned increment or external economies — the rise of land value that occurs, not through efforts of an owners, but through governmental action (subway lines, sanitary sewers, zoning changes, etc.) and through growth of the population and industry of the community.

2/ It should be noted that property taxes are regressive, and high property taxes can discourage consumption of and investment in housing, especially investment in rehabilitation of unmodernized older housing.

for civilization is the dwelling, and upon proper and becoming dwellings depends more than anything else the improvement of mankind. Such dwellings are the nursery of all domestic virtues, and without a becoming home, the exercise of those virtues is impossible." 1/

II.   PLANNING CONTROLS AND HOUSING COSTS

Planning controls such as zoning, building codes, subdivision controls, land use contracts, and the development approval process serve to mould urban development into a desired pattern, and to protect existing land uses and land values (on which property taxes are based). But these controls may negatively affect the supply and costs of housing if inappropriately imposed or applied e.g. large-lot zoning and restrictions on the number of bedrooms in apartment structures. It is therefore important for planners to understand the drawbacks of these controls and to try to lessen their adverse effects on the housing market.

A.   Zoning

Current zoning and zoning variance practices perform an important economic function, that is "to prevent individuals from creating harmful neighbourhood effects (negative externalities) likely to bring about unfair income losses and inefficient

1/ Quoted from Fisher,R.M. Twenty Years of Public Housing, Harper & Bros., 1959, p.62.

land use." 1/ Ideally, the allocation of land for residential
and other uses should take into account present and future
housing needs and their space requirements. However, when zon-
ing is predominantly governed by municipal cost-revenue con-
siderations, the prime objectives of zoning are lost. Physical
zoning becomes fiscal zoning which seeks to attract uses that
can produce a net tax revenue and exclude consumers of larger
amounts of public services.

Fiscal zoning may take the form of exclusionary development
controls such as minimum lot size, minimum lot frontage,
building size, exclusion of mobile homes and multiple family
dwellings. These regulations are public policy determinants of
housing cost and supply, and they tend to restrict the housing
supply, in particular low and moderate-cost housing, and to
raise housing prices or rents. Overzoning land for non-residen-
tial uses is another exclusionary device. The resultant re-
duction in the amount of land available for rapidly expanding
residential use would increase the prices of available
residentially-zoned land. 2/

Since large lot size and frontage are usually found to be

1/ Grieson,R.E. Urban Economics, Readings and Analysis, Little,
   Brown & Co., Boston, 1973. p.134-135. It should be noted
   that an activity that generates a negative externality might
   still be desirable for the community if its benefits outweigh
   the costs of its negative effects.

2/ Sagalyn and Sternlieb, Zoning and Housing Costs, Rutgers
   University, New Jersey, 1973, pp.1-6.

positively related to house size, price, and income of residents,
large-lot zoning 1/ appears to have the effect of screening out
inexpensive housing, and thus achieving the objective of fiscal
zoning, i.e. to maximize tax revenue and minimize service costs.
But large-lot zoning alone cannot attract expensive housing,
nor can it guarantee the ability of new developments to "pay
their way". 2/ In the absence of other exclusionary controls,
we can expect from large-lot zoning a diminishing supply of
land for low and moderate-cost housing.

Zoning regulations affect not only the supply of land and
housing, but also housing cost. A recent study correlating land-
use controls and housing costs in New Jersey found that minimum
zoning and developmental requirements are significant factors
explaining selling price variation of single family homes.
Dwelling size, which is directly affected by the minimum size
regulation and indirectly conditioned by minimum lot size re-
quirements, is the single most important factor explaining
selling price variation. 3/

1/ Large-lot zoning is often considered as an improper means
   to insure proper health standards in areas without public
   water supply or sewage disposal, and to avoid leap-frog
   development. See American Society of Planning Officials,
   New Directions in Connecticut Planning Legislation: A study
   of Connecticut Planning, Zoning and Related Statutes, ASPO,
   Chicago, Illinois, Feb. 1967, p.193-199.

2/ The reason that there are other factors which are more
   significant than density in determining municipal costs
   accompanying residential development, for example, servicing
   standards, availability of excess sewage processing capacity.

3/ Sagalyn and Sternlieb, op.cit. p.48.

B. Building Codes

Building codes share the objectives of zoning by-laws. The building specifications and performance standards serve to protect the occupants, the passers-by, and the neighbouring property and its occupants from potential hazards of buildings. However, unduly restrictive codes mean higher costs of construction. In final analysis, "costs in the form of reduced housing consumption and related side-effects could well exceed the costs of a slight increase in risk to neighbours, passers-by, and occupants, if provisions of the codes were relaxed." 1/

Local building codes and zoning by-laws often express the desire of municipal councils and ratepayers to ensure that prevailing high community standards are maintained, or that new development will not adversely affect the local tax base. As a result, "the general effect of the laws and regulations concerning housing production is to obtain good quality housing, but at high cost and at a delayed rate of production." 2/

C. Subdivision Controls and Development Approval Process

Subdivision regulations specify the development or servicing standards and conditions under which land can be subdivided

---

1/ Burns and Mittelbach, "Efficiency in the Housing Industry", The Report of the President's Committee on Urban Housing, Technical Studies, Vol.II, Housing Costs, Production Efficiency, Finance, Manpower, Land, Government Printing Office, Washington, D.C. 1969.

2/ Ontario Advisory Task Force on Housing Policy, Working Papers, Volume 2, Queen's Printer for Ontario, 1973, p.11.

prior to development. Most subdivision regulations require private developers to provide the necessary on-site services, such as roads, curbs, sidewalks, street lights, storm drainage, etc., and to dedicate or reserve land for school sites, recreation areas, and street rights-of-way. Some cities may also require developers to make financial contributions toward off-site services such as sewage treatment plants, widening of arterial roads, acquisition of school sites and construction of new school buildings or expansion of existing ones. Naturally, the costs of the on-site services, the financial contributions made, the land reserved or dedicated to municipalities for public uses are included in the end price of the lot and the final selling price of the house. 1/ If the servicing standards are set beyond reasonable health and safety requirements, or if too much land are required for public uses by municipalities, subdivision controls can negatively affect the supply and cost of housing land.

Delay in municipal approval of subdivision proposals is another cause for restricted land supply and higher housing prices. It can be explained by :

a) The negative attitude of "concerned" residents toward new development, and their vocal opposition in public hearings;

b) the adversary approach to residential planning whereby

1/ The fact that the expansion of existing services benefit the new residential areas rationalizes the shifting of the marginal servicing costs forward to the puchasers/renters of the new housing units.

municipalities attempt to extract concessions from developers;

c) the lack of municipal planning and the resulting anti-
growth attitude; and

d) the changing role of planning from development guidance to
one of purely development control;

Time-consuming procedures cost developers money and needless
to say, the extra land carrying costs are passed on to the
housing consumers.

The above discussion of planning controls and housing costs
echo one of the conclusions made in a recent Vancouver housing
study : "The cumulative effect of the negative laws, regulations,
policies, and attitudes, and the long and extremely complex
development process are the problems affecting the supply of
land for housing and therefore the supply of housing." 1/

Before city planners can become part of the solution to the
housing problem, there are steps they must take to make plan-
ning more responsive to present and future housing needs, and
to lessen the adverse effects of planning controls on housing
supply and housing costs :

a) To develop an understanding of the workings and trends of
the residential construction and housing markets;

b) To weigh the social benefits and costs of planning controls.

1/ ICO Real Estate Management Ltd., "The Land Development Process
as it affects the Supply of New Housing within the Greater
Vancouver Regional District", the Real Estate Board of
Greater Vancouver, 1974, p.54.

Alternative methods of control must be devised to replace those with negative effect on housing supply and housing costs;

c) To streamline the land development approval process;

d) To establish a new set of minimum development standards that reflect basic public health and safety requirements;

e) To take into consideration federal and provincial housing programs, such as the financial assistance for land banking, sewage treatment plant, neighbourhood improvement and residential rehabilitation, when making land use and redevelopment plans, and timing service expansion.

EIGHT. CONCLUSION

Housing is shelter for people, a place where most people
spend at least half their life time relaxing, eating, sociali-
zing, and in short, enjoying life. And yet different people
see housing in a different way. It is a social good to the
government; a profit-making product to the developers/builders,
lending institutions, and suppliers of building materials and
home furnishings; an election platform for the politicians; and
a raison d'être for planners. But there are very few people who
really understand the complexity of the problem of generating
housing.

What housing market analysis offers to the housing planning
process is a meeting ground where all the parties concerned
can understand people's housing requirements, the obstacles to
housing production and consumption, and the viewpoints and
problems of the other participants. It is with this kind of
mutual understanding that we can expect a concerted effort in
housing production for the welfare of the people.

BIBLIOGRAPHY

Abrams,E.D. and Blackman,E.B. <u>Managing Low and Moderate Income Housing</u>, Praeger, N.Y. 1973.

Adam,J.S. <u>New Homes, Vacancy chains, and Housing Submarkets in the Twin City Area</u>, Centre for Urban & Regional Affairs, University of Minnesota, Minneapolis, 1973.

Alonso,L. <u>Location and Landuse</u>, Harvard University Press, Cambridge, Mass, 1965.

Alonso,W. "<u>A Theory of the Urban Land Market</u>", Papers & Proceedings of Regional Science Association, Vol.VI, 1960.

Anderson,M. <u>The Federal Bulldozer</u>, McGraw-Hill, N.Y. 1964.

Armitage,A. and Audain,M. <u>Housing Requirements: A Review of Recent Canadian Research</u>, The Canadian Council on Social Development, 1972.

Atkinson,L.J. "<u>Long-term Influence Affecting the Volume of New Housing Units</u>", Survey of Current Business, Nov. 1963, pp.8-19.

Bagby,D.G. <u>Housing Rehabilitation Costs</u>, Lexington Books, Toronto, 1973.

Barker, Penney, & Seccombe, "<u>The Developers</u>", Canadian Dimension, Vol.9, Nos.2 & 3, Jan, 1973, pp.19-50.

Barlowe,R. <u>Land Resource Economics</u>, Prentice-Hall, 1958.

Beckmann,M.J. "<u>Application of a Neoclassical Von Thunen Model to the Housing Market</u>", The Annuals of Regional Science, June, 1972.

Berridge,J.D. "<u>The Housing Market & Urban Residential Structure: A Review</u>" Research Paper No.51, Centre for Urban & Community Studies, University of Toronto, 1971.

Binhammer,H.H. <u>Money, Banking and the Canadian Financial System</u>, Methuen, Toronto, 1968.

Bishop,R.L. "<u>Consumer's Surplus and Cardinal Utility</u>", Quarterly Jouranl of Economics, May, 1943.

Blaug,M. Economic Theory in Retrospect. Richard D. Irwin.
Inc., Illinois, 1962.

Block Bros. Industries Ltd. Annual Report, 1974, Vancouver,B.C.

Bourne,L.S. "Location Factors in the Redevlopment Process: A
Model of Residential Change", Land Economics, Vol.45, No.2,
May, 1967, pp.183-193.

Breckenfeld,G. "Housing Subsidies are a Grand Delusion",
Fortune, 1972.

Brewster,M.R. et. al. How To Make and Interpret Locational
Studies of the Housing Market, Housing and Home Finance
Agency, 1955.

Brueggeman, Racster, & Smith, "Research Report: Multiple Hou-
sing Programs and Urban Housing Policy", Journal of the
American Institute of Planners, May, 1972.

Butler, Pitkin, & Rothenberg, An Econometric Simulation Model
of Metropolitan Housing Markets, American Real Estate and
Urban Economics Association, 1972.

Canadian Welfare Planning Council, Housing Conditions, Require-
ments and Supply: A Profile of Housing in the Province of Man-
itoba, 1968.

Case,F.E. (ed.) Inner-city Housing and Private Enterprise,
Praeger, New York, 1972.

Central Mortgage & Housing Corporation, Research Group, Econo-
mics and Statistics Division, Housing Market Simulation Model,
Report No.1, March, 1973; Report No.2, May, 1973.

Central Mortgage & Housing Corporation, Briefing Material for
the Housing Need Studies Consultations, 1973.

Chapin Jr.,F.S. Urban Land Use Planning, University of Illinois
Press, Urbana, 1965.

Clark,C. & Jones,G.T. The Demand for Housing,UWP 11, Centre for
Environmental Studies, London, 1971.

Clark,W.A.V. & Cadwallader,M. "Locational Stress and Resiential
Mobility", Environment and Behavior, March, 1973.

Clawson,M. (ed.) Modernizing Urban Land Policy, Johns Hopkins University Press, Baltimore, 1973.

Cole,D. Preliminary Report on Residential Land and Lot Availability, Calgary Planning Commission, 1973.

Crecine,J.P. Financing the Metropolis, Public Policy in Urban Economies, Urban Affairs Annual Reviews, Volume 4, Sage Publications, London, 1970.

Cullingworth,J.B. "Housing Analysis" in Cullingworth & Orr,(ed.) Regional and Urban Studies, George Allen & Unwin Ltd., London,1969.

Davis,O.A. "Economic Elements in Municipal Zoning Decisions", Land Economics. 39, 1963, pp.375-386.

Dennis,M. & Fish,S. Programs in Search of a Policy — Low Income Housing in Canada. Hakkert, Toronto, 1972.

DeSalvo,J.S. "A Methodology For Evaluating Housing Programs", Journal of Regional Science, Vol II, No.2, 1971.

Doling,J.F. A Two-stage Model of Tenure Choice in the Housing Market, Urban Studies, 10(2), 1973, pp.199-211.

Downs,A. "Housing the Urban Poor: The Economics of Various Strategies", American Economic Review, Sept.1969, pp.646-651.

Economic Council of Canada, 11th Annual Review, Economic Targets and Social Indicators, Information Canada, 1974.

Firestone,O.J. Residential Real Estate in Canada, University of Toronto Press, 1951.

Frieden,B.J. "Locational Preferences in the Urban Housing Market". Journal of the American Institute of Planners, Nov.,1961.

Grebler,L. Housing Market Behavior in a Declining Area, Columbia University Press, N.Y., 1952.

Grieson,R.E.(ed.) Urban Economics, Readings and Analysis, Little, Brown & Co., Boston, 1973.

Griffin,C.W. Development Building: The Team Approach, The American Institute of Architects, 1972.

Grigsby,W.G. Housing Market and Public Policy, University of Pennsylvania Press, Philadelphia, 1963.

Harris, Tolley, & Harrel, "The Residence Site Choice", The Review of Economics & Statistics, Vol.L., No.2, May, 1968.

Herbert,J.D. & Stevens,B.H. "A Model for the Distribution of Residential Activity in Urban Areas", Journal of Regional Science, Vol.2, No.2, 1960.

Hirsch,W.Z. Urban Economic Analysis, McGraw-Hill, N.Y., 1973.

Holm,P. "A Disaggregated Housing Market Model", in Nevitt, A.A.(ed.) The Economic Problems of Housing, MacMillan, Toronto.1967.

Huges,J.T. & Kozlowski,J.M. "Threshold Analysis — An Economic Tool for Town and Regional Planning", Urban Studies, No.2, June, 1968.

Hughes,J.T. & Kozlowski,J.M. "Urban Threshold Theory and Analysis", Journal of the Town Planning Institute, Feb., 1967.

ICO Real Estate Management Ltd., "The Land Development Process as it affects the Supply of New Housing within the Greater Vancouver Regional District", The Real Estate Board of Greater Vancouver, 1974.

Illing,W.M. Housing Demand in 1970, Queen's Printer, Ottawa,1964.

Jessop,A. "The Form and Use of Housing Models", Journal of the Royal Town Planning Institute, Feb., 1973, p.78.

Kain,J.F. & Quigley,J.M. Measuring the Quality and Cost of Housing Services, Program on Regional and Urban Economics Discussion, Paper No.54, Harvard University, July., 1969.

Kemp,K. The Consumer Price Index for Canada with Particular Reference to the Housing Components, Economics and Statistics Division, CMHC, Jan., 1973.

Kirkland,J.S. Demographic Aspects of Housing Demand to 1986, Staff Study, Economics and Statistics Division, CMHC, Dec,1971.

Kirkland,J.S. Patterns of Housing Quality, Staff Study, Economics and Statistics Division, CMHC, Dec., 1972.

Kirkland,J.S. Demand for Housing in Canada, Staff Study, Economics and Statistics Division, CMHC, Dec., 1973.

Kirwan,R.M. & Martin,D.B. The Economics of Urban Residential Renewal and Improvement, WP 77, Centre for Environmental Studies, London, April, 1972.

Kirwan,R.M. & Martin,D.B. The Economic Basis for Models of the Housing Market, WP 62, Centre for Environmental Studies, London, May, 1970.

Kouskoulas,V. (ed.) The Proceedings of the International Conference in Urban Housing, Wayne State University, Michigan, May, 1973.

Kozlowski,J.M. & Hughes,J.T. Threshold Analysis, Architectural Press, London, 1972.

Lean,W. "An Economist's Note on the Validity of Urban Threshold Theory", Journal of the Town Planning Institute, July,1969.

Lean,W. Economics of Land Use Planning: Urban and Regional, The Estates Gazette Ltd. London. 1969.

Lichfield,N. "Relocation: The Impact on Housing Welfare", Journal of American Institute of Planners, August, 1962.

Lithwick,N.H. Urban Canada: Problems and Prospects, CMHC, Ottawa, 1970.

Lansing,J.B. et.al. Residential Location and Urban Mobility. University of Michigan, Social Research, 1964.

Lowry.I.S. "Seven Models of Urban Department: A Structural Comparison", Paper prepared for Conference on Urban Development Models. New Hampshire, June, 1967.

Lozano,E. "Housing Costs and Alternative Cost Reducing Policies", Journal of American Institute of Planners, Vol.38, No.3, pp.176-181, May, 1972.

Machlup,F. "Professor Hicks' Revision of Demand Theory", American Economic Review, March, 1957.

Maisel,S.J. "A Theory of Fluctuation in Residential Construction Starts", American Economic Review, June, 1963, pp.359-383.

Malisz,B. "Implications of Threshold Theory for Urban and Regional Planning", Journal of the Town Planning Institute, March, 1969.

Marcuse,P. "Social Indicators and Housing Policy", Urban Affairs Quarterly, Dec, 1971.

McCarthy,E.J. Basic Marketing, 4th ed. Irwin, Illinois, 1971.

Mckeever,J.R. (ed.) The Community Builders Handbook, Urban Land Institute, 1968.

Meyerson, Terrett, and Wheaton, Housing, People, and Cities, McGraw-Hill, N.Y. 1962.

Mishan,E.J. Cost Benefit Analysis, G.Allen & Unwin Ltd, London, 1971.

Mucha,F.A. "Techniques in FHA Housing Market Analyses", an address at the Construction Marketing Seminar of the American Marketing Association, 1966.

Muth,R.F. "Urban Residential Land and Housing Markets", in Perloff and Wingo, Jr. ed., Issues in Urban Economics, Johns Hopkins Press, 1968. pp.285-334.

Muth,R.F. "The Demand for Non-farm Housing" in Harberger,A.C. (ed.) The Demand For Durable Goods, University of Chicago Press, 1960.

Needleman,L. The Economics of Housing, Staples Press, 1965.

Nelson,R.H. "Housing Facilities, Site advantages, and Rent", Journal of Regional Science, Vol.12, No.2. 1972.

Nelson,R.L. & Aschman,F.T. Real Estate and City Planning, Prentice-Hall, 1957.

Nourse,H.O. The Effect of Public Policy on Housing Markets, Lexington Books, Lexington,Mass, 1973.

Oksanen,E.H. "Housing Demand in Canada, 1947 to 1962: Some Preliminary Experimentation", The Canadian Journal of Economics and Political Science, August, 1966, pp.302-318.

Olsen,E.O. "A Competitive Theory of the Housing Market", American Economic Review, September, 1959, pp.612-622.

Onibokun,A.G. "Evaluating Consumers' Satisfaction with Housing: An Application of a Systems Approach", Journal of the American Institute of Planners, May, 1974, pp.189-200.

Ontario Advisory Task Force on Housing Policy, Working Papers, Vol.1 & 2, Queen's Printer, 1973.

The Ontario Housing Advisory Committee, The Housing Production Process in Ontario, Queen's Printer, 1973.

Page, A.N. & Seyfried, W.R. (ed.) Urban Analysis: Readings in Housing and Urban Development, Scott, Foresman & Co, 1970.

Perloff, H.S. & Wingo, Jr.L. (eds.) Issues in Urban Economics, Johns Hopkins, 1968.

Pynoos, Schafer, and Hartman, (ed.) Housing Urban America, Aldine Publishing Co, Chicago, 1973.

Rapkin, C. & Grigsby, W.G. Residential Renewal in the Urban Core, University of Pennsylvania Press, 1960.

Ratcliff, R.U. Real Estate Analysis, McGraw-Hill, N.Y. 1961.

Ratcliff, R.U. Urban Land Economics, McGraw-Hill, N.Y. 1949.

Ravis, D. Advanced Land Acquisition by Local Government: The Saskatoon Experience, Community Planning Association of Canada, 1973.

Reid, M.G. Housing and Income, University of Chicago Press, Chicago, 1962.

Report of the Federal Task Force on Housing and Urban Development, Queen's Printer, Ottawa, 1969.

Richardson, H.W. Regional Economics — Location Theory, Urban Structure, and Regional Change, Praeger, N.Y. 1969.

Ricks, R.B. "Housing Policy as a Component of Urban Policy", Urban Land, Vol.31, No.10, Nov. 1972, pp.10-19.

Rossi, P.H. Why Families Move, The Free Press, Illinois, 1955.

Row, A. & Jurkat, E. "The Economic Forces Shaping Use Patterns", Journal of American Institute of Planners, Vol.25, 1959.

Sayegh, K.S. (ed.) Canadian Housing: A Reader, University of Waterloo, 1972.

Schreiber, Gatons and Clemmer, Economics of Urban Problems, Houghton Mifflin Co, Boston, 1971.

Simmons, J.W. "Changing Residence in the City: A Review of Intra-urban Mobility", The Geographical Review, LVIII, 1968.

Smith, L.B. Housing in Canada: Market Structure & Policy Performance, Research Monograph, No.2. CMHC, Ottawa, 1971.

Smith, L.B. Housing and Mortgage Markets in Canada, Bank of Canada Staff Research Studies, No.6, Ottawa, 1970.

Smith, L.B. "The Housing Market, the Housing Problem, and Government Policy", in Officer and Smith (eds.), Canadian Economic Problems and Policies, McGraw-Hill, Toronto, 1970, pp.242-257.

Smith, L.B. & Sparks, G.R. "The Interest Sensitivity of Canadian Mortgage Flows", Canadian Journal of Economics, Aug.1970, pp. 407-421.

Smith, W.F. Aspects of Housing Demand — Absorption, Demolition and Differentiation, The Centre for Real Estate and Urban Economics, Institute of Urban and Regional Development, University of California, Berkeley, 1966.

Smith, W.F. Housing: The Social & Economic Elements, University of California Press, 1971.

Solomon, A.P. Housing and Public Policy Analysis, Working Paper No.12, Joint Centre for Urban Studies of M.I.T. and Harvard University, June, 1972.

Stahl, I. "Some Aspects of a Mixed Housing Market", in Nevitt, A.A. (ed.) The Economic Problems of Housing, MacMillan, Toronto, 1967.

Stegman, M.A. "Accessibility Models and Residential Location", Jouranl of American Institute of Planners, January, 1969.

Stegman, M.A. (ed.) Housing and Economics, The American Dilemma, M.I.T. Press, Cambridge, Mass, 1970.

Sternlieb, G. The Tenement Landlord, Centre for Urban Policy Research, Rutgers University, N.J. 1966.

Sternlieb, G. et.al. Housing Development & Municipal Costs, Centre for Urban Policy Research, Rutgers University, N.J. 1973.

Stewart,J.I. *Real Estate Appraisal in a Nutshell*, 2nd ed.,
University of Toronto Press, 1972.

Thompson,W.R. *A Preface to Urban Economics*, Johns Hopkins
Press, London, 1968.

United Nations, Economic Commission for Europe, *Housing
Requirements and Demand: Current Methods of Assessment and
Problems of Estimation*, 1973.

United Nations, Department of Economic and Social Affairs,
*Methods for Establishing Targets and Standards for Housing and
Environmental Development*, 1968.

Vancouver City Planning Department, Quarterly Review, May, 1974.

Weimer, Hoyt, and Bloom, *Real Estate*, 6th ed. The Ronald Press
Co, N.Y. 1972.

Wendt,P.F. & Cerf,A.R. *Real Estate Investment Analysis and
Taxation*, McGraw-Hill, N.Y. 1969.

Wheaton, Milgram, & Meyerson, *Urban Housing*, The Free Press,
N.Y. 1966.

White,H.C. "*Multipliers, Vacancy Chains and Filtering in Hou-
sing*", Journal of American Institute Planners, march, 1971.
pp.88-94.

Whitebread,M. & Bird,H. "*Rent, Surplus and the Evaluation of
Residential Environments*", Regional Studies, Vol.7, 1974.
pp.193-223.

Wilkinson,R.K. & Archer,C.A. "*Measuring the Determinants of
Relative House Prices*", Environment and Planning, May/June, 1973.

Winger,A.R. *Housing Space Demand: A Cross Section Analysis*,
Land Economics, Vol.38, No.1, Feb, 1962. pp.33-41.

Winnick,L. "*Housing Market Analysis*", Journal of Housing,
December, 1955,

Wright,W.D.C. "*A Comparison Between Cost-effectiveness and
Threshold Analysis*", Journal of the Town Planning Institute,
April, 1970.