

"I conceive that land belongs
to a vast family of which many
are dead, few are living, and
countless members are still
unborn."

Nigerian proverb

THE UNIVERSITY OF MANITOBA

THE IMPACT OF PUBLIC INVESTMENTS
ON URBAN LAND VALUES

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PREFACE

The underlying assumption in this thesis is that an increment in land value results from a land development process largely financed through public investments.

The thesis is divided into four parts. In the first part; three interpretations of land value are reviewed; the economic approach, the legal approach, and the appraisal approach. Next, the types of public investments affecting land values are identified.

Models that have helped to explain how land values are determined, are analyzed in the second part. As well, a descriptive model emphasizing the influence of public investments on land values is constructed.

Part three examines case studies relating to the role of public investments on land values. Discussed first is the influence of public land assembly programs on the general level of urban land values. Next, investments in infrastructure are explored. The focus is then shifted to the modification of land values as brought about by the city planning process and the provision of municipal services.

The fourth part of the thesis proposes a method for identifying increments in land values. Finally, some alternative public policies are presented.

RÉSUMÉ

L' hypothèse de la présente thèse est que l' accroissement des valeurs foncières est dû a la transformation des terres cultivables en terrains a bâtir; transformation qui est en grande partie financée par les investissements publics .

Dans la première partie de cette thèse, la valeur foncière est étudiée sous ses aspects économiques et juridiques, ainsi que sous l' angle des techniques d' évaluation . Ensuite, les types d' investissements ayant un rôle sur les valeurs foncières sont classés .

Les modèles qui expliquent la détermination des valeurs foncières sont étudiés dans la seconde partie . Un modèle décrivant l' influence des investissements publics sur les valeurs foncières est élaboré .

La troisième partie comprend des études de cas . Le rôle des politiques d' assemblage des terrains, quant à leurs effets sur le niveau général des valeurs foncières est discuté . L' impact des investissements d' infrastructure urbaine est analysé . Le dernier chapitre de cette partie étudie l' influence des méthodes d' urbanisme et des pratiques de développement sur les valeurs foncières .

Dans la quatrième partie, une méthode d' analyse de l' accroissement des valeurs foncières est présentée .

Enfin, quelques politiques de rechange pour le secteur public sont proposées.

Tout au long de cette étude, la majeure partie des exemples sont tirés de la zone métropolitaine de Winnipeg.

Dans cette thèse, un essai est fait afin de générer une nouvelle approche des phénomènes urbains. Cette approche est multi-disciplinaire, ce qui permet une remise en cause des données de notre système socio-économique.

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INTRODUCTION

Escalating land values are a major problem in an urbanizing world. For the last twenty-two years in Canada, the price of lots suitable for the construction of single family dwellings has multiplied six-fold. During the same period of time land costs as a proportion of total costs have more than doubled. The major increases in land values have occurred in Toronto, Hamilton, and Calgary. Winnipeg has had an increase comparable to that of the average Canadian city.¹ The problem is not peculiar to North America. In France a recent report of l' Inspection Générale des Finances indicates that during the period 1945-1963, the per square metre price of developable land has increased six times as rapidly as the hourly average wage.²

It is important to evaluate the role of public investment in the creation of urban land values. Change in these values occurs when land is shifted from rural to urban uses.

¹ see Appendix A: The Variation in Prices of Land in Canada.

² Franz-Olivier Giesbert, "Logement: Priorité Pour Qui?" Le Nouvel Observateur, No. 382, 6 mars 1972, p. 31.

In the present thesis, it is assumed that a parallel can be drawn between the increment in land value and the land development process. For this reason, references are continually made to the rural-urban fringe areas, where land is under the development process.

Change in land values is a subject of major interest to economists, lawyers, and appraisers. Planners, however have made only a minor contribution to the analysis of land values. From time to time recommendations are made by professional planning associations on appropriate means for reducing the price of land. The present thesis provides a new planning perspective on this problem. Planning deals with "identification, definition and analysis of urban and regional problems [here, continuous increase of land values in metropolitan areas] while constantly questioning the existing social and economic systems [which manifest themselves through public investments] ." ¹ Necessarily then, planning is an interdisciplinary field of study.

¹Dr. Michael Y. Sellig, " In Search of a Discipline," Town Planning Institute of Canada News, February 1972, p.12.

PART ONE
SOME FUNDAMENTAL PRINCIPLES
AND DEFINITIONS

This first part includes the definitions of the principal generic terms used in this thesis: Urban Land Values and Public Investments. Economic theories, legal aspects and appraisal methods as theoretical approaches to urban land values are examined in the first chapter. The second chapter of this first part develops specific characteristics of public investments.

CHAPTER ONE
THE THEORETICAL GENESIS OF URBAN
LAND VALUES

A. Review of Economic Theories.

Some definitions at this stage will help to clarify the main issues of the problem. The definitions have been developed to provide for consistent terminology within the bounds of the thesis. Hence they may or may not have more general applicability outside the thesis.

The term land includes both urban land and non-urban land. The realization by economists that urban land has a special character has emerged along with the development of urbanization. Before economists made a distinction between urban land and non-urban land, their theories were applied to land in general. Land value is distinct from land valuation. Land value is a more static notion than land valuation and refers to the value of land at a certain period of time. On the other hand land valuation refers to an incremental process which occurs over time. Land rent corresponds to a flow of goods or money, from the tenant to the land owner for the use of land.

The economists who have studied land values can be divided into two major groups. The first group of economists have questioned the private ownership of land, while the second group has accepted such ownership as an inalienable right. However, an analysis of land values on the basis of type of ownership is not carried out here. Recent developments in economic theory have demonstrated that the theory of location plays a greater role in the determination of land values than does the type of ownership.

To begin with the theory of location will be reviewed.

The Physiocrats formed a school of economic thought before the French Revolution of 1789. They gave land a prominent place as a factor of production. Cantillon wrote:

"The Land is the source or Matter from whence all Wealth is produced."¹

The Physiocrats considered landowners as the only productive social class. The other social classes such as merchants, farmers, officers, etc., were thought to be living at the expense of the landowners.² Considering the principle of ownership, Quesnay and other Physiocrats took a metaphysical approach, claiming ownership was a divine institution, and the basis of distribution of wealth.³

¹Richard Cantillon, Essai sur la Nature du Commerce en Général, 1755, edited with english translation and other material by Henry C. Hoggs, in Reprints of Economic Classics, Augustus M. Kelley editor, New-York, 1964, p.4.

²Ibid., p. 47.

³Auguste Lebeau, Condillac Economiste, Burt Franklin, New-York, 1970, pp. 400-403.

Some discordant views were formulated by l'abbé de Condillac in his "Trade and Government and their Relationship," Condillac considered labor and capital to be more important factors of production than land.¹ Condillac also questioned the divine right of ownership. For him uses and customs were the basis of ownership.²

With Adam Smith³ economic theory progressed. According to Smith the rent of land equalled the difference between the price of the crop and the summation of wages and profits. Wages and profits represented the remuneration of the labour and the capital used to grow the crop. Land, which was in limited supply, was needed by farmers to grow crops. As a result, landowners established land rent and the rent of land was paid to landowners by farmers who grew the crop.^{4,5}

Malthus and Ricardo⁶ both introduced the fixation of price at marginal cost. Assuming an equal size of farming lots

¹Abbé de Condillac, Le Commerce et le Gouvernement considérés relativement l'un à l'autre.

²Auguste Lebeau, Condillac ..., p. 402.

³Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations, 1776.

⁴Henri Denis, Histoire de la Pensée Economique, Presses Universitaires de France, Paris, 1970, pp. 203-204.

⁵Joseph A. Schumpeter, History of Economic Analysis, Oxford University Press, New-York, 1966 edition, pp. 190-191.

⁶David Ricardo, The Principles of Political Economy and Taxation, 1817.

and a single product. Farmer A is the first to enter on the market. He has an indefinite choice of location. He therefore selects the best suitable land for his product. Farmer A sells the product to equal his costs so the market price P_1 , equals C_A ; his cost of production. Farmer B decides to enter the market, as a larger demand exists for the product. He locates on a lot of inferior quality in comparison to the lot occupied by farmer A. The price of his output is higher so that: $P_2 = C_B > P_1 = C_A$. The price P_2 is the new price fixed by the market. To equal P_2 farmer A pays to the landowner a rent r_A for the lot so that:

$$r_A = P_2 - P_1$$

If the demand for the product increases, farmer C enters on the market. The new price determined by the market P_3 is:

$$P_3 = P_2 + r_B = P_1 + r_A + r_B$$

Figure 1 below represents the situation of the three farmers discussed above.

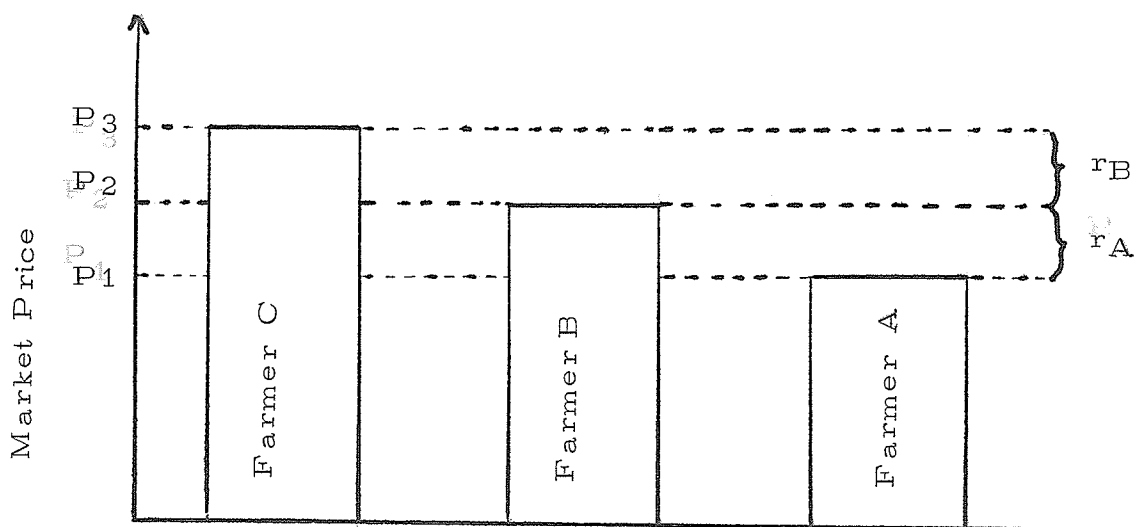


FIGURE 1: Illustration of the Theory of Differential Rent.

This theory is known as the law of differential rent of land. The farmers pay different amount of rents to the landowners. The theory of location is further elaborated by the work of Heinrich von Thünen which is analyzed in the next paragraph.

The following explanations are fundamental in understanding the basis of the theory of location. Von Thünen started from the ideal situation of a town in the centre of a fertile plain. The problem he wanted to solve was: "What pattern of cultivation will take shape in these conditions?" Near the town will be grown the products which are bulky in relation to their value and which are consequently so expensive to transport that the more remote districts are unable to supply them. Highly perishable products also are located near the town. The result is the formation of concentric rings or belts around the town, each of them supporting a particular staple product.¹ Such hypotheses are highly simplified as transport costs become the single factor determining land rent to the exclusion of other factors. Von Thünen was aware of the limitations of his theory and realized that adjustments were necessary. The quality of soil varies and affects the pattern of cultivation. The presence of a river or a canal changes the transportation costs. More than one town creates a competitive market

¹Heinrich von Thünen, Der Isolierte Staat, von Thünen's Isolated State, an english edition, translated by Carla M. Wartenberg, Pergamon Press, London, 1966, p. xxi.

for the farmers.¹ Furthermore in considering the total rent von Thünen makes a distinction between that portion applying only to the soil and the balance which is made up of interest on the value of buildings and other equipment. He called this composite element the estate rent.²

Walter Isard applied von Thünen's theory to urban land. Here, urban oriented uses replace agricultural uses. Isard noted four factors which influence use: effective distance from the core, accessibility of the site to potential customers, number of competitors, and proximity to land devoted to an individual use or a set of uses which are complementary in terms of both attracting potential customers and cutting costs.³ Isard deduced for each type of land use curves. The envelope curve shown on next page is the curve of potential uses. The horizontal axis represents the effective distance from the core O, while the vertical axis represents the rent of land. The envelope curve represents "the maximum rent potential at each possible site."⁴ Then the rent of land is derived from its use. A single rent and use are attached to each site. However Isard formulated some constraints for his theory. Rent potential he considered to be affected

¹ von Thünen, Der Isolierte ..., p. 268.

² Ibid., p. 18-22.

³ Walter Isard, Location and Space-Economy, the MIT Press, 1968, "Some Theoretical Notes on Urban Land Use."

⁴ Ibid., p. 204.

by adjacent land uses. Also, he felt that the law of supply and demand played a role. The increase in demand for housing requires an increased quantity of land for residential purposes. Thus the rent potential of corresponding units of land will rise. With Isard's theory it should be possible to derive an optimal land use pattern for each urban setting. However, the land use pattern thus derived is time-less.

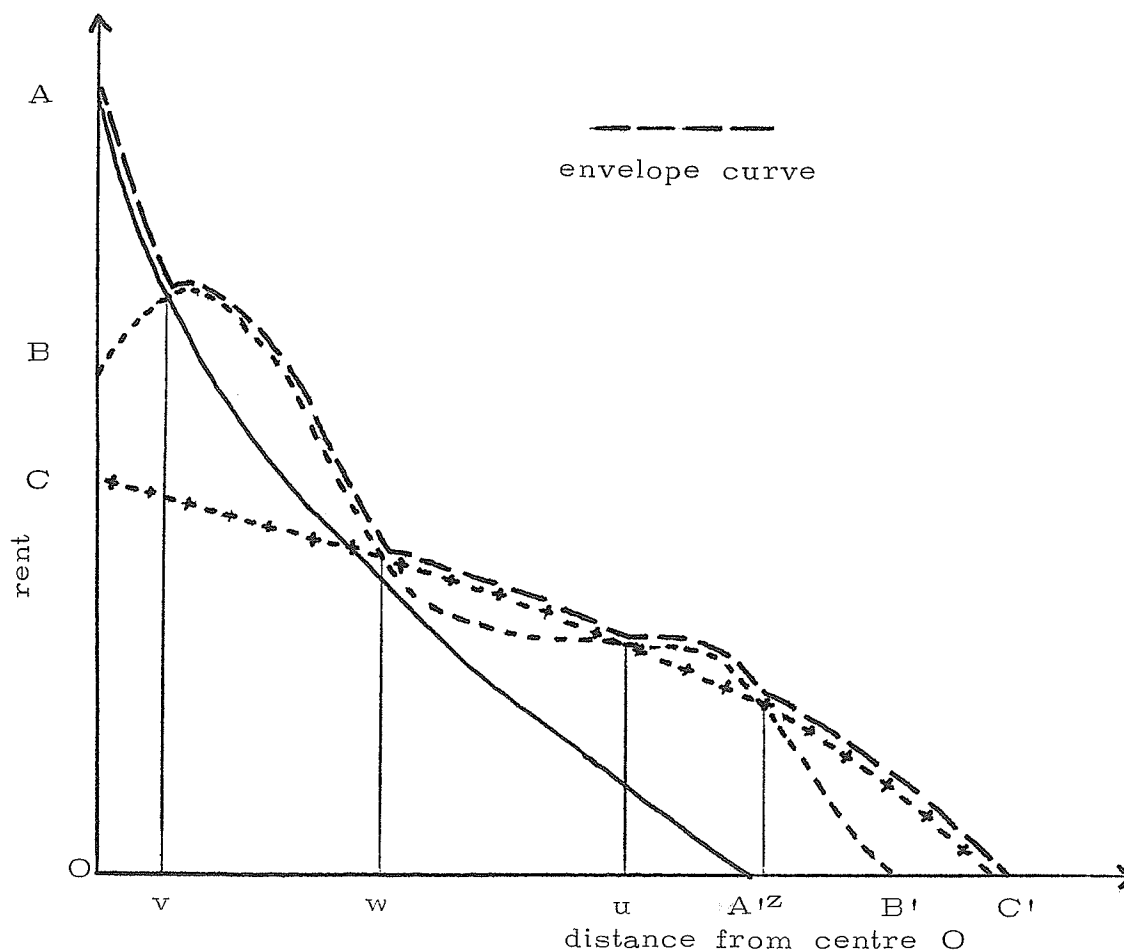


FIGURE 2: Rent Functions for Different Urban Land Uses.
(source: Isard, p. 203.)

Economists, other than those involved with the theory of location of urban rents, have expressed their views on the value of urban land.

As Schumpeter remarked: "John-Stuart Mill wrote a sketchy but suggestive paragraph on urban rent."¹ He observed that land could be used for other purposes than agriculture e.g. residential use.² The rent for residential use would be higher by an indefinite amount than the rent for agricultural use. Mill also estimated that urban land is characterized by its potential for making money. The difference is created by the beauty or the convenience of the site. The supply of beautiful sites results from their scarcity. On the other hand, Mill considered that convenient sites have their value determined by ordinary principles of the law of rent. This discussion of Mill has introduced new elements in the approach to land value being developed here. Urban land is a scarce resource and urban sites have a potential for making money.

Karl Marx's theory on urban land are not studied by many anglo-saxon researchers. The present theoretical approach would not be complete if Marx was not included. A recent study done by a French researcher has contributed to a better

¹ Joseph A. Schumpeter, The History ..., p.675, note 78.

² John-Stuart Mill, Principles of Political Economy with some of their Applications to Social Philosophy, 1848, Book III, Chapter 5, paragraph 3.

understanding of Marx's theory.¹ Marx paid little attention to the rent of land and he concentrated on other factors of production.² He made a distinction between three sources of scarcities, which he called absolute rent, differential rents I and II.

The absolute rent. Capital invested in agriculture produces more surplus than the same amount of capital placed in industry, because agricultural production requires more labour input than industrial production. Marx assumed that the surplus-value was extracted from the labour. Marx called labour variable capital and machines constant capital. In an industry it would be possible to reduce the share of variable capital by increasing the amount of constant capital. Marx felt that in agriculture, the private ownership of land made it difficult for this mechanism to operate. As a result then, an absolute rent was generated. The other two sources of scarcity Marx referred to as: Differential rents I and II. The origin of differential rent I resides in unequal fertility of land and different locations. Having described differential rent I, Marx took an historical approach to differential rent II and stated that it was produced by the inequalities in the distribution of capital among tenants.

¹Francois Alquier, "Contribution à l'étude de la Rente Foncière sur les Terrains Urbains," Etudes et Sociétés, No. 2, Mars 1971.

²Karl Marx, Das Kapital, translated from the first German edition by Ernest Unterman, Charles H. Kerr & Co, 1909, in particular Volume III, Part VI, "Transformation of Surplus Profit into Ground Rent," pp. 720-946.

Marx made several comments on urban land. He felt that the rent on building lots followed the same rules that applied to agricultural land. Location was seen to be an important determinant of rent of building lots. Marx felt that a landowner was an individual:

"... whose sole activity consists in exploiting the progress of social development, toward which he contributes nothing and for which he risks nothing, unlike the industrial capitalist."¹

But, landownership associated with industrial capitalism result in:

"the tremendous power wielded by private property in land when united with industrial capital in the same hand...."²

For Marx the rent of land was a major source of speculation:

"That is the ground-rent, and not the house, which forms the actual object of building speculation in rapidly growing cities, especially when building is carried on as an industry."³

Alfred Marshall also contributed to the advancement of knowledge on urban land values.⁴ He assumed that the value of urban sites was the result of general progress rather than the result of the gain obtained by investing capital and labour.⁵ For such sites he saw the importance of external economies.

¹Karl Marx, Das Kapital, p. 898.

²Ibid., p. 898.

³Ibid., p. 898.

⁴Alfred Marshall, Principles of Economics, 1890, eighth edition 1920, in particular Book V, Chapter 11, "Marginal costs in relation to Urban Land Values."

⁵Ibid., Macmillan, 1966, p. 365.

For Marshall, as the increase in site value was a direct consequence of these external economies. There was, he claimed, a difference between external economies and location. External economies were general, while location was an advantage which one site enjoyed over another. Marshall then analyzed public works that directly affected land values. He believed that when involved in their operations developers created public values:

"He [the developer] probably lays out the roads, decides where houses are to be continuous, and where detached; and prescribes the general style of architecture, and perhaps the minimum expenditure on each house; for the beauty of each adds to the general value of all. This collective value, thus created by him, is of the nature of public value; and it is dependent, for the greater part, on that dormant public value, which the site as a whole derived from the growth of a prosperous town in neighbourhood. But yet that share of it which results from his forethought, constructive faculty and outlay, is to be regarded as the reward of business enterprise, rather than as the appropriation of public value by a private person."¹

According to Marshall public schemes improved "the general condition of town property."² These schemes he compared with other schemes which contributed to the general development of the nation. Then Marshall adds:

" Thus that improvement of the environment, which adds to the value of land and other free gifts of nature, is in good many cases partly due to the deliberate investment of capital by the owners of the land for the purpose of raising its value; and therefore a portion of the consequent increase

¹ Alfred Marshall, Principles of ..., p. 369.

² Ibid., p. 368.

of income may be regarded as profits when we are considering long periods. But in many cases it is not so; and any increase in the net income derived from the free gifts of nature which was not brought about by, and did not supply the direct motive to, any special outlay on the part of land owners, it is to be regarded as rent for all purposes."¹

Regarding the determination of the rent of land Marshall considered that the same law operated for agricultural and urban land.

The law of diminishing returns applied in both cases. If farmers applied capital above a certain amount, each new unit of capital produced less output than the previous ones. The point of maximum return could be determined. For land in urban areas, if the site did not have any scarcity value, the point of maximum return varied with the purpose for which the land was wanted.²

If the site had a certain scarcity value it would be possible to go beyond the point of maximum return and apply more units of capital rather than buying more land.

Edward H. Chamberlin has paid little attention to the determination of urban land rent in his work. However, the mechanism involved in the determination of land rent in some ways reflects the point of view of Chamberlin stated in his Introduction:

"It will be the purpose of this book to show that most prices involve monopoly elements (usually included among the imperfections of competition) mingled in various ways with competition, and that the result is very generally

¹ Alfred Marshall, Principles of ..., p. 367.

² Ibid., p. 368.

equilibrium prices which do not equilibrate supply and demand."¹

Chamberlin made a distinction between agricultural and urban rents. Urban rents in the retail field for example are dependent on the number of customers for sites, a situation which creates a scarcity. Larger returns exist in some locations than in others. Hence, large differences in rents occur. The rents of location are monopoly returns.² From Chamberlin's point of view, the owners of businesses are faced with two attitudes, either they change the demand or they adapt to the demand. If a business can afford the high rent in the central shopping district, the business meets the demand. Then rent paid represents a cost of production on the part of the business. On the other hand, if the business locates in the outskirts and advertises to attract the demand, then it pays a low rent and tries to change the demand. The cost involved in changing the demand is a selling cost.³

Chamberlin summarized his theoretical views in Appendix D: "Urban Rent as a Monopoly Income." He felt that agricultural and urban rents had different natures. Agricultural rent was explained by pure competition, while urban rent was explained by location. For commercial activities rental variations existed

¹Edward H. Chamberlin, The Theory of Monopolistic Competition, 1933, eighth edition, 1962, Harvard University Press, 1965, p. 15.

²Ibid., pp. 112-113.

³Ibid., p. 125.

because some sites could sell more than others. The difference in rents between any two sites was due to the existence of different markets for both sites. Urban rent Chamberlin saw as the expression of a relative advantage between sites. And in conclusion, Chamberlin stated that urban rent is "due entirely to the monopoly elements of the monopolistic competition."¹

Recent theoretical developments in urban land values.

Paul Wendt has reviewed recent works in urban land values.² Wendt criticized urban land value theories for their unsubstantiated hypotheses and the unrealistic assumptions they made.³ The shortcomings arose from the application of traditional price and rent theory to urban site valuation. The land market claimed Wendt, is a set of fragmented sub-markets. The explanation of land values by a single factor is an oversimplification. Accessibility to the urban core is not the unique explanation. More research is necessary with a new set of hypotheses.

"Economists are in general agreement that it is the formation of people into communities which gives rise to the utility and scarcity of urban land and hence to its value."⁴ Economists could

¹Chamberlin, The Theory of ..., p. 266.

²H.B. Dorau and Albert G. Hinman, Urban Land Economics, the Macmillan Co. 1928; Richard U. Ratcliff, Urban Land Economics, McGraw Hill Publishing Co., 1949.

³Paul Wendt, "Theory of Urban Land Values," Land Economics, Vol. XXXIII, 1957, p. 240.

⁴Ibid., p. 231.

certainly agree therefore that land values at specific times "represent simply a condition of the public mind."¹

B. Some Legal Aspects of Land Values.

The development of the theoretical analysis of land values has in large part been ignored by members of the legal profession. Lawyers have developed a particular approach to land values. Their analysis focuses on two points, the real estate and the market value.

The legal notion of real estate. Real estate includes land and structures which are affixed thereto. The term real estate is a synonym for real property. The inclusion of structures in the definition of real estate presents some inconveniences in doing research on land itself. For lawyers the separation of land and structures is an artificial one. In fact real estate is characterized by its immobility. Thus real estate has a specific feature which distinguishes it from other kinds of property. However all properties have common characteristics. The privilege of ownership represents a bundle of rights. The value of a property is equivalent to the possession of these rights. Value is quantified when a change of ownership occurs, after the confrontation between seller and buyer.

¹Richard M. Hurd, Principles of City Land Values, the Record and Guide, New-York, p. 11.

The market value. Until recently the Courts were free to define the term value within their own terms of reference. There was "almost complete absence of statute law on the subject."¹ The Courts established various definitions of market value of land depending upon the purpose for which the value was being determined. Orgel considers that market value established with regard to land expropriation represents the most objective valuation by the Courts because comprehensive measurement of value is the goal. The problem consists in the determination of the amount of money which will be given to the owner to fully compensate for his loss of property rights. As the Court stated in *Irving Oil v R*:²

"...the displaced owner should be left as nearly as possible in the same position financially as he was prior to the taking, provided that damage, loss or expense for which the compensation was claimed was directly attributable to the taking of the lands."

The value to the owner represents one element in the determination of the compensation to be paid. Incidental losses can occur when property is taken. Under the provisions of the most recent legislation in Canada damages for disturbance and injurious affectation plus any special value or special adaptability value

¹Lewis Orgel, Valuation under the Law of Eminent Domain, second edition, 1953, p. 73. Recently at least Manitoba, Ontario and Canada have reenacted their expropriation legislation and dealt more thoroughly with definitions of value.

²(1946) SCR, p. 551.

can be included in the compensation. Special value usually comes to play when either the land being expropriated because of its current use has no readily established market value or the land in question contains some inmarketable improvements or some special attributes.

In the final Report of the Expert Committee on Compensation and Betterment of 1942 of the United Kingdom, some members of the Committee identified a floating value, sometimes referred to as special adaptability value. The experts considered potential development as speculative by nature. Uncertainty in development operations exists:

"The present value at any time of the potential value of a piece of land is obtained by estimating whether and when development is likely to take place, including an estimate of the risk that other competing land may secure prior turn."¹

The Committee concluded on the difficulty of predicting land development probabilities. Consequently, the Committee felt that floating values existed where land development could possibly occur. However problems arise from this interpretation:

"In practice where this process is repeated indefinitely over a large area the sum of the probabilities as estimated greatly exceeds the actual possibilities, because the "float" limited as it is to actually occurring demands, can only settle on a proportion of the whole area. There is therefore overevaluation."²

¹J.B. Milner, Community Planning: A Casebook on Law and Administration, University of Toronto Press, 1963, p. 89.

²Ibid., p. 89.

The Committee identified a significant component in the process of evaluation of developable land. The addition of all these figures will be considered to represent the value to the owner. To determine the exact compensation for land Halisbury's Laws of England gives some guidelines:

"... the price to be paid for the land - that land with all the potentialities of it, with all the actual use by the person who owns it, is to be **considered** by those who assess the compensation."¹

However indetermining the compensation to be paid the recent Canadian statutes have generally agreed that there are several potentially influential factors that are not taken into account.

Section 27(2) of the Expropriation Act of Manitoba can be taken as representative:²

"In determining the due compensation payable to the owner no account shall be taken of
 (a) the special use to which the authority will put the land; or
 (b) any increase or decrease in the value of the land resulting from the imminence of the development in respect of the expropriation is made or from any imminent project of expropriation...."

Having given more details on values of land to owner and taker it is now possible to define market value. "Market value" was defined by the Committee on the Acquisition and Valuation of Land for Public Purposes of England, in 1918:

¹Government of Ontario, Report of the Ontario Law Reform Commission on the Basis for Compensation on Expropriation, 1967, p. 10.

²S.M. 1970, c. 78 (E 190).

"... the standard of the value to be paid to the owner is to be the market value as between a willing seller and a willing buyer."

The recent Canadian statutes have been more precise than the above Committee, by adding the prerequisite of the existence of an open market.

The next section analyzes the techniques used by appraisers to determine land value. The result of appraisal is important to the Courts who can use it as an element in the establishment of the market value for compensation.

C. The Techniques of Appraisal.

The appraisers have a distinct view of real estate value, and claim that value is generated from the wishes of the purchaser who expects some benefits from the property. Value is not seen then as an intrinsic part of property but is dependent upon exogeneous factors. The estimation of value by appraisers is a subjective one. Appraisers do not set the value of property but rather, they estimate the value. At this stage it is important to distinguish the assessed value from the appraised value. Assessed value is a term commonly used to describe the value given by municipalities to equalize the burden of taxation. The ratio to the market value of the assessed value may vary from 10% up to 100%, and this within the same municipality.

¹James Innes Stewart, Appraisal in a Nutshell, University of Toronto Press, p. 111.

The appraisers use three major techniques to estimate the value of real estate. The market data approach uses data of sales of similar properties by analyzing the relations between these properties and the property to be estimated. The cost approach, which adds costs of improvements and subtracts depreciation. The income approach derives the value from the present worth of future benefits. For estimating the value of land without structures there are two techniques. The market data approach consists of comparisons with other properties. The sources of data are sales listings, and offerings for comparable sites. This method is the most commonly used. The other method is called the method of projected development. The technique consists of laying out hypothetical subdivisions. The only difficulty resides in timing the development operations.¹

Before determination of value, appraisers proceed with the study of the principal characteristics of the site. When raw land is ripe for development certain information is collected by the appraiser. The purpose of this is to check public acceptance for the development. The following items are verified by appraisers as being relevant to an investigation of public acceptance and the resulting determination of value:

- availability of utilities
- Bank, Mortgage Cy., and National Housing Act financing
- risks of flooding
- zoning modifications if necessary
- land costs

¹James Innes Stewart, Appraisal in ..., Chapter 8, pp. 117....

topographical survey
 planning of roads and thoroughfares
 existing improvements
 drainage, easements
 soil tests
 slope easements
 existing restrictions
 oil rights
 approximate number of lots
 shopping areas
 telephone
 garbage disposal
 schools
 taxes
 police and fire protection
 miscellaneous (prevailing winds).¹

D. The Ubiquity of the Concept of Urban Land Value.

This review has not resulted in a single comprehensive definition of the concept of urban land value. However the knowledge of what is behind the term "urban land value" has become more precise. To a certain extent urban land values are tied to the values of the persons making evaluations. Evaluation of urban land values is a projection of the values transmitted by society and those biases transmitted by each particular process of professional socialization.²

Economists have their own terms of definition for land value. The acceptance or non-acceptance of the mechanisms of the market creates different points of view among economists. Lawyers have given their own definition of urban land value.

¹The Appraisal Institute of Canada, Appraisal Reference Manual, fifth edition, October 1963, pp. 12-1 to 12-7.

²in particular, Rachel Alterman, "The Intervention of Values in the Planning Process, an unpublished Master's thesis, University of Manitoba, 1970.

Legally speaking, market value of land is determined in order to evaluate the amount of compensation to the owner of an expropriated property. Appraisers use their own set of techniques within specific terms of reference.

The notion of urban land value is more complex than implied by any of the individual theories discussed above. Urban land value is not equivalent to the market value because the market value simply represents the amount of money exchanged between seller and buyer at a given point in time. Market value is therefore instantaneous. In fact urban land value represents the results of a continuing process of change and change of ownership corresponds to the resolution of forces.

CHAPTER TWO

PUBLIC INVESTMENTS

The present chapter deals with public investments as investments different in character from other investments. Public investments can be classified on the basis of the effects they create. To analyze the main characteristics of public investments it is necessary to examine the subject in three parts. First, definitions and specific criteria of public investments are discussed. Next, public investments are discussed on the basis of their direct and indirect effects on land values.

A. Definition and Criteria of Public Investments.

Public investments have differences and similarities with investments made by the private sector.

Public investments are specific investments. The original character of the investor represents the major difference between public and private investments. The public sector represents a broader category than the "state" itself. Crown corporations are included in the public sector. Crown corporations have their own criteria for investment operations. They are very similar to the criteria used by the private enterprise. The "state"

includes the federal, provincial and municipal levels of government.

The state retains certain specific prerogatives, that could be referred to by the generic term monopoly of constraint.¹

The state has the power to force other agents to act in a certain manner. Hence, a definition of public investments in this thesis include those made directly by the state and those made under the constraints imposed by the state.

The realization of investments carried out under the control of the state follows a certain pattern. Public investments are capital investments, and as such, they differ from consumption expenditures. Investments are based on the implementation of programs and are carried out in stages. These stages often represent major steps of a planning process. The planning process implies philosophical and political options which can be either explicit or implicit. Qualitative goals are derived from these options.² The quantification of qualitative goals is formulated by means of government programs. The necessary public expenditures to realize such programs are then established. Thus public investments represent the last step of a complete process. Changes in political and philosophical options result in modification of programs. The attitude of certain governments towards

¹François Perroux.

²in particular, Geoffroy d' Aumale, La Programmation des décisions, Les Presses Universitaires de France, collection Sup, Paris.

the activities of the private sector e.g. laissez-faire represents an implicit option of the public sector.¹

Public investments have other important features. Most notably, such investments are made in order to increase the total amount of collective commodities or public goods. The collective character of a specific commodity depends on the condition of demand and consumption of the commodity. On the other hand, individual commodities are characterized by their price. A consumer pays a certain price and receives the advantages provided by the commodity obtained in exchange. The consumer who cannot afford the price is excluded from the market. For example, the use of a road represents a free commodity for the driver, and consequently the individual who does not use the road is excluded from this particular market. Determination of a pricing system for collective commodities is therefore a difficult task.² Recently the public sector has attempted to diminish the collective character of public investments by charging the real costs to the direct users eg. toll roads. By the imposition of such measures, public investments can be carried out on the same basis as private investments.

Similarities of public and private investments. Private and public investments can be divided in two categories, new investments and replacement investments. Replacement investments

¹ "ne pas agir, c' est toujours une manière d' agir." Sartre.

² Jean-Francois Besson, L' Intégration Urbaine, Les Presses Universitaires de France, Bibliothèque d' Economie Contemporaine, Paris, 1969, p. 29.

are necessary because of obsolescence and deterioration.

Obsolescence is concerned with reductions in service value relative to some improved version or substitute of the investment facility. Because there is always a chance that obsolescence will occur, an element of risk is introduced into the life of any capital investment. As a result, the average estimated life of an investment is shortened and the usefulness of the facilities terminate sooner than if physical deterioration alone was acting on the facilities. Deterioration is defined as the decline in service value of a capital investment relative to another identical new investment. The decline is usually attributed to increasing maintenance and repair expenses as the investment ages. Obsolescence and deterioration give rise to the assumption that service values of capital investments in the future will decline as the investment ages. An example will shed some light on the problem. Some sewer trunks located in the core area of Winnipeg were installed at the turn of the century. The installations are combined sewers, which means that a single main pipe handles sanitary and storm flows. Such installations are now considered obsolete as separate sewer systems have greater advantages. On the other hand, such sewers also deteriorate over time.

The choice of an appropriate capital recovery factor (CRF) and project life is an important element in considering any capital investment. New investments give rise to the recurring annual charges which include the recovery of the capital costs and

the annual maintenance costs. On an annual basis, the calculation includes a capital recovery factor. The formula for CRF is:

$$CRF = i(1+i)^L / [(1+i)^L - 1]$$

where i is the interest rate, and L the estimated useful life of the project in years.

For example, if \$1,000 is invested in a project, with L : 20 years, and i : 8%. $CRF = .1019$. The annual cost equals:

$$\$1,000 \times .1019 = \$102$$

\$102 represents the amount of principal and interest that must be recovered as income each year to justify an initial investment of \$1,000. To this amount must be added the annual maintenance costs in order to arrive at the total annual costs chargeable to the project.

These factors apply to both private and public investments. However, the interest rate for each category of investment may differ. The estimated useful life of an investment as well as interest rate to be applied are the critical factors in capital investment analysis. Public and private investments have different objectives. An investment in water purification is a public investment. Such investment yields benefits to all consumers. The choice of interest rate for the project results in the pricing of water. Normal price systems do not operate as such in this case. Consumers do not have a choice between water at two levels of purity. The price is not related to cost differences as all consumers will benefit from the new water purification

system. One consequence of the implementation of this project is probably the decrease in the number of infectious diseases. The reduction of the number of individuals infected can be considered a benefit of the project. Thus, the selection of an appropriate interest rate presents certain difficulties since the allocation of monetary values to social benefits becomes extremely arbitrary.¹

Benefits of public investments are not restricted to consumers or the direct users. The construction of a highway increases the convenience of private automobile travel and can also reduce the costs of trucking operations. Thus, a government investment may affect both the output of goods and the satisfaction of individual consumers.²

B. Public Investments with Direct Effects on Land Values.

This part discusses some examples of these kinds of investments. The effects are analyzed as case studies later in this thesis.

Transportation systems as an example of public investment, have a direct impact on land values. The construction of new

¹Kenneth J. Arrow and Mordecai Kurz, Public Investment: the Rate of Return and Optimal Fiscal Policy, John Hopkins Press, Resources for the Future Inc., Baltimore, 1970, p. 4.

²Ibid., p. 5.

highways increases the accessibility of certain pieces of land. Opportunities for new activities are created. As a result land values will probably increase in the vicinity of new highways.

The installation of trunk sewers and water mains represents investments in public services that will automatically raise the value of any land benefited thereby. G. Milgram noted the importance of sewer installations as they affect the price of land when she observed that the probability of development is directly increased by this type of investment.¹ This assumes however that all other conditions are unchanged.

Another type of public investment which is important for certain properties, particularly in Winnipeg, are flood control works. The Winnipeg Red River Floodway has certainly brought some unplanned benefits. As an example, before the construction of the Floodway, houses in the Wildwood Park area were under risk of damage by flooding. The demand for these properties certainly would not have been sustained if the Floodway was not in existence. The pressure of the demand, sustained partly because of the Floodway, has increased the value of these properties. The Floodway can therefore be cited as an example of public investment having a direct effect on land values.

¹Grace Milgram, The City Expands, Institute for Environmental Studies, Philadelphia, March 1967, p. 88.

Public investments with mixed effects on land values.

Not all public investments create automatic effects on land values. A distinction should be made between investments having indirect effects on land values and investments having composite effects.

C. Public investments with indirect effects on land values.

This type of investment produces changes in value of land remote from the location of the investment itself. Public investments in the core of cities have an indirect effect on the general level of urban land values. Jean-Jacques Granelle noted that urban land value was both a function and a variable:

"La valeur foncière est, en effet un élément synthétique des résidences et des activités de la ville. De façon plus précise, elle est un indicateur des services offerts par la ville, particulièrement en son centre."¹

Thus, land values are to a certain extent the image of public investments in the core of the city.

The gradual realization of the Downtown Development Plan in the City of Winnipeg certainly has an effect on urban land values over the entire Metropolitan Area. The exact relationship is difficult to measure, but the relationship does exist.

¹Jean-Jacques Granelle, "La Formation des Prix du Sol dans l' Espace Urbain," Revue d' Economie Politique, Tome LXXVIII, 1968, p. 51. "Urban land value is a synthesis of residential and business activities of a city. More precisely, it represents the image of services available in the city, particularly in its centre." translated by the author (t.b.a.)

Public investments with composite effects. Sometimes it is difficult to differentiate between the results of public and private investments. For example, the construction of a shopping centre is a private decision. The realization of a suburban shopping centre is partly the result of the existence of highways that will facilitate travel by shoppers. The public sector has contributed to the realization of a private investment. Private enterprise interested in the development of the shopping centre incorporates the existence of highways in its rentability calculation. If the shopping centre is erected in a residential development property in the immediate vicinity may decrease because of the traffic generated.

The improvement of amenity level can include certain economies of scale. The construction of a school in a new development for example does not always correspond exactly to the current school-age population. The planning authority may provide an excess capacity in the school. The surrounding undeveloped land is thereby affected by a "pull" factor and its value has increased. The probability of residential development has increased, other things being equal.

Public housing, as another type of public investment has a complex effect on land values. Hugh O. Nourse has found a relationship between public housing and property values.¹

¹Hugh O. Nourse, "The Effect of Public Housing on Property Values," Land Economics, vol. XXXIX, 1963, pp. 433-441.

He concludes that the existence of public housing increases surrounding property values. However Nourse does not find the results very convincing. Furthermore, the size of public housing projects is not mentioned. The integration of small size projects within existing residential areas would probably have a different effect on surrounding land values than would the introduction of large scale projects in the same areas.

PART TWO
THE METHODS EMPLOYED
IN THE DETERMINATION OF LAND VALUES.

This part is essentially an analysis of models which provide explanations of land valuation. A model is "in general a simplified abstraction from the real world."¹ Models which analyze the development process are incorporated in the following analysis. The first chapter is a review of theoretical models of land valuation. The second chapter identifies the role of the public sector in land valuation.

¹Britton Harris, "New Tools for Planning," Journal of the American Institute of Planners, vol. XXXI, No. 2, May 1965, p. 90.

CHAPTER THREE
SOME TRADITIONAL MODELS.

This chapter is a review of some important models which provide explanations of land valuation. Although some of the models give to land valuation a secondary importance, they are nevertheless studied from the point of view of land valuation.

The analysis of the various models is split into three parts. First, the study of theoretical models which are classical ones; second, the explanatory models; and lastly the stochastic models.

Each section includes a presentation of the models, a discussion of hypotheses, and a summary which reviews the contribution of each set of models.

A. The Theoretical Models.

This part includes the classical models developed by Wingo and Alonso. A more recent model developed by a French researcher is also included in these analyses.

A) Transportation and Urban Land, by Lowdon Wingo.

In his model, Lowdon Wingo gives to transportation the major role.¹ He determines a function of total transportation costs from which he derives a position rent. Wingo assumes that each worker seeks to maximize his net income and that workers try to locate as close as possible to the place of employment. Thus, workers compete among themselves for residential sites, and there is at least one set of position rents which corresponds to a locational equilibrium such as:

"No household could increase its net return by changing location, and no location could increase its returns by changing occupants. In a purely static sense, this is the spatial optimum toward which a perfectly competitive urban economy would move in the distribution of households."²

However, the locational equilibrium is modified by urban growth and by transportation policies.

The effects of urban growth on land rents. Figure 3, on the next page, illustrates the transportation function. The function includes two components: the system velocity, represented by the slope of the curve; and the ingression component represented by OG. The growth of the urban area will result in an increase of employment opportunities at the centre O and because all employment is concentrated in O, the direct consequence is an augmentation of ingression losses in the system

¹Lowdon Wingo Jr., Transportation and Urban Land, Resources for the Future Inc., Washington, 1961, 132 pages.

²Ibid., pp. 68-69.

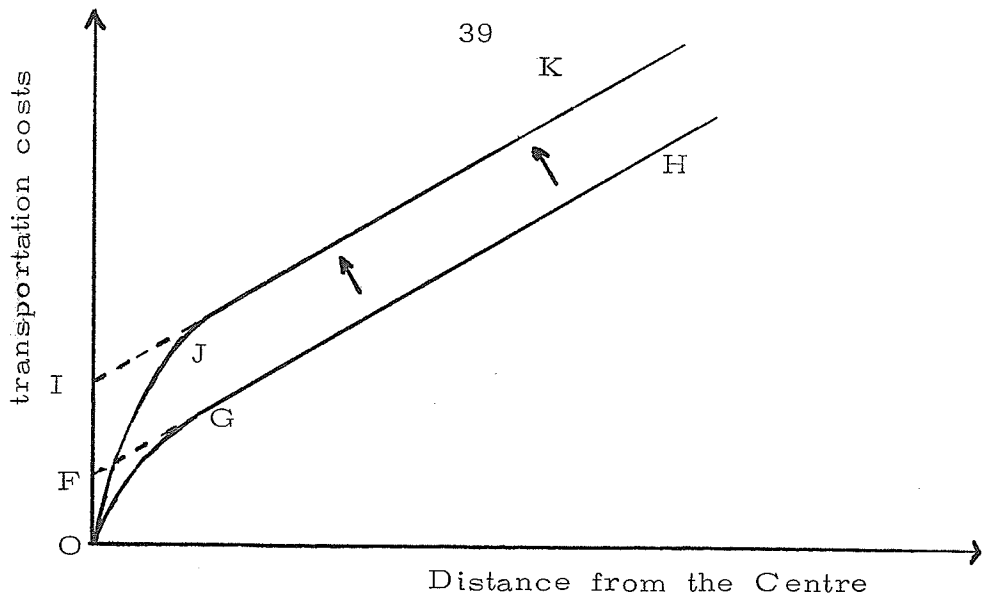


FIGURE 3: Transportation Functions and Increase of Ingression.
 (source: Wingo, p. 101)

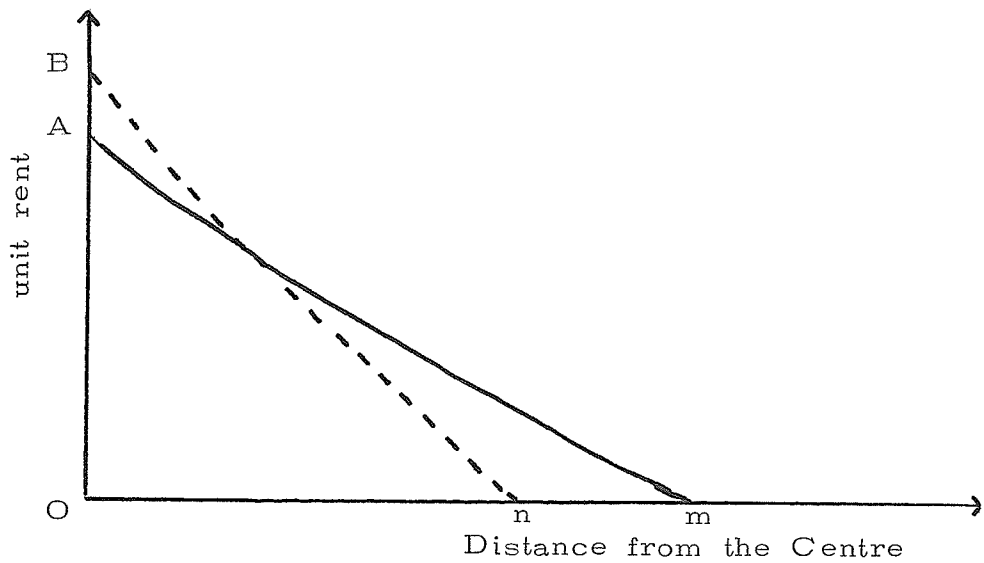


FIGURE 4: Unit Rent Curves and Increase of Ingression.
 (source: Wingo, p. 101.)

because of the loading of the system. Since the system velocity is not directly affected the transportation curve is simply shifted upward from FH to IK. As a consequence, the rent distribution shifts from Am to Bn (Figure 4). The result is a steepening of the rent curve. It is possible that as an effect on urban growth, rents will fall at the margin and the effects of ingressions losses will result in the contraction of the margin.

Wingo concludes:

"Thus, this model contradicts any ad hoc assumptions that extension of the urban margin results *pari passu* from population growth.

"The extent of this inward redistribution could be moderated by a public investment program aimed at preventing any increase in ingressions levels by adding capacity to the transportation system."¹

The effects of transportation policies on land rents.

By increasing the capacity of the transportation system, and reducing the congestion losses the transportation curve is shifted downward, as represented by Figure 5 on next page. Land values are redistributed, as in Figure 6. Because transportation projects are carried out, the result is a decline of land values in the core areas, (ie) the areas within a radius O_e .

On the other hand, land values increase on the outskirts of the city, (ie) the area em_2 , because easier accessibility. Thus, transportation improvements can redistribute land values.

¹Lowdon Wingo, Transportation and ..., p. 102.

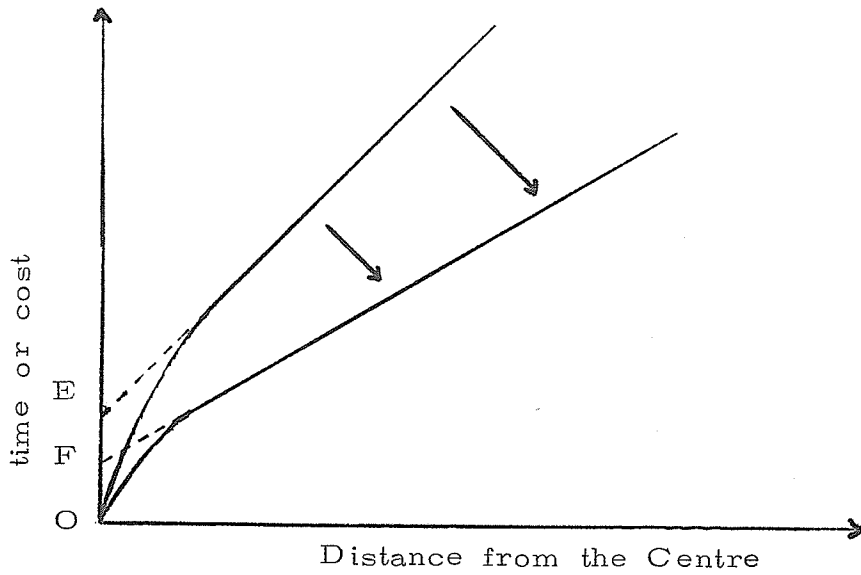


FIGURE 5: Transportation Functions and Transportation Planning
(source: Wingo, p. 108.)

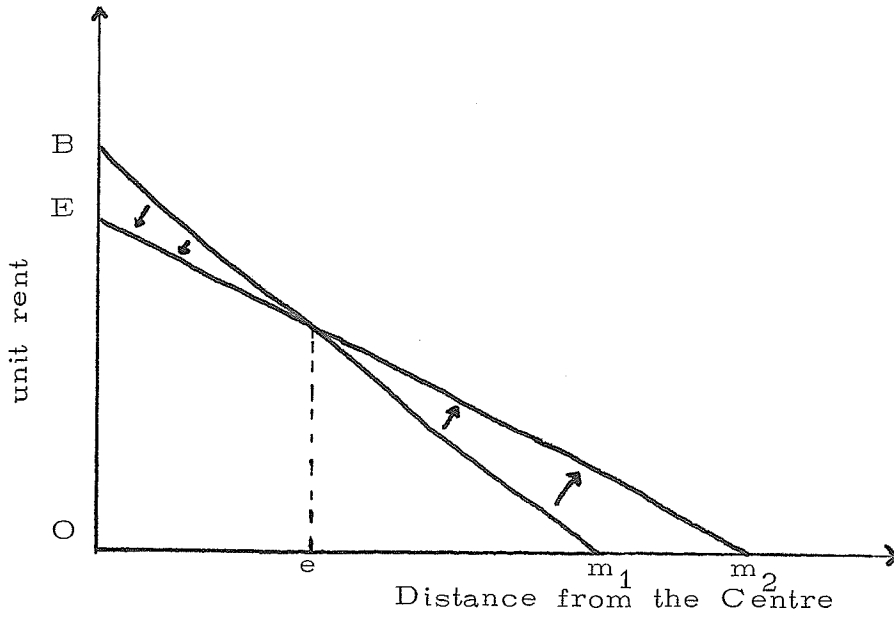


FIGURE 6: Land Rent Distribution and Transportation Planning
(source: Wingo, p. 108.)

Wingo concludes that his model reflects the patterns of development of American cities, as influenced by transportation projects. The model explains "urban sprawl, the subculture of suburbia, and accelerated decay around the core."¹

Some remarks are necessary at this point. Lowdon Wingo's model places the emphasis on the transportation factor in the determination of land values, or unit rents. The locational distribution of unit rents is static and optimal. The improvement of the transportation system modifies land values.

Herbert Mohring has made Wingo's model more operational.² In Mohring's model the difference in rents between two lots is equivalent to the difference of yearly travel time between residences and city centre. Mohring has tried to verify his assumptions in Seattle, Washington. He postulated that construction of a traffic artery that would reduce travel time should have an impact on land values. However, he failed to demonstrate his theory, and he concludes:

"... models will have to be developed that take into account the facts that real world communities typically have more than one center of economic activity, that the demands for both land and transportation are not totally inelastic, and that differences in taste do exist."³

¹Lowdon Wingo, Transportation and ..., p. 117.

²Herbert Mohring, "Land Values and the Measurement of Highways Benefits," Journal of Political Economy, June 1961, pp. 236-249.

³Ibid., p. 249.

B) William Alonso or the continuation of von Thünen's theory.

The model derived by Alonso describes the conditions of equilibrium between households, agricultural and business activities. The market equilibrium corresponds to a situation wherein all demands are satisfied. To meet quantity and price conditions, the market is considered to be in equilibrium when:

1. No user of land can increase his profit or satisfaction by moving to some other location or by buying more or less land.

2. No landlord can increase his revenue by changing the price of his land.¹

Alonso commented further that, increase in incomes tends to contribute to the relocation of wealthy households on the periphery of urban areas. Accessibility is a minor factor for this category of households. On the other hand, poor households are location-oriented, since they tend to remain in the core areas.² The increase in population will result in higher land prices in the urban areas as the level of demand increases. The improvements in the transportation system make commuting easier and less expensive. Consequently land prices become higher at the periphery and lower in the centre.³

¹William Alonso, Location and Land Use: Toward a General Theory of Land Rent, Harvard University Press, 1968, p. 77.

²Ibid., p. 1109.

³Ibid., p. 111.

The tax on land does not affect either land prices or pattern of settlement. A tax on land is equivalent to an increase in prices without changing the equilibrium conditions. However, Alonso analyzes only uniform taxation rates.

The theory developed is considered to be a turning point in the analysis of land values. However some differing views exist:

"Alonso's theory provides a guide to understanding highly generalized patterns of rent and land use, but in its present state, it cannot be expected to do more."¹

Alonso's theory is the basis of more complex models. George Papageorgiou and Emilio Casetti have recently contributed to the analysis of land valuation with a theory applied to multicenter settings.²

C) The theory of René Mayer.

The theory developed by Mayer uses the framework developed by Alonso and Wingo. However his conclusions may differ. Mayer has some explanations for the value on the fringe of the city.³ Urbanization of land as well as land valuation is a development process. Mayer claims that the value of developable land is equivalent to the sum of four terms:

¹"Location and Land Use by William Alonso," a review by William Pendleton, Journal of the American Institute of Planners, vol. XXXI, pp. 78-79.

²George Papageorgiou and Emilio Casetti, "Spatial Equilibrium of Residential Values in a Multicenter Setting," Journal of Regional Science, vol. XI, No. 3, 1971, pp. 385....

³René Mayer, "Prix du Sol et Prix du Temps: Essai de Théorie sur la Formation des Prix Fonciers," Ministère de la Construction, Direction de l' Aménagement Foncier et de l' Urbanisme, Paris, Mars 1965, p. 15.

- a) value of agricultural land,
- b) cost of infrastructures necessary to develop land,
- c) an anticipatory effect claimed by landowners who anticipate the future land value. It is a "speculative" effect, the value of which may vary,
- d) a scarcity effect resulting from the limited quantity of developable land. This effect is not speculative, but corresponds to an existing scarcity. Terms c and d could be eliminated, only a and b correspond to real economic costs.

René Mayer considers that increases in land values on the fringes of urban areas cause corresponding increases in land values in areas closer to the core, in the manner of a "chain reaction." He claims that land values rise as a function of the price that households are willing to pay to save on commuting time. Demographic growth and physical extension of urban area increase the distance between the centre and fringe areas where land has a low value. Thus, urban growth automatically occasions the rise of the general level of land values in already urbanized areas. Mayer assumes that the increase in land values is a natural economic phenomenon resulting from urban growth and the increase of the general level of income. Land speculation is a consequence of, and not a major factor in, the increase of

land values. Creation of secondary centres in an urban area reduces number of commuting trips to a single centre, thus moderating the increase in land values. In urban areas transportation (private or public) is a major economic element. The implementation of a urban rapid transportation system with high capacity increases accessibility to the centre and thus reduces the favorable position of neighbourhoods close to the centre.¹

D) Summary.

The analysis of theoretical models is not yet complete. Models using Cobb-Douglas production functions are not studied here because their analysis would not have provided major findings.²

From the models reviewed it is possible to draw some general conclusions. Land values tend to decrease in the core area of cities with an improvement in the transportation network. The creation of secondary centres tends to diminish land values. Land values are generated from the periphery towards the centre of the city. Furthermore, increases in land values on the fringes have an effect on all land values in the city. The provision of enough developable land to diminish the rent of scarcity would be a desirable step in controlling land prices.

¹René Mayer, Prix du Sol ..., pp. 18-20.

²in particular: Richard Muth, "Economic Change and Rural-Urban Land Conversions," Econometrica, vol. XXIX, No. 1, 1961, pp. 1-23; Edwin S. Mills, "The Value of Urban Land," The Quality of Urban Environment, edited by Harvey S. Perloff, Resources for the Future, 1969, pp. 231-253.

B. The Explanatory Models.

The explanatory models do not provide any theoretical explanation of land values. They identify factors which affect land values. Three models are analyzed in this section. The model developed by Brigham and the Rand Corporation, the model developed by Hansen and that developed by Gottlieb. The latter two models provide some insights into the development process. They contribute further to the determination of land values.

A) The factors influencing land values - A model by Brigham.

In this model, four major factors have an impact on land values:¹

- accessibility (P)
- level of amenity (A)
- topographic variable (T)
- historical variable (H)

The value of a residential lot V_{Ri} located in i is represented by a function:

$$V_{Ri} = f(P_i, A_i, T_i, H_i)$$

The level of amenity cannot be measured directly. Surveys of households provide certain knowledge of the level of amenity.

Brigham assumes the existence of a correlation between the level

¹E.R. Brigham, A Model of Residential Values, Rand Corporation, Santa Monica, California, (R.M. 40-43-RC), August 1964, reviewed in Les Cahiers de l'Institut d'Urbanisme et d'Aménagement de la Région Parisienne, vol. XI, May 1968, pp. 25-26.

of amenity and some quantitative information such as: average income, average value of existing dwellings, proportion of non-white households, level of density, etc. The historical variable H is a constraint and represents the past and present occupancy of land.

Brigham has tested the model in the Los Angeles area. The data on land values came from tax assessment records. The level of amenity was measured against four criteria:

- The median income of households living in corresponding Census Tracts,

- The proportion of nonwhite population (people of Mexican origin not included) ,

- Proportion of dwellings with more than one person per room,

- A mobile average of dwelling values in surrounding areas.

The topographical variable (T) is a discrete variable with values 0 or 1. 1 represents a mountainous site; other sites have value 0. In this test, Brigham did not include the historical variable H. The results were satisfactory, with a coefficient of multiple regression² varying between .79 and .89 for two areas.

¹"separate and distinct;" Webster's New World Dictionary.

²index measuring the degree of relationship between land values and the identified variables.

This model has a simple mathematical formulation and contrasts with the high degree of precision of some of the hypotheses. The model includes variables which are difficult to integrate, for example the level of amenity.

In his review A. Tomazinis includes Brigham's model among empirical studies.¹ Some refinements would be necessary in order to use this type of model. Tomazinis suggests the elaboration of a conceptual framework to achieve a better understanding of land valuation.

B) An analysis of the development process in fringe areas.

Hansen analyzes the residential development process on open sites, by taking a deliberate empirical approach.²

The definitions of generic terms are important to the understanding of the remainder of his analysis. A metropolitan region is defined as a relatively large urban agglomeration including one or more cores and a sizeable fringe area which has lower overall density. The residential development period is defined as usually lasting from two to ten years. A development subregion set is a portion of a metropolitan region, continuous and bounded, having a relatively large number of sites available for development. The residential development factor is an independent variable

¹Anthony R. Tomazinis, "Book review of Brigham's model," Journal of the American Institute of Planners, May 1965, pp. 172.

²Willard B. Hansen, "An Approach to the Analysis of Metropolitan Residential Extension," Journal of Regional Science, vol. III, No. 1, 1961, pp. 37-55.

which explains variations in subregional development levels.

The general statement of subregional development might be written as:

$$Y_i = \Phi_k(X_i)$$

where: Y_i = level of residential development in region i ,

${}_kX_i$ = level of residential development factor k in subregion i ,

Φ = development function prevailing in the metropolitan region,

$i = 1, \dots, n$: set of residential development subregions,

$k = 1, \dots, m$; set of residential development factors.

A development function is an algebraic statement which residential development levels to residential development factor levels. Hansen considers three types of development functions: linear, exponential, and power.

Linear function type: $Y = a_0 + a_1(x_1) + \dots + a_m(x_m)$

Exponential function type: $Y = (a_0)(a_1)^{x_1} \dots (a_m)^{x_m}$

Power function type: $Y = a_0(x_1)^{a_1} \dots (x_m)^{a_m}$

Where Y is dependent variable

$x_1 \dots x_m$: levels of independent variables $1 \dots m$

$a_0 \dots a_m$: independent parameters associated with variables $1 \dots m$.

the three functions are "monotonic", that is, value of the dependent variable (Y) changes with every change of a given independent variable, all other independent variables holding constant.

Hansen then elaborates on development rates. Three expressions are presented, which might be regarded as three ways to describe residential extension.

1) Dwelling construction volume: $Q = H_i$

H_i : number of new non-farm dwellings added in subregion i.

2) Dwelling capacity utilization ratio: $V = H_i / (J_i)(L_i)$

J_i : number of nonfarm dwellings H_i that could be added per unit of open area L_i

L_i : amount of open site area available in subregion i.

3) Incremental population density: $Z = (U_i - P_i) / A_i$

U_i : number of persons residing in subregion i at the end of period.

P_i : number of persons residing in subregion i at the beginning of a given period

A_i : total area of subregion i.

Hansen considers four development factors; residential settlement, residence access, centrality and employment access.

1) The residential settlement variable expresses the degree to which urban housing and local community facilities are present in a given subregion at the beginning of a particular period.

2) The residence access is a degree of subregional proximity to all metropolitan residents at the beginning of a given period.

3) The centrality variable expresses the proximity of the development subregion to the metropolitan centre.

4) The employment access variable represents a degree of subregional proximity to all metropolitan jobs during a given period.

The study of this model enlarges the perspective on factors influencing land values.

C) Factors of land valuation.

Gottlieb studies land value movement on a very general basis.¹ He concludes by determining the factors influencing this movement. The major factors are:

1) The relative supply of vacant lots, because the effective supply of vacant lots is related to the stock of improved lots.

2) The level of income and income distribution. Gottlieb notes the important role played by upper income families in the market for urban land and new housing.

3) The assessment of vacant land for property tax purposes. The tendency to assess vacant land at a lower rate than improved properties promotes and increases speculative holding of vacant lots and consequently contributes to higher lot prices.

Gottlieb assumes that the continuous provision of housing to families of moderate income causes site values to rise because of

¹Manuel Gottlieb, "Influences on Value in Urban Land Markets, U.S.A.: 1959-1961," Journal of Regional Science, 1965 pp. 1-15.

the "pull" factor exercised by the demand. In Gottlieb's opinion the increase in income levels influences land values, as consumers ask for larger and better lots.

D) Summary.

This review of explanatory models does not provide any new theoretical explanations for land valuation. However this review has produced an increased understanding of the land development process and a certain parallel can be drawn between the development process and land valuation. More precisely, it can be said that land values are modified at various stages of the land development process. However the explanatory models employ too many deterministic kind of relationships. For this reason, the explanatory models are often very detailed and make it difficult to apprehend the pattern of the development process.

C. The Stochastic Models.

The stochastic process does not require that causes or inter-relations among variables be specified. The advantage of stochastic processes is that they replace these relationships by probabilities. The analysis of stochastic models of land development contributes to the general understanding of land valuation.

A) Harris' development process.

The model developed by Harris attempts to explain the direction and the timing of suburban growth:

"The question is: should the current value of the surrounding land parcels be based on their ultimate urban use even though they may remain rural for some time?"¹

Having n states in the land development process: a_1, \dots, a_n , the probability of moving between these states is called the transition probability. p_{ij} is the probability of outcome a_j , given that outcome a_i has occurred.

"Any outcome or move in the process of suburban development is not certain but has a probability of occurring."²

The model considers only two alternatives: developed and undeveloped lots. However, Harris does not elaborate further on the process of land development.

B) The model of the University of North Carolina.

In this model analysis is limited to the review of the residential developer decision.³ It is the most elaborate study of the University of North Carolina which relates to this thesis.

The model is important for three reasons. First, the model

¹Curtis C. Harris Jr., "A Stochastic Process Model of Residential Development," Journal of Regional Science, vol. VIII, No. 1, 1968, p. 29.

²Ibid., p. 30.

³Weiss, Smith, Kaiser, and Kenney, Residential Developer Decisions: A Focused View of the Urban Growth Process, Center for Urban and Regional Studies, Institute for Research in Social Science, University of North Carolina at Chapel Hill, April 1966, 94 pages.

is a descriptive analysis of the developer's behaviour.

The formulation of this description is integrated into the model. For this reason, the model can be studied along with other stochastic models. Second, the model views the developer as the central agent in the conversion of open land on the periphery to residential communities. Three, the model assumes that the consumer plays a minor role in the residential development process.¹

Residential land development corresponds to different stages through which land evolves:

- 1) Urban interest,
- 2) Action consideration,
- 3) Programmed development,
- 4) Active development,
- 5) Residence.

However the theoretical stages are not so clearly delineated in practice. Developers mix development strategies and speculation practices.

"Developers often withhold land for no specific development purpose for an indefinite period of time. Until the land is purchased for a specific development purpose in a specific time period, the land remains in the initial stage of urban interest."²

¹Weiss et al., Residential Developer ..., p. 3.

²Ibid., p. 9.

Three sets of factors influence the development process in the North Carolina model:

- 1) Contextual factors,
- 2) Decision agent characteristics,
- 3) Site characteristics.

The factors which influence the land development process are detailed:

1) Contextual factors¹

Socio economic factors

- Geographic location
- Economic structure and growth prospect
- Community leadership
- Local development industry (concentration, competition)
- Psychology of the times

Public policies

- Federal
- Provincial
- Local
- Investment and service (transportation, water and sewers, schools, community maintenance)
- Regulatory (subdivision regulations, zoning, land use plan, annexation)
- Tax.

2) Decision Agent characteristics²

Developer characteristics

- Type of firm
- Scale of operations
- Entrepreneurial approach
- Life cycle of firm

Landowner characteristics

- Place of residence
- Type of landowner
- Financial position
- Reason for holding land

Consumer characteristics

- Life cycle
- Family status
- Education
- Income.

^{1,2}Weiss et al., Residential Developer ..., pp. 13 & 15.

3) Site characteristics¹Physical characteristics

Tract size
 Topography
 Soil conditions
 Ground cover

Locational characteristics

Social location
 Accessibility to urban activity places
 Proximity to existing development
 Visual quality of approach
 Proximity to incompatible uses

Institutional characteristics

Governmentally imposed boundaries (water and sewer service, zoning regulation, subdivision regulation, school district)
 Land ownership patterns (size of parcels under individual ownership, market availability of parcels, terms of availability).

Some remarks concerning the developer's behaviour can be made. The characteristics of the development industry in the particular city studied,² have some important implications for the development process.

"A high degree of concentration characterizes the development industry. During the past five years, two major developers accounted for 43.8 per cent of total lots₃ subdivided and 41. per cent of new housing units."³

An oligopolistic situation prevails in the development industry of this city.

¹Weiss et al., Residential Developer ..., p. 18.

²Greensboro, North Carolina.

³Weiss et al., Residential Developer ..., p.

The developers use a combination of two approaches in considering land for development. The marketing approach is the identification of demand from a specific price range of housing. The contact approach reveals the possible tracts of land available for development. The agents of information employed in the latter approach are realtors, landowners, and fellow developers.¹

The analysis of the mathematical model developed by the University of North Carolina would not aid in understanding the verbal explanation.

C) Summary.

The stochastic models provide new insights into the development process. It is important not only to identify the steps of the development process but also to grasp the relationships between each step. The analysis of such interrelationships is the major benefit in using stochastic models.

¹Weiss et al., Residential Developer ..., p. 25.

CHAPTER FOUR

THE IDENTIFICATION OF THE ROLE OF PUBLIC INVESTMENTS IN LAND VALUATION.

The present analysis attempts a different approach with respect to models than that taken in the previous chapter. It has been shown that the traditional models started with the subjective utility of the consumer. The present analysis however begins with the technical and social conditions which produce urban land values. Thus, the rationality of the consumer is questioned. Maurice Godelier has described this paradox:

"On comprend donc qu'à défaut d'une connaissance scientifique du rapport interne des structures sociales, l'économiste ne puisse atteindre qu'une connaissance statistique des préférences individuelles qui lui apparaissent nécessairement comme affaire de goût, données dont la rationalité ne se pose pas."¹

The problem is to gain a scientific knowledge of internal relationships between the various groups and forces which generate land values.

¹Maurice Godelier, Rationalité et Irrationalité en Economie, Francois Maspero, Paris, 1968, p. 47; "It is understood that at the expense of scientific knowledge of the internal relationship of social structures, economists can only reach a statistical knowledge of individual preferences, and those are only a question of taste, rationality of which is not questioned." (t.b.a.) underlined by Godelier.

Planners are not generally familiar with this type of approach. However Royce has focused on a new orientation for planning. He calls for a general understanding of forces which allow and cause certain major changes in urban areas. He observes however that planners "do not have to understand fully the causal and counterforces behind the spatial structure of the community in order to set goals for the functional elements within it."¹ The present chapter takes a similar approach and reviews the forces and counterforces which shape urban land values.

2

A certain statistical finesse is lost when taking this approach.

The chapter is divided into three parts. In the first part, major forces which have an influence on urban land values namely, consumers, private and public sectors, are described. The second part focuses on recent transformations in the role of the private sector. While, the last part evaluates the action of the public sector in light of these other forces.

A. The Major Forces Intervening in Land Valuation.

A) The consumer.

Land is not an usual commodity. It is non-reproducible. Sites are not equivalent. Each site is unique. Land is a durable

¹Ronald R. Royce, "Myth versus Reality in Urban Planning," Land Economics, vol. XXXIX, 1963, p. 241.

²"skill, adroitness and delicacy of performance," Webster's New World Dictionary.

good. However, differences in values are created by the possible uses to which sites can be put. Not only zoning but also the improvements made to a site (such as sewers) may create these differences in value. The consumer does not exercise a determining role in the improvements made to land. However, consumers do put a certain degree of pressure on some types of land, for example residential. The increase in the number of households living in an urban area creates a general pressure on land values because a shortage of improved land may result. However, the demand for land is nothing more than a derived demand for housing. The demand by consumers for land is not essential in comparison to their demand for housing. Housing is a very important commodity in North America. For almost all households housing represents the major investment of their lives.

It is important to note that housing is one element in the civilization of consumption. Housing - and land - is part of the daily relationship man enjoys with his belongings. Thus, housing represents more than the satisfaction of a functional need, since otherwise a simple shelter would be sufficient. It is difficult to determine what functional needs are. Man in the present civilization is confronted with a combination of functional and non-functional needs. Housing, as a durable commodity, creates a certain relationship between people and housing "object".¹

¹J. Baudrillard, Le Système des Objets, collection Les Essais, Gallimard, Paris, 1968, p. 275.

The civilization of consumption has replaced some of the technical characteristics of "objects" with social characteristics. The civilization of consumption is a systematic manipulation of such characteristics. Land has both social and technical characteristics.¹ While the concern in this thesis is primarily with the technical characteristics, it is nevertheless realized that in the North American context, the social characteristics of land are of major importance to consumers. However, because the technical characteristics of land are less important to consumers, a minor role is devoted to the consumer in the model.

¹The relationship which exists between social and technical characteristics is a continuum (thing whose parts cannot be separated or separately discerned). Land valuation corresponds to the increase in technical characteristics of land which is the result of transforming land from rural to urban uses. However, the increase is equivalent to the decrease in technical characteristics which made land suitable for rural use. Thus, it is difficult to identify a relationship between social and technical characteristics of land. And it is assumed that a modification of technical characteristics of land occasion some changes in social characteristics as well as in land values. Prairie farm land and the backyard of a suburban house are strong social characteristics of land in a western Canadian context.

What is the source of social characteristics of land? The social characteristics of land have their origin in private ownership and the capitalist economic system. Private ownership is almost a sacrosanct institution in North America. In order to evaluate the social characteristics of land, it is necessary to compare positive rights associated with land ownership and negative rights or sanctions associated with the absence of it.

B) The private sector.

This generic term refers to a large number of groups with differing attributes. Referring again to the analysis of land valuation, a descriptive study of the steps in the change of ownership provides a more clear distinction between the different elements in the private sector.

Allan Schmid has studied this aspect of the problem.¹ He distinguishes three steps in the valuation process concluding with the price paid by the developer. The steps are: the active farm value, the speculative price paid to the farmer, and the price paid by subdivider. Allan Schmid has produced the following table:

<u>Categories</u>	<u>\$ per acre</u>
Farm land value (1964)	300
Price farmers received for subdivision use (1961)	1,332
Price paid by developers for raw land (1964)	3,030
Improvement costs (\$2,435x2.6 lots/acre)	6,331
Selling price of improved lots (1964) (\$3,874x2.6)	10,072
Total appreciation above farm value (less improvement costs)	3,441

TABLE 1: Land Prices at various Stages in the Conversion Process: A Composite.
(source: Schmid, p. 26, table 13.)

The table only includes figures from the United States. The major drawback of the table is a lack of homogeneity of sources.

¹Allan Schmid, Converting Land from Rural to Urban Uses, Resources for the Future Inc., Washington, 1968.

Nevertheless some comments can be made on the table. The transfer of land from farmers to developers creates an important increase in land values. The change is not only a quantitative change. The transfer corresponds to a very profound change in use of land, (i.e.) from rural to urban. Both farmers and developers are using land as a factor of production. Farming operations do not result in a physical change in land use. However it is the purpose of development to change the use of land, and this in an almost irreversible way. In terms of differences between farmers and developers, the selling of land by farmers corresponds to a partial loss of their tools of production. If land is leased the loss is simply postponed. For developers land is a commodity which is in their hands for a relatively short period of time.

Figures similar to those of Schmid were compiled by the author for the Winnipeg area.¹ The price of agricultural land is divided into two categories: farm and cattle. Another step in the process is added. It corresponds to the option made by developers. The last step represents land zoned for single family units. The table produced is on the following page.

In the first step of land valuation, the interest of land shifts from rural to urban activities. This step is difficult to perceive, because the process varies from one piece of land to another. Normally the option on land is taken by developers.

¹Raymond Dubois, "Land Study of Metropolitan Winnipeg," Federal-Provincial Task Force on Low Income Housing, 1971.

<u>Categories</u>	<u>\$ per acre</u>
Agricultural raw land:	
farm	75-130
cattle	40
Land optioned or owned by a developer, to be developed in the next 5 to 8 years,	1,000
Developed land, by adding servicing costs	14,000-17,000
Land zoned commercial or multi-family	25,000
Downtown area	150,000-175,000

TABLE 2: Land Values at various Stages of the Conversion Process: Winnipeg, 1971.

Options are agreements made by developers to buy land at a fixed price within a specified time period. The length of the option is usually one year, and options are renewable. The mechanism of options permits developers to have a right to land without the disadvantages of full ownership. Land ownership necessitates a large quantity of immobilized funds.

Other processes of land conversion include more intermediary steps than those so far reviewed. At this point in the thesis land speculation and land development activities should be separated. Land speculation deserves more attention because "the general public is hardly aware of the extent to which it pays tribute, in the form of increased land prices, to people who have contributed nothing to the communal good in return for their gains."¹ It is rather difficult to tackle this problem in a North

¹G.W.R. Bryant, "Land Speculation: Its Effects and Control," Plan Canada, vol. V, No. 3, 1965, p. 109.

American context because as the same author stated:

"Most North Americans have not yet reached the point of seeing anything immoral or improper, in making profit out of land deals."¹

This situation explains why it could be difficult for some people to make a clear distinction between development and speculation practices. Howard P. Hamilton made these remarks regarding the profit made by developers:

"The developer, for his efforts, has made a profit of about 20% of the total selling price, a percentage that is not unreasonable for the risky business of developing a commercial property. A knowledgeable developer would not undertake such a project unless he was convinced he would make a reasonable profit."²

C) The public sector.

All three levels of government (i.e.) Federal, Provincial and Municipal are included, in the public sector. They all retain what was called the monopoly of constraint.³ What is considered here is the legislative power of the public sector. Goodall has described the effect of legislation on land values. He distinguishes between legislation having direct and indirect effects on land values.

"Any legislation having economic consequences may affect land values to varying degrees but the effect is the result of a roundabout process."⁴

¹G.W.R. Bryant, Land Speculation ..., p. 109.

²Howard P. Hamilton, "The Valuation of Improved Urban Land," Appraisal Institute Magazine, vol. XV, book 1, 1971, pp. 21-22.

³Supra, Chapter Two.

⁴B. Goodall, "Some Effects of Legislation on Land Values," Regional Studies, vol. IV, 1970, p.13.

In regard to enabling legislation having a direct effect on land values, Goodall comments:

"The principal fields of legislation involved are planning acts, agricultural acts, legislation on landlord-tenant relations, control of industrial location, building controls and land and property taxation."¹

Goodall reviews only legislation with direct effects on land values, and considers three types of effects. First, individual plots of land have their value altered where legislation increases demand relative to supply for particular types of sites. Alternatively legislation can decrease the supply of sites relative to demand. Second, changes in the value of individual sites modify the spatial distribution of land values. Finally, legislation modifies the aggregate of land values; for example, a case of legislation with blanket effect such as the imposition or removal on all tax deals.

B. The Changing Role of Private Developers.

In addition to obtain a more clear notion of the role of the public sector, it is necessary to analyze the private context within which public decisions are made.

"The private sector context of public decisions is without question of vital consideration in the land development process. Consequently, an understanding of how this process unfolds and makes its imprint on the community may be viewed as a positive move in the direction of planning for a more satisfying urban environment."²

¹B. Goodall, Some Effects of ..., pp. 14-15.

²Weiss et al., Residential Developer ..., p. 5.

Consequently, it is important to understand the changing role of the private developers. From traditional action limited to development activities, developers have now expanded into other fields of activity.

A) The traditional role of private developers.

Prior to World War II Clawson et al. observed the characteristics of the land development situation:

"The process was subdivision by a 'developer' or speculator who sold, or tried to sell, the lots to individual buyers, each of whom would arrange to build as he chose and could finance."¹

The above description is important in understanding the starting point of urban development activities. Usually these activities were small in scale, as many development operations were family businesses, e.g. the Simkin and the Borger families in Metropolitan Winnipeg. Competition among them was intense. On the other hand, government's involvement in housing and development was limited. The Government of Canada first introduced housing legislation in 1935. To that time, there was no "pull" factor for land development activities.

A survey made in 1971 by a Federal-Provincial Task Force on Low Income Housing illustrates the present importance of private developers' holdings in Metropolitan Winnipeg.²

¹Marion Clawson, R. Burnell Held, and Charles H. Stoddard, Land for the Future, The John Hopkins Press for Resources for the Future, Inc., 1960, p. 70.

²see Appendix B: Survey of Land Ownership in Metropolitan Winnipeg, 1971.

However the survey includes neither land which is optioned nor land held under other names. Thus the figures presented in the Appendix represent a minimum. A map of tracts of land held by private developers would help to locate these holdings and knowledge of their location in respect to the growth pattern of Metropolitan Winnipeg would represent a very useful tool for the elaboration of public policies.

B) The era of conglomerates.

The change in size of holdings by corporate developers has been accompanied by modification of development activities themselves. Land developers have a rural bias and hence differ considerably from industrial entrepreneurs. A recent evolution was observed in France by Henri Lefebvre and this might appropriately be applied to Canada.

"La mobilisation de la richesse foncière et immobilière doit se comprendre comme une des grandes extensions du capitalisme financier, depuis un certain nombre d'années. L'entrée de la construction dans le circuit industriel, bancaire et financier a été un des objectifs stratégiques pendant la dernière décennie."¹

The inclusion of land development and building interests into the financial and banking system is a very recent one. A Winnipeg firm also serves to illustrate this phenomenon.

¹Henri Lefebvre, "Réflexions sur la Politique de l' Espace," Études et Sociétés, Revue Critique Internationale de l' Aménagement de l' Architecture et de l' Urbanisation, No. 1, Novembre 1970, Editions Anthropos, Paris, p.9; "Mobilisation of real estate and urban land wealth should be comprehended as a major extension of the capitalistic economy for a number of years. The entry of the building industry into the industrial, banking, and financial network was one of the strategic goals (of the capitalistic system) during the last ten years." (t.b.a.)

Moody's manual provides the following information on one of the major corporate land developers in Winnipeg - the firm B.A.C.M.:

"Incorporated in Manitoba Dec. 20, 1960 as British-American Construction & Materials Ltd. combining Simkin's Construction Co. Ltd. and Tallman Construction Co. Ltd. Business established in 1911. Present name adopted July 5, 1967.

During 1961-1962 acquired Western Concrete Products Ltd., Brandon, Manitoba; producer of ready-mix concrete; Union Fuel & Builders Supply Co. and associated companies, which sell building materials fuel oil and coal in Winnipeg area and are engaged in land development, and Universal Construction Co. Ltd., and associated companies, which are engaged in building construction in Alberta and British Columbia and manufacture construction materials in Edmonton. These companies were sold in 1968.

In March 1965 amalgamated its 23 subsidiaries and organized its activities into four major operating divisions.

In March 1966, acquired Engineering Buildings Ltd., a Canadian company and its two wholly-owned subsidiaries in Great-Britain

Control: Genstar Ltd. owns 59.2% of stock. In March 1970 Genstar Ltd. made offer to acquire additional com. of Co. on basis of two Genstar for each B.A.C.M. share. Offer expired May 19, 1970.

Business: Company is engaged in production and sale of pre-cast and pre-stressed structural and architectural products, concrete block and pipe, metal culvert pipe, ready-mix concrete, gypsum wallboard, housing and specialized buildings, sand, gravel, classified aggregates, gypsum and other related materials; erection of commercial and institutional buildings and housing; development of land for resale and a wide range of heavy construction activities."¹

Land development is now integrated with other activities. Included are industries providing materials for sewer installations, and as well, other types of building materials. Thus all major activities required for the completion of land development projects are vertically integrated as essential components of the B.A.C.M. complex.

¹Moody's Industrial Manual, 1970, p. 3,194.

However Genstar Ltd. controls B.A.C.M. and also Inland Cement Industries Ltd. which; along with Canada Cement Lafarge, a subsidiary of Ciments Lafarge France; is the major cement producer in Canada. Genstar Ltd. is:

"... an investment company under the sponsorship of la Société Générale de Belgique, Brussels, Belgium, (a major financial institution of Europe) present title adopted Feb. 25, 1969."¹

This example illustrates the new dimension of development companies. The land development market is an oligopolistic market. Vertical integration of activities, including production and services, has been brought about by some important firms like B.A.C.M. Other firms in the construction field in Manitoba which are similarly integrated include, Winnipeg Fuel and Supply and LADCO.

C. The Role of the Public Sector.

The role of the public sector in modifying the technical characteristics of land could be compared to a sequential process. Each stage in the process corresponds to the occurrence of a threshold. Changes in zoning, the provision of drainage, the availability of watermains, sanitary sewers, or the existence of a development plan are some of the various thresholds by which the technical characteristics of land as well as land values are

¹Moody's Industrial Manual, 1970, p. 3,192.

modified. The various thresholds of the development process correspond to specific actions of the public sector.¹ Thus the public sector is no longer confined to a neutral role. Any type of public investment which affects the technical characteristics of land is made in order to achieve some of the goals of the public sector. J.D. McNairnay gave his interpretation of the relationship between the private and public sectors in the following way:

"Our city, any city, will not be greatly changed by the expenditure of public funds. Public funds will build the bridges and major thoroughfares, public funds will build the art centres and the government buildings but they will not, at least under our free enterprise system, build the Place Ville Marie or the other edifices which give the commerce of the city vitality and attractiveness. That is the job of the private sector. When we cease to make our city an attractive place to invest private capital we are in trouble."²

However there is an unclear relationship between the private and public sectors. It can be assumed that public investments tend to increase the rentability of private investments. A better approach to these problems would assume the existence of some kind of symbiosis between the private and public sectors. Such a perspective is implied in the remainder of the thesis. Before proceeding with the next part of the thesis, a schematic diagram will help to clarify the inter-relationships of the major forces involved in land valuation.

¹in particular, Boleslaw Malisz, "Implications of Threshold Theory for Urban and Regional Planning," Journal of the Town Planning Institute, vol. LV, 1969, pp. 108-110.

²J. D. McNairnay, "Excerpt from addresses concerned generally with Planning and Zoning, as part of the Pitblado Lectures," Winnipeg, May 6, 1967, p. 5.

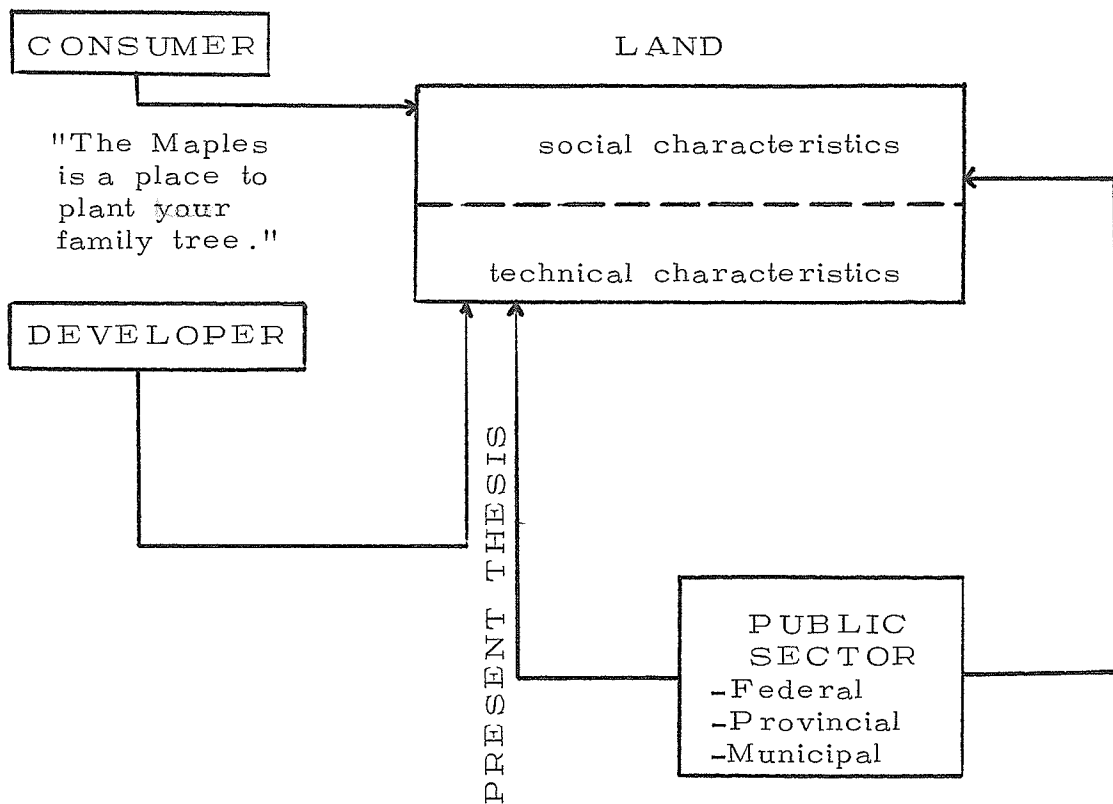


FIGURE 7: Major Forces Involved in Land Valuation.

PART THREE
SELECTED CASE STUDIES ON LAND VALUATION
AND THE ROLE OF PUBLIC
INVESTMENT

The present part consists of three chapters. The first one discusses public land assembly as a tool for the possible reduction in the general level of urban land values. The second chapter evaluates the effect of major infrastructures on urban land values, while the third chapter reviews development practices including municipal servicing.

CHAPTER FIVE

PUBLIC LAND ASSEMBLY

Public land assembly programs are policies directly oriented by the public sector to assemble land and to resell it for construction. By means of public land assembly housing costs should be reduced. Consequently the analysis and evaluation of such policies is an important objective of the present study. By its very nature public land assembly normally involves expenditures requiring large amounts of public funds. Public land assembly and banking¹ programs are carried out in order to achieve certain theoretical benefits. In Canada land assembly is enforced by federal legislation and specific regulations. An evaluation of specific programs where such programs have been carried out, will help to evaluate the success of land assembly in Canada. If this type of policy is successful, then theoretical benefits could become actual benefits. The present chapter is divided in three parts: The theoretical benefits of public land assembly, Public land assembly in Canada, and Evaluation of specific programs.

¹Both assembly of land and land banking are included in the term "land assembly", unless otherwise specified.

A. The Theoretical Benefits of Public Land Assembly.

Public land assembly is one means for the achievement of certain urban goals. However these goals are general and other means of action are possible to achieve the same goals. The goals of public land assembly are analyzed below and are then placed in a broader perspective.

A) The theoretical goals of public land assembly.

Land assembly programs could reduce land costs. They can help to achieve better control of urban planning and development than could be achieved through other means. Such programs can help to meet needs not satisfied by the private sector. At the same time land assembly is a steady source of revenue,¹ in that lands which are sold off help to stabilize or reduce housing costs while earning a return on investment.

Assuming that the price of land is determined by the level of demand and supply, land costs can be reduced by increasing the supply of serviced land on urban land markets. In this regard public land assembly can be used to counter oligopolistic pricing practices which contribute to an artificial increase in land values thus discouraging "pure" speculation in land by private entrepreneurs. In addition the economies of scale in servicing land in larger publicly controlled units should contribute to a reduc-

¹William Hamilton, "Public Land Assembly in Canada," in Preliminary Land Study, Central Mortgage and Housing Corporation, Policy Planning Division, March 1971, pp. 12-14.

tion in the ultimate price of land.

The control of land development in both short and long term ranges can be considerably influenced by public land assembly. A more rational process of urban growth could be realized, including means to encourage planning for urban open spaces. Since, the control of land development is influenced by the terms under which land is resold, public programs favouring leasing rather than resale of land can permit specific types of development for relatively controlled periods of time and to some extent obviates legal constraints such as conventional zoning.

Land assembly and the private market. Public land assembly as it is carried out in Canada by C.M.H.C.¹ is a residual function; that is, it helps the public sector to meet needs unmet by the private market. Land assembly is a residual adjunct to an overall housing policy, because as shown in the following table, CMHC land assembly expenditures are relatively minor.

Land assembly is a source of revenues. While it is debatable whether or not land assembly should be a source of revenue, profits in land assembly programs could be desirable in that they could be utilized to establish a self-sustaining revolving fund, and thereby help to reduce municipal taxes, or be used for other purposes.

¹CMHC: Central Mortgage and Housing Corporation.

B) Land assembly and other policies.

Land assembly programs are not the only means for achieving these theoretical goals. Development control and implementation of planning schemes are two of the feasible alternatives. However the goals of public land assembly are not solely oriented to the solution of land problems. To determine the role that public land assembly can play in housing policy, CMHC expenditures for the previous four years can be reviewed:

Categories	Year			
	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
Land assembly	9,735	26,647	10,503	43,000
Total Infrastructure	33,304	72,333	66,495	153,000
Total Housing	471,831	503,635	604,565	790,400
Total	511,135	575,966	671,060	943,400

TABLE 3: CMHC Expenditures (1968-1970) and Budget(1971)
Under the National Housing Act. \$ figures in 000's.
(source: W. Hamiton, p. 28.)

The role of public land assembly is very limited, in comparison to total expenditures and infrastructure expenditures. Land assembly programs are at present a tool of limited use. However this small percentage could be increased by means of efficient policy. The efficiency of the present policy is evaluated below.

B. The Characteristics of Public Land Assembly in Canada

The legislative source of land assembly programs is the National Housing Act and the General Instructions used by CMHC officials.

A) The terms of reference.

Under the present legislation two procedures of public land assembly are possible. They are included under the sections 40 and 42 of the National Housing Act.¹ The following study² was undertaken when the revised legislation of 1954 was still in use. The sections 40 and 42 are replacing the sections 35 A and 35 C of the older legislation. However the study is still valid and the changes are minor ones.

The section 40 of the Act includes matters other than public land assembly. The terms of the Act relating to public land assembly are:

"40. (1) The Corporation (Central Mortgage and Housing Corporation) may, pursuant to agreements made between the Government of Canada and the government of any province, undertake jointly with the government of the province or any agency thereof projects for
(a) the acquisition and development of land for housing purposes;....

(2) The amount of the capital cost and the profits and losses to be borne by the Corporation pursuant to an agreement referred to in subsection (1) shall not exceed seventy-five percent of such capital cost, profits and losses,....

¹The National Housing Act, Revised Statutes of Canada, 1970 Chapter N-10.

²R. Dubois, Land Study ..., pp. 7-16.

(6) The Governor in Council may make regulations with respect to the projects that may be undertaken by the Corporation under this section prescribing

(a) the type of land that may be acquired for housing purposes and the maximum purchase price that may be paid for such land; . . .

(d) the rates of interest and amortization that may be charged against the capital costs of a project undertaken under this section; . . .

(f) any other matters deemed necessary or advisable to carry out the purposes or provisions of this section.

On the other hand the object of the section 42 is more specific, and concerns only public land assembly:

"42. (1) The Corporation may make a loan to a province, municipality or public housing agency for the purpose of assisting that province, municipality or agency to acquire and service land for public or general housing purposes.

(2) A loan made under the authority of this section shall (a) bear interest at a rate prescribed by the Governor in Council;

(b) not exceed ninety per cent of the cost of the acquisition and servicing of the land, as determined by the Corporation;

(c) be secured by a first mortgage upon the project in favour of the Corporation;

(d) be for a term not exceeding fifteen years; and

(e) be repayable in full"

These two types of land assembly programs then present important differences. Section 40 requires a close contact with (and control by) the Central Mortgage and Housing Corporation. Under Section 42 agreements can be concluded with municipalities and provincial public housing agencies. Section 40 also makes a provision for joint agreements with provincial governments, but these still involve a high degree of control by CMHC.

B) The general instructions.

The study of the general instructions provided to CMHC officials is important in understanding the functioning of the land assembly programs. A parallel can be drawn between the two different types of programs and their differences are more formal than real.

Section 40. The instructions date back to April 30, 1968.¹ The instructions seem to combine a short term situation, and a long term policy option. The general purpose of public land assembly is to:

1. (1) acquire and service land for current use where:
 - (a) the lack of services is preventing residential construction, or
 - (b) serviced land is not available at a reasonable cost from private sources.
- (2) acquire land for future development either:
 - (a) to establish a land bank to avoid undue rising land costs, or
 - (b) to promote orderly future growth in the Community.

The instruction permit the use of CMHC funds to compete with private developers assembling land when they do not provide land or when they provide land at an unreasonable cost.

Land banking and land assembly are contradictory notions implying different goals. The difference between these two goals should be

¹CMHC General Instructions, Section 40 (35 A) of the National Housing Act, No. 306, File No. 119-2, April 30, 1968.

clearly understood. Land banking necessitates a large involvement on the part of the public sector and at the same time necessitates competition with the private sector.

The general instructions call for a great deal of collaboration between the Province and CMHC. The division of tasks between the Province and CMHC are as follows:

3. In the past, the responsibility for acquisition and development of land assembly projects was divided between the province and the Corporation, each carrying out its function in collaboration with the other. It is now recognized that as an alternative to the division of the functions, either the province, its agency, or the Corporation, may undertake the entire development on behalf of the partnership. Approvals by the other partner at critical stages are still required, although in practise it is expected that the partner's views should be sought throughout the whole process.

4. The major step in the development of a project are as follows:

- (1) Initiation
- (2) Approval to investigate
- (3) Investigation
 - (a) site selection
 - (b) planning and engineering
 - (c) approval of the subdivision plan
 - (d) report of investigations
- (4) Approval to proceed
- (5) Servicing of first and subsequent phases
- (6) Approval of lot and block prices
- (7) Disposal of land
- (8) Financial arrangements

Obviously the CMHC Branch office plays an important role under this scheme. While a provincial agency requires a great deal of expertise if it wants to achieve its ends. However, because approval of the CMHC Branch is necessary during all the critical stages, the actual role played by a Provincial agency under this section is a minor one.

For example, the approval to investigate means that the Province, acting at the request of a municipality, or on its own, will request from the local office of CMHC authority to investigate. This prerequisite may seriously limit land acquisition procedures which have to be carried on with some secrecy.

Site selection criteria also presents an interesting case. The instructions are:

5. (3) (a) Site selection - It is desirable that proposed sites be inspected jointly with the provincial representative. The CMHC planner, appraiser and engineer is to collaborate in reviewing the feasibility and the desirability of the various sites and include a consideration of purchase prices, location, suitability for and cost of development, proximity to existing services and market volume of the provided product. The feasibility report is to be reviewed by the province and the Corporation. When an eventually satisfactory site is selected, an option may be obtained for a term sufficient to permit the preparation of subdivision plans and preliminary service designs and cost estimates, and a decision taken as to its purchase. Since long-term options are sometimes difficult to obtain at a reasonable cost, it may be desirable to acquire the property under a land acquisition and holding agreement, even though it is intended for early development. In this case, the province will request such an agreement from the Corporation, and the Manager is to make his recommendation to the Director, Urban Renewal and Public Housing Division accordingly....

Collaboration between the partners is very close. While the short-term land assembly programs do not create much problem since the CMHC Branch is responsible for the entire process, long-term options on the other hand must go to the Head Office, with the recommendation of the Branch Manager. Generally it appears that CMHC takes out long-term options with more careful conside-

ration than short-term options. Other administrative barriers are put up in front of projects for long-term options:

6. (1) Present policy does not contemplate a long-term investment on the part of the Corporation for land assembly other than holding land for future use. Most land assembly to date has been disposed of and the capital recovered within a reasonable period of time. It has been agreed that the facilities of Section 35 A (40) can be used with limitations, to assist provinces desirous of developing land for disposal by means of long-term lease. In these cases, the partnership agreement provides for the repayment of the Corporation's share of the cost with interest at the current rate over a period of 15 years from the date of the completion of the project.

The above instructions tend to limit the efficiency of long-term public land assembly programs in that they contradict the general purpose of Section 40 on public land assembly. In any case, according to present instructions, CMHC cannot provide funds for land banking as it is by definition a long range operation: i.e. greater than 15 years in many instances. Thus it would seem that CMHC funds will not be very useful in significantly reducing the selling price of land.

A more recent instruction has resulted in the abandonment of long-term options. As a consequence public land assembly on a long term basis is no longer possible at least under Section 40 of the National Housing Act:

The Corporation will continue to consider proposals under Section 35 A (40). However, the special financial arrangement provided for in the general instructions 306 dated April 30, 1968, under which the Corporation was prepared to accept repayment of its 75% share of development costs over 15 years has been discontinued. This special arrangement was an interim measure to assist provinces wishing to

develop land on their own for disposal under a long-term lease, pending amendments broadening the scope of Section 35 C (now 42).¹

Section 42. In this Section, the general instructions of CMHC date back to June 27, 1969. The objective of Section 42 is defined in these terms:

1. (1) The new amendments to the National Housing Act incorporate important changes to Section 35 C (42). In addition to the Federal-Provincial arrangement for land assembly development under Section 35 A (40), the Act now provides an alternative technique for the acquisition and servicing of land for general housing purposes. The new legislation will provide a greater incentive and opportunity for provinces and municipalities to undertake on their own, the assembly and servicing of land to help meet the need for reasonably priced building lots.

The term "reasonably" which qualifies the price of building lots assumes that land assembly provides land at a price similar to that offered by private developers. "Reasonably" certainly means that the price of lots will not be fixed in a way that will interfere with the market mechanisms.

The upper limit of 15 years put on loans by the National Housing Act in its paragraph (d)² seriously impairs any attempt to undertake land banking on a long-term basis. As the loans for public land assembly cannot be provided for a period in excess of 15 years, the public housing authorities do not have comparable means to compete for available land with private developers.

¹CMHC General Instructions, Section 42 (35 C) of the National Housing Act, No. 329, File No. 119-1, June 27, 1969.

²Supra, p. 80.

In this sense the measure which limits the duration of the loans to fifteen years is certainly a serious constraint. Since the inflationary period of the last five years has produced a significant increase of land values, land banking programs urgently required now will be even more difficult to establish in the future.

The criteria for selecting land to be assembled are:

2. (1) (a) The land to be acquired for general housing purposes is to be unserviced land that is predominantly vacant or undeveloped at the time of a loan application. It may include land required for purposes other than housing to the extent that it is appropriate to a housing development. Loan applications for the acquisition and servicing of land that is to be used mainly or exclusively for public (excluding public housing), commercial, industrial or other non-residential uses will not be considered.
- (b) An applicant for a loan for the acquisition of land is to provide sufficient information to demonstrate that the land is in the path of urban development and is appropriate for housing purposes.

These criteria imply that land should be developed on a short-term basis. Because it is the view of CMHC officials that the public sector is not supposed to compete with private developers. Under present conditions prevailing in most Canadian cities, the land to be assembled consists primarily if not exclusively of land either already owned or optioned by these same developers. In most cases the costs of the land to be assembled will include the profit to private developers who either now hold or have held the land for many years.

With regard to the requirement that land be located in the path of urban development and be appropriate for housing purposes, no specific directive is provided defining the significance of the term "path of urban development" nor the term "appropriate

for housing purposes." Clarification of these regulations is essential if land assembly programs are to be effectively used as a tool to reduce land costs in larger urban centres.

The instructions for the eligible services for lending purposes are:

2. (3) (a) (i) Eligible services for lending purposes include all ground services required to serve the lands but excluding those utilities for which the capital cost is recovered from the rates charged to consumers. They may also include a pro-rata proportion of plan and trunk lines for water supply, sewage disposal and storm drainage.

(ii) The improvement of development of special use areas expecting fronting services, and the cost of any buildings or structures excepting those associated with the installation of services are not eligible. For example, the landscaping and equipping of a park site will not be eligible for loan purposes.

The services do not include the capital cost of utilities charged to the consumers, yet power and telephone lines, when underground may also be part of the outlay for utilities. Clearly this measure is inadequate, since some public housing authorities will be reluctant to pay for an extra service which will tend to increase monthly rents. Furthermore, this decision negatively affects the visual aspect of projects under public sponsorship.¹

At the present time CMHC gives public assemblers the right to sell land at the highest price possible:

2. (7) The Corporation will not regulate the price of other terms of sale at which the land is offered following development. The serviced land may be offered for sale on a leasehold or freehold basis at the discretion of the applicant. The Corporation will not share in profits or losses.

¹Infra, Chapter 7.

The public assemblers will not be inclined to lower land prices. The limitation of the duration of the loans under Section 42 limits the possible reduction of land prices, even if land is sold at cost. This regulation signifies that public land assemblers will compete on the land market on the same basis as the private developer.

Having reviewed the legislation and the general instructions, specific land assembly programs will next be discussed. Until 1971 the Province of Manitoba had not been allocated any money for land assembly.¹ In 1971 \$6 millions were allocated for the Metropolitan Winnipeg Area. Not all the funds were spent, however complicated procedures of public land acquisition and lack of experience at this new type of operation were the major reasons for the limitation of the expenditures. For this reason, case studies will be drawn from other locations outside of Manitoba.

C. Evaluation of Specific Land Assembly Programs.

The evaluation of the programs includes the extent of the reduction of land costs and the degree of control over the patterns of urban development. Also included in the evaluation is the production of revenue from land assembly programs.

A) Reduction of land costs and control over the pattern of urban development.²

Land assembly programs in Toronto, Montreal, and

¹Exception of the marginal cases of Brandon and Boissevain.

²W.A. Hamilton, Public Land ..., pp. 33-35.

Vancouver are negligible or non-existent. These urban areas are going to have a major role in Canada's future. The goals of reducing land costs and establishing control over the pattern of development are not yet achieved in major Canadian urban areas, because policies such as land assembly are not applied in these areas. Residual land assembly alone certainly could not achieve these goals.

There are other reasons why the reduction of land costs will not occur in Canadian urban areas. W.A. Hamilton considers it a reasonable policy for CMHC to sell land just below the market price. Otherwise, it would represent "a subsidy of the few by the many." New homeowners could make up the difference in prices by reselling their properties at market value. However W.A. Hamilton suggests that such problems could be alleviated by leasing land and having the public sector retain ownership.

The achievement of the goals is dependent on the scale of land assembly programs. Large scale land assembly is difficult to realize. Large amounts of money would be required and hence land assembly would be prohibitive.

B) The production of revenue.

Because publicly assembled land is usually sold at market value, considerable profits in public land assembly have been made. For example in Peterborough, Ontario some 50 feet and 65 feet lots having a 1970 book value of \$2,690 and \$3,850 were sold for \$4,000 and \$5,200 respectively.

The Malvern project in the borough of Scarborough, Ontario is another good example. The figures are as follows:

Land Use	Area (acres)	Market Value (\$ 000's)
Residential	846	71,994
Industrial	180	6,190
Institutional	62	2,460
Commercial	44	3,000
Schools	133	1,472
Streets, Parks & Open Spaces	440	--
Total	<u>1,705</u>	<u>85,116</u>
Total Cost		
Acquisition	1,762,500	
Planning	602,175	
Interest	1,310,711	
less rentals	168,178	
Total	<u>\$ 3,675,386</u>	
Totals:		
Estimated Market Value	\$ 85,116,000	
Land costs	3,675,386	

TABLE 4: Land Assembly; Malvern Project: Land Use, Land Value & Cost
(source: W. Hamilton, p. 49.)

W. Hamilton estimates: "taking into account future costs of servicing, there is a possible \$40 millions profit to be obtained by sale of the land at market price."¹

To conclude briefly, it can be said that land assembly programs do not significantly reduce land values, because the means to reduce these values are not provided. Public land assembly

¹W. A. Hamilton, Public Land ..., p. 50.

generates some significant revenues. Other means of action should be developed if the public sector wants to achieve the wider goals possible through land assembly.

CHAPTER SIX
THE ROLE OF MAJOR INFRASTRUCTURES
ON LAND VALUES.

The public investments that will be dealt with in the remainder of this chapter include certain major infrastructure investments which are necessary in order to change the use of land. Such investments include municipal waterworks, sewage collection and disposal and highway construction. On all these subjects the amount of information relating to the present thesis is limited. However it is important to understand the process which takes place, as these investments are realized.

It should be mentioned that different kinds of public investments can affect land values in different ways. Some public investments, such as airports, tend to have a negative effect on land values. However as is related in the study by Ronald W. Crowley, the conclusions regarding these effects may vary with the authors.¹ The effects of noise generated by aircrafts tend to decrease real estate values. However, there are "shock" periods which coincide with the introduction of new types of planes, when

¹Ronald W. Crowley, "A Case Study of the Effects of an Airport on Land Values," Unpublished Working Paper No. 4, The Ministry of State for Urban Affairs, Government of Canada, no date (1972?).

land values are the most affected. But the changes of land uses and the movement of noise-indifferent people in areas close to airports tend to compensate the decrease in land values over a certain period of time. It is debatable whether or not residents living close to airports make such distinctions. However a related case was recently brought forward in Winnipeg.¹ A homeowner living below a major aircraft approach route to the Winnipeg International Airport appealed before the Metro's Board of Assessment Revision to get a lower assessed value for his property. He produced before the Board various sound readings and other pertinent arguments. The Board did not make a decision as a precedent could be set. This case tends to show that property values are affected by the consequences of such public investments as airports.

A. Waterworks and Sewage Disposal Installations.

A) The dimension of the waterworks and sewage disposal systems.

These types of investments are an essential part of the "hardware" of cities. By its very nature the planning for such infrastructures is usually carried out well ahead of time, often fifty years in advance. The problem with these installations resides in the very permanent pattern they tend to establish in an urbanizing area. However until other methods for the delivery of such basic

¹"Air Traffic Noise Cited in Appeal," Winnipeg Free Press, March 15, 1971.

services as sewer and water are developed, it is difficult to conceive alternate patterns for urban growth.

To ascertain the exact amount of capital outlay required for such investments in Metropolitan Winnipeg would require the analysis of various expenditures by municipalities and private land developers. The only bases for measure are the capital expenditures made by the former Metropolitan Corporation of Greater Winnipeg. The figures include only sanitary sewers and water feeder mains. The figures for the period 1966-1969 are:

Year	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Waterworks system	852,697	1,751,131	1,219,304	148,165
Sewage Disposal system	1,745,293	1,660,631	1,059,330	1,256,509
Total Capital Expenditures	12,325,551	13,423,112	16,091,363	18,572,737

TABLE 5: Metropolitan Corporation of Winnipeg Capital Expenditures, Waterworks and Sewage Disposal. (1966-1969), all figures in \$.
(source: Metropolitan Corporation of Winnipeg, annual reports)

These capital expenditures have resulted in the development of sewer and water networks. The comparison of the length of these networks at various periods of time gives an indication of their development.

Year	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Networks				
Water feeder mains (Metro)	51.94	53.57	56.04	59.44
Metropolitan sewers	32.03	40.30	44.91	47.36
Municipal sewers	1,071.93	1,082.80	1,113.60	1,194.50

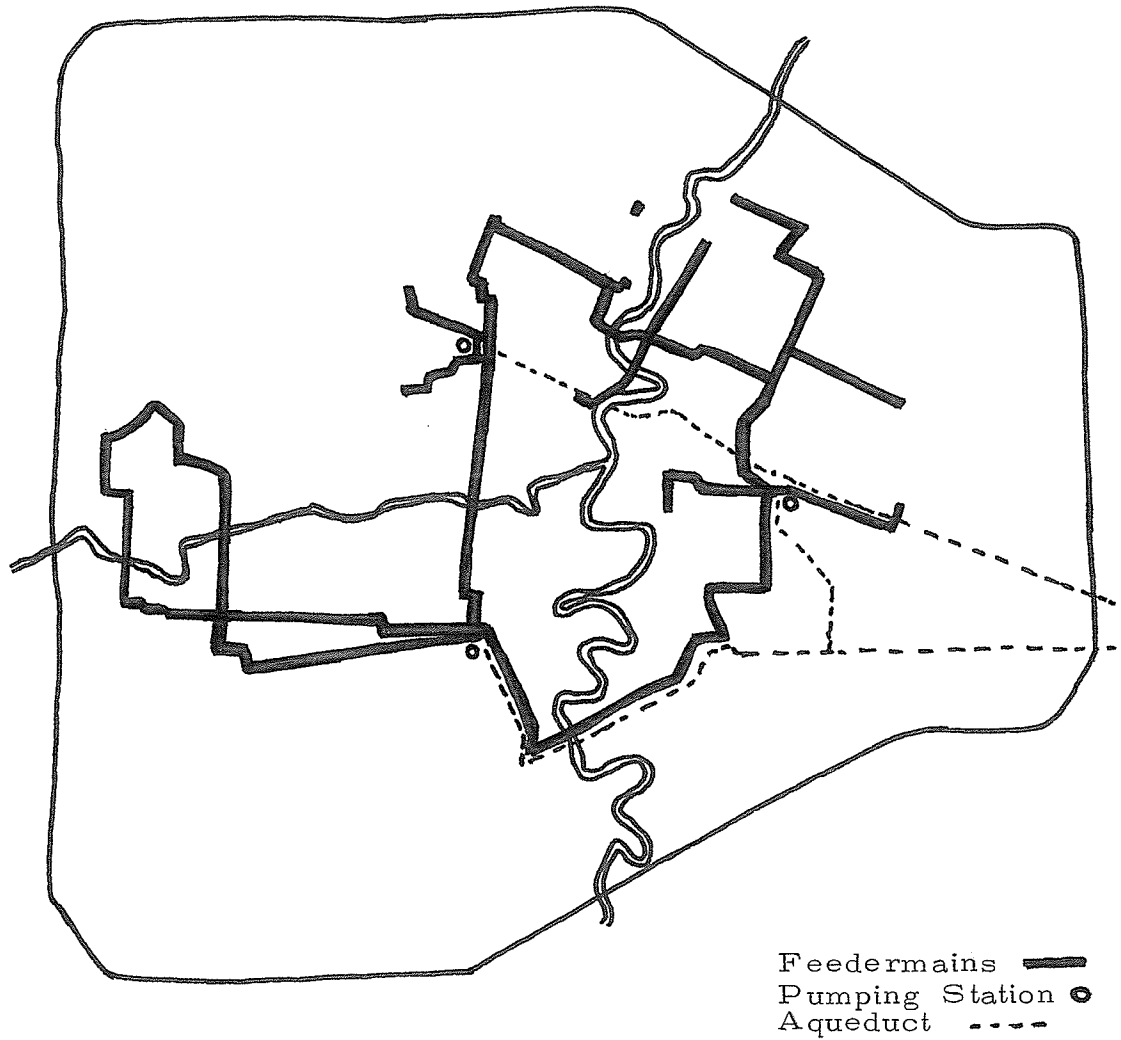
TABLE 6: Metropolitan Winnipeg, Length of Water and Sewer Networks at various years (1966-1969)
Length in miles
(source: Metropolitan Corporation annual reports)

The above figures reveal the considerable increase in length over time of the sewage disposal system, both metropolitan and municipal. The maps of metropolitan waterworks and sewage disposal networks (see the following two pages) reveal the location of the installations. These maps have a limited value, as they include only a very minor portion of the entire networks. The mapping of municipal networks would reveal the complete progression and the direction of urbanization in the Metropolitan Area.

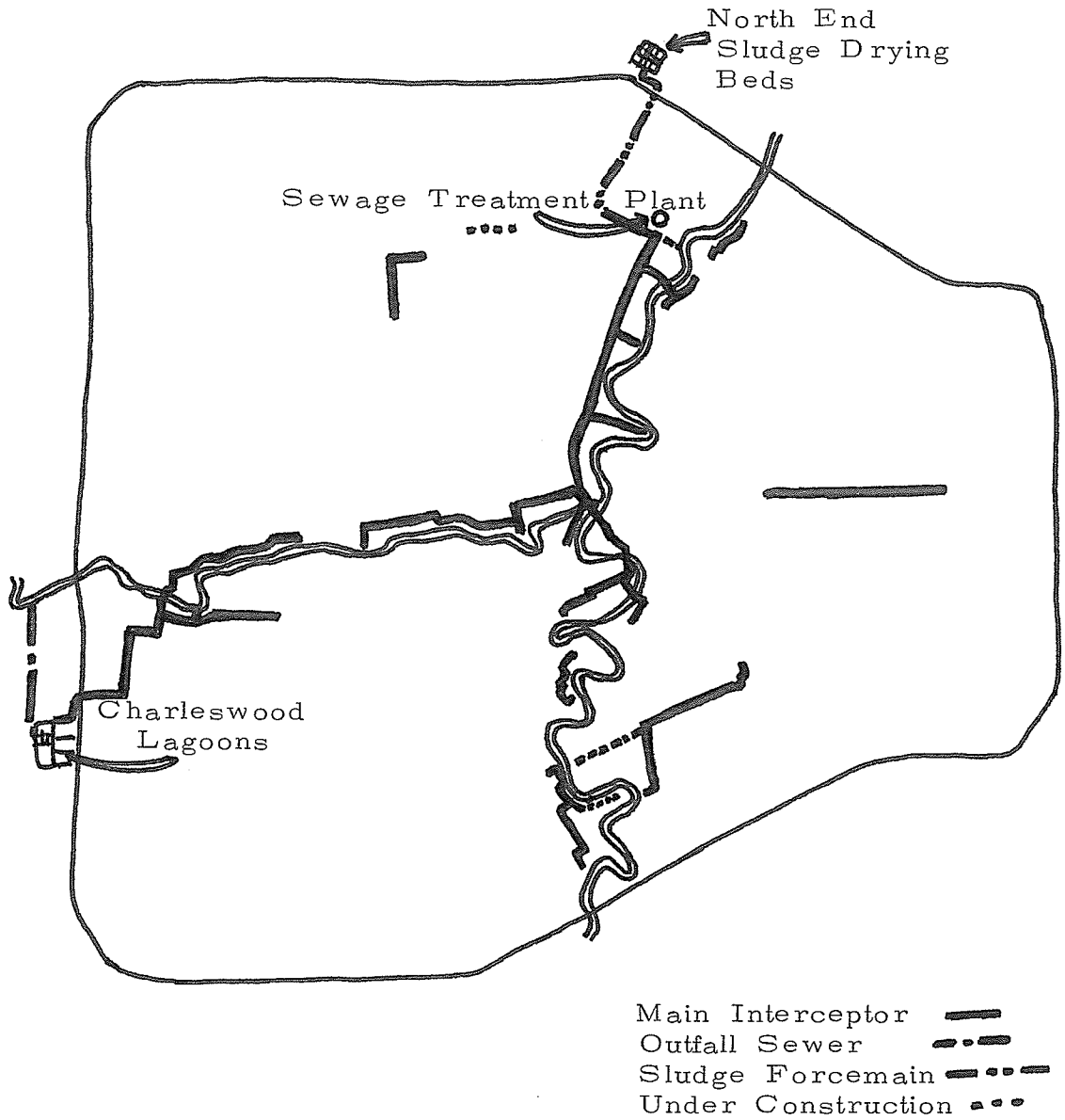
B) The methods of financing of these investments.

Until 1970 the extension of waterworks systems was financed primarily under the Federal Municipal Development and Loan Act. The Act made the provision for loans to municipalities involved in municipal projects such as:

- (a) municipally owned water treatment plants and distribution mains;
- (b) municipally owned storm sewers;



MAP 1: Metropolitan Waterworks System.
(source: Metropolitan Corporation,
annual report, 1969, p. F-30)



MAP 2: Metropolitan Sewage Disposal System.
(source: Metropolitan Corporation,
annual report, 1969, p. F-36)

- (c) municipal streets and thoroughfares;
- (d) municipally owned buildings; and
- (e) municipally owned public transport or transit systems,¹ exclusive of rolling stock and similar operating equipment;

The terms of the loans were not to exceed fifty years from the date of completion. The Act included a provision for the forgiveness of 25 % of the principal, on the condition that the projects be completed by March 31st, 1966. The interest rate was fixed by the Governor in Council. There was an upper limit to the total amount of funds which could be loaned under the Act. The total for the whole of Canada should not exceed \$400 millions and it was divided among provinces on the basis of their population as recorded by the 1961 census.

The Revised Statutes of 1970 have included new legislation for this category of loans. The provisions are included in the Municipal Improvements Assistance Act. The general conditions governing the loans are described in article 3 (1):

"The Minister, with the approval of the Governor in Council, and subject to this Act, may enter into an agreement with any municipality to make a loan or loans to such municipality out of any unappropriated moneys in the Consolidated Revenue Fund to enable such municipality to pay the whole or any part of the cost of constructing or making extensions or improvements to or renewals of a municipal waterworks system, a municipal gas plant, a municipal electric light system, or other municipal project, if the project to be constructed or the extensions or improvements or renewals to be made will be a self-liquidating project."²

¹The Municipal Development and Loan Act, Statutes of Canada, Chapter 13, 1963, p. 129.

²The Municipal Improvements Assistance Act, Statutes of Canada, Chapter M-16, pp. 5,097-5,098, 1970.

Under the new Act, urgent need for a project, as well as the relief of unemployment in the municipality, are necessary pre-conditions for the loans. Differing from the Municipal Development and Loan Act, the rate of interest is fixed and there is no upper limit to the terms of the loans.

4. Any such loan shall bear interest at the rate of two per cent per annum, payable semi-annually, and shall be amortized by semi-annual payments sufficient to pay off the full amount of the loan during a period to be fixed by the Governor in Council, which period shall not in any case be longer than the estimated useful life of the project that has been constructed, extended, improved or renewed, in whole or in part, with the proceeds of the loan.¹

The aggregate amount of the loans is limited to \$30 millions and the share of each province is determined by the population as recorded by the 1931 (sic) census. It should be noted that until 1969, all waterworks system installations undertaken by the Metropolitan Winnipeg Corporation were financed under the Municipal Development and Loan Act.

The sewage disposal system is financed by loans for which provision is made under the National Housing Act. The general conditions are described in Section 51 (1) of the Act:

51. (1) In order to assist in the elimination or prevention of water and soil pollution the Corporation (CMHC) may make a loan to any province, municipality or municipal sewerage corporation for the purpose of assisting in the construction or expansion of a sewage treatment project.²

The rate of interest is prescribed by the Governor in Council.

¹The Municipal Improvements ..., p. 5,098.

²The National Housing Act, Statutes of Canada, Chapter N-10, 1970, p. 5390.

The term of the loan should not exceed fifty years from the date of completion of the project. Up to two-thirds of the cost of the project may be borrowed under this legislation. The Act includes favorable conditions for the borrowers:

52. (1) Where the construction of a sewage treatment project in respect of which a loan is made under the authority of this Part is completed to the satisfaction of the Corporation on or before the 31st day of March 1975, the Corporation may forgive payment by the borrower of
- (a) 25% of the principal amount of the loan; and
 - (b) 25% of the interest that has accrued in respect of the loan as of the date of completion of the project.¹

The Metropolitan Corporation of Greater Winnipeg in carrying out its sewerage program has utilized the lending provisions under the the National Housing Act.

From an analysis of this category of investments certain observations can be made. These investments represent large amounts of public funds. The terms of the present legislation are very favorable to the borrowers and it would thus seem reasonable that the public sector should make efforts to recapture part of these monies.

C) The recapture of the funds spent in new major public investments.

On September 24, 1965 a report of Messrs. Alvord, Burdick, and Howson, a Chicago consulting engineering firm was received by the Metropolitan Corporation of Greater Winnipeg.²

¹The National Housing . . . , p. 5,391.

²Metropolitan Corporation of Winnipeg, "Annual Report," 1966, p. F-7.

The report develops methods of apportioning the costs of the sewage disposal system.

The report identifies four major groups affected by the extension of a sewage disposal system.

The land developers. This group tries to generate population in outlying subdivisions where land prices are lowest. Such a strategy requires the extension of servicing facilities at the expense of the general public.

The municipal engineers. This group is influenced by the rising costs of sewage disposal systems. "They have tripled in the past thirty years and there is little reason to expect any appreciable change in this trend."¹

The landowners and tenants. This group lives in older and densely populated areas of the city. They may be adequately serviced by existing sewage disposal facilities that have already been paid for. In such a situation these groups may be reluctant to help finance new facilities for other users.

The planners. This group influences the growth and direction of development by selecting routes for utility construction, which encourages urbanization.

The report reveals some of the financial problems to be solved in allocating sewage disposal system construction costs.

¹Alvord, Burdick, and Howson, "Report on Allocation of Annual Costs for the Sewage Disposal System," prepared for the Metropolitan Corporation of Greater Winnipeg, September 1965, p. 10.

The funded debt and the annual charges of the Metropolitan Corporation of Greater Winnipeg for the sewage disposal system have evolved as follows:

Years	Sewage Funded Debt	Annual Charges
1966	16,960,283	1,573,542
1967	18,228,895	1,863,620
1968	18,995,177	2,176,142
1969	18,964,314	2,443,269
1970	19,192,306	2,733,709

TABLE 7: The Metropolitan Corporation of Greater Winnipeg - Sewage Funded Debt and Annual Charges
(source: annual reports)

The total cost of reproduction of the entire Metropolitan Winnipeg sewage disposal system was estimated at \$54,600,000 in 1965. It represents a cost of \$215 per capita or \$855 per equivalent single dwelling.¹ The cost of rebuilding would be two or three times the accumulated cost of the facilities because of the continual depreciation in purchasing power of the construction dollar. There is presently no adequate basis for charging for the service provided. The present method of allocating these costs in Winnipeg is based on water consumption. Thus present users pay for the maintenance and depreciation of the existing sewage disposal system as well as for annual debt charges on capital expenditures for new sewer construction. The most drastic solution would be to make new users pay their total share of sewer construction costs. However, unless some provision is made for future demands,

¹Alvord et al., Report on ..., p. 24.

it is impractical to finance present construction of sewage disposal systems in this way, because future users who would benefit from such construction are not yet present. Under the existing system of allocation the present users carry this cost.

The report proposed two solutions for allocating the costs of new sewage installations: the User Share method, the Connection Charges method.

The User Charge method allocates the construction costs to Public and Property. The Public benefits from the abatement of nuisance, prevention of infection, etc. because new sewers are installed. The Property benefits from the existence of a sewage disposal system whether or not it uses the system. Thus, the rationale for allocating the costs is a simple one:

"The excess capacity represents a readiness-to-serve which primarily benefits real estate that is capable at any time of exerting a demand for service. In other words, that portion not now in use was made available largely for future users associated with the development of real estate."¹

The proposed method corresponds to a levy on land values.

The recommendation for the application of this method was rejected by the Metropolitan Council, because it would not have sufficient impact to justify the administrative cost involved.²

In addition to this recommendation, the report proposed the imposition of a Connection Charge for each new user of

¹Alvord et al., Report on ..., p. 29.

²Metropolitan Corporation, "Annual Report," 1966, p.F-7.

the system. The new user would pay his fair share of equity in the physical plant. The connection charge would be used for debt retirement as well as for new construction. Connection charges are used on a "single family dwelling unit basis" and the charge to industrial and commercial establishments is worked out on the basis of the number of equivalent single family dwelling units they represent. The proposed connection charges was to be based on Metro's debt and was to change as Metro's equity increased. The connection charge should be based on the reproduction cost of the physical plant, otherwise the money would be technically free of interest. In 1965, the report fixed the connection charge at \$90 per equivalent single family dwelling. On June 23, 1966 the recommendation concerning the imposition of a connection charge was adopted by the Metropolitan Council.

In order to implement a system of connection charges, enabling legislation was required. An amendment to the Metropolitan Winnipeg Act was put before the Legislative Assembly. In 1967 the Metropolitan Winnipeg Act was amended to permit the collection of connection charges.

152 A. (1) For the purpose of recovering a portion of the capital cost of the metropolitan sewage disposal system as that cost may exist from time to time, the metropolitan council may, by by-law, impose upon any person, firm or corporation applying for a permit to construct or enlarge a building, and who applies to connect directly to either a municipal sewer or to the metropolitan sewage disposal system, a connection charge or charges payable by a sum of money to the corporation.

(2) In a by-law passed under this section, the metropolitan council shall set forth

(a) methods of calculating the charges imposed by the by-law, which may vary in accordance with the

occupancy, use, size or other characteristic of the building in respect of which the charge is made; and (b) methods and procedures for collecting the charges imposed by the by-law.¹

However, action at the municipal level to implement the connection charges has not been proceeded with.² The method of apportioning the sewage disposal system costs, therefore, remains as in the past - a charge against the area municipalities based on their water consumption. The author was told that private developers and the Chamber of Commerce opposed the proposal for recapturing the capital cost. On the other hand private developers put pressure on the Corporation of Metropolitan Winnipeg to have interceptors installed in areas which they control. It tends to demonstrate that the system of recovering capital costs was never used because private developers understood clearly the inconvenience it could create for their operations.

The City of Winnipeg Act makes a provision for a uniform assessment charge on lands fronting new sewer installations.

355 (1) Subject to the provisions of Section 385, the special assessment to be levied in respect of sewers constructed by the city in any year (whether or not such sewers be partly outside the city) shall be uniform through the city and shall be imposed and paid as follows:

(a) Each owner of land fronting on the street wherein the sewer is constructed, or otherwise served by the sewer, shall pay to the city a sum equal to eight dollars for each foot of frontage of that land, whichever is the greater, and if the special assessment be extended over a term of years interest shall be chargeable as in other cases.

¹The Metropolitan Winnipeg Act, Statutes of Manitoba, Chapter 79, 1967, p. 429.

²Metropolitan Corporation, "Annual Report," 1967, p. F-7.

(b) The remaining expense, if any, shall be borne by the city.¹

There is a special provision for land not previously assessed.

356 (1) Where the property that has never been charged with an assessment for the construction of a sewer is connected with a sewer within the city formerly belonging to an area municipality, a charge may be made against the property in the amount of an assessment calculated, as set forth in Section 355 and, unless commuted, shall be spread over a term of not less than ten years with interest as in the case of an ordinary local improvement.²

The Act gives the council strong powers for levying the costs of sewers and passing the necessary by-laws.

358 (1) Notwithstanding the Section 383 the whole or any part of the cost of the construction, enlargement, replacement or extension of a sewer, drain or watercourse may be assumed by the city at large, or levied against the property in the opinion of the council benefited thereby, by a rate according to its frontage or according to its assessment as the council shall decide, or in such other manner and spread over such term of years as to the council seems equitable.

(2) If it is intended to assess the whole or any part of the cost of the proposed work against the land in a specified area of the city, hereinafter called the assessment area, a by-law containing a description of the work in general terms and of the assessment area, together with a statement of the estimated cost of the work and the proportion of the cost intended to be assessed against the land in the area, shall be published in full in at least one newspaper published in the city.³

The legislation of the City of Winnipeg Act is more detailed than that of the former Metropolitan Winnipeg Act. The new legislation provides for the replacement and the extension of sewer, drain or watercourse. The redevelopment of certain areas of the city will certainly include some capital expenditures and those could be levied against the property if the council was to pass the corres-

¹The City of Winnipeg Act, Statutes of Manitoba, Chapter 105, 1971, p. 722.

²Ibid., p. 722.

³Ibid., p. 725.

ponding by-laws. However the property owners can always petition against such by-laws.

Regarding the watermains, the city can impose a frontage rate for the costs, as prescribed in Section 361 (1). If land is not fronting on a street the provisions of the Act are:

363 (1) When the owner of any land not fronting on a street wherein a watermain is constructed requests the city to provide such land with a water service by means of a special water connection the owner shall reimburse the city for the cost of construction thereof and the owner from time to time of such land shall reimburse the city for the cost of maintenance of the water connection and any other expense, loss or damage which the city may suffer by reason of or arising out of the construction, existence or removal of the special water connection. Provided that, on the recommendation of the city engineer, the city may pay a portion of the cost of constructing any such special water connection, not exceeding the estimated amount that would be paid by the city in the case of a normal service to the said land.¹

The City of Winnipeg Act includes sufficient provisions to recapture part of the capital costs occasioned by the installation of large infrastructures. Also, it serves to illustrate that the installation of such infrastructures can create "free rides" for the property owners. If the public sector is acting rationally the municipalities should not let property owners (land developers) have the full advantage of these investments. Otherwise it would be a form of subsidy provided by the community at large to a restricted number of property owners.

¹The City of Winnipeg Act, Statutes of Manitoba, p. 725.

B. Transportation Planning and Land Values.

The problem here is to analyze urban transportation planning and its effects on urban land values. Firstly, methods used in transportation planning are reviewed. The Winnipeg Area Transportation Study (WATS) serves as an example of such transportation planning. Secondly, some remarks on transportation planning are formulated in light of its potential impact on land values and other considerations.

A) Transportation planning methods.

The basis of transportation planning is an analysis of future demand for urban area transportation. The analysis of the demand for transportation is user-oriented. It is possible to consider transportation planning as a total process. However the prediction of future demand is no more than a traffic estimation. Of course the planning process should include the inventory of existing conditions, the estimates of future urban area growth and the determination of future demand for transportation. However up to this stage of the planning process the externalities produced by a transportation system have not yet been considered.¹

The WATS is a clear example of the problems arising with urban transportation planning. The forewords of the first and third volumes insist that the objectives of transportation planning is to meet users' needs.

¹in particular Brian V. Martin, Frederick W. Memmott, III, Alexander J. Bone, Principles and Techniques of Predicting Future Demand for Urban Area Transportation, M.I.T. Report No. 3, 1970.

"It is only by establishing needs and determining the types of facilities required to meet these needs well in advance, that capital investment in transportation improvements can proceed in a regulated manner.¹

"This report culminates six years of comprehensive data collection and tabulation, analysis, testing, functional design and evaluation utilizing the most developed techniques for urban transportation planning and systems engineering. As such, it constitutes a realistic presentation of future transportation needs and the financial requirements necessary to meet those needs.²

On the basis of this study various schemes were proposed.

The detailed scheme includes total expenditures of an amount of \$746.40 millions (1967 dollars), out of which \$609.19 millions are allocated to the implementation of major streets and highway system.³

The plan is to be carried out in four stages. Each stage includes capital expenditures divided in two categories: Property and Construction. The following table gives the distribution of expenditures between these two categories (see following page). Property expenditure represents a significant portion of the costs involved in implementation because land is required for right-of-way purposes. However land costs are only a derived expenditure

¹"The Winnipeg Area Transportation Study," 3 volumes, 1966-1968, volume 1, foreword.

²The Winnipeg Area . . . , volume 3, foreword.

³Ibid., p. 169.

resulting from the objectives of the plan which will occasion

"... substantial direct savings to the average vehicle owner."¹

Period	Construction	Property	Total
Stage I (1968-1971)			
major streets	48.04	5.00	53.04
freeways	16.38	5.43	21.81
Total	64.42	10.42	74.85
Stage II (1972-1976)			
major streets	33.73	7.53	41.26
freeways	77.20	23.73	100.93
Total	110.93	31.26	142.19
Stage III (1977-1981)			
major streets	19.05	9.41	28.46
freeways	89.43	39.72	129.15
Total	108.48	49.13	157.61
Stage IV (1982-1991)			
major streets	44.36	12.47	58.83
freeways	159.63	18.08	177.71
Total	203.99	30.55	234.54
Totals	487.82	121.37	609.19

TABLE 8: Winnipeg Area Transportation Study - Capital Expenditures, Detailed Scheme (\$ millions)
(source: WATS, vol. 3, p. 226)

The expenditure for the necessary rights-of-way is justified by the long-term benefits the transportation system will provide.

The consideration of alternate routes for construction was opposed as being extremely costly and in some instances as a practical impossibility. However this aspect creates some difficulties as owners of land located on the proposed routes benefit from a monopoly situation. These owners have a strong bargaining position in that they can force the public sector to meet their

¹The Winnipeg Area ..., volume 3, p. 229.

prices unless the public sector invokes its powers of expropriation. The annual reports of the Metropolitan Winnipeg Corporation reveal the total expenditures made by the Corporation for the acquisition of all rights-of-way. A certain portion of the sums of money spent was allocated to the realization of the WATS. Figure 8 represents this category of expenditures. The effect of the property expenditures for the construction of the Beltway and other proposed projects included in the WATS was significant, and corresponded to the increase of the curve until the peak was reached in 1968. With the change in the provincial administration, after the election of June 1969, this category of expenditures was limited as the new provincial government modified the policy.

The Winnipeg Area Transportation Study has given some consideration to the effects of the plan on nearby areas. Some measures are proposed to control the development of these areas. Property acquisition "should be related in some manner to the future development."¹ The study group proposed some kind of joint partnership between the Federal, Provincial and Municipal governments. WATS also stressed that:

"Carrying the foregoing proposals one step further, there would appear to be considerable merit in expanding the extent of the property acquired by the government partnership beyond the limits of that required for the actual transportation corridors."²

¹The Winnipeg Area ..., volume 3, p. 230.

²Ibid., p. 230.

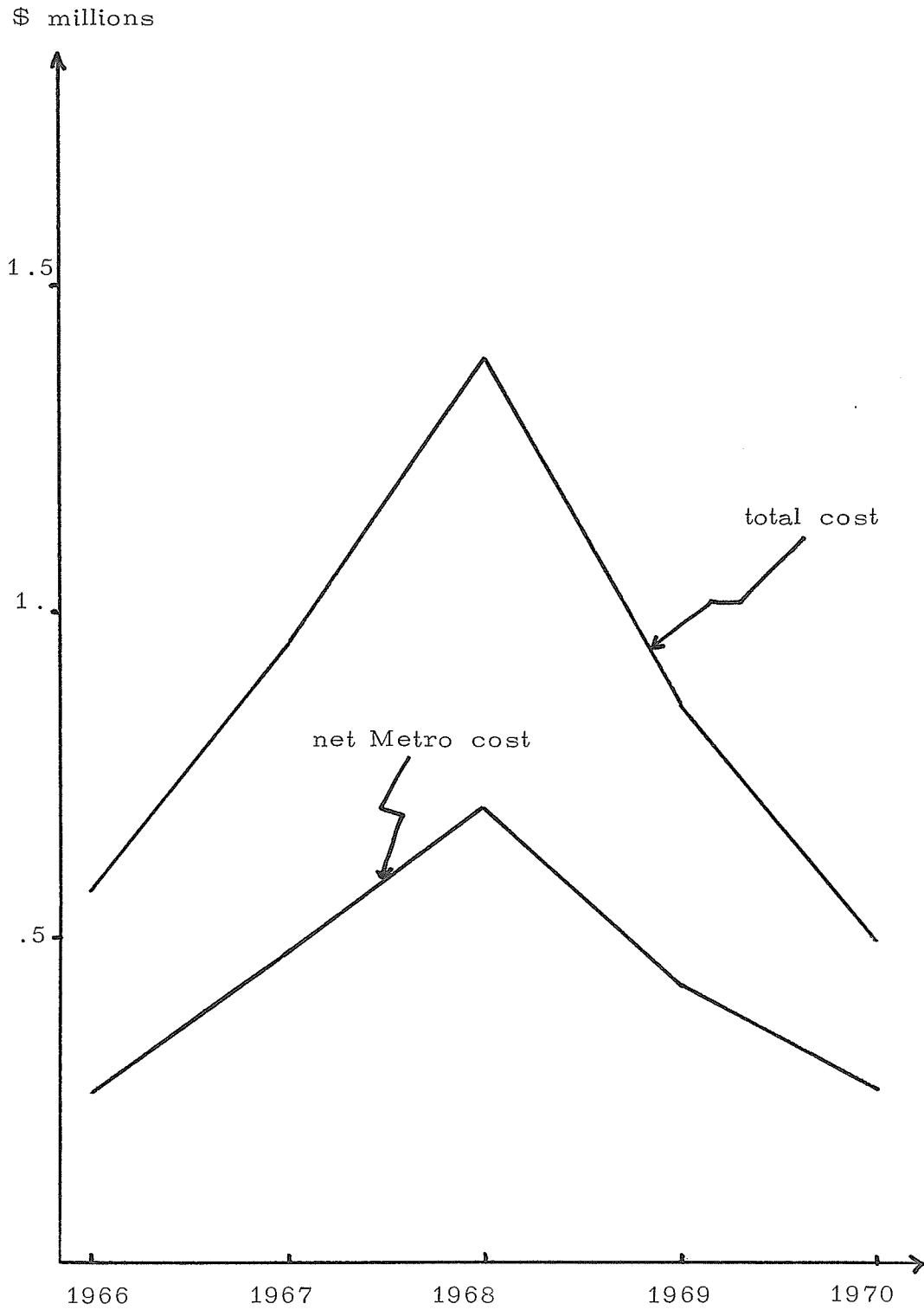


FIGURE 8: Capital Expenditures - Land Acquisition for Rights-of-Way, Metropolitan Winnipeg.
 (source: Metropolitan Winnipeg Corporation, annual reports)

There is a possibility of recovering part of the costs involved in such a procedure by reselling developed land.

"... benefit from the increase in land values resulting from its own advance planning and investment. By such a process, again a substantial recovery of the initial capital outlay for the acquisition of the future right-of-way could be realized to the benefit of the citizens at large."¹

Although such an approach has great merit, it demonstrates the limitations of narrowly defined transportation planning. Because these suggestions are only briefly mentioned in WATS, they are not given the full attention they deserve. Transportation is only one aspect of urban planning. More complex problems arise which necessitates the formulation of more precise development plans along the proposed routes. Transportation planning methods used in the WATS have failed to integrate all the components of urban planning, and have dealt only with the transportation component, in a narrowly defined way.

B) Transportation planning reconsidered.

There is a limited amount of literature on the effects that transportation systems have on land values. However it is felt that transportation systems do have an effect on land values. It is not the transportation system per se but more precisely the consequences resulting from the extensive use of the transportation system by motor vehicles which have an effect on land values. Motor vehicles generate various effects. For the residential property owners living in areas close to highways these effects

¹The Winnipeg Area ..., volume 3, p. 230.

become disturbances or nuisances, for which some property owners have claimed compensation, however the Courts have tended to refuse compensation to property owners on the sole basis of the effects created by noise, speed and increased traffic.¹

The construction of highways with limited access could have the effect of isolating adjacent tracts of land left without legal means of access to a public street or road system. These parcels are called "landlocked" parcels.² It is difficult for the appraisers to accurately evaluate such land. There is no market for such parcels.

These various problems demonstrate the necessity for a change in transportation system location analysis. Clearly transportation planning is a two way problem:

"Historically, transportation facilities have not been established with sufficient regard for their impact on population distribution and land use. Conversely, land has been subdivided and whole communities built without analysis of the burdens they would create on existing transport or the pressure for costly new transportation facilities."³

A certain shift in emphasis is required so that more importance can be given to the physical environment. The analysis of changes in land values could create the necessary link between

¹"Highway Research Circular No. 71," Highway Research Board, Washington, D.C.

²"Research into the value of Landlocked Right-of-Way Parcels," Highway Research Record, No. 8, 1963, p. 95.

³William J. Ronan, "Shifting Emphasis on Transportation," Highway Research Record, No. 183, 1967, p. 3.

users and non-users in the planning of transportation facilities. However our concern here is more deep-rooted than the simple enhancement of highway corridors. If highways are to be located and designed as an integral element of the environment, more than a landscaping arrangement is involved. Scenic trips without economic and social integration into the surrounding environment are only beneficial to the users. Any integration should therefore incorporate the non-users. Techniques to achieve such integration have to some extent been developed but are not yet fully accepted.

CHAPTER SEVEN
LAND DEVELOPMENT PRACTICES AND LAND
VALUATION.

In a recent article in the Globe and Mail, James Lorimer noted:

"It is silly to ignore the tremendous impact of public policy - including city planning and zoning policy - on land values."¹

City planning per se does not have any direct effect on land values; but the investments made, and the criteria chosen for these investments have a direct impact on land values. Often such investments are not even made by the public sector, although they are made in accordance with public controls. For this reason they are classified as public investments in this thesis.

One of the major public controls is the use of subdivision regulations. Variations in layouts and size of lots are some of the factors which have an influence in the valuation process of land. This aspect is examined as an important element which generates investments under public control and which modifies the ultimate sales price of lots. The other aspect which has a role in the

¹James Lorimer, "It's a Champagne Time for Developers," the Globe and Mail, March 20, 1972, p. 7.

valuation process are municipal servicing standards, insofar as variation in such standards can considerably affect the final value of lots.

These two questions can be analyzed in relation to the situation in Winnipeg. The two tier system of municipal government in effect up to December 31st, 1971 did not permit the standardization of urban development practices among the twelve municipalities that made up the metropolitan area. However comparison is possible between the performance of the various municipalities.

A. Subdivision Layout, Control and Practices.

A) Historical review.

Since the Second World War there has been a continuing "legislative attack on the free market in urbanizing land."¹ There are three reasons for this pressure from the state, developers would continue to subdivide land in rather small lots "of perhaps thirty-three foots (sic) or even less."² Secondly, land would still be subdivided with grid pattern streets, a notion which suggests that the 5th Century Greek architect Hippodamus was the inventor of town planning. Thirdly, municipalities would have to bear too large a burden of servicing costs, as it was common practice to have municipal services installed by municipalities.

¹J.B. Milner, "An Introduction to Subdivision Control Legislation," The Canadian Bar Review, vol. 63, 1965, p. 51.

²Ibid., p. 50.

Then subdivision control was imposed. This type of control has to do with the design of the proposed layout of streets and lots, the objective being to create a pleasant and convenient environment.¹

B) Design practices.

Not enough attention is paid by subdividers and public authorities to the cost implications of their developments. The design of layouts should be given more attention. The variation between layouts is not only qualitative but also quantitative. Professor Kostka observed that the length of roadways could be increased up to 25% with different designs.² A systematic study for a ten acre subdivision has been made, changing the number of accesses.³ (see Figure 9 on the following page). The study shows a difference in the number of lots, varying from 39 to 50. The length of linear front streets varies between 1,795 feet and 2,480.

C) Some elements of rationalization.

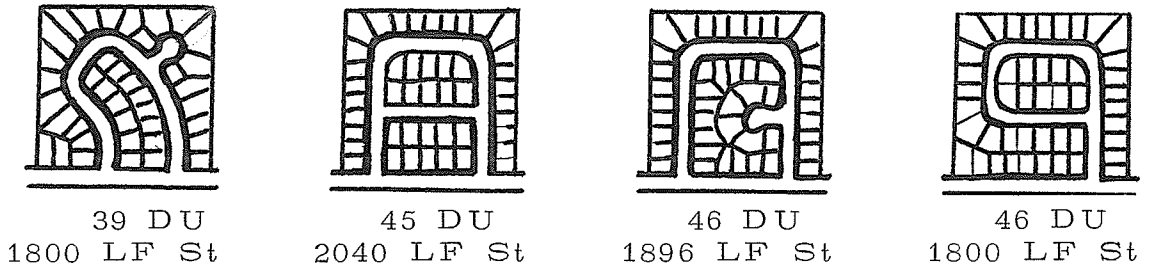
It is certainly possible to provide some principles for the optimal layout of subdivisions. In the simplest case of land subdivision the uses are split between residential and transportation. The problem in an optimal allocation is to maximize the number

¹J.B. Milner, An Introduction ..., p. 50.

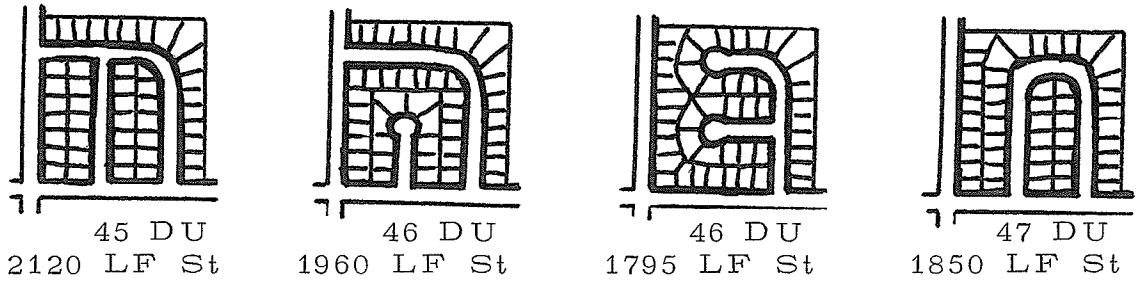
²V. Joseph Kostka, Neighbourhood Planning, Winnipeg, 1957, p. 81.

³"Innovative vs Tradition in Community Development," Urban Land Institute, Technical Bulletin No. 47, 1963, p. 24.

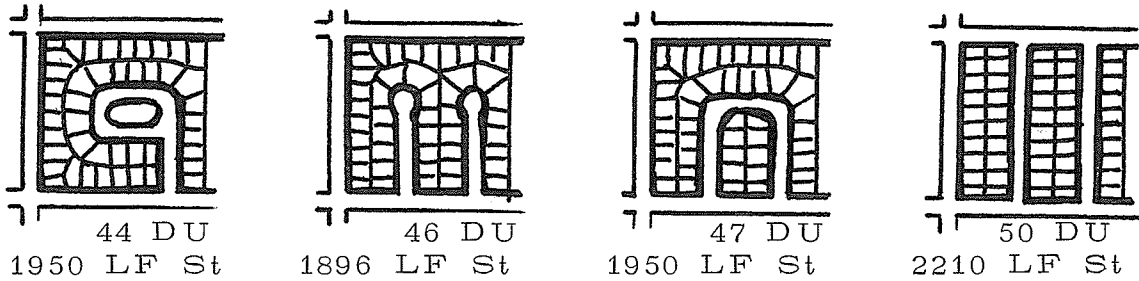
One Street Access



Two Streets Access



Three Streets Access



Four Streets Access

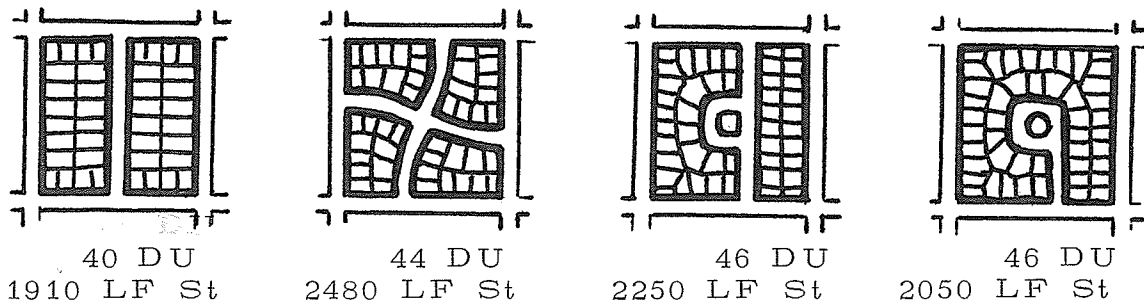


FIGURE 9: Ten-Acre By-Passed Land Use Study.
 (source: ULI Technical Bulletin
 No. 47, 1963, p. 24.)

of the lots and minimize the length of the streets. The constraints include the width of the streets, the size of the lots, the length/width ratio of the lots as well as the total area to be subdivided. This problem is a simple linear program, the solution of which will certainly not provide the final design of the layout, but will provide some limits to the design. If limits are not respected by the designer, the increase in costs will become very significant and measurable. This approach is then an important consideration in the rationalization of land through subdivision control.

D) The present subdivision control system.

Under the City of Winnipeg Act Section 637 regulates subdivision of land:

"The city has exclusive authority in the city and the additional zone for the purpose of the administration and enforcement of the Greater Winnipeg development plan, the district plans and action area plans, and for that purpose, in addition to its other powers, the council may enact by-laws, having force in both or either the city and the additional zone, or in parts of both or either the city and additional zone with respect to,

- (a) plans of subdivision of areas of land, including by-laws establishing, for any designated locality,
 - (i) the amount of land that shall be used for parks or boulevards, or both,
 - (ii) the width of any streets or lanes opened for the use after the enactment of the established by-law; and
- (b) requirements with which persons establishing and developing, or proposing to establish and develop, a subdivision of an area of land shall comply.¹

The Act gives the council extended powers to pass regulations. However the criteria for the regulations are not spelled out in the Act. If a certain degree of rationalization of public control

¹The City of Winnipeg Act, Statutes of Manitoba, p. 859.

and as well, an appreciable limitation of costs in subdividing land is to be achieved, it is necessary to provide and to use objective criteria for subdivision control. Present requirements are too subjective because cost analysis is often sketchy and not adequately considered by municipal authorities. However the effort of rationalizing subdivision practices is not sufficient unless municipal servicing standards are also rationalized.

B. Municipal Servicing Standards.

For a long time municipalities have been concerned about municipal servicing costs. But the concern is "... on who is going to pay these costs, or how they are going to be paid, rather than on reducing their magnitude."¹ The problem is one of reducing servicing costs, and therefore implies the limitation of land valuation.

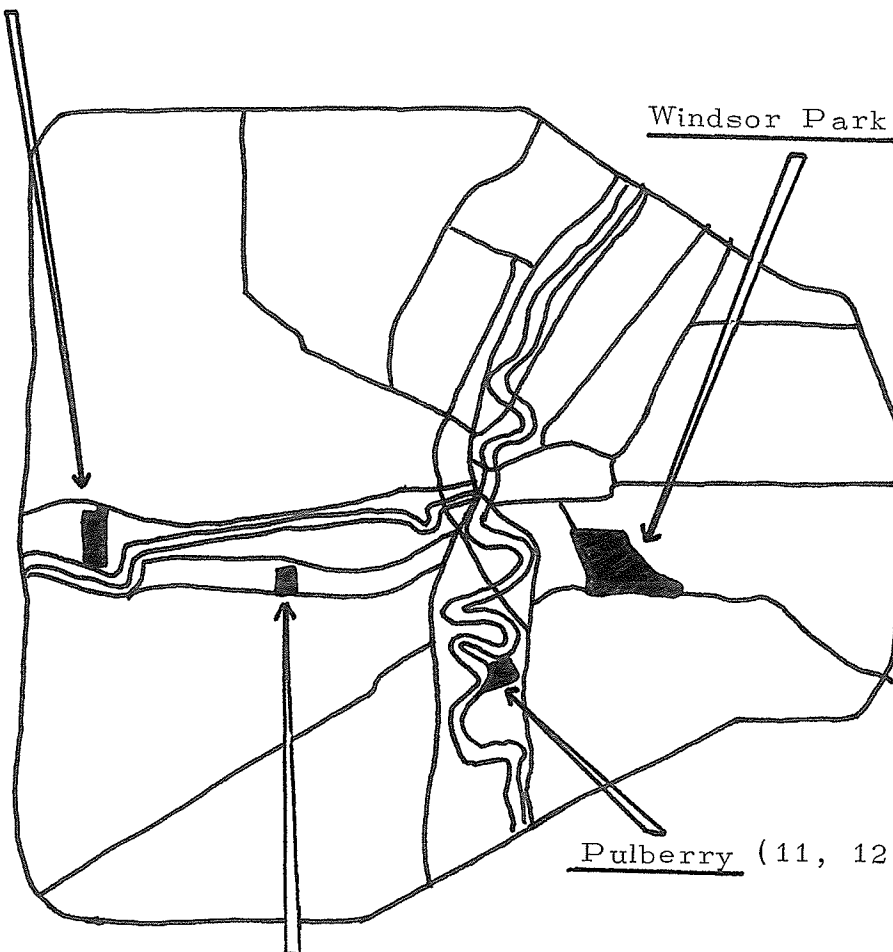
The comparison of four subdivisions in the Metropolitan Winnipeg area provides the following eight tables of figures and standards.² (see next eight pages). The costs and the standards of servicing differ considerably from one subdivision to another. The analysis of municipal standards could result in the establishment of criteria more appropriate for servicing the Winnipeg area.

¹Norman Pearson, What Price Suburbia? The Lower Mainland Regional Planning Board, New Westminster, B.C., 1967, p. 23.

²"An Analysis of Development Costs in Residential Subdivisions," Underwood McLellan and Associates Limited, Winnipeg, 1965.

Westwood (tables 9, 10)

Windsor Park (15, 16)



Pulberry (11, 12)

Tuxedo Park (13, 14)



MAP 3: Location of Residential Subdivisions Analyzed.

TABLE 9: TRUNK SERVICES WESTWOOD

Description	Proportion Charged	Total Cost (1964 base) +15% engineering legal & survey fees	Cost per Acre	Cost per Frontage Foot
STORM				
..storm sewer 30" and over 7920 ft. of 36" to 72" pipe	61.5%	= 203,000	\$864	\$3.38
SANITARY				
..sanitary sewer larger than 10" 3330 ft. of 12" to 18" pipe	100%	= 37,400		
..plus charge of \$4.00/ft. on land fronting existing 36" trunk		18,200 55,600	\$242	\$0.93
WATER				
..watermains over 8" diameter 6910 feet of 12" asbes- tos cement	100%	= 71,000	\$304	\$1.19
PAVEMENT				
..excess over stand- ard 24' concrete roadway on West- wood Drive and Sansome Avenue 14,820 sq. yds.	100%	= 112,000	\$476	\$1.86
TOTALS			\$1,886	\$7.36

TABLE 10: OTHER MUNICIPAL SERVICES WESTWOOD

Description	Total cost (1964 base) +15% engineering, legal and survey fees (where applicable)	Cost per acre	Cost per frontage foot
Lateral storm sewers ..23,320 ft. of 8" to 24"	\$ 5.45/ft. x 23,320 + 15%	\$ 635	\$ 2.43
Lateral storm sewers ..23,160 ft. of 8" & 10"	\$ 3.60/ft. x 32,160 + 15%	578	2.22
Lateral watermains ..34,790 ft. of 6" & 8"	\$ 6.52/ft. x 34,790 + 15%	1,130	4.34
Concrete pavement & curb ..40,800 ft. of 6" & 7" thick and 24' wide	\$18.50/ft. x 40,800 + 15%	3,770	14.45
..3,700 ft. of 6" thick and 16' wide in back lanes	\$11.85/ft. x 3,700 + 15%	222	0.85
House connections ..954 sanitary & water	\$200 ea. x 954 + 15%	957	3.66
Sidewalks along main roads ..14,900 ft. 5' wide 4" thick	\$2.23/ft. x 14,900 + 15%	166	0.64
Driveways servicing all lots without lanes ..834-6" thick & 20 sq. yd.	\$87.00 ea. x 834 + 15%	363	1.39
Landscaping boulevards ..188,000 sq. yd. sodding	\$ 0.45/sq. yd. x 188,000	368	1.41
Street lighting ornamental	\$150 ea. x 260	170	0.65
Hydro underground* monthly charge by Hydro			
Telephone underground*	\$25/lot x 954	104	0.40
	TOTALS	\$8,463	\$32.44

*All installations were assumed to be underground.
This was actually the case only in part of the sub-
division.

TABLE 11: TRUNK SERVICES PULBERRY

Description	Pro- portion Charged	Total Cost (1964 base) +15% engineer- ing, legal & survey fees	Cost per acre	Cost per frontage foot
STORM				
..4650 ft. of 30" to 54"	100%	151,000		
..pumping cham- ber and 42" outfall	100%	= 32,000 183,000	\$ 1980	\$ 6.45
SANITARY				
..pumping station	100%	= 59,200		
..2350 ft. of 12" outfall	100%	= 45,800 105,000	1135	3.70
WATER				
..4,220 ft. of 10" and 12" water- main outside subdivision	100%	68,000	735	2.39
PAVEMENT				
..extra width over 24' concrete road- way				
..1350 sq. yd. on River Road* and St. Vital Road*	100%	= 9,020	97	0.32
TOTALS			\$3,947	\$12.86

* (River Road and St. Vital Road were not actually paved during the period of development but for purposes of comparison it was assumed they were).

TABLE 12: OTHER MUNICIPAL SERVICES PULBERRY

Description	Total cost (1964 base) +15% engineering, legal and survey fees (where applicable)	Cost per acre	Cost per frontage foot
Lateral storm sewers ..9,000 ft. of 12"to24"	\$9.63/ft. x 9,000+15%	\$1,075	\$ 3.51
Lateral sanitary sewers ..14,240 ft. of 8" & 10"	\$6.08/ft.x14,240 + 15%	1,075	3.51
Lateral watermains ..19,420 ft. of 6" & 8"	\$6.97/ft.x19,420 + 15%	1,680	5.47
Concrete pavement & curb ..18,110 ft. of 6" thick and 24' wide ..no back lanes	\$16.15/ft.x18,110 + 15%	3,630	11.82
House connections ..484 sanitary and water	\$71.80 ea. x 484 + 15%	433	1.41
Sidewalks along main roads ..12,900 ft. 4' wide 4" thick	\$1.82 x 12,900 + 15%	292	0.95
Driveways constructed by builder			
Landscaping done by builder or homeowner			
Street lighting ornamental ..123 standards	\$150 ea. x 123	200	0.65
Hydro standard overhead..no extra cost			
Telephone standard overhead..no extra cost			
	TOTAL	\$8,385	\$27.32

(Note that the average recovery from private land, 1964 basis, was \$22.60/ front foot in compliance with St. Vital by-law. Cost of servicing was \$27.32 plus \$12.86 for trunks = \$40.18. Remaining lots were required to make up the difference).

TABLE 13: TRUNK SERVICES TUXEDO PARK

Description	Pro- portion charged	Total Cost (1964 base) +15% engineer- ing, legal & survey fees	Cost per acre	Cost per frontage foot
STORM				
..4330' of 84" & 96" (to Assiniboine River)	20%	= 60,600		
..1334' of 48"	50%	= 18,900		
..1520' of 30"	100%	= 22,700		
		<u>102,200</u>	\$ 974	\$ 4.46
SANITARY				
..pumping station	100%	= 56,000		
..3390' of 8" forcemain	100%	= 15,400		
..3680' of 12" and 15" infall (granular backfill)	100%	= <u>118,500</u>		
		<u>189,940</u>	1,810	8.30
WATER				
..4450' of 10" water- main in subdivision (major supply trunks existing)	100%	= 39,000	372	1.70
PAVEMENT				
..All residential streets 28' wide				
..Grant Avenue collector by Metro				
TOTAL			\$3,156	\$14.46

TABLE 14: OTHER MUNICIPAL SERVICES TUXEDO PARK

Description	Total cost (1964 base) +15% engineering, legal and survey fees (where applicable)	Cost per acre	Cost per frontage foot
Lateral storm sewers ..15,000 ft. of 12" to 24"	\$13.50/ft. x 15,000 + 15%	\$2,220	\$10.12
Lateral sanitary sewers ..15,500 ft. of 10" sewer (granular backfill complete)	\$ 8.64/ft. x 15,500 + 15%	1,465	6.70
Lateral watermains ..15,660 ft. of 6" and 8"	\$ 6.06/ft. x 15,660 + 15%	1,038	4.74
Concrete pavement & curb ..18,980 ft. of 28' and 20' wide 6" to 8" thick (thickened edge) ..no back lanes	\$22.00/ft. x 18,980 + 15%	4,575	20.85
House connections ..298 water, sanitary & storm	\$339 ea. x 298 + 15%	1,103	5.04
Sidewalks along main roads ..2610 ft. 8' & 5' wide 4" thick	\$ 3.50 x 2,610 + 15%	100	0.46
Driveways by builders			
Landscape - sodding, trees and sprinkler systems for parkettes	57,000 square yards sod- ding boulevards and par- kettes plus sprinklers	548	2.43
Street lighting ornamental ..98 standards	\$150 ea. x 98	140	0.64
Hydro underground	Monthly charge		
Telephone underground	\$35.00/lot (estimated)	99	0.45
	TOTALS	\$11,288	\$51.43

TABLE 15: TRUNK SERVICES WINDSOR PARK

(estimated by developer)

Description	Proportion Charged	Total cost (1964 base) +15 engineering legal & survey fees	Cost per Acre	Cost per Frontage Footage
STORM				
..7400 ft. of 108" (Dawson Road to Seine River)	86.6%	= 932,000		
..sub trunks 30" to 54"	100%	= <u>688,000</u> 1,620,000	\$2,130	\$9.50
SANITARY				
..main trunks 15" & 18"	100%	= 364,000		
..sub trunks 12"	100%	= 84,000		
..lift station & forcemain	100%	= <u>197,000</u> 645,000	\$ 849	\$3.78
WATER				
..12" & 10" water-main feeders down main roads	100%	= 469,000	\$ 617	\$2.75
PAVEMENT				
.. full width of all main streets 32' wide 8" thick	100%	=1,038,000	\$1,365	\$6.09
TOTALS			\$4,980	\$22.12

TABLE 16: OTHER MUNICIPAL SERVICES WINDSOR PARK

Description	Total Cost (1964 base) +15% engineering, legal and survey fees (where applicable)	Cost per Acre	Cost per Frontage Foot
Laternal storm sewers ..12" to 24"	\$ 396,000 + 15%	\$ 600	\$ 2.67
Laternal sanitary sewers ..8" and 10"	\$ 462,000 + 15%	\$ 700	\$ 3.11
Laternal watermains ..6" and 8"	\$ 579,000 + 15%	\$ 875	\$ 3.90
Concrete pavement & curb ..residential streets only 24' wide 6" thick reinforced	\$1,780,000 + 15%	\$2,700	\$12.00
..back lands	\$ 25,500 + 15%	\$ 35	\$ 0.17
House connections (included under water and sanitary laterals).			
Sidewalks and walkways	\$ 186,000 + 15%	\$ 282	\$ 1.25
Driveways constructed by builder			
Landscaping ..boulevard sodding and park landscaping	\$ 229,000	\$ 300	\$ 1.34
Street lighting ..734 standards	\$ 150 X 734 = 109,000	\$ 145	\$ 0.64
Hydro standard overhead no extra cost			
Telephone standard overhead no extra cost			
TOTALS		\$5,641	\$25.08

To facilitate the study servicing operations are divided into four categories: drainage, streets, sewage and public utilities.

Drainage. From the analysis of the standards and the costs of drainage systems in the four subdivisions, the following remarks can be made. Storm sewers represent an important proportion of servicing costs. The municipalities tend to ask for a larger capacity of drainage facilities than is necessary. For example, this is the case in Windsor Park and Pulberry in Winnipeg, where the facilities installed benefit larger areas than the subdivision itself. The analysis of standards reveals large differences between various municipalities. Under the former system of municipal government, municipal engineers had the entire responsibility, in agreement with the municipal council, to set up such standards. Rationalization is felt to be necessary so that some of the costs might be reduced.

Rain storms are such that rainfall intensity reaches a peak for only a short period of time. The peak corresponds to a rainfall of several times greater intensity than the average rainfall. The construction of buildings, streets and paved areas on land increases the runoff coefficient of water. Thus, urbanization causes the runoff water to concentrate in a short period of time. Consequently, "... the peak flow from a watershed after urbanization may be in order of three times what it was before the area was developed."¹

¹Jack Newsville, "New Engineering Concepts in Community Development," Urban Land Institute, Technical Bulletin No. 59, 1967, p. 16.

To cope with such drainage problems it is possible to design a storm sewer that will carry all the drainage from any conceivable storm that may occur in the future, no matter how rare the frequency. However, because of its limited use such a system would be economically unrealistic. To solve this problem, cities have two separate drainage systems: a "primary" system and a "secondary" system. The primary system consists of closed and open conduits and their appurtenances. The secondary system is the natural route followed by runoff water when the primary system is inoperable or inadequate. The problem involved in reducing the costs of a drainage system is to recognize the relative importance of each system. "The adoption of a higher minimum design standard usually is indicative of a failure to recognize the existence of the secondary drainage system, or of the economics or risks involved."¹

To reduce the storm water peak flow, land development and drainage system design practices should be modified in order to limit the size of the elements included in the primary drainage system. Some of the areas in subdivisions should be reserved for the storage of runoff waters. The principle to be applied is the on-site retention by the creation of green spaces and lakes. While this would require a broader approach to land development than is usually adopted. Some kind of incentives should be provided at the municipal level if such approaches are to be put

¹Jack NewsVile, New Engineering Concepts . . . , p. 17.

into practice. Other measures to reduce the costs of drainage systems also exist. The designer should eliminate the small pipes on the system's fringe and concentrate the runoff water at points as far as downstream as possible. Economies of scale do not seem to operate with the available pipe sizes used for drainage systems. If a single pipe of an appropriate diameter is not available, it may be less costly to employ two smaller pipes rather than to use a single one size pipe, whereas this is not the case if a larger size pipe is used.

Streets. Each of the four Winnipeg subdivisions has different street widths. Wider streets provide for larger and faster traffic flows, an undesirable situation for residential streets. There is no logic in requiring wide street pavements which increase the final cost of the lots and also increase the costs of maintenance to the community. Larger traffic flows then must be discouraged by means of, stop signs, curvilinear design, etc. In general the use of overly wide residential streets is thus a major obstacle to economical development.

The municipal standards of pavement thickness vary considerably between the four subdivisions for comparable thoroughfares. However pavement thickness should be designed to fit the traffic loads and the bearing value of the soil and other environmental conditions. There is no reason why the municipalities should not make a distinction between pavement thickness standards used on minor residential streets and those used for heavier traffic loads.

Sewerage. The standards here also vary from one subdivision to another. In Westwood and Pulberry the smallest pipes used are 8 inches in diameter, on the other hand in Tuxedo Park and in Windsor Park the smallest pipes have a diameter of 10 inches. The normal minimum domestic sewer diameter in other Canadian cities is 4 inches as compared to 6 inches in three out of the four subdivisions studied. While Winnipeg area soil conditions probably account for some of the difference, the practice remains somewhat arbitrary.¹

One of the major problems with sanitary sewer design standards is that they were established at the turn of the century and have not been questioned since.

"Habit makes it extremely difficult to put tradition aside for a fresh look at old and new problems, but a fresh look should be taken periodically by every engineer worthy of the name."²

The installation of sewers in areas not fully developed has resulted in the practice of calculating the capacity of the sanitary sewer system on the basis of the most dense development permitted per acre. If over-design to cope with unforeseen contingencies is justified, standards established by communities are somewhat arbitrary. Six inch sewers perform satisfactorily in many localities and a minimum of 8 inches is hard to justify.

¹An Analysis of Development ..., p. 81.

²Jack Newville, New Engineering Concepts ..., p. 27.

Gravity sewers require the construction of manholes, the cost of which represents from 30 to 60 per cent of the collection system cost.¹ Manholes are used to provide access to the pipes for maintenance. The maintenance consists of the removal of roots and other solids obstructing the pipes. The work is performed with rods to which a brush, cutter, or other device is fixed. The limit of the length of the rods for convenient work is 150 feet. Manholes were thus spaced with this in mind. Nowadays the most troublesome cause of stoppage - roots - has been eliminated. Sedimentation of solids can be eliminated by design standards which require a minimum level of velocity. Completely powered equipment with a capacity of 1,000 to 1,200 feet of flexible steel cleaning rod is now in use. However the practice of building manholes 300 to 500 feet apart persists, even though this spacing is now unnecessary.

Sanitary systems other than gravity flow systems show promise.² A pressure sewer system would require smaller pipe sizes, few manholes and would be very flexible in its alignment. The Vacuumatic System developed in Sweden and successfully used in large projects in Mexico City and elsewhere is also a very promising system. In this Swedish system, waste water is segregated into two separate categories, one for "black water" (from toilets) and "grey water" (from kitchens, laundries, lavatories).

¹Jack Newsville, New Engineering Concepts . . . , p. 29.

²Ibid., pp. 31-32.

"Grey water" flows by gravity and is used for irrigation and public services, such as fountains and fire hydrants. "Black water" is pulled along by vacuum (with very little water used to transport the solids) to a treatment plant.

Public utilities. Hydro and telephone distribution differ between the four subdivisions. In two out of four subdivisions the lines are overhead and in the other two they are underground. It should be noted that hydro and telephone companies do not charge to developers any extra cost for overhead distribution, a questionable practice at best. One of the reasons for burying power and telephone lines is to create a more aesthetically pleasing neighbourhood. Further certain dangers are also created by overhead wiring. The most important for underground distribution is the reduction in maintenance costs. A survey of various Canadian municipalities showed from 30 to 90 per cent savings in maintenance costs with an underground electrical distribution system.¹ Thus it is paradoxical for the hydro companies to make underground distribution financially impractical while at the same time attempting to save on maintenance costs. These procedures are not rational and represent an unjustified increase in land values.

It is also possible to apply certain cost-reducing methods

¹George C, Bestor, "Buried Cables: A Survey of Buried Electric Distribution for Residential Development," Urban Land Institute, Technical Bulletin No. 48, 1964, p. 5.

to underground distribution.¹ Random separation of power and telephone cables in the same trench would produce a saving of \$6 per lot. Elimination of high voltage switching, use of aluminium cables, and use of simple transformer design would reduce the cost by \$25 per lot. Mr. Cook of Westinghouse Electric Corporation stated that "... use of all available new methods might mean a savings of as much as \$75 per lot."²

It is more difficult to reduce the costs of the water distribution system. The water system has two purposes; firstly to provide potable water in each home, and secondly, to provide water for fire protection. The second purpose determines the cost of the system, since fire protection is the factor governing the capacity of the system. Savings may be possible by finding new ways to provide fire protection without the use of large water mains.

To conclude, a few remarks are necessary on the role of engineers and planners.

"So should the city engineer consider specifying wheel loads rather than pavement thickness, or the desired degree of protection from storm water rather than details of catch basin placement or type of pipe to use. This approach will require a greater degree of consideration by both private engineers in design and public engineers in review, but the greater flexibility and the opportunity to innovate and to use

¹Jack Newsville, New Engineering Concepts ..., p. 33.

²American Public Power Association Conference, May 8-11, 1967, in Jack Newsville, p. 33.

new material and methods will result in benefits to the community and to the engineering profession which will far outweigh the extra effort required."¹

This also applies to planners who will have to innovate responsibly and to be more critical of conventional methodology. Some standards are however necessary. Newsville suggests that, "In setting criteria, {planners and engineers should} consider the merits of a performance type of criteria as opposed to a specification type of standard."²

¹Jack Newsville, *New Engineering Concepts . . .*, p. 7.

²Ibid., p. 7.

PART FOUR
PERSPECTIVES ON NEW PUBLIC POLICIES
AFFECTING LAND VALUATION

The present part consists of two chapters. The first one develops a method to analyze land valuation, thus permitting public investments which affect land values to be placed in a broader perspective. Second, from the analysis developed, specific alternative public policies will be evaluated, and possible new policies formulated.

CHAPTER EIGHT

A PROPOSAL FOR AN ANALYSIS OF LAND VALUATION IN METROPOLITAN AREAS

In the present chapter land values represent a function of many variables which are identified. Some of these variables are nationally or provincially determined. The variables effective at the metropolitan level, could be either disaggregated national or provincial indicators, or specific metropolitan variables. Other variables are limited in their effects to a sub-region of the metropolitan area.

A. The National and Provincial Variables.

Such variables are determined at the national level, and their influence is not limited to a particular metropolitan area. The modification of the national variables does not depend on the action of a particular metropolitan area. For example, although the rate of capital gains taxation as well as the capital gains taxation system will have an effect on land valuation,¹ these measures cannot be controlled by a metropolitan area. The rate of federal sales taxes is in direct relationship to

¹Infra, Chapter 9.

the costs of construction materials used in major infrastructure investments, thus there is also a direct effect on land values. The land developers have complained about these taxes, which in their opinion contribute to the high final price of lots.¹ Other national variables could certainly be analyzed. From the above discussion the general level of land values in a metropolitan area (λ) can be seen as a function of national variables of the type:

$$\lambda = \Phi(K, S, \dots) \quad [1]$$

where:

K : rate of federal capital gains taxes,

S : rate of federal sales taxes.

A modification of the rates of these taxes will have an effect on (λ). However a modification of the capital gains taxation system, i.e. including the abandonment of the favorable clause to expropriated land owners,² will transform (K) into (K'). Further the introduction of a sales taxation system based on the added value³ would not only occasion a change in the rate, but also a change in the taxation system such as (S) will be (S').

[1] is thus modified:

$$\lambda = \Phi(K', S', \dots) \quad [2]$$

¹in particular, Mr. Ellis from LADCO, a major Winnipeg land development company, interview with the author in June 1971.

²Infra, Chapter 9.

³A taxation system implemented in all countries of the European Common Market. The tax is levied on the value added to the product or service by manufacturer or retailer.

The same type of discussion applies to Provincial variables, which include the taxes levied by the Province. Provincial variables such as the rate of rural migration to the metropolitan area could be added. Provincial grants used to encourage businesses to invest in the Province, make it easier for industries to locate in a metropolitan area.¹ Consequently, there is a tendency for land values to increase in that area. Thus, a new function is established:

$$\lambda = \pi(r, g, \dots) \quad [3]$$

where:

r : rate of rural migration to the metropolitan area,

g : grants for industries to locate in the metropolitan area.

The relationships ϕ and π are not determined here.

B. The Metropolitan Variables.

One such variable is the nature of the land development industry in the metropolitan area. The oligopolistic situation of land development is an element which influences considerably land values. The portion of land held by a developer tends to create scarcities on the land market. The strategy of the developer modifies land values if he chooses to play a major role in the market. This variable has an important effect on land values which is difficult to evaluate. However the relationship does exist.

¹except if such grants apply only to non-metropolitan areas.

The income variables include both the average level of income after taxation and the rate of increase of this level over a number of years. Some of the effects of the latter variable on land value, have been analyzed by Gottlieb and could be incorporated here.¹ Demographic variables would include those age-groups which are in most need of housing. Their unsatisfied demand creates a "pull" factor, which tends to raise land values.

Municipal taxation systems also influence land values. Areas zoned for industrial sites provide municipalities with potentially large revenues. Thus municipalities tend to over-zone for such areas. Municipal taxes are recovered by land owners when they sell their land. A change in municipal standards, as it was demonstrated earlier² considerably modifies land values. To summarize:

$$\lambda = \mu(l, y, \Delta y, d, t, s, \dots) \quad [4]$$

where:

- l : land development market characteristics,
- y : level of income in metropolitan area,
- Δy : rate of increase of level of income in metropolitan area,
- d : demographic variable,
- t : municipal taxation variable,
- s : municipal standards variable.

¹Supra, Chapter 3.

²Supra, Chapter 7.

C. Sub-Region Variables.

The effect of some variables is limited to a specific sub-region of a metropolitan area. The term sub-region refers to an homogeneous area containing a substantial quantity of open sites available for residential construction. Drainage areas could constitute boundaries for sub-regions; however drainage is not the only element to be considered. A sub-region is an area in which the installation of various elements such as watermains, major highways, etc. would have a direct influence. The area of influence would thus correspond to the area served by these installations.

The metropolitan area can be divided into a certain number (n) of sub-regions which are being affected by the process of urbanization. Urbanization is a sequential process which adds new elements to the land development process. The analysis of the land development process can be carried out for each of the sub-regions, so that the various pieces of land within a sub-region are surveyed.¹ The information could be summarized into a single figure for each element of the land development process. This could be carried out for each sub-region. The figures could then be integrated into a table including all sub-

¹either exhaustively or at random.

regions. Figure 10 below represents such a table of the land development process.

Sub-Region				
Elements of land development	1^A		i^A	n^A
topography	1^{a_1}		i^{a_1}	n^{a_1}
proportion of land owned by major land developers	1^{a_2}		i^{a_2}	n^{a_2}
drainage	$1^{a_{k-1}}$		$i^{a_{k-1}}$	$n^{a_{k-1}}$
sewers	1^{a_k}		i^{a_k}	n^{a_k}
water	$1^{a_{k+1}}$		$i^{a_{k+1}}$	$n^{a_{k+1}}$
public utilities
subdivided lots sold to builders	1^{a_m}		i^{a_m}	n^{a_m}

FIGURE 10: Table for analyzing Land Valuation and the Development Process.

This table is a device for analyzing land valuation and the development process in various sub-regions of a metropolitan area. Each figure could represent the proportion of land served by a specific element. Thus a certain relationship exists between the degree of attainment of a particular element and the previous

elements.¹ If each figure represents the value of land equipped with the particular element and the previous ones, then a table of land valuation is established.

D. The Explanatory Model of Land Valuation in Metropolitan Areas.

Land valuation in one sub-region influences land valuation in other sub-regions. Thus if one element increases in value in a particular region then similar increases will occur in other sub-regions. A cumulative process exists between various sub-regions. The following schematic diagram summarizes the above statements. It clarifies the complexity involved in determining land valuation as a function of a number of variables.

¹This assumes implicitly that a single sequential process of land valuation could exist, such a sequential process may vary from one sub-region to another.

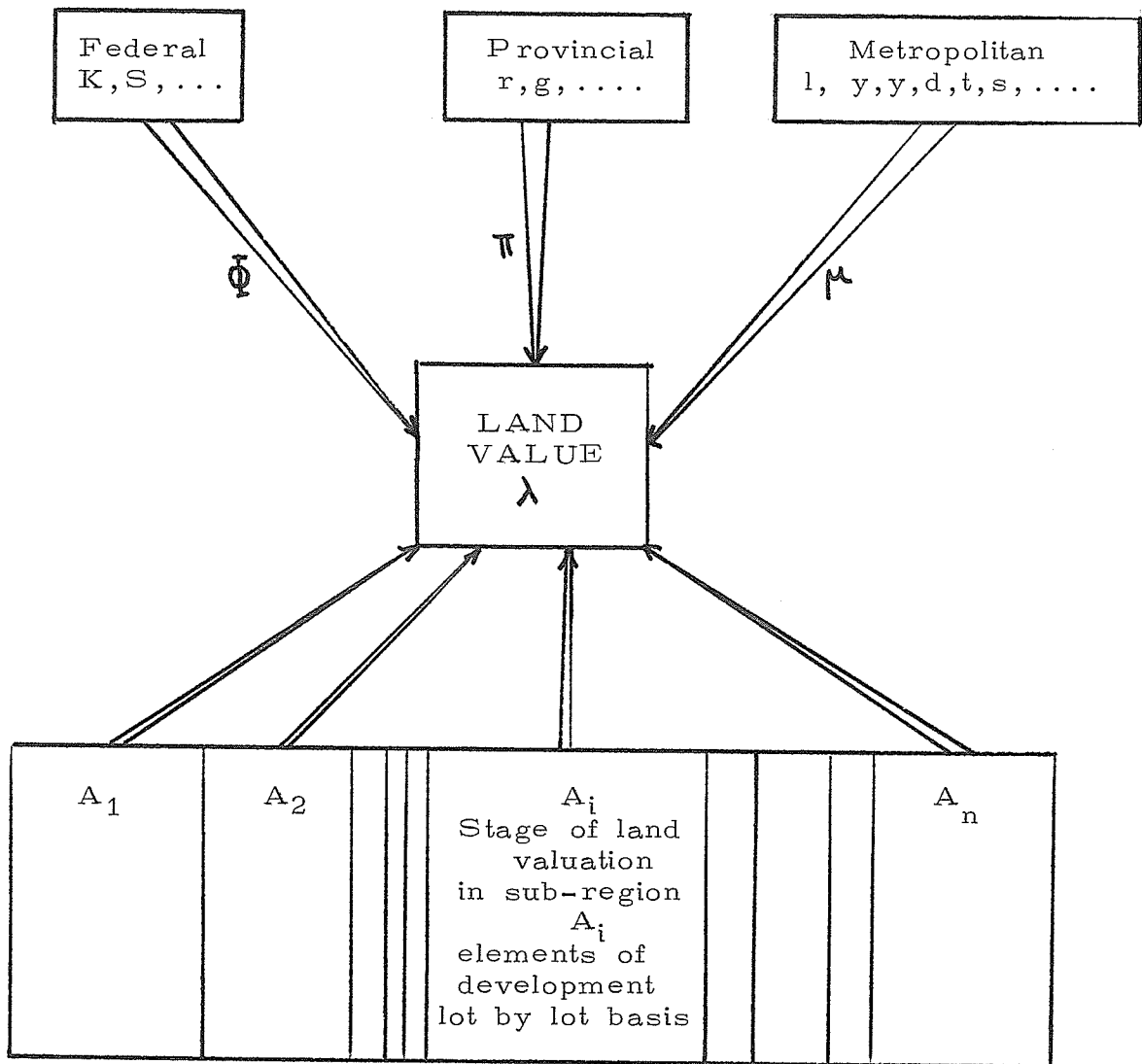


FIGURE 11: Schematic Diagram of the Explanatory Model of Land Valuation in Metropolitan Areas.

CHAPTER NINE

THE SPECIFIC ALTERNATIVES OF THE PUBLIC SECTOR FOR INTERVENING IN LAND VALUATION

Before analyzing the policies of the public sector, it is necessary to make more precise the notion of market value of land.

A. The Limits of Measuring Land Values.

Land values should be given more consideration in the planning process, for this process could limit land valuation. However the market value ascribed to land can be misleading. For example, any piece of land has its value increased by the installation of new elements of the land development process. Thus a piece of land without such elements is monetarily penalized and its value is comparatively lower. Such a piece of land, located in the rural-urban fringe, comes under pressure for development. However, rural-urban fringe open spaces, if used as such, can have a value higher than their market value. The law of the State of California has recognized such value by introducing a provision to subsidize this category of land:

"6951. Spread of urban development; scenic or esthetic value of open areas and spaces. The Legislature finds that the rapid growth and spread of urban development is encroaching upon, or eliminating, many open areas and spaces of varied size and character, including many

having significant scenic or esthetic values, which areas and spaces if preserved and maintained in their present open state would constitute important physical, social, esthetic or economic assets to existing or impending urban and metropolitan development.

"6953. Legislative declaration; public purpose. The Legislature further declares that the acquisition of interests or rights in real property for the preservation of open spaces and areas constitutes a public purpose for which public funds may be expended or advanced, and that any county or city may acquire, by purchase, gift, grant, bequest, devise, lease or otherwise, the fee or any lesser interest, development right, easement, covenant or other contractual right necessary to achieve the purposes of this chapter."¹

This legislation tends to inflate the market value of open space, by increasing the value of such land by artificial means. However, the retention of open spaces by means of subsidies is costly to the public sector. Traditional projects such as streets, sewers and schools are usually given higher priority for increased public spending, than is the retention of open spaces.² Thus, the effects of such a policy are limited.

It was proven earlier that open spaces could be used as on site retention for runoff waters.³ As such the open spaces reduce the required capacity for drainage systems. Thus, open spaces could have their value increased in monetary terms.

¹Purchase of Interests and Rights in Real Property, California Codes: Government, Division 7, Title 1, Chapter 12.

²Richard S. Volpert, "Creation and Maintenance of Open Spaces in Subdivisions: Another Approach," University of California at Los Angeles Law Review, Vol. XII, 1965, p. 832.

³Supra, Chapter 7.

It would be to the advantage of municipal authorities to consider the value of open spaces in such terms. The value of open spaces would then become an integral element of the planning process, rather than an external element whose value is modified by the implementation of planning schemes.

Chapters 5, 6 and 7 discussed possible methods for the rationalization of land development practices. The following sections study some alternative policies that could be implemented by the public sector. These policies are larger in scope than those previously developed in this thesis.

The nationalization of land could be a policy applying to the country as a whole. On the other hand, policies involving the use of the Expropriation Act, land valuation benefits taxation and the public acquisition of development rights would be more limited in their area of influence.

B. The Nationalization of Land.

Public ownership of land is the surest way of attaining and maintaining control over land valuation. Such ownership could ensure an adequate supply of serviced land. However the implications of nationalization of land have never been evaluated. In what way would "landed" versus "non-landed" citizens be affected? What legislation would have to be enacted to cope with the new situation? It is well established that large government bureaucracies are inflexible and more inefficient than the private

sector. However, the private sector has to be restrained in order to protect the public interest. Although the nationalization of land is a possible policy its implementation would depend upon prevailing public attitudes.

Land nationalization is somewhat unrealistic, but the policy is technically possible. The basis of our present day system of land holding is to be found in the feudal system of landholding introduced in England by William the Conqueror after his successful Norman Conquest in 1066. William, who considered England to be his absolutely by virtue of his conquest, parcelled out the land to his henchmen by way of conditional grants. All land was held either immediately or in the name of William and each grant was made upon certain terms or conditions for a certain length of time. Out of this developed the doctrines of tenures and estates. Thus it remains true to say that land is not susceptible to absolute ownership - only to qualified ownership. The Crown continues to be the absolute or ultimate owner of all land.

The British North America Act does not prevent the Provincial legislatures from expropriating land without payment of compensation. Unlike the fifth and fourteenth constitutional amendments in the United States, there is in Canada no constitutional provision against taking private property without due process of law.

"As to the question whether Parliament has the power

to expropriate land for public purposes without compensation, there cannot be any doubt."¹

C. The Expropriation of Land.

The Crown, through the Parliament of Canada or any of the Provincial Legislatures or their delegates, can expropriate land - this right of our governments is sometimes called the right of eminent domain. In Manitoba a new Expropriation Act was passed in 1970.² The Act standardizes the expropriating procedures for all expropriating entities,³ provides pre-acquisition hearings and codifies the common law regarding the determination of compensation. This latter provision will concern us here.

In Manitoba anyone whose property is being expropriated or as well, an expropriating entity, may ask the Land Value Appraisal Commission⁴ to determine the "amount... which represents the due compensation... in respect of the land expropriated."⁵

¹ in particular, *Winnipeg v Cauchon* (1881), *Armour* 350. See also: *In re Mc Dowell and Palmerston* (1893), 22 O.R. 563; *Ex P. Gould* (1854), 2 *Mathieu Rev. Rep.* 376, at p. 378.

²The Expropriation Act, Royal Statutes of Manitoba, Chapter E-190, 1970.

³Provincial Government and their administrative entities or delegates.

⁴The Land Value Appraisal Commission was established under the Land Acquisition Act, "an Act respecting the acquisition of land by the Government and agencies of the Government." (R.S.M. Chap. L40, 1970). The Commission proceeds by means of public hearings, and determines and certifies an amount which, in its opinion, represents due compensation in respect of the acquisition.

⁵The Expropriation ..., s. 15 (1).

When the Land Value Appraisal Commission is requested by either side to give its determination of the compensation which should be paid, its determination is not binding in any way the expropriated owner¹ but the expropriating entity cannot pay any different amount unless it is ordered to do so by a judicial determination of the compensation to be paid.²

The basis of determining compensation is the market value, defined generally in the Expropriation Act as:

"... the amount that the land might reasonably be expected to realize if sold in the open market by a willing seller to a willing buyer."³

This definition replaces the "value to owner" definition which the Supreme Court of Canada formerly used:

"The owner at the moment of the expropriation is deemed as without title, but all else remaining the same, and the question is what would he, as a prudent man, at that moment, pay for the property rather than be ejected from it."⁴

The market value is usually determined through the use of expert appraisers who in turn look at such indicators as the purchase price of the land in question,⁵ the price for which comparable

¹The Land Acquisition Act, s. 12 (2): "The certification of compensation does not obligate the owner to accept the amount so certified as compensation in respect of the acquisition nor does it bind a judge arbitrating a claim for compensation on the expropriation of the land under the Expropriation Act."

²The Expropriation ..., s. 15 (2) and (3).

³Ibid., s. 27 (1).

⁴Diggon-Hibben v R., (1949) S.C.R. at p. 715.

⁵Serviss v Flett's Springs (1961), 26 D.L.R. (2d.) 663.

neighbouring land have recently sold,¹ the municipally assessed value of the land,² the income earning power of the land,³ the value the owner gives to the land in his books,⁴ etc.

The definition of the market value of the land is elaborated later in the Expropriation Act:

"In determining the due compensation payable to the owner no account shall be taken of

(a) the special use to which the authority will put the land; or

(b) any increase or decrease in the value of the land resulting from the imminence of the development in respect of which the expropriation is made or from any imminent prospect of expropriation; or

(c) any depreciation of the value of the land which is attributable to the fact that, whether by way of designation, allocation or other particulars contained in a development published by any government or government authority or whether by any other means, an indication has been given that the land is, or is likely, to be acquired by any authority; or

(d) any increase in the value of the land resulting from the land being put to a use that could be restrained by any court or is contrary to law or is detrimental to the health of the occupants of the land or to the public health."⁵

However, although no account is to be made of the special use to which the expropriating authority will put the land, "... the owner is entitled to have the market value based upon the most

¹Toronto Suburban Ry v Everson (1917) 54 SCR 395.

²R v Supertest Petroleum, (1954) Ex. CR 105, at p. 136; but municipal assessments are not a determining factor: Halifax Relief Commission v Halifax, (1963) 36 DLR (2d.) 126.

³Robitaille v Québec, (1948) KB 787; R. v Potvin, (1952) Ex. CR 436, at p. 444.

⁴R. v Morris Realty, (1943) Ex. CR 140.

⁵The Expropriation ..., s. 27 (2).

advantageous use to which the property is adapted or could reasonably be applied."¹

The owner is not only entitled to the basic market value of the property but also to the as yet unrealised possibilities of the land, i.e.: its special adaptability value. However in calculating potential value one must ensure that such value has not already been included in the market value.

The difficulties involved in separating potential value from present value can be demonstrated by reference to several articles.² In *R. v Eastern Trust* where there was expropriated unbuilt property subdivided on paper only, although nearby property was being built upon. Thorson J. held:

"While the property was not improved otherwise than I have mentioned, its future possibilities and its possible sale in lots must be taken into account, but there again it is only the present value as at the date of the expropriation that is to be considered While, therefore, a considerable portion of the expropriated land was in fact pasture land at the time of the expropriation, it is not fair to value it solely as such, but its present value for building purposes in the future must also be ascertained."³

In *Gatineau Power Co. v Watters*, the probability of the use of the property expropriated for building lots was considered because

"... la doctrine et la jurisprudence sont a l' effet qu' une situation avantageuse à raison du voisinage doit entrer en ligne de compte lorsqu' il s' agit d' exproprier...."⁴

¹*F.D.C. v Franceschini*, (1962) 31 DLR (2d.) 482.

²to be found in Challies, The Law of Expropriation, Montreal, 1963, pp. 117-118.

³(1945) Ex. CR 115, at p. 119. See also: *R. v North York*, (1948) 2 DLR 381; *Timms v Welland*, (1956) OWN77 (CA); *C.B.C. v Hoar* (1958), 11 DLR (2d.) 32.

⁴(1928) 44 KB 557, at p. 559.

In calculating potential value one must be careful to calculate only the present value of an as yet unrealized possibility and not to treat the potentiality as a realized possibility.¹ The future advantages may be taken into account in determining the value of the property, but in so far only as they may help to give the property its present value.² Expropriated land which is not yet subdivided must not be valued as if it were already subdivided.³ So in *Board of Education for North York v Village Developments Ltd.*,⁴ it was held as follows:

"While the general rule for fixing compensation for expropriated land is to determine its present value to the owner in terms of all its advantages, present and future, which the land possesses, nevertheless it is wrong in determining the value of land, which, admittedly is suited for a subdivision development, to ignore the statutory requirement of approval to any subdivision plan under planning legislation and to fix compensation as if the owner were entitled to proceed to an immediate sale of the land as building lots. Regard must be had to all the eventualities foreseeable or only vaguely foreshadowable by which a prudent person, looking forward immediately before the expropriation would be influenced."

¹*Fitzpatrick v New Liskeard* (1909), 13 OWR 806 (CA); *Gibson v Toronto* (1913), 28 OLR 20; *Brown v Peterborough* (1957), 8 DLR (2d.) 626 (Ont. CA).

²*R. v Elgin Realty*, (1943) SCR 49. See also: *R. v Morris Realty* (1943) Ex. CR 140, at p. 154; *R. v Potvin*, (1952) Ex. CR 436, at p. 440.

³*C.N.R. v Harricana*, (1943) 3 DLR 529; *Shields v Etobicoke*, (1954) OR 831 (Ont. CA); *Gordon v North York*, (1954) OR 863 (CA); *O'Mara v St. Catherines*, (1954) OWR 362 (CA).

⁴(1956) 3 DLR (2d.) 161.

The Expropriation Act could be used to lower the cost of land assembly in urban areas of Manitoba. The City of Winnipeg Act authorizes the council to use the powers of the Expropriation Act to assist in the assembly of land for development or redevelopment.¹ However municipal officials differ about the use of expropriation for facilitating private development.

Mr. E. Levin, former Director of Planning for the Metropolitan Corporation of Greater Winnipeg, was in favor of the possession of such a power by municipal corporations, and considered it essential for the municipalities "... if the development is desired cannot be realized without such action."²

On the other hand, a body of opinion believes that the delegation of such a power to municipal corporations is clearly not right and its necessity doubtful in any event. Professor Cameron Harvey of the Faculty of Law at the University of Manitoba analyzed the body of opinion opposed to the use of expropriation by municipalities as follows:

"Recently, I had the privilege of serving on a provincial body in Manitoba concerned with municipal affairs and during the course of our deliberations this power [to expropriate land] was discussed. I was amazed to learn the number and vociferousness of the members of that group of experienced municipal officials who were totally opposed to such a power being given to municipal corporations. Their arguments, as far as the discussion went, were based on

¹The City of Winnipeg Act, 1974, s. 147 (3).

²E. Levin, Address to Canadian Bar Association, Municipal Law, Manitoba Subsection, September 1970.

the property rights of individuals, the impossibility of ascertaining what is so clearly in the public interest to justify such expropriations, and the belief right or wrong that through expropriations generally speaking the expropriated individual loses. They simply could not accept the idea of the "state" taking property from one citizen or group of citizens in order to give it to another citizen or group of citizens, for whatever purpose or end."¹

Such attitudes demonstrate the deep-rooted social characteristics of land. A change in popular opinion is necessary in order to use the Expropriation Act as a policy to limit land valuation. The extent of the use of expropriation powers is also limited by the amount of capital available for this policy.

C. Land Valuation Benefits Taxation.

By "land valuation benefits taxation", it is meant that fiscal weapons used to combat undue benefits are also tools to limit land valuation. Two possible methods studied here are the capital gains tax and site value taxation.

A) The capital gains tax was introduced in Canada by the tax reform legislation of 1971. The capital gains tax has a blanket effect on all sorts of capital gains and is thus not limited to capital gains on land.

The fewer the exceptions to the tax, the more efficient is a capital gains tax system. The new legislation no longer allows the deduction of carrying charges on undeveloped property from

¹Cameron Harvey, "Is it right for municipal corporations to have authority to expropriate lands to facilitate private development?" Course on Land Use and Planning, Faculty of Law, University of Manitoba, March 1972, p. 4.

other income to be held as capital investment. However these charges are deducted from capital gains at the time of selling the properties. In case of expropriation the legislation contains the following provisions:

"... in the case of a property which is destroyed or expropriated, the capital gain may be deferred if the compensation received is reinvested by the end of the following year in equivalent property. The cost of the new property will be reduced by the amount of the capital gain arising from the disposition of the old property."¹

Such a provision permits the expropriated landowner to avoid the taxation of all capital gains made on the expropriated property. In order to avoid taxation it is necessary to reinvest in property with a value equivalent or greater than that of the capital gain. Such a condition partly defeats the purpose of the taxation. Corporate and private land owners expropriated will search for pieces of land. The new institutional demand for land created by the taxation system may contribute to the rise in the value of properties at the periphery of urban areas. Thus some of the effects of capital gains taxation could defeat the original objectives of the taxation system.

B) Site value taxation is difficult to assess and administer.

However the system of analysis of land valuation contributes to a better approach to site valuation.² Such taxes will inevitably

¹Summary of 1971 Tax Reform Legislation, Government of Canada, 1971, p. 34.

²Supra, Chapter 8.

be passed on in some way to the ultimate consumer.

The present provincial sales taxation system includes this major inconvenience. With land valuation, a system of sales taxes applied to the added value would be a more adequate solution. The sales tax on materials would be replaced by a percentage applied on the added value given to land by the owner. The added value represents the difference between the selling price and the buying price of land. With such a system provisions could be made to have two rates of taxation:

- (1) The low rate of taxation applicable to the costs of materials, services, less holding expenses.
- (2) The high rate of taxation applicable to the profit "without cause" made by the land owner.

D. Public Acquisition of Development Rights.

The public acquisition of development rights is used in Europe and elsewhere. The policy has the advantage of reducing the initial cost of land to the public sector. With such a policy speculation could be restricted, and urban development could be controlled. This type of policy is exemplified by the French Z.U.P.¹ technique of urban development.²

¹Zone à Urbaniser en Priorité, an area of high priority for urban development.

²David N. Kinsey, "The French Z.U.P. Technique of Urban Development," Journal of the American Institute of Planners, vol. XXXV, No. 6, November 1966, p. 369.

"A decree of the Minister of Construction can designate a Z.U.P. in those communes municipalities and agglomerations where the importance of housing projects will necessitate the creation, strengthening, or extension of public services."¹

Under this legislation local authorities are given the right to refuse a building permit to a developer outside a Z.U.P. if an equally suitable site is offered to him within a Z.U.P. The local authorities have the right of preemption for the purchase of any land put up for sale in the Z.U.P. If there no agreement can be reached between the landowner and the municipality, the purchase price is fixed by expropriation procedures. Local authorities benefit from public agency loans taken out for the installation of infrastructures. The terms of the loans are two years at an annual interest rate of 2.5 per cent with a possibility of two renewals. The loans are repaid when lots are sold to builders.

The Z.U.P. technique is not directly applicable in Canada, because it requires extensive national financial commitments. Furthermore, this technique prohibits the development of un-designated areas. In Canada however, the courts have issued mandamus² orders when municipalities have passed by-laws which attempt to prevent the development of land.³

¹A translation of: Decree No. 58-1464, Journal Officiel de la République Française, January 4, 1959.

²Mandamus: lat. we command. This is the name of a writ (formerly a high prerogative writ) which issues from a court of superior jurisdiction, and is directed to a private or municipal corporation, or any of its officers, or to an executive, admi-

Because of the complexity of the land valuation process, the evaluation of the public policies formulated in this thesis could only proceed with their implementation. Furthermore, none of the above policies could be applied separately. The control of land valuation will require a set of policies. However the social characteristics attached to land in the North American context tend to limit the role of the public sector. The impact of public investments on land values has demonstrated the inherent limitations of the public sector. Both rationality and increased action on the part of the public sector are necessary. This is the price to be paid for solving the economic and social problems created by land valuation.

The goal of the planning process is to analyze complex situations, to formulate policies and then to make them operational. Thus, it is my task as planner to:

"... doubt what is obvious to every eye [and to] persuade those who have the power of decision to act against their own short-run interests or bring pressure on them to do so."

Ivan Ilyich.

... nistrative or judicial officer, or to an inferior court, commanding the performance of a particular act therein specified, and belonging to his or their public, official, or ministerial duty, or directing the restoration of the complainant to rights or privileges of which he has been illegally deprived, Black's Law Dictionary, revised fourth edition, 1968.

³Township of Brock in Re Kerr, 1968; and City of Belleville in Re O' Donnel, 1969, DLR (3d.) 460, at p. 462.

APPENDICES

APPENDIX A: THE VARIATION IN PRICES OF
LAND IN CANADA.

APPENDIX B: SURVEY OF LAND OWNERSHIP IN
METROPOLITAN WINNIPEG, 1971.

APPENDIX A: The Variation in Prices of Land in Canada.

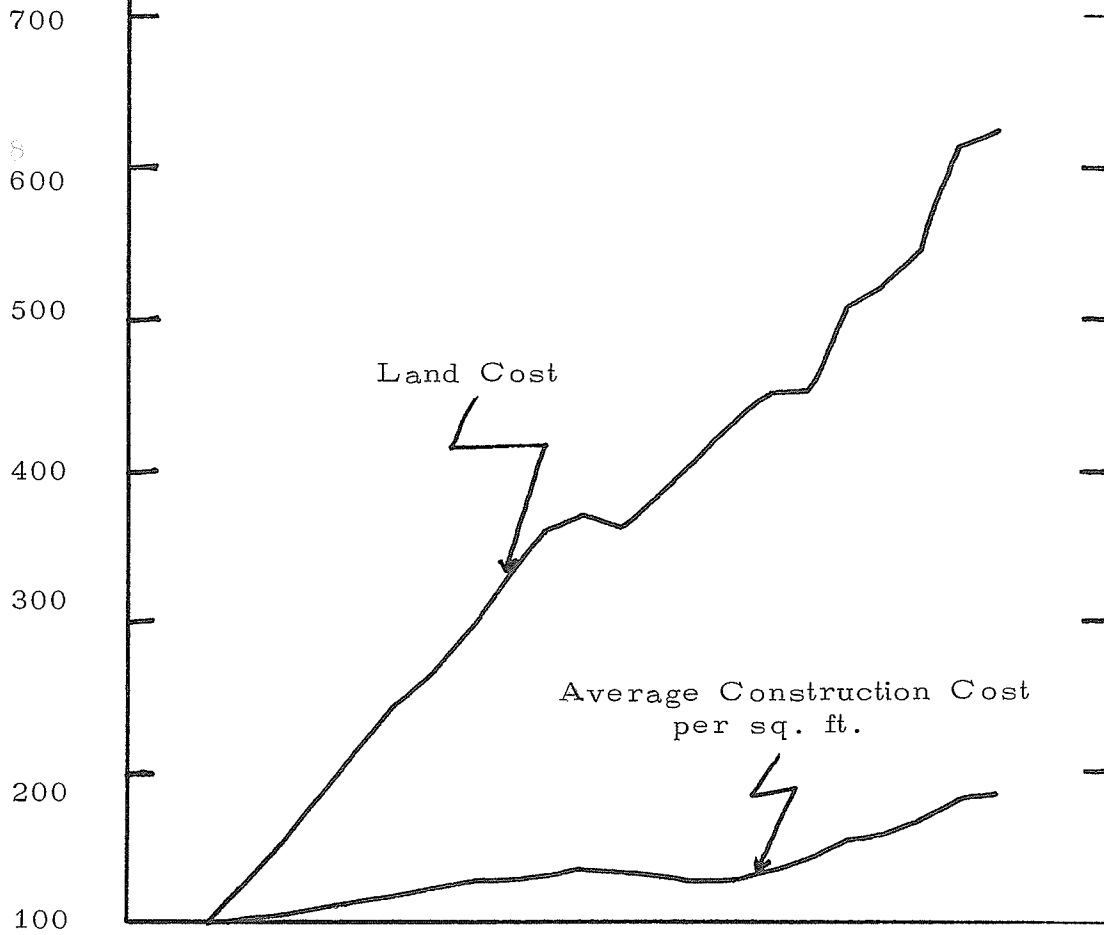
Year	Land price \$	Total Cost \$	Land/Total %	Index for land price
1949	684	8,598	7.95	100.00
1951	1,058	10,948	9.66	154.67
1954	1,687	12,418	13.58	246.63
1955	1,819	12,841	14.16	265.93
1956	2,025	13,854	14.61	296.05
1957	2,260	14,278	15.82	330.40
1958	2,471	14,479	17.06	361.25
1959	2,533	14,729	17.19	370.32
1960	2,473	14,639	16.89	361.54
1961	2,602	14,888	17.47	380.40
1962	2,783	15,233	18.26	406.87
1963	2,973	15,682	18.96	434.64
1964	3,082	16,478	18.70	450.58
1965	3,095	17,402	17.78	452.48
1966	3,480	19,293	18.03	508.77
1967	3,580	19,611	18.25	523.39
1968	3,746	19,898	18.82	547.66
1969	4,201	21,860	19.21	614.18
1970	4,258	21,599	19.71	622.51

TABLE 17: Estimated Costs of New Single-Detached Dwellings Financed under the National Housing Act, Canada (1949-1970). The figures represent all single-detached dwellings. (source: Canadian Housing Statistics, CMHC, 1970, Table 85, p. 70.)

Cities	Land price \$	Total Cost \$	Land/Total %
Winnipeg	4,548	23,041	19.89
Calgary	5,192	22,590	22.98
Hamilton	10,489	29,322	35.77
Toronto	10,639	29,914	35.56
Regina	2,625	16,050	16.35

TABLE 18: New Single-Detached Dwellings' Costs in Some Canadian Cities, 1970. (source: Canadian Housing Statistics, 1971)

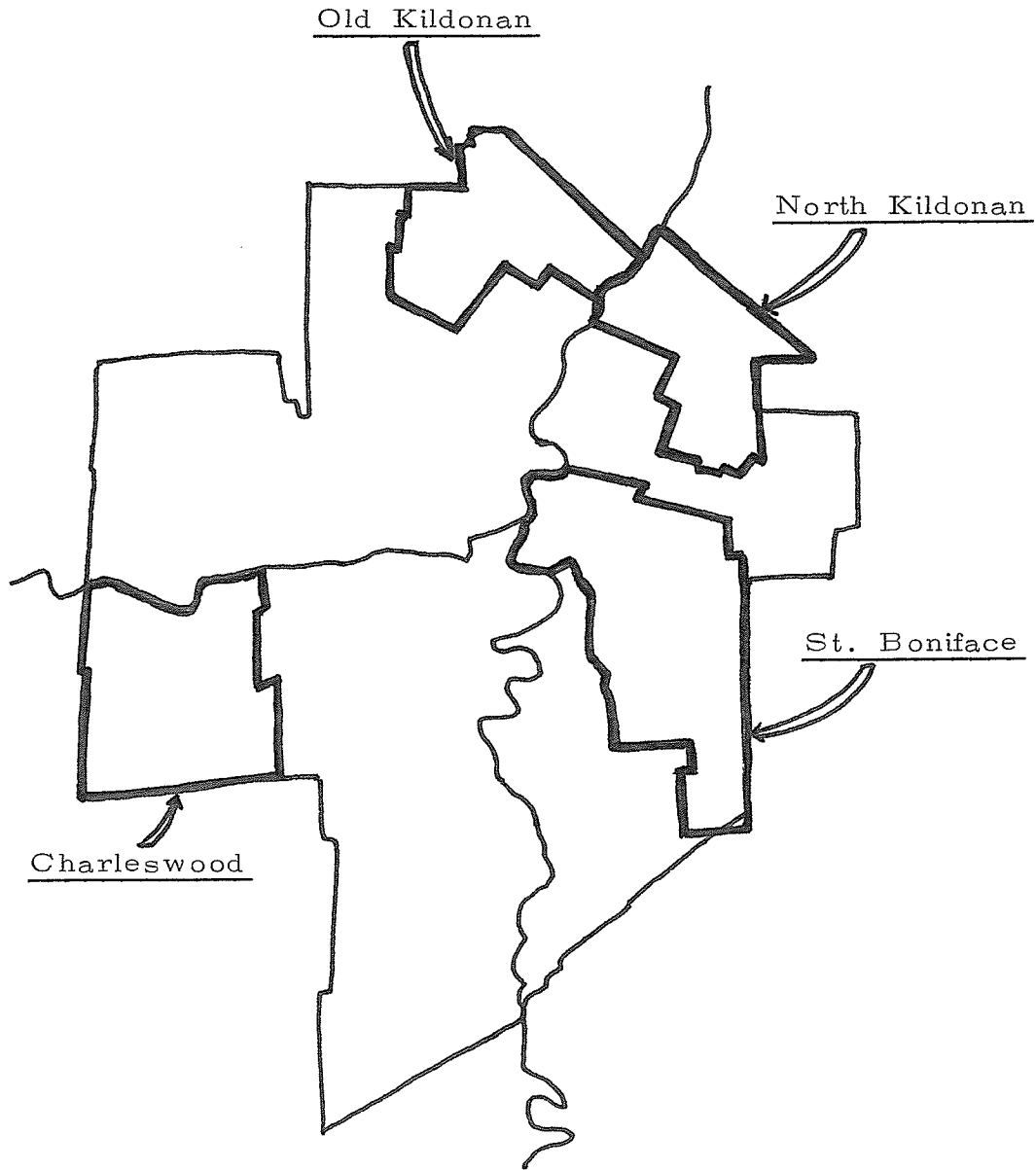
Index of land costs for new single-detached dwellings
and average construction cost per square foot,
(1949: 100)



Land Cost/Total Cost



APPENDIX B: Survey of Land Ownership in Metropolitan
Winnipeg.



MAP 4: Land Ownership in Metropolitan Winnipeg - Areas
Surveyed.

TABLE 19: Corporate Owners, Lots of Two Acres and more.
(source: Land Titles Office, 1971)

<u>Charleswood</u>		
Corporate Owners	Acreage	Number of lots
1. Metro	1,176.590	4
2. BACM	727.488	13
3. Mc Creary Inv, Ltd.	376.800	2
4. Monico	286.340	3
5. RM of Charleswood	147.450	9
6. Quality Construction (Lad (LADCO)	102.800	6
All Corporate Owners	5,953.736	101
Private Owners	11,524.885	244

<u>St. Boniface</u>		
Corporate Owners	Acreage	Number of lots
1. LADCO	429.534	7
2. Twin Cities Devt. Ltd. (LADCO)	416.630	11
3. Dept. of Municipal Affairs	194.477	3
4. City of St. Boniface	164.780	18
All Corporate Owners	3,334.600	73
Private Owners	2,128.031	37

<u>Old Kildonan</u>		
Corporate Owners	Acreage	Number of lots
1. BACM	773.021	226
2. Manitoba Hydro	161.710	4
All Corporate Owners	1,916.541	73
Private Owners	2,857.140	178

North Kildonan

Corporate Owners	Acreage	Number of lots
1. BACM	531.370	22
2. Land Development Company	516.530	4
3. RM of North Kildonan	163.143	11
4. Quality Construction	130.900	7
<hr/> All Corporate Owners	1,623.872	74
Private Owners	1,317.634	164

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