THE EFFECT OF REZONINGS ON PROPERTY VALUES

A theoretical and empirical examination of the taxation of land value increments attributable to rezonings in the City of Vancouver, B.C.

by

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ABSTRACT

In any well-developed urban area where building sites are in relative inelastic supply, rezonings from one type of permitted land use to another become an important factor in the supply of urban sites. As a result, rezonings can favorably or adversely affect land values depending upon the type of rezoning. Aside from Federal capital gains legislation, no other taxation legislation attempts to tax away property value increases that result from rezonings, the increases accruing to property owners or developers, not necessarily through any direct action of their own. Since, in Vancouver, the power to rezone is at the discretion of the Vancouver City Council, this increase in value is a result of public policy and could therefore be taxed accordingly. It is the purpose of this thesis to examine the theoretical, historical, and empirical aspects of the taxation of land value increments that result from rezonings. The term which is used throughout the thesis to denote such a taxation scheme is "betterment levy", a term consistent with much of the literature on the subject, especially that of British origin.

Based upon a background of urban land theory and the practical legislative experiences of other areas, notably the United Kingdom, an empirical analysis is carried out on the effects of rezoning on land values in the City of Vancouver. A total of 529 properties were selected for study which represent 267 properties of various types which were rezoned during the period 1966-1972 and, as a control group, 262 properties which were not affected by rezonings during the same
time period. Assessed values, using the general roll, which are available for each property and which are adjusted to reflect non-arm's length property transactions were used as the value base. The statistical technique employed for data analysis was regression analysis.

Essentially three analyses were undertaken: to determine the relationship between assessed and market values, to determine the overall effects of rezoning on property values, and to determine the effect of specific types of rezoning on value. Basically, the results showed a close relationship between assessed and market values, the overall importance of rezonings on property value, and, most significantly, the importance of the specific type of rezoning on value. Finally, the implications of these findings and the recommendations and limitations derived therefrom are presented as a guide to policy-makers in applying the results to possible policy decisions.
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CHAPTER I

INTRODUCTION

A. Authorization and Justification*

On Thursday, October 11, 1973, in a memorandum to the Finance Committee of Vancouver City Council, Alderman Jack Volrich proposed that an "added value" tax be levied on the increase in property values that have resulted from the rezoning of property to a higher use.

"It is a well-known fact that such rezonings often result in an increase to the market value of the land which is twice, three times or four times the original value. This increase in value is created by the community. In fact, rezoning to a higher use is the greatest gift that the City can give to an owner or developer."¹

The only portion of the increased value that accrues to the community is that obtained through increased property taxes, which usually does not offset the other costs to the community that have resulted because of the rezoning, such as increased densities, transportation

*Initially, it was hoped to include in this study other types of public activities which could give rise to increases in property values such as curbing and paving schemes, street lighting, playground facilities, etc. Depending upon the specific case, such infrastructure placement can have an impact on property values. However, an internal report, no longer available, prepared for the Assessment Department of the City of Vancouver in the early 1960's, showed that in built up areas such as Vancouver which have been served to at least minimally accepted urban standards (paved streets, lighting, sewers, etc.), the upgrading of these facilities (e.g. new pavement) has a generally negligible effect on property values and since that time, and therefore throughout the duration considered in this study, such factors have not been included in property assessment values. Also, the City has not engaged in any major infrastructure development (freeways, rapid transit, etc.) except for some beautification projects which have led to higher taxes for the specific properties benefited.
problems, and other needed public facilities. With regard to the areas 
that have been downzoned, Alderman Volrich suggested that compensation 
need not be considered when such actions are in the interests of the 
community although downzonings undertaken with any other motive than 
public interest in mind may give rise to claims for compensation. The 
recommendation was made for the Director of Finance to report on the 
implications of an "added value" tax and it is from this recommendation 
which this report comes.

The term that will be used in the remainder of this thesis to 
signify the "added value" tax will be "betterment levy". While 
"added value" tax tends to be associated with a form of turnover of 
sales tax, and usually refers to a tax on final consumer expenditure, 
the "betterment levy" term is more consistent with the literature on 
the subject, especially that of British origin. While other terms such 
as land value increment tax have been used to denote the same thing, 
the betterment levy seems to more clearly define the meaning at hand. 
The term betterment has been used in several ways. "In the narrow 
sense, betterment means the increase in the value of neighbouring 
property brought about by a particular improvement, such as the 
construction of a new street." The Uthwatt Committee in Great Britain, 
whose task it was to report on the various aspects of compensation and 
betterment, used the broader sense "to mean any increase in the value 
of land (including the buildings thereon) arising from central or local 

government action, whether positive, e.g., by the execution of public 
works or improvements, or negative, e.g., by the imposition of 
restrictions on other land." Whatever definition is used, the principle
remains the same and it is the principle that gives rise to the hypothesis for this thesis that:

"Since the power to rezone is at the discretion of the Vancouver City Council, any increases in property value that result from a decision to rezone should accrue to the City."

This hypothesis implies two things:

1. that rezonings do in fact have an influence on property values and

2. that the City is justified in its claim to any increased values that have resulted from rezoning decisions. It will be an aim of this thesis to examine these assumptions.

B. The Nature of Value

Already, the term "value" has been used a great deal throughout this discussion and yet no definition has been attempted. Value means many things to many people. "...both the concepts of value and the technique of its proof are decidedly influenced by the specific purpose for which the valuation is made."

When an asset is purchased, its purchase price becomes a matter of record and depreciation may be deducted to determine book value (with the possible exception of land). Similarly, the sales price of an asset is of importance. For insurance purposes, perhaps the replacement cost of the asset would be considered. Assessed values are used for taxation purposes while to the individual homeowner, value might be indicated by the money paid in compensation for the loss of his property or the price his property might bring if offered for sale on the open market, two concepts which are not necessarily related. Value has long been synonymous with the term
"market value" which is taken to mean, at least in appraisal terms, that price estimated in terms of money that a property will bring between a willing buyer and a willing seller dealing at arms length, and allowing an adequate time for market exposure. However, even this definition is fraught with such ambiguities as what is "willing" and how long is "adequate?" Even the term value is questionable for, as Ratcliff has pointed out, to determine what a property will bring on the market, one is not really concerned "...with some abstraction called "value" but with a transaction price - the number of dollars which a buyer would pay to a seller to acquire title to the property. Thus when we say market value, we really mean market price...."5

Wendt has suggested that: "It is generally agreed that the value of urban land results from the discounting of future net incomes attributable to urban land by virtue of its location."6 The theory of urban land, he feels, may be simply stated but is difficult to apply in that property yields are the result of combinations of labor, capital, and entrepreneurial services and therefore problems of imputation arise. In what way is one component related to the others and of what importance is each component in relation to the others? Since location is of such critical importance in the decision of what type of improvement to place on a particular site, the decision made will be based upon maximizing the site's net returns after some allowance "for a return on and amortization of the investment in improvements."7 The expectation of rights to future returns of whatever form, a process of discounting since future returns are not worth as much as if they were currently available, is fundamental to the understanding of market values of urban sites.
To further illustrate his theories on urban land value, Wendt presents a theoretical model taking into consideration and distinguishing between factors which affect the value of individual sites and those which affect aggregate values within a city as a whole. It should also be recognized that specific factors may vary depending upon the classification of urban land, a point which implicates the effect of zoning on land values.

In the aggregate, land values are represented by average future expected aggregate net annual urban land rent divided by some capitalization rate (this model is formulated in the appendix to chapter 1). In other words, the numerator represents a residual net income after allowances for various costs. Expected revenues are broken down into various components which could have an effect such as investors' expectations as to population, average amount of incomes spent for urban services, the competitive pull of the urban area, the supply of competitive urban land, and the prospective investment in public improvements. It must be remembered that these revenue components have been generalized to all urban areas and these factors may vary in importance. Similarly, cost expectations may include the sum of all local property taxes, operating costs, interest on capital invested in present and future improvements, and depreciation allowances on present and future improvements. The capitalization rate, the denominator, is influenced by interest rates, allowances for expected risk and expectations concerning capital gains, again depending upon the individual case at hand.

In many cases these components are beyond the manipulation of the investor. For example, in the City of Vancouver, land is always valued
to reflect its highest and best use as permitted by zoning, so that in
the case of a rezoning, the land component would reflect the change in
use even if the improvement represented a non-conforming use after the
rezoning. Taxes in general may reflect other social, political, or
economic trends beyond immediate influence. Wendt's model does not
attempt to isolate any one factor in recognition, no doubt, of the
interdependence of a number of different forces, and does not specifi-
cally mention zoning as being one of the variables. This fact does
not negate the usefulness of the model for this study but, on the
contrary, by inference of the importance of location directly involves
the concept of the zoning by-law.

In the past, the zoning by-law has served several purposes, but
two principal roles emerge:

1. to protect established areas from unwanted land uses and
2. as a regulatory instrument, to guide or control the
development of possible future established areas.

The legal power to pass zoning by-laws is outlined in Part XXVII of the
Vancouver Charter entitled "Planning and Development." It seems likely
that such by-laws had their origin partly in the common law of nuisance
and were formulated for the protection of existing property values.

It has been suggested that the value of land depends directly
upon the use permitted by the local authority. "What land is worth
depends upon what use may be made of it, and this depends upon the
planners." "Planners", in the sense used here, should not be taken too
literally but could include all those public officials engaged actively
in the zoning process. The implication of this statement is that public
officials have the only voice in determining land value and this, of
course, is erroneous. Many private decisions also affect land value, and the proposition is not simply "either-or": either development is allowed or it is not. However, the point to consider is that without proper zoning, at least as far as the developer is concerned, an individual site cannot achieve its peak value. Therefore, larger gains could be expected from property which has the proper zoning necessary for whatever type of development is desired.

The supply of competitive urban land is included in Wendt's theoretical model of land value, and bears brief mention. Within urban areas, the supply of vacant land available for development is limited and declines each year. Therefore, the demolition of existing buildings, either for redevelopment in the same use with a more modern structure or for redevelopment of a different use requiring a change in zoning, becomes an important factor in the supply of sites. The concept of elasticity will be discussed in chapter 2, but suffice it to say for now that, in general, the supply of urban land is fairly inelastic, that is, the response to a change in price does not elicit a large change in the supply of land, an understandable response given the long life of real property relative to other commodities. However, if land supply is inelastic, land services, such as the permitted use of the land, become more elastic as pressure for rezoning builds. Zoning, therefore, becomes a service in the sense that permission to rezone becomes another factor in determining the supply of urban sites for development and will affect elasticity.

Value, as a concept, has been shown to be a very complex term, not easily categorized. As Wendt's model indicates, value is comprised
of a number of components which would vary in importance depending upon the goals and expectations of the individual investor as well as the social, economic, and political trends affecting an area in aggregate. Value is extrinsic to the object, that is, in the minds of people, of the society. Less abstract in its application, but important in its own effect on land value, is the zoning by-law as administered by the elected and delegated officials of a community. Although this discussion is specifically concerned with rezonings and the effect on land values, the concept is still of social proportions, in the broad sense, and it is upon the principle of the social effect on land value upon which the concept of the betterment levy is based.

C. The Principle of Betterment

Betterment was previously defined to reflect two different contexts: the narrower meaning to reflect property value increases due to a specific improvement and the broader meaning to reflect any activity decided upon by some central authority to affect property values. The meaning of betterment has not remained the same over time, especially with regard to the British experience, but the above two definitions in no way conflict with the past evolution of betterment. Originally the term was used to describe increased values attributable to public works such as street improvements, creation of parks, etc., where a levy was imposed on the owners of specific sites which would benefit. This scheme of taxation was based upon the principle that if government performs some specific service from which the community as a whole receives negligible benefit, there is no just reason for the community as a whole to contribute to it. This is perhaps the least objectionable
application of the betterment levy.

The remaining forms of betterment of historical interest tend to be more abstract and more controversial. The first of these was brought to light in nineteenth century England as industrial growth and rapid population increases caused site values to increase through no activity of property owners, and which was considered unearned. It was felt that these increases could be taxed away without harm to the economy. One of the main proponents of such a tax was Henry George who advocated a single tax on site values, a topic which will be discussed in a later section. In a sense, it is unfortunate that site value taxation has been associated with the betterment levy in that the emotion surrounding site value taxation as a base for local taxation tends to cloud the main issue: that the betterment levy is usually proposed as a supplement to the current tax base and does not intend to replace it and stand on its own.

The second of the more controversial applications of betterment was that considered by the aforementioned Uthwatt Committee in the U.K., and which will be discussed in further detail in the third chapter. It had become more and more evident that land values were increasing simply as a result of planning permission. In recognition of the new development potential, this permission would favorably affect the value of all properties included in the planning scheme, no matter what their levels of development at the time. The argument for taxing away the unearned increment realized through planning permission is analogous to that used for the collection of betterment as a result of zoning changes.

The authority given to proceed with a development is not a
certainty merely given upon application for permission, but usually entails careful scrutinization to ensure that the project is in the best interests of the community and in accordance with overall planning goals. In Vancouver, a change of zoning requires an application in writing to the Director of Planning and the proposal is reviewed by the Planning Department, the Vancouver City Planning Commission, and finally by City Council. Any of these groups may turn down the application. If the application passes, it must still be ratified at a public hearing, and until such time as the zoning is changed, any increase in value due to the potential development must by nature be speculative.

In the U.K., planning permission takes on a broader, more national appearance so that permission to develop is of importance not only in one specific area of a city but also throughout the country. Nevertheless, the principle is the same: in the city, the change of zoning (and therefore the development) may or may not be allowed, while nationally, development may occur on one piece of land or on another either now, in five years, or in twenty-five years. "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." This potential development value was termed a "floating value" because of the impossibility of predicting with certainty when it will settle. Although the increase in value will never occur on some land, the potential is still present and many land values reflect the expectations of individual owners. As long as the public controls land use through zoning and certain planning schemes, value may be shifted among various properties and may increase or decrease but is not
destroyed.

"If, for instance, part of the land on the fringe of a town is taken out of the market for building purposes by the prohibition of development upon it, the potential building value is merely shifted to other land and aggregate values are not substantially affected, if at all. Nevertheless, the loss to the owner of the land prohibited from development is obvious, and he will claim compensation for the full potential development value of his land on the footing that, but for the action of the public authority in deciding that development should not be permitted upon it, it would in fact have been used for development."10

As indicated by the above quotation from the Uthwatt Report, the collection of betterment raises another consideration, that of compensation. It would appear that the justification for the betterment charge is the theoretical inverse of compensation.

"Where values go up we may speak of "betterment"; where they go down we may speak of "worsement". These are changes in values caused by the regulatory and constructional activities of the public authorities. The problem is whether, when and how a share of betterment should be secured by the authorities and a share of worsement borne by them in the form of compensation."11

It was suggested in the initial proposal that no compensation should be paid for downzonings that are in the public interest, but where does one draw the line? What are the criteria to be used in determining the meaning of "in the public interest" as rationalization for the payment or non-payment of compensation?

The main problem faced by many betterment schemes in the past, and one that was handled differently to compensate for this by the Uthwatt Committee, was in determining with any degree of certainty which properties had increased in value as a result of government activity, and if that could be determined, how much of the value increase was attributable to this action. While this question will be considered
in the empirical analysis, another related problem arises: that of government control over the allocation of resources in the market. Except in a completely centralized economy, the market works as a rationing device, allocating resources among competing uses. In this case there is a conflict of, on the one hand, taxing away increases in property value, and, on the other hand, keeping the market working. Of course, should a government decide on a "no-growth" policy, the implications of the betterment levy may at once be seen. Land will only be sold for development if the owner can realize more in return for another use than it brings with its present use. If the increased value realized upon a change of use is taxed completely away, it is unlikely that land will be made available.

To suggest that the market currently operates freely would be erroneous. Because of a perceived divergence between social and private costs, decisions regarding land use are to a large extent decided by policies of the local government, hence the use of zoning and planning controls to attempt to minimize social costs. Private property rights have gradually been eroded as public control over land use has been extended. The market has for some time been operating within limits in selecting the most profitable scheme available so there is little justification for regarding the present market system as operating within a totally laissez-faire atmosphere. The problem facing local officials is not whether they are infringing upon market forces, that has already been done, but rather how much importance is to be placed on market workings. Clearly a different solution or emphasis will be made depending on the answer. While the objective is essentially political,
obviously the mechanism for solution should not be.

To repeat, the betterment levy is seen as a supplement to the existing tax base. Taxation provides a powerful means for influencing the nature of development and, in the case of the betterment levy, the rates levied will affect land use decisions. The other question which occurs is when to levy the charge: periodically throughout the life of the property, at transfer of the property, or some other alternative. If levied at the time of transfer, the burden would probably fall no more heavily on land which was held over many years and land which was transferred more frequently, but this is still uncertain. New schemes, whether for taxation or for other purposes, often raise more questions than they answer and, in fact, the betterment levy has already done so—questions that will be considered throughout the study.

D. Outline of Remaining Procedures

To this point, the attempt was made to set the betterment levy in context: by establishing that there may be justification for collecting betterment from socially created values and by reviewing some of the past definitions of betterment and the questions they raise. The second chapter will focus on some economic considerations of value and taxation such as the theory of economic rent, work in site value taxation and marginal cost pricing, and the concept of elasticity in relation to the incidence of taxation (can the effects of a tax be shifted elsewhere and, if so, by how much and to whom?). The third chapter will review related legislation both in other countries, notably Great Britain, and in other areas of Canada, such as Ontario’s speculation tax.

The fourth chapter centres on the empirical analysis in relation
to the concept of betterment of specific concern to this study: the effect of rezonings on property values in Vancouver. Two types of properties will be studied: those affected by rezonings during the period 1966 - 1972 and a control group, unaffected by rezoning during the same period, which will allow an estimation of the secular, or ongoing, trend in property values within the city.

The final chapter will summarize the principal findings of the empirical study. From these findings, a series of recommendations will be presented, not only through the theoretical justification but also through the appropriate institutional setting for their proper administration. In conclusion, the weaknesses of the study will be presented to allow policy makers to identify where, and how much, judgement they must exercise in applying the results to actual policy decisions.
Chapter I Footnotes

1. Jack Volrich, Memorandum to the Finance Committee, October 3, 1973, Vancouver, B.C.


10. Ibid. Para. 26, pp. 15-16.

CHAPTER II

HISTORICAL AND CONTEMPORARY ECONOMIC THEORY: METHODOLOGY

A topic of sufficient importance to be included in conjunction with its relationship to betterment is that of the distinction between two different concepts of rent: annual property rent and economic rent. Annual property rents are simply factor payments for the use of land and constitute the definition of rent that would most quickly come to mind. In Great Britain, the property tax is based upon the income, expressed in annual rental terms, obtained from the property.

Economic rent is a term which is less often considered but which is perhaps of much greater importance. "More precisely, economic rent is defined in one of two ways: It is either the return received by a factor in excess of what it would receive in its second-best employment, or it is income received by a productive resource in excess of the payment required to keep it in its present use."¹ In the case at hand, either definition could be related to land but this need not always be so and, in fact, the concept of economic rent can be generalized to include all factors of production in inelastic supply. Based upon the above definition, if the factor's supply were not inelastic, that is, if the factor had alternative uses, the owner could change the quantity offered if part of the rental return were captured through taxation. The taxation of economic rent in cases of less than perfect inelasticity of supply, will adversely affect the allocation of resources. For all intents and purposes, the supply of urban land is inelastic, if elasticity of supply can be defined as the degree of responsiveness of
the amount of a good supplied (in percentage terms), such as land, to a given percentage change in the competitive price. Due to the nature of real property, if property taxes are increased, sites will not be withdrawn from the market since the tax liability of the landowners would not be affected by doing so.

Economic rent, then, is an important concept which will be shown to affect the incentives for the organization of production and thereby the entrepreneurial returns. This may or may not be considered a worthwhile objective. A brief discussion, notwithstanding the extensive literature, of economic rent covering both historical and contemporary viewpoints will be presented to both follow the evolution of the subject and to show further relevance to betterment taxation.

A. **Historical Perspective of the Theory of Rent**

The theory of land rent has had a considerable history, so that by the end of the eighteenth century, many of the essential features of the subject had been drawn. Adam Smith extended the works of earlier theorists into a general synthesis and was the first to relate rent and economic growth. He viewed land "rent as a surplus above all other costs, the size depending jointly upon the demand for agricultural products and the various costs of production as affected by soil fertility and locational advantages. To Smith, this surplus or unearned income represented a means of raising public revenue through the taxation on the rent of the land. Because of the nature of the economy at the time, which was largely agricultural, discussions of land rent and the taxation of this "surplus" income tend to be centred on agricultural land.
Perhaps the name most closely associated with the theory of land rent was that of David Ricardo (1772-1823). Again, Ricardo's system centres around an agricultural base. To Ricardo, land had two important characteristics which differed from other factors of production: it is limited in quantity and it is a free gift of nature, therefore any rent derived from the land is a surplus. "Rent is that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil." To set the context for his theory, Ricardo suggested that no rent would be paid for land upon the first settling of a country in which there is no scarcity of land, for no one would pay rent on land if other equally desirable land was available. It is only when inferior land is brought into production that rent is paid on the land of first quality.

"It is only, then, because land is not unlimited in quantity and uniform in quality, and because, in the progress of population, land of an inferior quality, or less advantagously situated is called into cultivation, that rent is ever paid for the use of it.... With every step in the progress of population, which shall oblige a country to have recourse to land of a worse quality, to enable it to raise its supply of food, rent, on all the more fertile land, will rise."

The rent obtained would be calculated upon the difference of the productive capacity of the land of the highest quality and each succeeding type of marginal, or inferior, land. Since marginal land is of poorer quality, more labor would be required to bring it into production. The value of the produce, in terms of price, is raised because of the increase in labor costs, on this type of land. Ricardo recognized that beyond a certain point, the introduction of another unit of labor would not add to the productive capacity of the land but rather resulted in diminishing returns as each extra unit was applied.
In a crude way, Ricardo introduced the principle of marginal productivity to land. Ricardo's rather rigid theories of his overall model opened him to much criticism and some modification of his basic theories by such notables as John Stuart Mill. Land rent was no longer considered solely the result of soil fertility and productivity, becoming less important in the productive process as non-agricultural forces began to exert themselves in the economy of the day. Ricardo's assumption of historically diminishing returns to labor was discarded as empirical evidence to the contrary was produced.

B. Economic Rent in a Contemporary Setting

Modern theorists have begun to consider unearned income as a question of ethics - the right to enjoy income as a result of unforeseen and usually uninitiated developments. Also considered in contemporary thought is the long-run adjustment of resources to changes in demand where price equals average costs. However, costs are reflected by the alternative uses, as governed by demand, to which resources may be put. "In making his decision the developer is faced with alternative possible uses which he can provide and alternative ways of providing for them and will employ the concepts of proportioning the factors of production, of substitution, capacity and efficiency." Individual developers are rarely considered to the exclusion of other developers and in fact tend to be aggregated. In considering the results of specific policy decisions the overall effect of, for example, the supply of land offered for a particular use would be generalized and the alternative uses for the resource would be fewer in number, as a result of this generalization. To analyze a surplus condition, the use of economic rent should
really be closely related to the specific problem at hand.

"In contemporary theory, economic rent, no longer iden-
tical with land-rent, is viewed in a number of different ways and the amount varies accordingly. The payment for the use of land received by the owner which is in excess of the amount which would be received in its next-best use is economic rent, or alternatively, the excess over that required to keep the land in its present employment. From the perspective of the individual firm or user of land, the full payment is required to keep the land away from competition and there is no economic rent."

A concept which Ricardo probably would soon have grasped is that of consumer surplus, surpluses being closely associated with economic rent. Essentially, consumer surplus is defined as the difference between the amount the consumer would be willing to pay for a particular good and the amount he actually pays. This concept is presented in Figure 1, where OABC represents the consumer's outlay, or total revenue of the producer, and CBD the surplus. Each successive unit that the consumer purchases costs only as much as the last unit, the earlier units being worth more than the last, under conditions of diminishing marginal utility. The surplus rests on the earlier units which the consumer values more. When the consumer no longer receives a surplus, he stops buying. The triangle CBD, then, represents the:

Figure 1
Consumer Surplus
the total amount the consumer would be willing to pay if forced to do so on an all or nothing basis. The lower the price, the greater the consumer's surplus - the consumer is able to buy a greater array of goods at lower prices. The reverse situation works in favor of the producer who logically would try to raise prices enough to bring out the last (marginal) unit, creating for him a surplus on the factors already in use for production.

The effect of taxation policies on both consumer and producers surpluses can easily be diagrammed, as in Figure 2, which represents the market for some commodity. A tax is imposed, but to simplify the description and to isolate the effects of the tax, it is assumed there is no concurrent shift in demand and nothing else alters the supply curve.

Figure 2
Incidence of a Fixed Tax

The initial demand curve is represented by DD and the initial supply curve SS, with equilibrium at point A. With a tax imposed on the sellers, the supply curve will shift to the left as the sellers attempt to pass the tax to the consumers, the new supply curve being S'S' and the new equilibrium price being B, reflecting the amount of the tax per unit. At point B, less is offered on the market as
indicated by the movement from \( X_1 \) to \( X_2 \), but at a higher price \( P_2 \).

The sellers attempted to pass on the tax to the buyers but were not completely successful. If before the tax, the sellers needed a price of at least \( P_o \), then after the tax they must charge \( P_2 \) to receive the same net price as before imposition of the tax. Initially, buyers paid a price of \( P_1 \) and now pay \( P_2 \). The part of the tax paid by the consumer is therefore \( P_2 \) minus \( P_1 \) while the sellers pay \( P_1 \) minus \( P_o \). \( B-D \) equals the consumer's share while \( D-C \) equals the producer's share. The tax yield equals of \( P_0CBP_2 \), but the reduction in both producers and consumers surplus is the amount \( P_0CABP_2 \), which is greater than the tax revenue, indicating this tax may not be particularly efficient in reducing surpluses, as witnessed by the residual \( CAB \).

The relationship between rent and surpluses has dominated much of the past thought on tax policy. Taxes on surpluses affect the decisions of suppliers to the extent that if they are free to do so, they will withdraw, or reduce, their services from the market, especially if by so doing they can reduce the tax liability. The taxation of economic rent, or surpluses, depending upon the viewpoint, would tend to affect entrepreneurial incentive. Assuming the surplus to land could be determined, and was then taxed entirely away, there would be no advantage to land ownerships.

"If,..., the tax authorities set rates below highest rental values, although substantial capital losses would be incurred, some incentives for ownership would remain. But the tax authorities would find it necessary continually to revise the rates upward as newer and better uses for the land were found. Consequently, any unusual gains accruing to the landowner would be short lived, and the incentives to "transfer" land into its best use would be blunted."^7

As will be shown, a reduction of this incentive occurred in Britain
in the late '40's and early '50's when a development charge of 100% was levied against development rights, a term corresponding to the surpluses discussed. The result was a breakdown in the market until such time as the levy was revised.

Based upon the above discussion, it must be apparent that rent as defined is an ambiguous term. On the one hand, surplus income represents an ideal target for taxation, especially if the surplus is unexpected, since unexpected income does not provide motivation, and if the resource is in inelastic supply so as not to be withdrawn from use. On the other hand, it has been shown that economic rent can provide a motivating force and its taxation could affect the allocation of resources. Expected rents or returns play a large part in the market and directly influence decisions. Furthermore, the identification and measurement of what is and what is not considered rent would depend upon the identification of future expectations under conditions of risk and uncertainty, a difficult if not impossible task. By considering other theoretical and practical cases, perhaps greater insight may be reached.

C. Site Value Taxation and Betterment

Perhaps no other form of taxation has aroused such passionate advocates, and equally passionate opponents, as site value taxation. As Dick Netzer points out: "Site value taxation has been presented not only as a panacea for urban land use but also as a cure for unemployment, a preventative for inflation, and a guarantor of perpetual industrial and international peace." The more serious proponents of site value taxation believe it will have the following benefits:
1. encourage building and rehabilitation;
2. discourage land speculation;
3. reduce urban sprawl;
4. reduce the unearned increment;
5. reduce the cost of land;
6. redistribute the tax load among land uses.

While each of these proposals deserves mention, the focus will concentrate on the relationship of site valuation and the reduction of the unearned increments.

No other name has been more closely associated with site valuation than that of Henry George (1839-97), although as stated, he was not the first to recognize that the unearned surplus provided a target for taxation. George's theories are similar to Ricardo's in that the marginal productivity of land plays an important role in both. It was George's belief that the rent of land should be taxed away from the individual and given to the state providing sufficient revenue to abolish all other taxes. The deficiency of this "single tax" proposal is at once apparent since even a 100% tax on rent would be insufficient to meet current government expenses.

Under conditions of inelastic supply as shown in Figure 3, the

Figure 3
Incidence of a Site Value Tax Under Conditions of Perfect Inelasticity

![Figure 3](image-url)
entire burden of the tax is meant to fall on the landowner. If a tax of 50% is levied against all rents, or the yield of a fixed supply of urban land, there will be no shift in the total demand for land since consumers would be willing to pay only the same amount for an unchanged supply of land. The market price is the same, at $E$, because supply and demand have not changed. If the price were raised, under competitive conditions, there would be a reduction in the demand for land and some would therefore go unwanted. The effect of the tax on the landowners would then be the same as if net demand had shifted from $DD$ to $D'D'$ and net return reduced from $E$ to $E'$, the tax being shifted backward to the landowners. However, if the particular factor of production is not completely inelastic, as shown in Figure 2, at least a part of the tax burden would be shifted forward to the consumer. The assumption that the landowner would bear the whole burden and would not shift any part must certainly be questioned.

Current advocates of site value taxation disassociate themselves and their theories from those of Henry George whose single tax proposal is considered an additional burden on site values, while site valuation is meant as a means of collecting local revenues on a more equitable basis. Essentially, site value taxation calls for the untaxing of improvements (buildings, etc.) coupled with a heavier taxation of the land. The effects of the system can be examined by observing the ratios of improvement value and land value. If it can be assumed that a small city might have land values assessed at $10$ million and improvement values assessed at $20$ million, the ratio of improvement values to land values would be $2:1$. The ratio for that city would be $2$, which
represents a dividing line. Every property having a ratio of 2 would pay the same taxes under either the present property tax system or under the site value system. However, under the site value system, owners of properties having ratios above the city average of 2 would have their taxes reduced while properties with a ratio below the city average would have its taxes raised. Taxes are therefore not increased if the owner improves the property nor are they reduced if it is allowed to deteriorate. Vacant sites have a ratio of 1:1.

British Columbia adopted such a system toward the end of the nineteenth century and by 1914 about 2/3 of all municipalities, including Vancouver, were exempting improvements from taxation. However, the trend since that time has been to increase taxes on improvements so that today in B.C., municipalities tax improvements on 75% of assessed value for school purposes and up to 75% for municipal purposes. Site value taxation was imposed at a time of great prosperity in the Canadian west and was not able to prevent the tremendous land speculation that occurred at the same time. Land speculation occurred in spite of site value taxation. Holding costs of land increase under site valuation, encouraging owners to build on their properties, a condition which occurred at the time, although the general air of prosperity as a result of rapid growth was probably a greater stimulant (See Table I).
Table I

Vancouver - Population and Taxable Assessment - 1890-1915

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Taxable Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1890</td>
<td>12,000</td>
<td>9,404,445</td>
</tr>
<tr>
<td>1895</td>
<td>17,862</td>
<td>18,147,384</td>
</tr>
<tr>
<td>1900</td>
<td>24,750</td>
<td>19,553,645</td>
</tr>
<tr>
<td>1905</td>
<td>45,000</td>
<td>28,543,890</td>
</tr>
<tr>
<td>1910</td>
<td>93,700</td>
<td>106,454,265</td>
</tr>
<tr>
<td>1915</td>
<td>97,995</td>
<td>224,202,883</td>
</tr>
</tbody>
</table>


Both Pennance and Finnis, although in different contexts, recognize the same basic point: that land will be developed only when it is economically feasible to do so, regardless of the type of taxation. Land that is held vacant or at substantially lower usage than is most profitable can be released from that position upon payment of the market price. This point is further corroborated by Turvey: "In general, areas where rents are particularly high show a greater building density and have higher site values than the rest of the town." Some users, he feels are willing to pay a high premium for the accessibility usually offered by the high rent site. The indication is that site values will vary with rent levels, high rents making dense building profitable and sites valuable. Presumably, this observation would hold true no matter what the type of taxation. If building at high density were not profitable on the low rent site without site value taxation, there is no reason to suppose the opposite would be the case under site value taxation, thus reiterating the argument of Pennance and Finnis.
In Figure 4, he illustrates how density will be greater where rent levels are higher by considering two physically identical sites, A in the high rent area, and B located elsewhere.

"Because of the difference in rent levels in the two areas and the absence of any major difference in building costs, it can be assumed that the average net returns curve for site A will lie above the average net returns curve for site B for the whole of its length. It follows that the marginal net returns curve for A will probably be higher for the whole of its length...."  

If the opportunity cost rate of interest, OU in Figure 4, is the same in both cases, there will be a greater outlay of JK on the high rent site. If the type of building is the same, as to use, the building on site A will be taller or have greater site coverage.

Density will be greater where land rents are higher. Because the annual value of the high rent site as represented by UVWY is greater than the low rent site, URST, high rents will make denser building more profitable. Location, and thereby accessibility, as stressed previously, plays a key role in the determination of value and site value taxation will not necessarily cause a site to be developed to its highest use.
One fundamental premise of site value taxation is that the incidence of the tax falls on the owner and cannot be shifted, diminishing the site value by the capitalized amount of the tax and lowering land prices. As shown above, this point remains questionable. It would seem that the effects of the imposition of site value taxation to capture the unearned increment are somewhat limited and that some of the claims made for the system would not wholly be the result of introducing such a system, such as the curbing of speculation and the fostering of development. This is not to say that none of the claims for site valuation are valid, not only that some of the claims, without further study, are questionable.

D. Welfare Economics and Marginal Cost Pricing

The provision of public goods and services, whether a rapid transit system, a park, or the permission to redevelop property, by nature causes a divergence between private and social costs. "The peculiar nature of public goods is that their consumption is necessarily joint: the more there is for one household, the more not the less there is for any other."13 The quantity of public goods supplied is not a market decision but is political. Because most public goods and services, unlike rezonings, benefit the general community, their cost is borne by all taxpayers, there being no question of charging beneficiaries and compensating those harmed by some scheme. However, because of this divergence between the private and social costs of providing public services, the question still arises as to the means of recovering these government expenditures.

In this regard, one group of theorists wishes to allocate taxes,
and government expenditures, in such a way as to minimize the aggregate sacrifice and maximize the aggregate welfare of the community. The condition for meeting this criterion was believed satisfied if price equalled marginal cost. The provision of public services is then a logical extension of the welfare approach to taxation. Theorists have proposed two basic policy principles:

"The first is that resources should be distributed among different public uses so as to equalize the marginal return of satisfaction for each type of outlay. The second is that public expenditures should be pushed to the point where the satisfaction obtained from the last dollar expended is equal to the satisfaction lost from the last dollar taken in taxes. Thereby, the marginal satisfaction derived in the public and private sectors is equalized."\textsuperscript{14}

The concept of marginal utility theory was pioneered in the mid-nineteenth century by Dupuit who sought to measure the social benefit of collective goods such as roads, canals, and bridges through the concepts of producers' and consumers' surplus. The principle is the same as that used throughout this discussion of surpluses: that as the amount consumed of a particular good increases, the marginal utility as measured by the extra utility of the last unit tends to decrease.

Recent welfare economics proposes to influence social consensus by describing how the ends of social policy are related to particular relationships with the policy means. Blaug sums up the current thought as follows:

"Between any two goods (products and factors) the subjective and technical marginal rates of substitution must be equal for all households and all production units, respectively, and these subjective and technical ratios must equal one another."\textsuperscript{15}

Marginal rate of substitution is defined as the amount of Y the consumer
is just willing to give up to get an additional unit of X without changing his level of utility.

In the 1930's, Hotelling revised and updated Dupuit's work and bases his arguments upon the provision of and rate charged for public utilities such that "...the optimum of the general welfare corresponds to the sale of everything at marginal cost." He feels the best way to operate a utility, whether bridge, railroad, or whatever, is to make it free to the public as long as its use does not cause an overcrowding of the service. Society, he feels must pay for the utility, say a bridge, in some way but gets more benefit if it is free while charging a toll will cause some people to seek alternative and probably longer methods of crossing.

"There is no such damage if the bridge is paid for by income, inheritance, and land taxes, or for example by a tax on the real estate benefited, with exemption of new improvements from taxation, so as not to interfere with the use of the land. The distribution of wealth among the members of the community is affected by the mode of payment adopted for the bridge, but not the total wealth, except that it is diminished by bridge tolls and other similar forms of excise."

This phenomenon may be diagrammed in the following way:

![Figure 5](image_url)

Substitution and Income Effects in the Case of a Price Rise
Assume the consumer has two choices as to the route he may take to a particular destination as characterized by his initial budget line of LM, governed by his income. At M he spends all his allotted income on route X while at L he spends it all on route Y, equilibrium being reached at point A on indifference curve II, which represents different combinations of the two routes about which the individual is indifferent. If a toll, which is the same as a tax, is levied on route X, the effect is to reduce expenditures on route X as witnessed by the shift to LM'. The consumer suffers a decline in real income, as indicated by the movement to a lower indifference curve, I₂. The total effect, then, can be broken into two sub-effects: the substitution effect and the income effect. To isolate the substitution effect, assume the consumer were given an amount of additional income to compensate what would otherwise be a loss: to enable him to remain on the original indifference curve. This may be shown by constructing the line CC which is parallel to LM', and therefore in the same ratio, but tangent to I₁. The substitution effect is represented by the movement to the new artificial equilibrium position of D with the reduction in the use of route X measured by X₁X₃ units. The income effect, the change of income expended on route X as a result of the decline in real income caused by the toll, is represented by the decrease from X₃ to X₂ after the substitution effect has been accounted for. This is the result of the excise tax (toll) of which Hotelling speaks.

In optimal terms, under conditions of perfect competition, price equals marginal cost, causing firms to minimize average costs. However, as is often the case with the provision of public goods, overhead costs
may cause marginal cost to be below average costs. Hotelling vehemently argues against attempting to pay overhead costs out of operating revenue which he feels contributes to instability in the economic system as a whole. In the case of public goods deficits are covered by public funds, which raises problems of administrative procedures. It is more conducive to the welfare of all if it is not attempted to recover from each enterprise its costs relative to its services rendered since taxes are not necessarily collected from those that benefit.

As was pointed out in the discussion of consumers' surplus, many users of public services, if forced to do so, would pay more for certain services than they actually do. However, "Each individual if left to his own devices, will contribute nothing to public services simply because the total supply of public goods remains unaffected by his decision; everyone benefits from public goods, whether he pays or not."18

Again, the argument of Pennance and Finnis holds true: that, in the private sector, if a project is economically sound, it will be undertaken. In the public sector, if everyone concerned is better off with the new investment than without, it should be undertaken on social grounds with everyone "coerced" into paying his share of the cost (since most public goods show a divergence between private or social costs). The consumer's choice, therefore, does not necessarily reflect the social optimum and it is left to government action to improve the general welfare.

E. The Incidence of Taxation

One concept which has been mentioned in conjunction with other theories of taxation is that of the incidence of taxation. A
distinction should be made between the formal incidence (who the taxation scheme is attempting to tax) and the effective incidence (who the taxation scheme eventually taxes). In other words, given the problem of tax shifting backward and forward, who is actually paying the tax? Tax shifting depends upon the elasticities of demand and supply of land and should not be overlooked in the taxation process.

There are, therefore, two separate factors of elasticity to consider: demand and supply. Taking demand into account first, consider the following diagrams:19

Figure 6 The Elasticity of Demand
In each case of Figure 6, S is the pre-tax supply curve and $S_1$ the post-tax supply curve while D is the demand curve. Although the elasticity of supply remains the same in each case, the elasticity of demand varies from very elastic (a), unitary elasticity (b) (similar to Figure 2), and very inelastic. In each case, the tax raised equals AFHC with BCHG borne by the "firm" while ABGF is shifted to the consumer. The excess, FHE, is shared by both groups depending upon the elasticity of demand. It is apparent that the greater the elasticity of demand, the lesser amount of shifting will occur.

On the supply side, D remains constant while the elasticity of supply changes in response to the tax:

Figure 7 The Elasticity of Supply
In this case, the greater the elasticity of supply, the greater the degree of shifting, as witnessed in 7-a which shows elastic supply and the greatest amount of shifting (ABGF to BCGH) and 7-c showing inelastic supply and the lesser amount of shifting. "Supply elasticity, then, tends to increase forward shifting and demand elasticity tends to reduce forward shifting." The implications of the concept of taxation incidence, and therefore elasticity of demand and supply, are considerable and must be carefully weighed when considering the objectives of any taxation policy. Where does the burden fall?

F. Conclusion

This chapter has attempted to focus on some of the economic considerations of value and taxation in relation to the problem of betterment. The evolution of attitudes regarding economic rent and taxation has a direct bearing on the perception of such topics as viewed by current standards. Surpluses such as economic rent, while seemingly providing an ideal target for taxation, have also been shown to directly affect entrepreneurial incentive. Finally, the elasticity of supply and demand was discussed in relation to the incidence of taxation, an important consideration for any taxation scheme.
Chapter II Footnotes

3. Ibid. p. 35.
5. Keiper et. al., p. 110.
7. Keiper et. al., p. 123.
12. Ibid.
17. Ibid. p. 261.

20. Ibid. p. 56.
CHAPTER III
EXPERIENCE WITH BETTERMENT LEGISLATION

The concept of betterment is by no means totally theoretical, but rather has a long and varied practical history. Many past schemes to collect betterment are extremely complex and it would not be possible or practical to discuss each case in detail. However, because many past, and more recent, experiences have at least an indirect relevance to this study, the main provisions of a number of these schemes will be offered for comparison. It will be seen that political expediency, especially in Great Britain, has played a large part in determining the longevity of betterment legislation. Notwithstanding the political aspect of capturing betterment, the awakening realization of society's role in the creation of land values, and the legislation either enacted or under consideration, is creating a phenomenon that bears watching.

A. British Experience - Past and Present

In Britain, the recognition of the role of positive public action in increasing land values has been evident since 1427 when an Act empowered the Commissioner of Sewers to levy special rates on those properties which benefited by particular sea defense works. This principle was also applied, under the name of "melioration," in the rebuilding of London after the Great Fire. Up until the Town and Country Planning Act of 1947, with certain exceptions, betterment was linked directly to compensation or, perhaps more precisely, "worsement." Because the British experience in this regard is so vast, only the main legislation will be cited.
Various Acts throughout the nineteenth century had provided for the collection of betterment, but not until the Housing and Town Planning Act of 1909, which allowed local authorities to collect a betterment levy of 50% of the increase in land values which resulted from planning schemes, was betterment applied in a general public act. Under this Act, betterment was collected as a direct charge on those lands which had increased in value as a result of negative restrictions imposed by planning schemes on the use of other lands. These provisions were repeated in the Town Planning Act of 1925. However, because of a system of deferred payments and the difficulty of defining and collecting betterment, in only three cases was cash actually received for the payment of betterment charges. The Finance (1909-10) Act, 1910, applied four kinds of land taxes, one of which, the increment value duty, attempted the taxation of increased assessed values (20%) over the original site value upon the sale of the land, its lease for more than fourteen years, or the death of the owner. However, yields proved to be disappointing and the scheme was eventually abandoned.

Other Planning Acts had intervened after 1909, but the most important change from past Acts occurred with the passing of the Town and Country Planning Act of 1932 where the amount of betterment that could be claimed rose from 50 to 75 percent. The provisions for the collection of betterment seemed somewhat arbitrary.

"... the period of time within which the claim could be lodged was extended from three to twelve months from the date of approval of the planning scheme (or such longer period as might be specified). Or the twelve months might run from the date of completion of the work which gave rise to the betterment claim. On the other hand under certain circumstances the owner could have the claim deferred, or even waived altogether. Where no claim for compensation existed at least
equal to the amount of betterment, such an owner could require the claim to be deferred until in fact the betterment had been realised, through development, sale, etc. And if this did not occur within fourteen years of the original date the claim lapsed completely."\(^1\)

The provisions for compensation were altered slightly from previous Acts, but were still not too clear. The principle of "good neighbourliness" was applied to those cases where compensation was not paid for planning restrictions which were deemed to be in the best interests of the community. Included in this list of prohibitions were provisions for prescribing the space requirements around buildings, their height or character, or any limitations on the number of buildings allowed in a particular development as well as any building operations that might be injurious to health. However, it was not possible to prescribe minimum frontages without paying compensation. These provisions remained in effect throughout the 1930's and during the war years, but were repeatedly criticized as depending too much on local authority resources (it must be remembered that this Act was national in scope) so that one local authority might incur heavy compensation costs for prohibiting certain developments while a neighbouring authority might allow the same land uses.

The most comprehensive discussion of betterment was carried out by the Expert Committee on Compensation and Betterment, the Uthwatt Report of 1942. In addition to the question of floating value already mentioned, the report recognized two other factors which had affected planning in the 1930's:

1. the high value of central city sites which tended to discourage redevelopment schemes because of the high liability for compensation by local authorities and
2. the fractionalized ownership of central area properties which had led to difficulties in acquiring properties for redevelopment.

In order to overcome these difficulties, the Committee recommended that all underdeveloped land be acquired by the state at the existing use value and leased to a developer at the future use value which in effect means nationalizing development rights. Compensation would be paid to owners to reflect the lost development value at a "fair value" so as to avoid overpayment and avoid the floating value problem. Betterment would then be received where the price or rent paid by the developer exceeded the cost to the state of both the development rights and the property. For land which had already been developed, it was recommended that such lands should be subject to compulsory acquisition (expropriation) when required for redevelopment, the price not exceeding its value on March 31, 1939. In addition to the above:

"... in all land other than agricultural, including that developed after the scheme was started, increases in annual site value, from whatever cause other than that of certain recent expenditure by the owner, would be subject to an annual levy of, it was suggested, 75 per cent. An initial valuation was to set the datum, and a revaluation made every five years."  

This report was not without criticism, especially from right-wing political groups who felt that the nationalization of development rights would ultimately result in total land nationalization.

Essentially, the Town and Country Planning Act of 1947 followed the Uthwatt Report's recommendations and nationalized all development rights with no development allowed to take place without permission from the local planning authority, a broad parallel to development through rezoning. If permission to develop was refused, no compensation was paid.
paid, while if permission was granted a development charge of 100 per cent was levied against any resulting increases in property values that occurred because of the permission. A fund of £300 million was established, a portion of which could be paid to those property owners who felt their property had some development value, but which did not receive development permission, as of an appointed 1948 date. Of course this is only a brief summary of the provisions, but the principles are clear.

In fact, this scheme did not work too smoothly. It was hoped that a rate of 100% would result in prices being paid for land that more closely resemble existing use values rather than development values, but this was not the case. "The basic difficulty was that purchasers of land were compelled to pay a premium above the existing-use value in order to persuade an owner to sell: a development charge of 100 per cent therefore constituted a permanent addition to the cost of development."

The previous Acts were passed by the Labour governments and were promptly repealed by the Conservatives in 1953 and replaced by the Town and Country Planning Act of 1954. In effect, this legislation created two values for land based upon whether it was acquired through the open market or by public authority. Full market price was paid in the former case while 1947 existing use value (plus any loss of 1947 development value) was paid in the latter, not a very satisfactory situation. Betterment was left to general taxation while the principle of "good neighbourliness" for compensation was again applied. This Act was followed by another in 1959 which restored market value as the basis for compensation when property was expropriated. Again development
rights were vested in the state.

Labour was returned to power in 1964 and introduced both a capital gains tax in the 1967 Finance Act and a new betterment levy in the 1967 Land Commission Act. The difference in concept between the two schemes is interesting: the capital gains tax is charged on increases of current use value of land (income) while betterment is recaptured on increases in development value (community-created). The Land Commission Act, a very complex piece of legislation, took effect on April 6, 1967 and differs from the 1947 Act in two ways:

1. all development value is not taken but rather an initial rate of 40 per cent is charged, later to be increased to 45 and 50 per cent, although the time period is not specified;

2. that although the levy would normally be paid by the seller, if some residual development value was still in existence after a sale (e.g. if the property were sold at existing use value plus a small "sweetener" in anticipation of development permission) the purchaser would be liable for levy on the residual.

Some public bodies were exempt from the levy. The base date from which development value increases were determined was April 6, 1967 which allowed expropriation, if necessary, at less than market value, avoiding the previous two price system of the 1954 Act.

Although the Conservatives did not oppose the betterment levy in principle, it was viewed in terms of the 1947 type of nationalization. Further objections may be summarized as follows:

so: "i. It will inject more uncertainty into the market and deter development.

ii. It will reduce the net rewards which a seller of land might expect and so reduce the supply coming onto the market, raise its price, and gain deter development."
There is some doubt that the amount returned by the levy, £21,172,000 a year at its peak, would have been much more than that provided by the capital gains tax and income tax together. In 1970, after the election of a Conservative government, the levy was abolished. A more recent proposal is under consideration by the new Labour government, but reports of its intentions are sketchy. "Basically, when any development, development scheme or land with planning permission is sold, the gains from development are to be taxed as income for the individual and at the corporation tax rate (with no offsets) for companies instead of as capital gains as now." The present status of this legislation is not known.

B. Johannesburg's Betterment Levy

Johannesburg, South Africa, has been collecting a betterment levy; or as it is called, a development contribution, officially since January, 1966. Unofficially, betterment was collected on individual properties before this date if a developer sought approval for a higher use rezoning. The development contribution of 50 per cent of the increase in value that resulted from the rezoning was levied by the local authority on the developer. It was felt that the 50 per cent rate still left an attractive increase in land value to the developer which would not deter development.

The official 1966 levy did not differ significantly from the unofficial charge. Once a development scheme had been approved by the local authority, it was required that a valuer be appointed who would value all properties in the scheme on the day immediately before the day of approval, followed by a valuation on the day of approval. A
development contribution of 50 per cent (or any lesser percentage the
authority may determine) would be levied against any increase between
the pre and post approval dates. The charge is payable by the
registered owner as of the date of approval and must be paid before any
transfer of the land can be registered, or before the property can be
put to any use which would have violated the earlier zoning regulations.
However, payments may be made in instalments over a maximum of three
years. Revenues generated by development contributions may be used by
local authorities in meeting any expenditures of town planning activi-
ties. In some circumstances, land of an equivalent value to the
development contribution may be accepted by the local authority, and has
been done so by the Johannesburg City Council for some road-widening
purposes. 6

C. Betterment Experience in Vermont and Hawaii, U.S.A.

In the State of Vermont, on May 1, 1973, a tax was imposed on any
gains realized on the sale or exchange of lands. Initially, this tax
was part of a political platform of a successful candidate for governor.
It was proposed that tax receipts would be used to give property tax
relief for farmers, although in the end, funds were earmarked for
generall relief.

Basically, the tax:

"... applied to the sale or exchange of land only, not
buildings, and not to land (up to a certain amount) used as
the site of a principle residence. The rate of tax is vari-
able. For land held less than one year the tax is 60 per-
cent age of the gain if the gain is 200 per cent or more. The
percentage drops as the holding period is shorter and the gain
less so that a gain of less than 100 percent with property
held for five to six years results in a tax on five percent
of the gain." 7
Clearly, this is an attempt to tax speculative transfers of land. This tax has been held to be constitutional by the Vermont Supreme Court.

The State of Hawaii has considered legislation geared specifically to taxing away gains realized through changes in zoning as an additional base of taxation with existing ad valorem property taxation, special assignments, and user charges. The proposed tax would be levied on the unimproved site and would tax the increase in market value that occurred on the day of rezoning and would be levied only once, at the event of rezoning. In this respect, the rezoning tax proposal seems very similar to Johannesburg's development contribution, and in fact it was recommended that the tax rate be 50 per cent of the increase in value. Also under consideration were different rates for different types of rezoning, depending upon which authority (counties or State Land Use Commission) had jurisdiction over the rezonings. It is believed that the implications of such a tax would induce developers to reduce their efforts in obtaining earlier rezonings than were actually needed, particularly from agricultural uses, which might imply a smaller supply of urban land at a higher price. Whether or not this scheme was enacted is not known.

D. Recent Ontario Legislation

Of special concern in Ontario recently has been the spiralling cost of land which was largely attributed to foreign speculators. On April 9, 1974, two real estate bills were introduced into the provincial legislature. The first, the Land Speculation Tax Act imposes a 50 per cent tax on any profits resulting from the sale, option, lease, transfer at death, and change in control of a partnership or corporation.
of unimproved real estate, in addition to the normal income tax. Exempted properties include principal residences, principal recreational property (when sold to a Canadian resident), or a family farm (with conditions). The second, the Land Transfer Tax Act imposes a 20 per cent tax on any property acquired by a non-resident of Canada. The tax rate for Canadians on the transfer of land remains unchanged at .3 per cent on the first $35,000 and .6 per cent on the remainder. Both taxes are in addition to the Federal capital gains tax. Apartment buildings may be harder to sell under this legislation because, for a new owner to avoid the tax, he would have to renovate the building by 20 per cent of the purchase price before he sells at some future date. This feature could cause difficulties for a developer wishing to sell a project to an investor, not an uncommon procedure. The longer the intended holding period, the less onerous the tax. Clearly, the speculator's life will be made a lot more difficult, particularly with quicksale schemes, and other provinces, notably Quebec and Nova Scotia are considering similar types of legislation.

E. Land Use Contracts

One means of collecting betterment already in existence in B.C., is the land use contract, analagous to Vancouver's CD-1 zoning designation. Prior to 1968, a number of B.C. municipalities were exacting both cash and certain amenity provisions as a prerequisite to allowing a development to occur. At the time, this practice was seemingly illegal under the Municipal Act. Considerable interest was shown in developing a more adequate and innovative means of controlling land development and, at the same time, in legalizing the existing practice. In April,
1971, the land use contract was made available through Section 702A of the Municipal Act. Essentially, municipalities could enter into a contract with developers which would specify the conditions for the use and development of the land after a public hearing on the subject had been held.

Procedural difficulties and misunderstandings reduced the effectiveness of the land use contract. In a recent study, Porter found that processing time for 19 contracts studied showed delays of up to two years for some contracts to be completed, compared with approximately 6 months for normal rezonings in Vancouver. Notwithstanding this problem, most planners surveyed felt the land use contract, when used in conjunction with a comprehensive plan, provided a very flexible means of controlling development.

F. Conclusion

The principle of betterment taxation is not a particularly recent innovation but has evolved over time in various guises, depending upon the perceived need at the time. The various examples shown above (forms of betterment legislation have appeared in Australia and New Zealand as well) can attest to this point. Nevertheless, the principle has remained the same: it is unjustifiable for landowners to profit from increased property values that have been created by the community as a whole and not by any particular efforts of the landowner. That land has exchange value, as an economic good, is the result of interactions of supply and demand, both private and public, and is directly influenced by the impact of public land use controls. The implication is that undeveloped property as well as property to be
redeveloped, either from a completely vacant site and in compliance with existing zoning ordinances or to some higher use through a change in zoning, for example, are both the recipients of unearned increments. Depending upon the objectives of the betterment legislation, then, all property value increases independent of specific activities of the owner should be taxed. Deviations from the principle of equality in enacting actual legislation have depended, and will depend, therefore, on the specific objectives of that legislation.
Chapter III Footnotes


2. Lichfield. p. 344.


The hypothesis of this thesis implied two points: that rezonings influence property values and that there is some justification for the recapture of any increases in value that may be attributable to rezonings. The latter assumption has been considered in conjunction with both theoretical models and practical experience. It will be the purpose of this chapter to examine the former assumption through the analysis of properties affected by various types of rezonings and, as a measure of secular effects on property values, a control group of properties which resemble the rezoned group as to pre-rezoning type but which were not themselves rezoned. Questions arise as to the selection of properties for study, the best indicator of property value, the overall effects of rezoning, and the specific effect of different types of rezonings, questions which will be considered throughout this chapter.

A. Initial Selection of Study Properties

Of approximately 100,000 properties within the City of Vancouver, only a small number, less than .5 per cent of the total number of properties were affected by rezonings in each of the years 1966-1972. Because of the relatively small number of properties involved, initially the entire population, that is, 100 per cent of the property rezonings from 1966-1972 (the choice of this time period will be examined in section B) was considered for inclusion in the study. As will be shown, a lack of data for a number of properties and a failure to meet certain
statistical requirements further reduced this number. Rezonings of a temporary nature were not included in the initial population.

The total number of properties involved with rezonings during the time period considered was 445 which represented 21 different rezoning classifications. These classifications are given in Table II where the total number of individual properties are represented by both pre and post rezoning types.

<table>
<thead>
<tr>
<th>Pre-Rezoning</th>
<th>RS-1</th>
<th>RS-2</th>
<th>RM-3</th>
<th>C-2</th>
<th>CRM-2</th>
<th>M-1</th>
<th>M-2</th>
<th>CD-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-1</td>
<td>87</td>
<td>1</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>42</td>
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<tr>
<td>RS-2</td>
<td>4</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RT-2</td>
<td>40</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>RM-3</td>
<td></td>
<td>13</td>
<td>9</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-2</td>
<td>2</td>
<td>1</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-1</td>
<td>49</td>
<td>31</td>
<td>107</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table II Matrix of Initial Pre and Post Rezoning Types

The initial control group was selected to reflect the pre-zoning category, the size of which depended upon the number of properties in each re-zoned type. In other words, as closely as possible, it was attempted to include as many properties in the control group as there were properties affected by rezonings. Where the rezoned group was scattered throughout the city, the control group was chosen randomly by pre-rezoning classification. However, in many instances, large groups of properties were rezoned in specific areas of the city. Where this was the case, the control group was selected from an adjacent group of
properties exhibiting pre-rezoning similarities but which had not been rezoned. The rationale for the selection of adjacent properties was based on the belief that secular forces acting upon a concentration of properties could only be adequately measured by a group of properties which exhibit as closely as possible other forces, except rezonings, influencing property values of the rezoned group. Randomly selected control properties for this group would reflect city-wide trends but might have negated the importance of the local area.

B. **Assessment Practices**

The time horizon with which this study is concerned, 1966-1972, is not an arbitrary selection of dates, but is based somewhat upon current assessment practices and procedures. The assessment rolls for the City of Vancouver provided the primary sources of information on property values within the city and, as such, require further explanation. Each year, every property is given an assessed value for taxation purposes which is based upon permitted use of land and actual use of improvements, lot size, available market information (sales), etc. Assessed values for one year, however, are calculated in the previous year, using data supplied from the previous complete year. For example, assessed values for 1974 are calculated throughout 1973 and will be based largely on information from 1972, the last complete year. Assessed values therefore exhibit a lag of two years from the current year. 1972 was chosen as the upper limit for study to enable complete use of available assessed values in comparison with market information, which would be required for analysis, given the existence of a two year lag in assessed values.
Although 1966 is the first year in which rezonings were studied, it was desirable to employ a base year, or lower limit, which had not been affected by rezonings of the study properties. This choice was based on the assumption that if rezonings were significant, there would be little appreciable difference in property values for those properties rezoned in 1966. Subsequent years, that is 1967-1974, would show only secular, or ongoing, increases in value and would negate any possible importance of rezonings for that year. Because of the nature of the storage facilities of historical data, information prior to the year 1965 is not readily available. 1965, utilizing 1963 market data, was therefore chosen as the base year for study largely because there were few gaps in the assessed value data, as was not the case in earlier years.

Property assessments are broken down into two sets of values: land value and improvement value. Once a rezoning has occurred, and the Assessment Department has been informed by the Planning Department, any properties involved in the rezoning are reassessed to reflect the new permitted use of the land. Improvements are assessed at the current use which in many cases may mean that improvements reflect a non-conforming use as may now be permitted by the rezoning. Reassessments from rezonings are lagged two years to remain consistent with general assessment practices. This means that properties are reassessed on the basis of what the value would have been for each specific property two years previously but under the new zoning. For all but one section of analysis, which will be explained, land values were chosen for study because land, under current assessment practices, is most directly
responsive to zoning changes. Improvements, in many cases, become redundant.

Over the years of the study, a number of legislative changes have occurred which have affected assessment practices. From the period 1962-1966, land and improvements were assessed at 50 per cent of actual value, so that a simple arithmetic doubling would give the actual value for any property. In 1967, land and improvements were again assessed at 50 per cent of actual value, but a 5 per cent limitation on increased assessments on individual properties was imposed which could artificially restrict assessed values and would restrict the use of such data for study purposes. The year 1968 saw the first use of the dual roll, one roll for school and hospital purposes which was subject to legislative limitations and one roll for general purposes, not artificially limited, where land and improvements are assessed at 100 per cent of actual value. The general roll, through 1974, has remained without constraints while the school and hospital roll has been subject to further legislative limitations. For this reason, only the general roll, where applicable, has been used for study purposes.

Two factors related to assessment procedures reduced the total number of properties initially considered for study. The first factor is largely an administrative matter. Assessment information is printed on cards which are freely available for use by assessors in the field. As a result, many cards which were required for study were not available for prolonged periods, and these properties were excluded from the study. The second factor is affected by actual physical changes in property boundaries. Consolidation of properties is a fairly common
practice whereby a number of smaller parcels of land are merged to create one larger parcel. In this case, the sum of the assessed values of the individual parcels of land simply add to reflect the land value of the new parcel after rezoning. For this reason, the total value can be traced historically. However, in some cases a replotting of lot lines may occur where, for example, five individual parcels are replotted to become three larger parcels. In this case, the "new" properties bear no resemblance to the previous plotting in that each of the three larger parcels may contain portions of the original five. Historically, assessed values can no longer be traced because of a lack of common data. These properties were also excluded.

C. Statistical Technique - Regression Analysis

The statistical technique used in the analysis of data is regression analysis. It is to be used here, not as a means of predication, but as a method for examining the relationship between two variables (further definitions, statistical interpretation, supporting data, etc. may be found in the appendix to Chapter IV). Two types of relationships are of interest:

1. that between assessed values and market values and
2. that between, firstly, a ratio of the base year, 1965, values and the most recent values, 1974, to rezonings and secondly, the same ratio against a breakdown of rezonings into type.

In other words, the second relationship will study the overall effects of rezonings on property values and the effect of the type of rezoning on property values. Regression analysis is well suited to this purpose.

The regression equation, $Y = A + BX$, is a mathematical model in
which the value of one variable may be statistically related to the
value of the other variable.

"The regression curve describes the relationship
between any given value of \( X \) and the mean \( U_{y|x} \) of the
corresponding conditional probability distribution of \( Y \). Thus, the regression curve indicates the expected
(mean) value of the \( Y \) variable for any given value of the
\( X \) variable."

If the \( X \) variable is taken as the independent variable and \( Y \) as the
dependent variable, it is possible, through the regression equation,
to determine how \( Y \) is affected by or related to \( X \). This is termed the
regression of \( Y \) on \( X \) and may be represented diagramatically as in
Figure 8.

Properties of \( Y \)
Linear Regression
Line

The slope of the regression function indicates the mean change that is
expected in \( Y \) with a unit change in \( X \).

Linear regression, then, is a technique used to find a straight-
line relationship from a set of bivariate observations (\( X \) and \( Y \)), and
provides procedures to measure the adequacy of the relationship. A
particular agent, in this case an individual property, would exhibit
two characteristics, for example, a market value (\( X \)) and an assessed
value (\( Y \)) which could be plotted as a point somewhere on Figure 8.
Because of the definition of the mathematical model, the regression line must go through the overall mean of the data. Since no point necessarily lies directly on the line, and only one line is required for analytical purposes, the line producing the "best fit" is the one in which the deviations of each of the observations from the line is least. This may be represented by the least squares line.

"Of all lines that can represent the functional relationship for a given set of bivariate observations, the least squares line is the one for which the sum of the squared deviations of the data from the line is a minimum. In this sense, the least squares line is the line of best fit."²

In other words, the plus deviations from the line cancel out the minus deviations.

The smaller the dispersion of observations from the regression line, the smaller is the expected error in the regression relationship. A measure of the relative strength of the regression relationship is the coefficient of determination (given by the Greek letter rho, \( \rho^2 \), or more simply as \( R^2 \)).

"A coefficient of determination close to zero indicates that the X variable is of little additional help in predicting Y. On the other hand, a coefficient of determination not close to zero indicates only that knowledge of X may be helpful in making a useful prediction of Y, even if the coefficient of determination is close to 1."³

The coefficient of determination describes the portion of the variance in the observations of the dependent (Y) variable, from the overall mean, that is explained by regression analysis.

A conditional probability distribution, as is the case here where Y (in this example, assessed value) is the dependent variable, also has a standard deviation called a conditional standard deviation or the
standard error of estimate which measures the variability in Y for a
given X. "When a variable is strongly dependent upon another variable,
the standard error of estimate will be much smaller than the standard
development of the observations of the dependent variable about their own
mean." The significance of the standard error, the degree of disper­sion of the data about the regression line, is given by the t-statistic.
The stronger the relationship between the two variables, the greater
the reduction in the dispersion.

Whenever a sample consists of fewer than 30 observations, as is
the case with many of the specific rezoned categories, a confidence
interval estimate of the population mean, a test of the accuracy or
the range within which a population mean might be, is based on the
t-statistic. The t-distribution contains the following properties: it
is symmetrical, ranging from minus infinity to plus infinity; its mean
is zero; the variance is greater than 1, therefore it is more spread
out than the standard normal distribution; there is a different t-
distribution for every sample size; as the sample increases, the
t-distribution approaches the standard normal distribution. The
t-statistic, calculated by dividing the estimated coefficient (B, the
slope of the regression line) by the standard error, becomes a useful
tool in the testing of the significance and accuracy of the estimated
coefficients (or the statistical hypotheses of interest).

One other concept which will be used to test the importance of
rezoning both generally and on specific type is the so-called "dummy-
variable," which bears some introduction.

"It is perhaps not generally appreciated that the
... regression model can be adapted easily to deal with
nominal variables, expressed originally as either dichotomies or multichotomies. The device used to accomplish this adaptation consists of defining new pseudovariables or "dummy" variables, which are binary coded as zero or one."

In this case the independent variable (X), zoning, could be recoded as: 1 = rezoned; 0 = not rezoned. By quantifying rezonings this way, and substituting into the regression equation, the significance of the rezoning on property values may be calculated when compared with the t-distribution.

Generally, the larger the sample size, the greater the accuracy and the validity of the statistical results of tests made upon that sample. As previously mentioned, certain assessment procedures reduced the number of properties under consideration for study. The requirements of regression analysis further reduce this number: it is preferable to include at least 20 observations in each sample under study. In this case, because only one dependent variable, property value, is under consideration, this number could be reduced to as low as 15 observations, although results could be insignificant. As a result of the three uncontrollable factors: lack of information, property replottings, and sample requirements, the rezoning types and the number of properties involved are revised in Table III.

<table>
<thead>
<tr>
<th>Pre-Rezoning</th>
<th>Post-Rezoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>RS-1</td>
</tr>
<tr>
<td>11</td>
<td>RS-2</td>
</tr>
<tr>
<td>6</td>
<td>RM-3</td>
</tr>
<tr>
<td>10</td>
<td>C-2</td>
</tr>
<tr>
<td>26</td>
<td>CRM-2</td>
</tr>
<tr>
<td>10</td>
<td>CD-1</td>
</tr>
</tbody>
</table>

Table III Revised Matrix of Pre and Post-Rezoning Types
The zoning by-law outlining the requirements for each type of zoning under consideration is presented in the appendix to Chapter IV. The total number of rezoned properties now under consideration for study has been reduced from 445 to 267, with 262 properties being selected as a control, or non-rezoned, group, bringing the total number to 529 properties.

D. The Assessed Value and Market Value Relationship

In the determination of the effect of rezoning upon property values, the most convenient measure of value was that of assessed value simply because assessments are made each year on every property for taxation purposes, employing fairly consistent assessment techniques each year. In order to avoid legislative limitations on property assessments, the general roll, which is mainly free from interference, was used for this purpose. Clearly, assessed values would be available for study on a before and after basis for rezonings even allowing for the aforementioned two year lag in assessed values whereas market values would be available only for those years in which properties actually sold. Furthermore, there would be no means for determining whether or not a sale price represented an arm's length transaction. Assessed values are adjusted to reflect property transactions which may involve an artificial sale price. Since market values reflect total property value, assessed value for both land and improvements was included.

It is often suggested that the best reflection of the value of a property is the price that property would bring when exposed to the market. No matter how convenient the use of assessed values may be, if
there is a poor relationship with market values, assessed values will be questionable when applied as a measure of value to the effects of rezonings. It is desirable, therefore, to have some indication of this relationship.

Of the 529 properties under consideration for study, approximately 22% or 118 properties had experienced a market transaction during the period 1965-1972. Because market values are employed in the determination of assessed values, for the purposes of regression analysis, assessed values were deemed to be the dependent variable. The results of this analysis are presented in Table IV. The observed \( t \)-statistic clearly exceeds the critical \( t_{n-1}, .95 \) value while the coefficient of determination \( (R^2) \) is very close to 1, indicating a very significant relationship exists.

<table>
<thead>
<tr>
<th>( n )</th>
<th>Estimated Co-efficient</th>
<th>Standard Error</th>
<th>( \text{t-stat.} )</th>
<th>( t_{n-1}, .95 )</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>118</td>
<td>0.8723</td>
<td>0.006</td>
<td>144.2034</td>
<td>1.960</td>
<td>0.9945</td>
</tr>
</tbody>
</table>

Table IV Regression of Assessed Value on Market Value

E. Effects of Rezoning on Property Values

The assumption was first made in the hypothesis to this thesis that rezonings do in fact have an effect on property values. This assumption has pervaded the discussion thus far and yet no attempt has been made to assess the nature of this relationship. By adapting the "dummy" variable to the independent variable (zoning) of the regression equation on the either-or basis, either a property was rezoned during the period 1965-1972 \( (X = 1) \) or it was not \( (X = 0) \), it is possible to
isolate the overall effects of rezoning, as presented in Table V. Although $R^2$ is relatively low, the observed $t$-statistic again significantly exceeds the critical $t_{n-1}, .95$ value.

<table>
<thead>
<tr>
<th>n</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>t-stat.</th>
<th>$t_{n-1}, .95$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>529</td>
<td>1.3179</td>
<td>0.1225</td>
<td>10.7543</td>
<td>1.960</td>
<td>0.1799</td>
</tr>
</tbody>
</table>

Table V Overall Effects of Rezoning

As with many overall statistics, individual variations within the average are often lost. Of particular interest would be the effect of specific types of rezonings upon properties. Based upon Table VI, nine different rezonings may be discerned, each of which is matched with a control group of approximately the same size. By applying a similar analysis to the individual rezonings as was applied to the overall case,

<table>
<thead>
<tr>
<th>Type</th>
<th>Rezoning</th>
<th>No. Rezoned</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RS-1 to RS-2</td>
<td>86</td>
<td>86</td>
<td>172</td>
</tr>
<tr>
<td>2</td>
<td>RS-1 to C-2</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>RS-1 to CD-1</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>RT-2 to RM-3</td>
<td>11</td>
<td>13</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>RT-2 to C-2</td>
<td>8</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>RM-3 to C-2</td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>M-1 to RS-1</td>
<td>26</td>
<td>27</td>
<td>53</td>
</tr>
<tr>
<td>8</td>
<td>M-1 to C-2</td>
<td>17</td>
<td>15</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td>M-1 to CRM-2</td>
<td>93</td>
<td>90</td>
<td>183</td>
</tr>
</tbody>
</table>

Table VI Rezonings by Type

it is again possible to isolate the specific effect of rezoning, but as applied to type. As might be expected, different types of rezonings exhibit different effects of property values. In three of the nine types (2, 3 and 8), the observed $t$-statistic did not exceed the critical
<table>
<thead>
<tr>
<th>Type</th>
<th>n</th>
<th>Estimated Coefficient</th>
<th>Standard Error</th>
<th>t-stat.</th>
<th>$t_{n-1} .95$</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>172</td>
<td>0.1017</td>
<td>0.0103</td>
<td>999012</td>
<td>1.960</td>
<td>0.4022</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
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<td>1.7661</td>
<td>1.0244</td>
<td>2.201</td>
<td>0.0950</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>2.8266</td>
<td>1.4165</td>
<td>1.9955</td>
<td>2.093</td>
<td>0.1811</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>3.9299</td>
<td>0.6792</td>
<td>5.7859</td>
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<td>0.6034</td>
</tr>
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<td>5</td>
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<td>0.5505</td>
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<td>0.3940</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
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<td>-6.9366</td>
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<td>0.7873</td>
</tr>
<tr>
<td>7</td>
<td>53</td>
<td>3.3469</td>
<td>0.4786</td>
<td>6.9927</td>
<td>1.960</td>
<td>0.4895</td>
</tr>
<tr>
<td>8</td>
<td>32</td>
<td>0.2228</td>
<td>0.1334</td>
<td>1.6701</td>
<td>2.021</td>
<td>0.0853</td>
</tr>
<tr>
<td>9</td>
<td>183</td>
<td>1.7993</td>
<td>0.1013</td>
<td>17.7669</td>
<td>1.960</td>
<td>0.6358</td>
</tr>
</tbody>
</table>

Table VII Effect of the Type Rezoning

t-value indicating either that rezoning did not have a significant impact on value (probably 3 and 8), or simply that the sample size was not large enough (probably 2). Rezoning exhibited a negative influence on Type 6, while in the remaining five types rezoning positively influenced property values but in varying degrees. Even Type 7, a rezoning from M-1 to RS-1, which might intuitively be considered a downzoning, showed a positive reaction to rezonings.

F. Relative Effect of Rezoning by Type

As a further indication of the specific effect of rezoning on type, a constant term (C, the Y intercept) determined simultaneously with B (the slope of the regression line), has been built into the model. The estimated coefficients of the independent variable, zoning, and of the constant term are additive so the specific impact of zoning as related to the constant may be calculated as in Table VIII. For the key to rezoning types, refer again to Table VI.


<table>
<thead>
<tr>
<th>Type</th>
<th>(1) Est. Co. Constant</th>
<th>(2) Est. Co. Zoning</th>
<th>(3) % Change (2/1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.7130</td>
<td>0.1017</td>
<td>3.75</td>
</tr>
<tr>
<td>2</td>
<td>2.8296</td>
<td>1.8093</td>
<td>63.94</td>
</tr>
<tr>
<td>3</td>
<td>2.8667</td>
<td>2.8266</td>
<td>98.60</td>
</tr>
<tr>
<td>4</td>
<td>2.4250</td>
<td>3.9299</td>
<td>162.06</td>
</tr>
<tr>
<td>5</td>
<td>3.1723</td>
<td>1.7758</td>
<td>55.98</td>
</tr>
<tr>
<td>6</td>
<td>5.1722</td>
<td>-2.2511</td>
<td>-53.52</td>
</tr>
<tr>
<td>7</td>
<td>2.9045</td>
<td>3.3469</td>
<td>115.23</td>
</tr>
<tr>
<td>8</td>
<td>2.5271</td>
<td>0.2228</td>
<td>8.82</td>
</tr>
<tr>
<td>9</td>
<td>2.6248</td>
<td>1.7993</td>
<td>68.55</td>
</tr>
</tbody>
</table>

Table VIII. Relative Importance of Rezoning by Type, 1965-1974

Column 1 - the impact of non-controlled factors on property value
Column 2 - the impact of rezoning on property value
Column 3 - the importance of rezoning relative to other factors influencing property values.

Table VIII very clearly shows the variation in the impact of rezoning by type. For example, in column 3, a value of 100% would indicate that rezoning played an equal part in influencing property values as did secular, non-controlled factors. The higher the value over 100%, the greater the effect of rezoning on that type relative to other factors influencing property values, but which were not controlled. Similarly, the lower the value under 100%, the less important was rezoning relative to other factors. The range varies from an average decrease of -53.5% for those properties in Type 6 to an average increase of 162% for those properties in Type 4. The influence of the type of rezoning on value is well demonstrated.

Over the 9 year period covered by the ratio of 1974 values to 1965 values, it is possible to determine, by applying the estimated
coefficients of the constant term and of the rezonings, the average rate of change of property values each year. The formula $A_{65} (1 + r)^9 = A_{74}$ will give the compound rate of assessed values in 1965 for 9 years at a level of $r\%$ (assumed to be constant). By subtracting the secular change in value as given by the constant from the average percentage change of the rezoned group for each type, the average absolute percentage change in value, resulting from rezonings, for each year over the 9 year period may be described. The results obtained are presented in Table IX and show no surprises, based upon the above data.

<table>
<thead>
<tr>
<th>Type</th>
<th>Constant (%)</th>
<th>Rezoned (%)</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.177</td>
<td>11.211</td>
<td>.4</td>
</tr>
<tr>
<td>2</td>
<td>12.3</td>
<td>18.6</td>
<td>6.3</td>
</tr>
<tr>
<td>3</td>
<td>12.4</td>
<td>21.3</td>
<td>8.9</td>
</tr>
<tr>
<td>4</td>
<td>10.4</td>
<td>22.8</td>
<td>12.4</td>
</tr>
<tr>
<td>5</td>
<td>13.7</td>
<td>19.4</td>
<td>5.7</td>
</tr>
<tr>
<td>6</td>
<td>20.0</td>
<td>12.6</td>
<td>-7.4</td>
</tr>
<tr>
<td>7</td>
<td>12.6</td>
<td>22.6</td>
<td>10.0</td>
</tr>
<tr>
<td>8</td>
<td>10.9</td>
<td>11.9</td>
<td>1.0</td>
</tr>
<tr>
<td>9</td>
<td>11.3</td>
<td>18.0</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Table IX. Average Yearly Percentage Change in Value, 1965-1974

Although rezoned properties in Type 6 showed an annual increase in value over the period 1965-1974 of 12.6%, properties in the control group for that type experienced a 20% increase in value over the same time period. Once again, Type 6 shows an average annual decrease in property values, in this instance, of 7.4% per year when compared to its constant. Type 4 again experiences the greatest positive change of 12.4%, with other types falling in between.
Essentially, Tables VIII and IX represent different ways of presenting the same data, therefore the cross-confirmation of results is not surprising. These two tables, in conjunction with Table VII, confirm the divergence in property values resulting from the effect of rezonings on different types of properties. Depending upon the type of rezoning, properties so affected will exhibit different growth rates in value. In terms of policy decisions, such results would imply a need for flexibility, since all property values do not respond in the same way to rezonings.

F. Conclusion

It was the purpose of this chapter to examine a crucial implication of the hypothesis, that rezonings do have an effect on property value. The statistical technique used for data analysis was regression analysis, the results from which were computed through UBC TSP (Time Series Processor) a prewritten, or "canned" computer program designed for such purposes. Three major points have been established: that market value is a good indicator of assessed value, that rezoning overall does have a significant impact on property values, and that the impact of rezoning can be expected to vary in accordance with the specific type of rezoning. This latter point perhaps the most significant, implies the need for flexible taxation policies in recognition of the varied responses in property values to different types of rezonings.
Chapter IV Footnotes


4. Ibid.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

Betterment is a complex subject which has varied in its specific practical application as often as its name has changed. Whatever the name: betterment levy, land value increment tax, development contribution, or redevelopment levy, the underlying principle is the same: that whenever social activities, of whatever form they may take, add value to property which is not attributable to the owner, that increase should accrue to society. In many cases the practicability of betterment has been questioned on the grounds that the recipient of value increases is not easily definable. This is especially true in the British case where development rights on a national scale were nationalized; the so-called "floating value" of development permission could occur anywhere.

With many types of infrastructure placement such as parks, rapid transit, freeways, etc. the question of the extent of any benefits arises. How is it possible to determine with any degree of certainty where benefits start and end? Rezonings are different in that the area to be immediately affected by the rezoning is clearly defined at the time of the application of rezoning. Adjacent properties often experience either favorable or unfavorable spillover effects depending upon the type of rezoning, but again, the uncertainty of delineating the extent of such effects arises. Since rezonings have been found to have a significant impact on property values, since the power to rezone is at the discretion of Council, and since rezoned areas are clearly defined, betterment appears to be best collected through the rezoning...
mechanism. Based upon the arguments for the collection of betterment in other countries, the principle is generally acceptable.

A. Summary of Empirical Analysis

Essentially, three major findings emerged from the empirical analysis:

1. there is a very close relationship between market values and assessed values in Vancouver,

2. zoning overall has a significant effect on property values, and

3. the type of rezoning has an even greater significant effect on property values.

Certain implications for policy decisions flow from these findings. The nature of the relationship between market values and assessed values indicates that in the determination of value increases, assessed values will be a useful tool for this purpose if the two year lag, in keeping with current assessment practices, is taken into consideration. This is not to say that a better system for determining value will not evolve, only that under current circumstances this lag is an important factor. The convenience of being able to use assessed values becomes a distinct advantage. It must be understood, however, that this relationship is an average; all assessed values do not necessarily closely correspond to market values, but on average this appears to be so.

Perhaps of more direct importance is the effect of the type of rezonings on property values, and the implications derived therefrom. Clearly property values will be affected by the type of rezoning, but
at different levels depending upon type. It is evident that for the collection of betterment, each type of rezoning must be considered on its own. No schedule of charges outlining the degree to which a property would be subject to the betterment levy, if betterment were to be collected differently for different types of rezoning, could be drawn up in advance. This point is clearly shown in the case of Type 7, a rezoning from M-1 (industrial) to RS-1 (residential), intuitively a downzoning, which showed a marked increase in property value. While this may or may not be a typical case, it does point out the need for the consideration of each case on its own as different economic conditions will reflect different zoning requirements. "The demand for land is a derived demand, and its price is determined by the prices of the goods and services it facilitates: not the other way round."1 "The basic point has been made that the behaviour of land prices has been a consequence, not a cause."2

B. Taxation Incidence

As outlined in Chapter II, an important point to consider is the incidence of the tax, just where does it fall?

"... the burden of a tax on a non-reproducible resource whose supply cannot be varied (e.g. land ) will fall on its owner...the owner must take the conditions of demand as given. He cannot shift the burden of the tax on to buyers or renters by raising price, since nothing will have happened to their circumstances to increase their ability to pay more. They will thus be prepared to buy or rent the pre-tax quantity of available land only at a pre-tax prices and rents."3

As Pennance points out, the above argument refers only to a fixed stock of land which is not the case for developable land. The higher the price offered, the more pressure is placed on public officials to release land for development through rezoning and, by and large, more
land is forthcoming. Land will be marketed if developers' bid prices outweigh the owners' preferences and expectations of the land in its current use. For land that requires rezoning before development may occur, a tax on property value increases could reduce the quantity supplied or raise the price level and choke off demand. The English experience in this regard, where, for a while, development value was being taxed at 100% and which eventually came to constitute a permanent addition to development costs, should not be forgotten. The degree of the price shift that would occur, a higher price for buyers or a lower price for sellers, would depend on the elasticity, or responsiveness, of demand and supply relative to price changes. This is a very real problem which must be taken into consideration.

The level of levy charges would appear to directly influence the above price shift, depending upon elasticities: if too lenient, there would probably be little impact, if too onerous, possibly a major influence on market decisions. In a study of residential developer behavior in the Vancouver area, Goldberg found that after proper zoning and access to trunk sewers (one would expect this factor to be of lesser importance in Vancouver city), land price and availability were considered next in importance by the developers. The implications of an onerous levy at once become apparent.

Several possibilities exist for setting the level of the levy: a flat percentage based upon the type of rezoning, a percentage levy above some "reasonable" return to the properties concerned, etc. However, because of the expected difficulty in setting out a schedule of charges, the levy, of whatever form it may take, may simply have to be negotiated beforehand with the developer. This case injects an
undesirable degree of uncertainty, for both the City and any potential developer, into the situation. Federal capital gains legislation which currently taxes 50% of increased property value realized upon sale (except for principal residences), must also be considered. The combination of the betterment levy and the capital gains tax could prove very onerous depending upon the timing of the levy. It should be pointed out that of all rezonings taking place between 1965 and 1972 (actual rezonings, not individual properties involved), 48.8% involved changes, in some combination, in RS-1 zonings, by far the largest group involved with rezonings.

C. Implementation Procedures

The possible uncertainty mentioned above could be softened somewhat if all betterment charges were known as soon as was practicably possible in the proceedings. In England, the 1967 Land Commission Act specified that "...a 'betterment' levy was to be imposed at a uniform rate on development value in land when realised either by transaction or by development." The levy is paid whenever development value is realised, although notification of any intention to begin development did not incur any liability, by the person receiving the value. It was charged only once on any one specific development. All increases in the current use value of land were ignored.

In Johannesburg, South Africa, as mentioned, the development contribution was charged against 50% of the increase in value arising from rezoning. Valuation was done in two stages: on the day immediately prior to the rezoning day and again on the actual day of the rezoning being approved. Payment could be deferred but had to be made before any transfer of land could be registered, before any
building plan is approved, or before any property can be used in any manner which, before the rezoning, would have contravened existing zoning. A mechanism of appeal for aggrieved owners is also provided. Under this system development charges would be known well in advance of development, depending upon the timing of the development.

Closer to home, an earlier study was carried out to outline some of the implications of imposing a redevelopment levy in the City of Vancouver in which implementation procedures were considered:

"In Vancouver, B.C. for example, the basic sequence of development approval begins with rezoning (when necessary), then proceeds to the development permit and finally the building permit stage. As the developers and the proposed density are known at the time of development permit application, it would be most appropriate to impose the levy at this stage, as a condition of approval. Imposition of the levy at the time of rezoning would be unworkable because:

a. the developer and proposed density may not be known.

b. Rezoning often involves a large number of property owners who have no intention of developing their property to a higher density."^6

This approach follows somewhat those of both England and South Africa in that the levy basically applies to realised value which would allay some of the fears expressed earlier in the proposed Hawaiian legislation in which it was felt that developers would reduce their efforts to obtain rezonings ahead of time resulting in a smaller supply of more expensive land. In terms of knowledge of the actual development to be undertaken and in early timing, based upon local conditions, this seems a logical approach.

The implementation of the betterment levy at the development permit stage concentrates on development and neglects the possibility of a sale occurring after rezoning but before development, sales which
could take advantage of inflated prices based upon the rezoning. In effect, a developer could pay betterment twice: an inflated sale price and the levy upon development. Following somewhat the British example, the levy could be imposed at the time of sale or at the development permit stage, whichever came first after rezoning. In this way, betterment would be imposed only once per rezoning, a more equitable solution.

D. Compensation

Compensation for loss of property value because of downzoning or because of a refusal to rezone is bound to be a contentious issue. It was earlier suggested that compensation is the theoretical inverse of betterment; that if unearned gains are passed to the community a balance should be created whereby land injuriously affected (reduced in value) by local actions should be compensated. It was also suggested that downzonings "in the public interest", similar in concept to the English "good neighborliness" rule for lack of compensation payments, would not result in compensatory payment. However, a case could be made to the effect that all rezonings, to a higher or lesser use, should only be undertaken if they are indeed "in the public interest," whatever that implies.

Currently the Vancouver Charter under Section 569 specifically exempts the City from making any payments of compensation for property injuriously affected because of rezonings of any sort. However, the City is not collecting betterment charges as such and were it doing so, for equitable purposes, the wording of this section could change. If land were expropriated by the community, it would clearly be inequitable not to pay compensation for a total loss of property rights,
but the application of compensation to betterment is less clear. It cannot be argued that individuals currently have complete freedom for the use of their land; community influences through zoning by-laws and other ordinances effectively restrict the use of land and yet compensation is not paid in this case. Therein lies the paradox of the situation:

"...that despite the strong rights of the community in privately owned land, the individual owner's sense of property and its rights is more strongly developed in real estate than anything else. He therefore expects full compensation for the infringement of such established rights, although if the same man were operating as a second-hand car dealer he would not demand compensation for the loss on his stock due to the overnight reduction in the purchase tax on new vehicles;..."\(^7\)

The same point could be made regarding landlords operating under rent control. Landlords claim that rent levels do not allow an adequate return after expenses and yet, even if it were shown to be true, the question of compensation does not arise (the same is true in England).

Federal capital gains legislation allows a portion of capital losses to be deducted from income, not an unreasonable parallel to the case at hand and yet the two concepts are not actually comparable. Capital gains and losses for federal tax purposes have already been realized; they are a fact. While rezonings to a higher use tend to increase land values, downzonings or refusal of rezoning permission may involve losses which are only hypothetical, based on what the property "would" have sold for under different circumstances. Compensation cannot be based upon hypothetical assumptions. If rezonings can be shown to be completely deleterious, providing a distinct hardship which cannot be remedied through other legal channels (eg. nuisance),
then certainly a claim for compensation would be valid. Again it appears that claims for compensation would depend upon the specific case. Certainly some mechanism for review and appeal of rezonings as applied to possible claims for compensation should be provided in any legislation.

E. Legal and Administrative Application

At present, the imposition of a betterment levy in the City of Vancouver is illegal and it tends to violate certain legal maxims. Municipalities must be impartial in the exercising of legislative powers and cannot discriminate against or show favoritism toward different classes of citizens. In this sense the betterment levy discriminates against those carrying out development and ignores value enhancement in other properties, even though the question was raised as to how the extent of civic activities can be measured. It is also understood that councils cannot fetter, or diminish, the legislative power of future councils by bargaining away their discretion to make law (often called the "you can't sell zoning" maxim). An example of such a case would be a contract to change the zoning of an area for some benefits which would result in the future. Betterment need not be paid in cash but could take the form of payment "in kind" through the provision of public services by the developer over a period of years as the development progressed, as a condition of future required rezonings. Development permits in comprehensive development zones, outlining all required restrictions, operate in a similar manner. Furthermore, a council is not meant to apply its legislative authority to judge each case on its own merits. If this were so, the principle of ascertainability, the certainty with which legislation should be made, would be
violated. The expected difficulty in providing a schedule of betterment charges would appear to violate this principle.

The exception to the above conditions occurs if the relevant enabling legislation so allows. For the City of Vancouver, the enabling legislation is found in the Vancouver Charter which would probably require substantial amendments. The betterment levy is an indirect form of taxation, not specifically related to current zoning provisions. Although affected upon rezoning, it in itself is not based upon the same principles as zoning and, as such, could require a new section in the Charter. The development permit or land use contract may prove a viable means for the collection of betterment, and, because of legislative precedents in B.C., may be, legally, a more palatable method than outright taxation. It is recommended that an in-depth legal examination of the betterment levy, in all its complexity, be forthcoming.

As the Goldberg study found, the number of agencies that must be contacted by developers in order to gain approval for developments (in this case, residential) was a major source of difficulty. It would therefore seem expedient to incorporate betterment legislation into the existing departmental structure. While the department most closely related to the collection of betterment might be Permits and Licences, at least in terms of timing, administrative problems are bound to be complex, the final decision depending upon the City Manager. It is perhaps a fitting conclusion to quote the Uthwatt Committee, possibly the most prestigious group to study the implications of betterment:

"...the fairness of the principal of betterment commands general acceptance. It is in its practical application that difficulties arise."
F. Limitations of the Study

Any study representing essentially an analysis done at one point in time suffers from limitations. Property values are the result of the complex interaction of a number of variables which do not remain static. As a result, the effects of rezonings upon property values reflect only the conditions throughout the duration of the study, 1965-1974, and for the specific areas in which the studies rezonings took place. It is conceivable that similar rezonings in different areas of the city could exhibit different results, further supporting the need to study each rezoning individually.

Lack of data in many instances restricted the extent of the study, although the nine types studied did represent the majority of the rezonings, by properties involved, at that time. In utilizing data based upon a ratio of 1974 values to 1965 values, possible variations within that time period are excluded. However, in so doing, artificial legislative limitations on assessed values, especially for 1967 which had no general role, are also excluded to the benefit of the study. Because of the time horizon required for statistical analysis, many recent large-scale rezonings had to be excluded which again may limit the overall effect of the study simply because of the scale involved.

For those rezonings which showed little significance upon analysis, it is impossible to say exactly why, although based upon the sample size it is possible to surmise which reason, sample size or lack of zoning significance, is more likely. The changing nature of property values and economic conditions renders future predictions as to the effects of rezonings an uncertain task. Nevertheless, the study does provide some insight into the current effects of zoning on property values.
G. Summary of Findings and Recommendations

1. Although deviations from the mean occur, on average, there is a good relationship between market values and assessed values.

2. Overall, rezonings have a significant effect on property value.

3. The impact of the type of rezoning on property value varies with each type.

4. At any point in time, a schedule of charges could apply for the collection of betterment, but over time it is doubtful such a schedule would apply. As a result, the effect of each rezoning type upon value would have to be considered on its own to reflect current economic, social, and political conditions.

5. Implementation should occur as early as possible in the development stage but to avoid double payment, payment should probably be made at the development permit stage or upon sale, whichever came first after rezoning.

6. Betterment should be collected only once per rezoning.

7. A mechanism for appeal and review of rezonings as applied to possible claims for compensation should be included in any legislation.

8. CD-1 zoning, or equivalent development permit or land use contract legislation, should not be overlooked as a means for the collection of betterment.

9. A study should be made of the legal implications as applied to the implementation of betterment.

10. Betterment legislation should be incorporated into the existing departmental structure.
Chapter V Footnotes

1. Pennance pp. 41-42.


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B. Monographs


C. Periodicals


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F. Unpublished Material


APPENDIXES
APPENDIX TO CHAPTER I

Wendt's Theoretical Model of Urban Land Value

\[ V = \frac{\text{Average future expected aggregate net annual urban land rent}}{\text{Capitalization rate}} \]

\[ V = \frac{R_x - C_x}{\text{Capitalization rate}} \]

\[ R_x = f_x(P, Y, Pu, S, PI), \text{ where} \]

\[ X = \text{investors' expectations} \]
\[ p = \text{population} \]
\[ y = \text{average amount of income spent for urban services} \]
\[ Pu = \text{competitive pull of the urban area} \]
\[ S = \text{supply of competitive urban land} \]
\[ PI = \text{prospective investment in public improvements} \]

\[ C_x = \text{sum of } x(T + O_c + iim + Dim), \text{ where} \]

\[ T = \text{sum of all local property taxes} \]
\[ O_c = \text{operating costs} \]
\[ iim = \text{interest on capital invested in present and future improvements} \]
\[ Dim = \text{depreciation allowances on present and future improvements} \]

\[ \text{Cap Rate} = f_x(i, R, C_g), \text{ where} \]

\[ i = \text{interest rates} \]
\[ R = \text{allowances for expected risks} \]
\[ C_g = \text{expectations concerning capital gains} \]

\[ V = \frac{f_x(P, Y, S, Pu, PI) - \sum x(T + O_c + iim + Dim)}{f_x(i, R, C_g)} \]
APPENDIX TO CHAPTER IV

A. Hypothesis Testing by Regression Analysis

The actual regression model is \( Y/X = A + BX + u \), where \( u \) is a disturbance term, with the traditional assumption \( E(u) = 0 \); or, taking expectation \( E(Y/X) = E(A + BX + u) = E(A) + E(BX) + E(u) = A + BX \)

Since \( Y/X = A + BX + u \)
\( E(Y/X) = A + BX \), then

\( E(Y/X) \) which is the overall mean is a point on the regression line.

\[ Y = A + BX \]

\( A_{74}/A_{65} = A + B \) (Zoned), where,

\( A_{74}/A_{65} \) is a ratio of the 1974 land value to the 1965 land value

The hypothesis typically tested is the null hypothesis:

\[ H_0 : B = 0 \]

that is, zoning has no effect on property value, which is tested against the alternative,

\[ H_1 : B \neq 0 \]

The distribution of the t-statistic is given as follows:
If an observed value falls within ± 1.96 standard deviations, the null hypothesis that rezonings have no effect on property value will be accepted as being correct 95% of the time, the probability of its being incorrect only .05. Any observed t-value falling in the rejection range, above 1.96 standard deviations or below −1.96 standard deviations, results in rejection of the null hypothesis. For example, in the case of the overall effects of rezoning on property values, the observed t-statistic, 10.7543, is greater than the critical t-value ($t_{n-1}, .95$) of 1.960 thereby rejecting the null hypothesis that zoning has no effect on property values overall.
B. The Dummy Variable

With both the overall effects of rezoning and the specific effect of the type of rezoning, that which is being studied is a total mean of 529 properties in the first case and 9 different means in the second case, which is then applied to the regression equation $A74A65 = A + BX$

$A$ is a term common to both rezoned and non-rezoned groups

$X$ will be either 1 or 0 depending upon whether the property is rezoned or unrezoned

Regression tests whether the estimated mean of $A74A65$ is significantly different from the common factor $A$.

$$A(A74A65) = A + BX$$

$$U_1 = A + B(0) = A$$

$$U_2 = A + B(1) = A + B$$

The $t$-statistic, based upon the number of observations, will indicate whether or not the $B$ term of the rezoned group is significantly different from 0,

that is, whether rezoning is or is not a significant factor.
C. Analysis of Variance (ANOVA)

Analysis of variance is a statistical technique which is used in this case to test the results obtained through regression analysis. Essentially, ANOVA performs a simultaneous comparison of means, requiring the breakdown of the overall zoning effects and the various types of rezonings into their component parts, rezoned and non-rezoned properties.

<table>
<thead>
<tr>
<th>Type</th>
<th>Mean</th>
<th>Standard Deviation</th>
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</thead>
<tbody>
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<td>Overall-control</td>
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</table>

By applying first the formula $SD = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$ the overall standard deviation is found, where: $s_1^2$ = standard deviation for rezoned group

$s_2^2$ = standard deviation for control group
\( n_1 = \) population of rezoned group

\( n_2 = \) population of control group

It is then possible to find the observed t-statistic by applying the formula

\[
\frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}
\]

where,

\( \bar{X}_1 = \) the mean of the rezoned group

\( \bar{X}_2 = \) the mean of the control group

\( S = \) the predetermined standard deviation

As with regression analysis, if the significance of the difference between \( \bar{X}_1 - \bar{X}_2 \) will be given by the t-statistic. For comparison purposes, the two methods are presented side-by-side, and it will be noted that in each case, ANOVA confirms the regression findings.

| ANOVA |  |  | REgression |  |
|-------|  |  | t-stat.    |  |
| Type  | \( \frac{t_{n-1}}{\text{sum}} + \text{n}-2 \) | \( t_{n-1} + \text{.95} \) | \( t_{n-1} \) |  |
| Overall | 10.8378 | 1.960 | 10.7543 | 1.960 |
| 1 | 9.9014 | 1.960 | 9.9012 | 1.960 |
| 2 | 1.0244 | 2.228 | 1.0244 | 2.201 |
| 3 | 1.9954 | 2.101 | 1.9955 | 2.093 |
| 4 | 5.3005 | 2.074 | 5.7859 | 2.069 |
| 5 | 2.8798 | 2.120 | 3.2256 | 2.093 |
| 6 | -4.8905 | 2.131 | -6.9366 | 2.145 |
| 7 | 6.9059 | 1.960 | 6.9927 | 1.960 |
| 8 | 1.6408 | 2.042 | 1.6701 | 2.021 |
| 9 | 17.9037 | 1.960 | 17.7669 | 1.960 |

Comparison of Results Obtained by ANOVA and REGRESSION
D. Combined Effects of Type and Zoning

If all 529 properties were subjected to analysis by binary code (0 and 1) not only as to rezoning but also as to type, the problem of sample size would not occur because of the number of properties involved. Each type would experience four different options. For example, Type 1:

<table>
<thead>
<tr>
<th>Type 1 or not</th>
<th>Rezoned or not</th>
<th>Combination (multiplicative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1 Type 1, rezoned</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0 Type 1, not rezoned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 Not Type 1, rezoned</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 Not Type 1, not rezoned</td>
</tr>
</tbody>
</table>

This analysis would apply the same way to each in turn (because of statistical requirements, one type, Type 6, was dropped from this analysis). As evidenced by the accompanying table, all results are significant. "Type" again signifies the possibility of being in one of the rezoning classifications while "ZONTYP" refers to the combined effect of rezoning on specific type.
<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLE</th>
<th>ESTIMATED COEFFICIENT</th>
<th>STANDARD ERROR</th>
<th>T-STATISTIC</th>
<th>MEAN OF VARIABLE</th>
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<tr>
<td>TYPE3</td>
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**F-STATIST:** 0.5256

**LURRIN-WATSON STATISTIC (ADJ. FOR 6 DEGFS) = 1.3220**

**NUMBER OF OBSERVATIONS = 529**

**SUM OF SQUARED FESICLALS = 625.371**

**STANDARD ERROR OF THE REGRESSION = 1.08843**
Appendix to Chapter 1V

E. Pertinent Zoning Regulations - Excerpts from Zoning and Development By-Law No. 3575

(RS-1) ONE-FAMILY DWELLING DISTRICT SCHEDULE:

1. Uses permitted and regulations:
Subject to all the provisions of this by-law on any site within any district defined, designated or described in this by-law as an (RS-1) District the only uses permitted and the only uses for which development permits may be issued are those contained in Sections 1 and 2 hereof.

A. Uses:
   (1) One-family dwelling.
   (2) The keeping of not more than two boarders or lodgers or not more than five foster or day-care children in a dwelling unit.
   (3) A building or use customarily accessory to the above uses (except for another dwelling unit) provided that:
      (a) All accessory buildings are located in the rear yard and in no case are less than five feet from a flanking street subject also to the provisions of Section 11 (1) of this By-law.
      (b) The total accessory buildings do not occupy an area greater than 25 percent of the minimum rear yard prescribed in this schedule, or 460 square feet, whichever is the greater.
      (c) No accessory building shall exceed one storey or 10 feet in height.
      (d) Not more than two-thirds of the width of the rear yard of any lot shall be occupied by accessory buildings.
      (e) No accessory building shall be closer than 12 feet to any dwelling on the property.

B. Height.
The height of a building shall not exceed 35 feet nor 2½ storeys.

C. Front Yard:
   (1) A front yard shall be provided having a depth of not less than twenty-four (24) feet.
   (2) In the case of a site having an average depth of less than one hundred and twenty (120) feet the front yard may be reduced in accordance with Section 11 (1B) of this by-law.

D. Side Yards:
   (1) A side yard of not less than 10 percent of the width of the site shall be provided on each side of the building; provided that the maximum width of such side yard need not exceed five feet.
   (2) In the case of a corner site at the rear of which, whether a
lane intervenes or not, is a site fronting on a street which flanks such corner site, the minimum width of the side yard on the corner site along the flanking street shall be in accordance with the provisions of Section 11(1) of this By-law.

E. Rear Yard:
(1) A rear yard shall be provided, the minimum depth of which shall be not less than thirty-five (35) feet.
(2) In the case of a site having an average depth of less than one hundred and twenty (120) feet the rear yard may be reduced in accordance with Section 11 (1B) of this By-law.
Provided always that where the rear of a site abuts a lane, the depth of the rear yard may be decreased by the width of that portion of the lane lying between the rear of the site and the ultimate centre line of the lane. (21/6/62—*3995)

F. Site Area:
A site either for a new one-family dwelling or the relocation of an existing one-family dwelling shall have an area of not less than 4,800 square feet, except in the case of a lot of lesser area, on record in the Land Registry Office for the Vancouver Land Registration District.

G. Floor Space Ratio:
The floor space ratio shall in no case exceed 0.45.
For the purposes of this schedule, in computing the floor space ratio the floor area of the building shall include the total area of all the floors of all the buildings on the site, including accessory buildings (measured to the extreme outer limits of the building), except for areas of floors used for parking purposes and areas of cellars or basements which are not used as habitable accommodation or access to habitable accommodation. (4/7/61—*3926)

H. Off-street Parking Spaces:
Off-street parking spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 12 of this By-law.

J. Off-street Loading Spaces:
Loading and unloading spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 13 of this By-law.

K. Advertisements:
Advertisements, bulletin boards, or identification signs are not permitted in the (RS-1) District except as provided for in Section 10(21) of this By-law.

2. Uses which may be permitted subject to special approval by the Technical Planning Board:
With the approval of the Technical Planning Board development permits may be issued for the following uses. If the development
permit is granted it shall be subject to such conditions and regulations as the Technical Planning Board may decide. (18/12/62—*4031)

A. Uses (Group A):

(1) A dwelling which has been continuously used and occupied as a boarding house or rooming house since a date prior to June 18, 1956, and which use was installed with or without one or more of the required City Permits may be granted a development permit limited in time.

(2) A dwelling unit or a housekeeping unit which has been continuously used and occupied as such since a date prior to June 18, 1956, and which was installed with or without one or more of the required City permits may be granted a development permit limited in time. (8/11/60—*3884)

(3) School (public or private) kindergarten, day-care school, creche or day nursery.

(4) Park or playground.

(5) Golf course.

(6) Truck garden, nursery, or greenhouse for propagating and cultivating.

(7) Tourist court subject to the provisions of Section 11(5) of this By-law.

(8) The deposit or extraction of material so as to alter the configuration of the land.

(9) Home craft or occupation provided that there is nothing to indicate from the exterior that the building is being utilized for any purpose other than that of a dwelling; that there is no commodity sold upon the premises and that no person other than one member of the immediate family residing there is engaged in such craft or occupation on the premises.

(9a) Marina (excluding boat building and major repairs to and overhaul of boats). (31/7/73—*4713)

(10) Parking area (public) ancillary to a principal use on an adjacent site.

(11) Buildings or uses customarily accessory to the above uses and accessory buildings or uses to dwellings other than those provided for in Section 1 of this Schedule.

B. Uses (Group B) which may only be granted by the Technical Planning Board after consultation with the Vancouver City Planning Commission.

(1) Stadium or similar place of assembly.

(1A) Aircraft landing place. (15/9/64—*4125)

(2) Community centre.

(3) Church, subject to the provisions of Section 11(7) of this By-law.

(4) A new building specifically designed for a Hospital or Personal Care Home, excluding a mental hospital or hospital for the
treatment of animals, subject to the provisions of Section 11 (15) of this by-law. (7/11/63—*4077)

(5) Institution of a religious, philanthropic, or charitable character.

(6) Public utility.

(7) Building or use essential in this district required by a public authority.

(8) Building or use customarily accessory to the above uses.

(9) Local area activity centre. (2/4/74—*4763)
(RS-2) ONE-FAMILY DWELLING DISTRICT SCHEDULE

1. Uses Permitted and Regulations:
Subject to all the provisions of this by-law on any site within any district defined, designated or described in this by-law as an (RS-2) District the only uses permitted and the only uses for which development permits may be issued are those contained in Sections 1 and 2 hereof. (18/12/62—*4031)

A. Uses:
(1) One-family dwelling.
(2) The keeping of not more than two boarders or lodgers or not more than five foster or day-care children in a dwelling unit. (22/3/66—*4234)
(3) A building or use customarily accessory to the above uses (except for another dwelling unit) provided that:
(a) all accessory buildings are located in the rear yard and in no case are less than five feet from a flanking street subject also to the provisions of Section 11(1) of this By-law;
(b) the total accessory buildings do not occupy an area greater than 25 percent of the minimum rear yard prescribed in this schedule, or 460 square feet, whichever is the greater.
(c) no accessory building shall exceed one storey or 10 feet in height.
(d) not more than two-thirds of the width of the rear yard of any lot shall be occupied by accessory buildings.
(e) no accessory building shall be closer than 12 feet to any dwelling on the property. (13/8/57—*3649)

B. Height:
The height of a building shall not exceed 35 feet or 2½ storeys.

C. Front Yard:
(1) A front yard shall be provided having a depth of not less than twenty-four (24) feet.
(2) In the case of a site having an average depth of less than one hundred and twenty (120) feet the front yard may be reduced in accordance with Section 11 (1B) of this by-law. (21/6/62—*3995)

D. Side Yards:
(1) A side yard of not less than 10 percent of the width of the site shall be provided on each side of the building; provided that the maximum width of such side yard need not exceed five feet.
(2) In the case of a corner site at the rear of which, whether a lane intervenes or not, is a site fronting on a street which flanks such corner site, the minimum width of the side yard...
on the corner site along the flanking street shall be in accordance with the provisions of Section 11(1) of this By-law.

**E. Rear Yard:**

(1) A rear yard shall be provided, the minimum depth of which shall be not less than thirty-five (35) feet.

(2) In the case of a site having an average depth of less than one hundred and twenty (120) feet the rear yard may be reduced in accordance with Section 11 (1B) of this by-law. (21/6/62—*3995)

Provided always that where the rear of a site abuts a lane, the depth of the rear yard may be decreased by the width of that portion of the lane lying between the rear of the site and the ultimate centre line of the lane.

**F. Site Area:**

A site either for a new one-family dwelling or the relocation of an existing one-family dwelling shall have an area of not less than 4,800 square feet, except in the case of a lot of lesser area, on record in the Land Registry Office for the Vancouver Land Registration District.

**G. Floor Space Ratio:**

The floor space ratio shall in no case exceed 0.45.

For the purposes of this schedule, in computing the floor space ratio the floor area of the building shall include the total area of all the floors of all the buildings on the site, including accessory buildings (measured to the extreme outer limits of the building), except for areas of floors used for parking purposes and areas of cellars or basements which are not used as habitable accommodation or access to habitable accommodation. (4/7/61—*3926)

**H. Off-street Parking Spaces:**

Off-street parking spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 12 of this By-law.

**J. Off-street Loading Spaces:**

Loading and unloading spaces shall be provided and maintained as required by and in accordance with the provisions of Section 13 of this By-law.

**K. Advertisements:**

Advertisements, bulletin boards, or identification signs are not permitted in the (RS-2) district except as provided in Section 10(21) of this By-law.

2. Uses which may be permitted subject to special approval by the Technical Planning Board:

With the approval of the Technical Planning Board development permits may be issued for the following uses. If the development permit is granted it shall be subject to such conditions and regulations as the Technical Planning Board may decide. (18/12/62—*4031)
A. Uses (Group A):

(1) The conversion of an existing building into dwelling units or housekeeping or sleeping units in any case where such existing building, by reason of its age and size, is deemed to be unsuitable for its present use; in the granting of a development permit the Technical Planning Board shall have regard to the regulations for the (RM-1) and (RM-2) schedules and also to the amenity of the neighbourhood, and shall notify such adjoining property owners as the said Board deem necessary.

(1A) A two-family dwelling on a site not less than 7,200 square feet in area, subject to the (RT-2) Two-Family Dwelling District regulations and subject to notification of such adjoining property owners as the Technical Planning Board deems necessary. (24/3/70—*4487)

(1B) Town houses and apartment buildings subject to the (RM-1) Multiple Dwelling District regulations, and subject to notification of such adjoining property owners as the Technical Planning Board deems necessary. (24/3/70—*4487)

(2) A dwelling unit or housekeeping or sleeping unit other than one granted a development permit in accordance with clause (1) above which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits may be granted a development permit limited in time; before granting a development permit for such conversion the Technical Planning Board shall notify such adjoining property owners as the said Board deem necessary.

(3) The conversion of an existing building into a boarding or rooming house in any case where such existing building, by reason of its age and size is deemed to be unsuitable for its present use; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of the RM schedules and also to the amenity of the neighbourhood, and shall notify such adjoining property owners as the said Board deem necessary.

(4) A dwelling which has been altered or used for a boarding or rooming house, other than one granted a development permit in accordance with clause (3) above, which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits, may be granted a development permit limited in time; before granting a development permit for such conversion the Technical Planning Board shall notify such adjoining property owners as the Board deem necessary.

(5) School (public or private) subject to the provisions of Section 11 (7A), and kindergarten, day-care school, creche or day nursery.

(6) Park or playground.

(7) Golf course.

(8) Truck gardens, nurseries, and greenhouses for propagating
and cultivating.

(9) Tourist courts subject to the provisions of Section 11(5) of this By-law.

(10) The deposit or extraction of material so as to alter the configuration of the land.

(11) Home craft or occupation provided that there is nothing to indicate from the exterior that the building is being utilized for any purpose other than that of a dwelling; that there is no commodity sold upon the premises and that no person other than one member of the immediate family residing there is engaged in such craft or occupation on the premises.

(12) Parking area (public) ancillary to a principal use on an adjacent site.

(13) Buildings or uses customarily accessory to the above uses and accessory buildings or uses to dwellings other than those provided for in Section 1 of this schedule.

B. Uses (Group B) which may only be granted by the Technical Planning Board after consultation with the Vancouver City Planning Commission:

(1) Stadium or similar place of assembly.

(2) Community centre.

(3) Church, subject to the provisions of Section 11(7) of this By-law.

(4) A new building specifically designed for a Hospital or Personal Care Home, excluding a mental hospital or hospital for the treatment of animals, subject to the provisions of Section 11 (15) of this by-law. (7/11/63—*4077)

(4A) The conversion of an existing building into a Hospital or Personal Care Home, excluding a mental hospital or hospital for the treatment of animals; before granting the development permit for such conversion, the Technical Planning Board shall be satisfied that the existing building is suitable for such use, having particular regard to the size of the site and building, open spaces on the site, proximity of adjacent buildings, and the amenity of the neighbourhood and shall notify adjacent property owners. (7/11/63—*4077)

(5) Institution of a religious, philanthropic, or charitable character.

(6) Public utility.

(7) Building or use essential in this district required by a public authority.

(8) Building or use customarily accessory to the above uses.

(9) Local area activity centre. (2/4/74—*4763)
1. Uses Permitted and Regulations:
Subject to all the provisions of this by-law on any site within any district defined, designated or described in this by-law as an (RT-2) District the only uses permitted, and the only uses for which development permits may be issued are those contained in Sections 1 and 2 hereto.

A. Uses:
(1) One-family dwelling subject to the same regulation as required in the (RS-1) schedule.
(2) Two-family duplex dwelling.
(3) Two-family semi-detached dwelling on sites of not less than 49 feet frontage.
(4) The keeping of not more than two boarders or lodgers or not more than five foster or day-care children in each dwelling unit. (22/3/66—*4234)
(5) A building or use customarily accessory to the above uses (except for another dwelling unit) provided that:
(a) all accessory buildings are located in the rear yard and in no case are less than five feet from a flanking street subject also to the provisions of Section 11(1) of this by-law;
(b) the total accessory buildings do not occupy an area greater than 25 percent of the minimum rear yard prescribed in this schedule, or 460 square feet, whichever is the greater;
(c) no accessory building shall exceed one storey or 10 feet in height;
(d) not more than two-thirds of the width of the rear yard of any lot shall be occupied by accessory buildings;
(e) no accessory building shall be closer than 12 feet to any dwelling on the property.

B. Height:
The height of a building shall not exceed two storeys plus a cellar or one storey plus a basement.

C. Front Yard:
(1) A front yard shall be provided having a depth of not less than twenty-four (24) feet.
(2) In the case of a site having an average depth of less than one hundred and twenty (120) feet the front yard may be reduced in accordance with Section 11(1B) of this by-law.

D. Side Yards:
(1) A side yard of not less than 10 percent of the width of the site shall be provided on each side of the building; provided
that the maximum width of such side yard need not exceed five feet.

(2) In the case of a corner site at the rear of which, whether a lane intervenes or not, is a site fronting on a street which flanks such corner site, the minimum width of the side yard on the corner site along the flanking street shall be in accordance with the provisions of Section 11(1) of this by-law.

E. Rear Yard:
(1) A rear yard shall be provided, the minimum depth of which shall be not less than thirty-five (35) feet.

(2) In the case of a site having an average depth of less than one hundred and twenty (120) feet the rear yard may be reduced in accordance with Section 11(1B) of this by-law.

Provided always that where the rear of a site abuts a lane, the depth of the rear yard may be decreased by the width of that portion of the lane lying between the rear of the site and the ultimate centre line of the lane.

F. Site Area:
A site for a new two-family dwelling or the relocation of an existing two-family dwelling shall have an area of not less than 4,800 square feet, except in the case of a lot of not less than 3,800 square feet, on record in the Land Registry Office for the Vancouver Land Registration District prior to September 7th, 1965.

G. Floor Space Ratio:
The maximum floor space ratio shall in no case exceed 0.45. In computing the floor space ratio, all floors, whether earth floors or otherwise (with ceilings of more than 4 feet in height) of all buildings shall be included, both above and below ground (measured to the extreme outer limits of the buildings) except for parking areas the floor of which is at or below the highest point of the finished grade around the building. For the purpose of this section the gross cross-sectional areas of stairways, fire escapes, elevator shafts, chimneys and any other services which, in the opinion of the Director of Planning, are similar to the foregoing, shall be included as floor area at each floor at which they are located; balconies, canopies, sundecks and any other appurtenances which, in the opinion of the Director of Planning, are similar to the foregoing, may be excluded from floor area measurement provided the total floor area of all such excluded items does not exceed 8 percent of the permitted floor area.

Patios and roof gardens also may be excluded from floor area measurement provided that any sunroofs or walls forming part thereof are approved by the Director of Planning.

H. Off-Street Parking Spaces:
Off-street parking spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 12 of
J. Off-Street Loading Spaces:
Loading and unloading spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 13 of this by-law.

K. Advertisements:
Advertisements, bulletin boards, or identification signs are not permitted in the (RT-2) District except as provided in Section 10(21) of this by-law.

2. Uses which may be permitted subject to special approval by the Technical Planning Board:
With the approval of the Technical Planning Board development permits may be issued for the following uses. If the development permit is granted it shall be subject to such conditions and regulations as the Technical Planning Board may decide.

A. Uses (Group A)
(1) Group Houses subject to the provisions of Section 11(6) of this by-law.

(2) Town houses and apartment buildings subject to the (RM-1) Multiple Dwelling District regulations and subject to notification of such adjoining property owners as the Technical Planning Board deems necessary. (24/3/70—*4487)

(3) The conversion of an existing building into dwelling units or housekeeping or sleeping units in any case where such existing building by reason of its age and size is deemed to be unsuitable for its present use; before granting a development permit the Technical Planning Board shall have regard to the regulations for the multiple dwelling districts and also to the amenity of the neighbourhood.

(4) A dwelling unit or housekeeping or sleeping unit other than one granted a development permit in accordance with clause (3) above which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits may be granted a development permit limited in time.

(5) A new boarding or rooming house not more than two storeys nor 30 feet in height on a site not less than 7,200 square feet in area, and subject to the provisions of subsections F. and G. of Section 1 of the (RM-1) District schedule. The Technical Planning Board shall notify such adjoining property owners as the said Board deems necessary.

(5A) The conversion of an existing building into a boarding or rooming house in any case where such existing building, by reason of its age or size, is deemed to be unsuitable for its present use. Before granting a development permit for such conversion the Technical Planning Board shall have regard to
the regulations of the RM Schedules and also to the amenity of the neighbourhood, and shall notify such adjoining property owners as the said Board deems necessary.

(6) A building which has been altered or used for a boarding or rooming house, other than one granted a development permit in accordance with clause (5) above, which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits may be granted a development permit limited in time.

(7) A new fraternity or sorority house not more than two storeys nor 30 feet in height on a site not less than 7,200 square feet in area, and subject to the provisions of subsections F. and G. of Section 1 of the (RM-1) District Schedule. The Technical Planning Board shall notify such adjoining property owners as the Board deems necessary.

(7A) The conversion of an existing building into a fraternity or sorority house in any case where such existing building, by reason of its age or size, is deemed to be unsuitable for its present use. Before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of the RM Schedules and also to the amenity of the neighbourhood, and shall notify such adjoining property owners as the said Board deems necessary.

(8) School (public or private) subject to the provisions of Section 11 (7A), and kindergarten, day-care school, creche, or day nursery.

(9) Park or playground.

(10) Golf Course.

(11) Truck gardens, nurseries, and greenhouses, for propagating and cultivating.

(12) Tourist court subject to the provisions of Section 11(5) of this by-law.

(13) The deposit or extraction of material so as to alter the configuration of the land.

(14) Homecraft or occupation provided that there is nothing to indicate from the exterior that the building is being utilized for any purpose other than that of a dwelling; that there is no commodity sold upon the premises and that no person other than one member of the immediate family residing there is engaged in such craft or occupation on the premises.

(15) Parking area (public) ancillary to a principal use on an adjacent site.

(16) Club or Lodge (fraternal) provided that no commercial activities are carried on.

(17) Buildings or uses customarily accessory to the above uses and accessory buildings or uses to dwellings other than those provided for in Section 1 of this schedule.
B. USES (Group B) which may only be granted by the Technical Planning Board after consultation with the Vancouver City Planning Commission:

(1) Stadium or similar place of assembly.
(2) Aircraft landing place.
(3) Community centre.
(4) Church, subject to the provisions of Section 11(7) of this by-law.
(5) A new building specifically designed for a Hospital or Personal Care Home, excluding a mental hospital or hospital for the treatment of animals, subject to the provisions of Section 11(15) of this by-law.
(6) The conversion of an existing building into a Hospital or Personal Care Home, excluding a mental hospital or hospital for the treatment of animals; before granting a development permit for such conversions, the Technical Planning Board shall be satisfied that the existing building is suitable for such use, having particular regard to the size of the site and building, open spaces on the site, proximity of adjacent buildings and the amenity of the neighbourhood, and shall notify adjacent property owners.
(7) Institution of a religious, philanthropic, or charitable character.
(8) Public utility.
(9) Building or use essential in this district required by a public authority.
(10) Building or use, customarily accessory to the above uses.
(11) Local area activity centre. 

(2/4/74—*4763)
MULTIPLE DWELLING DISTRICT SCHEDULE: (Medium Density) (17/7/61—*3926)

1. Uses permitted and regulations:
   Subject to all the provisions of this by-law on any site within any district defined, designated or described in this by-law as an (RM-3) District the only uses permitted, and the only uses for which development permits may be issued are those contained in Sections 1 and 2 hereof. (18/12/62—*4031)

A. Uses;
   (1) One-family dwelling but subject to the same regulations as required in the (RS-1) schedule.
   (2) Two-family dwelling but subject to the same regulations as required in the (RT-2) schedule.
   (3) Apartment building.
   (4) Dwelling units in basements, subject to the provisions of Section 11(3), in any building:
      (a) in respect of which the building permit is dated on or after January 1st, 1951, and
      (b) which is designed or erected exclusively for use as an apartment building and is not a building converted to such use. (13/8/57—*3649)
   (5) The keeping of not more than two boarders or lodgers or not more than five foster or day-care children in each dwelling unit. (22/3/66—*4234)
   (6) Boarding or rooming house.
   (7) Fraternity or Sorority house.
   (8) A building or use customarily accessory to the above uses (except for another dwelling unit), provided that:
      (a) all accessory buildings are located in the rear yard and in no case are located closer to the flanking street than the width of the side yard required for the principal building;
      (b) the total accessory buildings do not occupy an area greater than 25 percent of the minimum rear yard prescribed in this schedule, or 460 square feet, whichever is the greater;
      (c) no accessory building shall exceed 10 feet in height;
      (d) no more than two-thirds of the width of the rear yard of any lot shall be occupied by accessory buildings;
      (e) no accessory building shall be closer than 12 feet to any dwelling on the property;
      (f) no accessory building shall obstruct the daylight access as required by this by-law for any residential use.

B. Height and Length
   On any site the height of a building shall not exceed 120 feet,
provided, however, that where any portion or portions of a building extend above a height of 35 feet, the maximum length of any such portion or portions combined shall in no case exceed an amount equal to 25 percent of the sum of the average depth of the site and the average width of the site.

For purposes of this subsection, where it is proposed to erect a building in two or more parts (towers), a site may be interpreted as two or more sites as the case may be, provided that the area of each such site so created is 25,000 sq. ft. or more, and the parts of the building (towers) are not less than 80 feet apart.

The height of a building shall be the vertical distance between the finished grades of the site and a hypothetical surface which is parallel to the finished grades of the site. It shall be assumed that the finished grades within the outer walls of the building are formed by straight lines joining contours on the finished grades at the outer wall of the building. (21/7/64—*4119)

C. Front Yard:
A front yard shall be provided having a depth of not less than 20 feet.

D. Side Yards:
(1) Side yards shall be provided on each side of the building such that the outer walls of the building be contained within 135 degrees horizontal angles subtended from all points along the side property lines, provided however, in no case shall the side yard be less than 7 feet.

(2) In the case of a corner site where the side yard adjoins a flanking street, the above containing angle is not applicable but the side yard shall be 20 percent of the width of the site, provided however, this amount shall be increased by one foot, or fraction thereof, for every 5 feet by which the highest height of the building exceeds 40 feet (measured as in B above) but in no case shall it be less than 10 feet nor need it be more than 20 feet.

E. Rear Yard:
A rear yard shall be provided the minimum depth of which shall be not less than 35 feet, provided however, this amount may be reduced to 25 feet in the following cases:

(1) Where the building abutting the rear yard is not more than 30 feet wide nor less than 25 feet from any adjoining site.

(2) Where the average distance from the rear line of the site to the rear of the building taken over the full width of the site is not less than 35 feet and provided further that no portion of such building, abutting such rear yard so reduced, shall have a width of more than 50 feet nor be less than 25 feet from any adjoining site.

Provided that where the rear of the site abuts a fully or partially
dedicated lane the minimum depth of the rear yard or the average depth of the rear yard, as the case may be, may be decreased by the width of that portion of the lane lying between the rear of the site and the ultimate centre line of the lane.

F. Daylight Access

(1) From the outside of the mid-point of the exterior wall (walls) of every habitable room there shall be an unobstructed view for a distance of not less than 80 feet, measured horizontally 3 feet above the floor of the habitable room. Such view shall extend through either a continuous horizontal arc of not less than 50 degrees, or through two or more horizontal arcs which in the aggregate contain not less than 70 degrees. For the purpose of this subsection the following shall be considered as obstructions:

(a) The theoretically equivalent buildings located on any adjoining sites in any R district in a corresponding position by rotating the plot plan of the proposed building 180 degrees about a horizontal axis located on the property lines of the proposed site;

(b) Part of the same building including permitted projections;

(c) Accessory buildings located on the same site as the principal building.

(d) The maximum size building permitted under the appropriate C or M schedule if the site adjoins a C or M site.

(2) For the purpose of this subsection, a kitchen shall not be counted as a habitable room unless its area is greater than 10 percent of the total floor area of the dwelling unit in which it is situated, or 70 square feet, whichever is the greater.

G. Vertical Angle of Daylight Obstruction

In the case of buildings of over 35 feet in height (measured from the finished grade at all points around and adjacent to the building) no part thereof shall project above lines extending over the site at right angles from:

(1) All points along the ultimate centre line of the street (or streets) in front of the site and inclined at an average angle of 25 degrees to the horizontal.

(2) All points along the rear boundary line of the site or the ultimate centre line of the lane where one has been dedicated, and inclined at an average angle of 25 degrees to the horizontal.

(3) All points along the interior side boundary (or boundaries) of the site at ground level and inclined at an average angle of 30 degrees to the horizontal.

(4) In the case of a corner site, all points along the ultimate centre
(3) The conversion into dwelling units of an existing building, other than one granted a development permit in accordance with Section 1 of this schedule; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of Section 1 of this schedule and also to the amenity of the neighbourhood.

(4) The conversion of an existing building into housekeeping or sleeping units in any case where such existing building, by reason of its age and size, is deemed to be unsuitable for its present use; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of Section 1 of this schedule and also to the amenity of the neighbourhood.

(5) A dwelling unit or housekeeping or sleeping unit other than one granted a development permit in accordance with this schedule which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits, may be granted a development permit limited in time.

(6) The conversion into a boarding or rooming house of an existing building, other than one granted a development permit in accordance with Section 1 of this schedule; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of Section 1 of this schedule and also to the amenity of the neighbourhood.

(7) A building which has been altered or used for a boarding or rooming house, other than one granted a development permit in accordance with clause (6) above, which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits, may be granted a development permit limited in time.

(8) School (public or private), kindergarten, day-care school, creche or day nursery.

(9) Park or playground.

(10) Golf course.

(11) Truck gardens, nurseries and greenhouses, for propagating and cultivating.

(12) Tourist courts, subject to the provisions of Section 11 (5) of this by-law.

(13) The deposit or extraction of material so as to alter the configuration of the land.

(14) Home craft or occupation, provided that there is nothing to indicate from the exterior that the building is being utilized for any purpose other than that of a dwelling, that there is no commodity sold upon the premises and that no person other than one member of the immediate family residing there is engaged in such craft or occupation on the premises.
(15) Parking area (public) ancillary to a principal use on an adjacent site.

(16) Club, or Lodge (fraternal), provided that no commercial activities are carried on.

(17) Buildings or uses customarily accessory to the above uses and accessory buildings or uses to dwellings, other than those provided for in Section 1 of this schedule.

B. Uses (Group B) which may only be granted by the Technical Planning Board after consultation with the Vancouver City Planning Commission:

(1) Stadium or similar place of assembly.

(2) Community centre.

(3) Church, subject to the provisions of Section 11 (7) of this by-law.

(4) A new building specifically designed for a Hospital or Personal Care Home, excluding a mental hospital or hospital for the treatment of animals; in granting a development permit the Technical Planning Board shall have regard to the amenity of the neighbourhood. (7/11/63—*4077)

(4A) The conversion of an existing building into a Hospital or Personal Care Home, excluding a mental hospital or hospital for the treatment of animals; before granting the development permit for such conversion, the Technical Planning Board shall be satisfied that the existing building is suitable for such use, having particular regard to the size of the site and building, open spaces on the site, proximity of adjacent buildings and the amenity of the neighbourhood, and shall notify adjacent property owners. (7/11/63—*4077)

(5) Institution of a religious, philanthropic, or charitable character.

(6) Public utility.

(7) Building or use essential in this district required by a public authority.

(8) Building or use customarily accessory to the above uses.

(9) Local area activity centre. (2/4/74—*4763)
The (CRM-2) District Schedule is designed to accommodate a highly urban environment embodying a compatible mixture of commercial residential and ancillary uses. The regulations are intended to positively encourage low profile development designed to optimize the potential amenities inherent in the topography and location of this district.

(CRM-2) COMMERCIAL/MULTIPLE DWELLING DISTRICT SCHEDULE (30/5/72—*4624)

1. Uses Permitted and Regulations:
Subject to all the provisions of this by-law on any site within any district defined, designated or described in this by-law as a (CRM-2) District the only uses permitted, and the only uses for which development permits may be issued are those contained in Sections 1 and 2 hereof.

A. Uses:
(1) One-family dwelling subject to the same regulation as required in the (RS-1) schedule.
(2) Two-family duplex dwelling.
(3) Two-family semi-detached dwelling on sites of not less than 49 feet frontage.
(4) The keeping of not more than two boarders or lodgers or not more than five foster or day-care children in each dwelling unit. (22/3/66—*4234)
(5) A building or use customarily accessory to the above uses (except for another dwelling unit) provided that:
(a) all accessory buildings are located in the rear yard and in no case are less than five feet from a flanking street subject also to the provisions of Section 11(1) of this by-law.
(b) the total accessory buildings do not occupy an area greater than 25 percent of the minimum rear yard prescribed in this schedule, or 460 square feet, whichever is the greater;
(c) no accessory building shall exceed one storey or 10 feet in height;
(d) not more than two-thirds of the width of the rear yard of any lot shall be occupied by accessory buildings;
(e) no accessory building shall be closer than 12 feet to any dwelling on the property.

B. Height:
The height of a building shall not exceed two storeys plus a cellar or one storey plus a basement.

C. Front Yard:
(1) A front yard shall be provided having a depth of not less than twenty-four (24) feet.
(2) In the case of a site having an average depth of less than one hundred and twenty (120) feet the front yard may be reduced in accordance with Section 11(1B) of this by-law.

D. Side Yards:
(1) A side yard of not less than 10 percent of the width of the site shall be provided on each side of the building; provided that the maximum width of such side yard need not exceed five feet.

(2) In the case of a corner site at the rear of which, whether a lane intervenes or not, is a site fronting on a street which flanks such corner site, the minimum width of the side yard on the corner site along the flanking street shall be in accordance with the provisions of Section 11(1) of this by-law.

E. Rear Yard:
(1) A rear yard shall be provided, the minimum depth of which shall be not less than thirty-five (35) feet.

(2) In the case of a site having an average depth of less than one hundred and twenty (120) feet the rear yard may be reduced in accordance with Section 11(1B) of this by-law.

Provided always that where the rear of a site abuts a lane, the depth of the rear yard may be decreased by the width of that portion of the lane lying between the rear of the site and the ultimate centre line of the lane.

F. Site Area:
A site for a new two-family dwelling or the relocation of an existing two-family dwelling shall have an area of not less than 4,800 square feet, except in the case of a lot of not less than 3,800 square feet, on record in the Land Registry Office for the Vancouver Land Registration District prior to September 7th, 1965.

G. Floor Space Ratio:
The maximum floor space ratio shall in no case exceed 0.45. In computing the floor space ratio, all floors, whether earth floors or otherwise (with ceilings of more than 4 feet in height) of all buildings shall be included, both above and below ground (measured to the extreme outer limits of the buildings) except for parking areas the floor of which is at or below the highest point of the finished grade around the building. For the purpose of this section the gross cross-sectional areas of stairways, fire escapes, elevator shafts, chimneys and any other services which, in the opinion of the Director of Planning, are similar to the foregoing, shall be included as floor area at each floor at which they are located; balconies, canopies, sundecks and any other appurtenances which, in the opinion of the Director of Planning, are similar to the foregoing, may be excluded from floor area measurement provided the total floor area of all such excluded items does not exceed 8 percent of the permitted floor area.
Patios and roof gardens also may be excluded from floor area measurement provided that any sunroofs or walls forming part thereof are approved by the Director of Planning.

H. Off-Street Parking Spaces:
Off-street parking spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 12 of this by-law.

J. Off-Street Loading Spaces:
Loading and unloading spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 13 of this by-law.

K. Advertisements:
Advertisements, bulletin boards, or identification signs are not permitted in the (CRM-2) District except as provided in Section 10 (21) of this by-law.

2. Uses which may be permitted subject to special approval by the Technical Planning Board:
With the approval of the Technical Planning Board development permits may be issued for the following uses. If the development permit is granted it shall be subject to such conditions and regulations as the Technical Planning Board may decide. In the exercise of its discretion, the Technical Planning Board shall also have due regard to the compatibility of the specific use with the local residential environment in terms of scale, and noise and vehicular traffic generation.

A. Commercial Uses (Group A):
(1) Advertisements and signs.
(2) Bakeries retailing on the premises only.
(3) Barber or Beauty Shop.
(4) Cleaning and dyeing shop (collection and delivery).
(5) Launderette or coin-operated drycleaning.
(6) Office building.
(7) Restaurants (excluding a 'drive-in').
(8) Shoe repair shop.
(9) Retail store, business or undertaking catering for the day-to-day needs of residents.
(10) Jewellery manufacturing.
(11) Any other building or use which is similar to the foregoing buildings or uses, and which in the opinion of the Technical Planning Board will not generate noises, odours, or vehicular traffic incompatible with adjoining residential uses. Before granting a development permit for such building or use the Technical Planning Board shall have regard to the types of buildings and uses which specifically may be permitted in this schedule.
B. Other Uses (Group B):

1. Apartment building.
2. Townhouse.
3. Boarding or rooming house.
4. Fraternity or sorority house.
5. Dwelling units in basements, subject to the provisions of Section 11(3) in any building:
   a. in respect of which the building permit is dated on or after January 1, 1951 and,
   b. which is designed or erected exclusively for use as an apartment building and is not a building converted to such use.
6. The conversion of an existing building into housekeeping or sleeping units, in any case where such existing building, by reason of its age and size, is deemed unsuitable for its present use; before granting a development permit for such conversion, the Technical Planning Board shall have regard to the regulations of Section 1 of this Schedule and also to the amenity of the neighbourhood.
7. The conversion into dwelling units of an existing building other than one granted a development permit in accordance with Section 1 of this Schedule; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of Section 1 of this Schedule and also to the amenity of the neighbourhood.
8. A dwelling unit or housekeeping or sleeping unit other than one granted a development permit in accordance with this Schedule, which has been installed or used prior to June 18, 1956, with or without one or more of the required City permits, may be granted a development permit limited in time.
9. The conversion into a boarding or rooming house of an existing building other than one granted a development permit in accordance with Section 1 of this Schedule; before granting a development permit for such conversion, the Technical Planning Board shall have regard to the regulations of Section 1 of this Schedule and also to the amenity of the neighbourhood.
10. A building which has been altered or used for a boarding or rooming house other than one granted a development permit in accordance with this Schedule which has been installed or used prior to June 18, 1956, with or without one or more of the required City permits may be granted a development permit limited in time.
11. School (public or private), kindergarten, day-care school, creche or day nursery.
12. Park or playground.
13. Club, or lodge (fraternal).
14. Homecraft or occupation.
15. Building or use customarily accessory to the above uses.
16. Local area activity centre. (2/4/74—*4763)
C. Uses (Group C) which may only be granted by the Technical Planning Board after consultation with the Vancouver City Planning Commission:

(1) Community centre.

(2) Church, subject to the provision of Section 11(7) of this by-law.

(3) A new building specifically designed for a Hospital or Personal Care Home, excluding a mental hospital or hospital for the treatment of animals; in granting a development permit the Technical Planning Board shall have regard to the amenity of the neighbourhood.

(4) The conversion of an existing building into a Hospital or Personal Care Home, excluding a mental hospital or hospital for the treatment of animals; before granting a development permit for such conversion, the Technical Planning Board shall be satisfied that the existing building is suitable for such use, having particular regard to the size of the site and building, open spaces on the site, proximity of adjacent buildings and the amenity of the neighbourhood, and shall notify adjacent property owners.

(5) Institution of a religious, philanthropic, charitable or philozoic character.

(6) Public utility.

(7) Building or use essential in this district required by a Public Authority.

(8) Building or use customarily accessory to the above uses.

3. Regulations subject to special approval by the City Council:

In order to encourage the development of buildings designed to take advantage of the steep north-facing slope, the City Council may, in its discretion, permit a building at variance with the regulations set out in Section 1 of this District Schedule after having received a report thereon from the Technical Planning Board and after consultation with the Vancouver City Planning Commission. In the exercise of its discretion, the Council shall also have due regard to the following:

A. The provision of private outdoor living space, daylighting, landscaping, the disposition of the required off-street parking and loading facilities, the location of the building in relation to the site and surrounding streets and buildings, and its overall design.

B. For buildings approved under this clause only, Council shall determine the maximum floor area which shall be allowed having particular regard to the factors noted above. In no case however shall:

(i) The maximum floor space ratio exceed 1.5, computed or described in Section 1.G. of this CRM-2 Multiple Dwelling District Schedule.

(ii) The height of a building exceed thirty-five (35) feet, nor twenty-five (25) feet measured from the centre line level of the nearest street directly southward.
(C-1) COMMERCIAL DISTRICT SCHEDULE: (Local)

1. Uses permitted, conditions and regulations:

Subject to all the provisions of this by-law on any site within any district defined, designated or described in this by-law as a (C-1) District the only uses permitted, and the only uses for which development permits may be issued are those contained in Sections 1, 2 and 3 hereof. 

(18/12/62—*4031)

A. Uses:

(1) Barber or beauty shop.
(2) Bakeries retailing on the premises only, not exceeding a total of 2,200 square feet of floor area.
(3) Cleaning and dyeing shop (collection and delivery).
(4) Deleted 17/12/68—*4395.
(5) Launderette, or coin operated dry cleaning. (21/6/62—*3995)
(6) Office building.
(7) Restaurant (excluding a drive-in).
(8) Retail store, catering for the day-to-day needs of residents of the local neighbourhood.
(9) Shoe repair shop.
(10) Dwelling units in conjunction with and in addition to any of the above uses provided that no portion of the first storey of a building to a depth of 35 feet from the front wall of the building and extending across the full width of the building shall be used for residential purposes except for entrances to such residential part. 

(10/9/62—*4019) 

(11) The keeping of not more than two boarders or lodgers or not more than five foster or day-care children in each dwelling unit. 

(22/3/66—*4234)

(12) A building or use which is customarily accessory to the above principal buildings or uses, except for a building or use which is only listed as a principal use in the (CM-1), (M-1) or (M-2) Schedules, provided that:

(a) All accessory buildings are located in a rear yard and subject also to the provisions of Section 11(1) of this By-law. 
(b) All accessory buildings shall occupy an area of not greater than ten percent of the area of the site.
(c) No accessory building shall exceed one storey or 12 feet in height.
(d) No accessory building shall obstruct the daylight access as required by this By-law for any residential use.
(e) All accessory uses of the type which would not be permitted as principal uses under Section 1 of this schedule shall occupy an area of not more than 25 percent of the gross floor area of the principal use, and shall be located within the principal building.
B. Conditions of Use:
(1) Every business or undertaking shall be conducted wholly within a completely enclosed building except for parking and loading facilities, a gasoline service station, subject to the provisions of Section 11(10) of this by-law, and signs or advertisements. (22/4/69—*4423)
(2) Goods sold shall consist primarily of new merchandise.

C. Front Yard:
A front yard shall be provided of not less than 24 feet in depth.

D. Side Yard:
(1) No side yard shall be required provided however that where a (C-1) Commercial District adjoins any R district without the intervention of a street or lane, the following side yards shall be provided:
(a) Three feet in the case of an RA, RS or RT district.
(b) Five feet in the case of an RM district.
If a side yard in a (C-1) district be provided where not required by the provisions of this By-law, the said side yard shall be not less than three feet in width.
(2) In the case of a corner site, at the rear of which, whether a lane intervenes or not, is a site fronting on a street which flanks such corner site, the minimum width of the side yard on the corner site along the flanking street shall be in accordance with the provisions of Section 11(1) of this By-law.

E. Rear Yard:
A rear yard shall be provided the minimum depth of which shall be not less than 35 feet; provided however that where the rear line of the site adjoins a dedicated lane the minimum depth of the rear yard may be reduced by the width of that portion of the lane equal to the distance from the ultimate centre line of the lane to the rear line of the site.

F. Height:
The height of a building shall not exceed 30 feet nor two storeys.

G. Horizontal Light Angle for Residential Use:
Where part of the building is used for residential purposes:
(1) The window of every habitable room shall be not less than 10 feet from the interior side boundary of the site onto which it faces.
(2) Every window shall permit of an unobstructed view for a distance of not less than 80 feet, measured horizontally from its centre at sill level. Such view shall extend through either a continuous horizontal arc of not less than 50 degrees, or through two or more horizontal arcs, which in the aggregate contain not less than 70 degrees; provided however the above
arcs may be reduced from 50 degrees to 40 degrees, and 70 degrees to 60 degrees, respectively, in the case of a building of two storeys or less in height; for the purpose of this subsection the following shall be considered as obstructions:

(a) The theoretically equivalent building, if located on any adjoining sites in any R district in a corresponding position by rotating the plot plan of the proposed building 180 degrees about a horizontal axis located on the property lines of the proposed site.

(b) Part of the same building, including permitted projections.

(c) Accessory buildings located on the same site as the principal building.

(d) The maximum size building permitted under the appropriate C or M schedule if the site adjoins a C or M site.

(3) Where a window is greater in area than the minimum required under the Building By-law, the above conditions may be tested against the least restrictive portion of the window equal in area to the required minimum. For the purpose of this subsection, a kitchen shall not be counted as a habitable room unless its area is greater than ten percent of the total floor area of the dwelling unit in which it is situated, or 70 square feet, whichever is the greater.

H. Floor Space Ratio:
The floor space ratio shall in no case exceed 1.20, provided however that where a building is used in part for residential purposes every square foot of the floor area used for residential purposes shall be counted as the equivalent of 2½ square feet for the purposes of this section. For the purposes of this schedule, in computing the floor space ratio the floor area of the building shall include the total area of all the floors of all the buildings on the site, including accessory buildings (measured to the extreme outer limits of the building), except for areas of floors used for parking purposes and areas of cellars or basements which are not used as habitable accommodation or access to habitable accommodation.

In addition, balconies, canopies, sun decks and other appurtenances which, in the opinion of the Director of Planning, are similar to the foregoing, may be excluded from the floor area measurement, provided that the total floor area of all such excluded items does not exceed eight percent of the permitted floor area.

(30/3/66—*4260)

J. Off-street Parking Spaces:
Off-street parking spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 12 of this By-law.

K. Off-street Loading Spaces:
Loading and unloading spaces shall be provided and maintained as
required by, and in accordance with the provisions of Section 13 of this By-law.

L. Advertisements and Signs:

No advertisements, bulletin boards, or identification signs are permitted in the (C-1) district except as provided in Section 10(21) of this By-law.

2. Uses which may be permitted subject to special approval by the Technical Planning Board:

With the approval of the Technical Planning Board development permits may be issued for the following uses. If the development permit is granted it shall be subject to such conditions and regulations as the Technical Planning Board may decide. (18/12/62—*4031)

Uses:

(1) Building or use required by a public authority.
(2) Cleaning and dyeing shop.
(3) Club, or Lodge (fraternal).
(4) Community centre.
(5) Deposit or extraction of material so as to alter the configuration of the land.
(6) Parking Garage (Public). (30/12/57—*3671)
(7) Home craft or occupation.
(8) Hospital or personal care home, excluding a mental hospital or hospital for the treatment of animals. (21/6/62—*3995)
(9) Institutions of a religious, philanthropic, charitable or phialo Zoic character.
(10) Park or playground.
(11) Parking area (public).
(12) Public utility.
(13) Radio and television broadcasting and receiving masts and antennae (commercial).
(14) Radio broadcasting and receiving station for motor vehicles, trains, watercraft and aircraft.
(15) School (public or private), kindergarten, day-care school, creche or day nursery.
(16) Stadium, curling rink, ice rink, roller rink, race track, gymnasium or similar place of assembly.
(17) Any other building or use which is not specifically listed in any schedule of this By-law, and which is similar to the foregoing buildings or uses; before granting a development permit for such building or use the Technical Planning Board shall have regard to the type of buildings and uses which specifically may be permitted in this schedule. (12/3/57—*3622)
(18) The use of a site for purely residential purposes, if the site has unusual peculiarities of location, such use to include one and two-family dwellings only.
(19) The conversion into dwelling units of an existing building, other than one granted a development permit in accordance with Section 1 of this schedule; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of Section 1 of this schedule and also to the amenity of the neighbourhood.

(20) A dwelling unit other than one granted a development permit in accordance with clause (19) above, or a housekeeping or sleeping unit which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits may be granted a development permit limited in time.

(21) A building which has been altered or used for a boarding or rooming house and which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits may be granted a development permit limited in time.

(22) Any building or use which can be considered as accessory to the above uses and to the uses listed in Section 1 of this schedule, other than those accessory buildings or uses for which provision is made in such section, subject to:

(a) All accessory buildings occupying an area of not greater than ten percent of the area of the site.

(b) All accessory uses occupying an area of not greater than one-third the total gross floor area of all the buildings on the site.

3. Uses which may be permitted subject to special approval by the City Council:

Development permits may be issued for developments comprising the following uses subject to such uses first of all being approved by the City Council. Before giving such approval, Council shall refer the application for such permit to the Vancouver City Planning Commission and the Technical Planning Board for consideration and report. If a development permit is granted, it shall be subject to such conditions and regulations as the City Council may impose, having due regard to the amenity of the district and to the intent of the by-law:

(1) Gasoline service station, subject to the provision of Section 11(10). (17/12:68—*4395)
COMMERCIAL DISTRICT SCHEDULE: (Suburban)

1. Uses permitted, conditions and regulations:

Subject to all the provisions of this by-law on any site within any district defined, designated or described in this by-law as a (C-2) District the only uses permitted and the only uses for which development permits may be issued are those contained in Sections 1, 2 and 3 hereof.

(A-2) 

A. Uses:

(1) Advertisements, billboards and signs subject to the provisions of Section 10(21) of this By-law.

(2) Auction room.

(3) Bakeries retailing on the premises only, not exceeding a total of 2,200 sq. ft. of floor area.

(4) Billiard and pool hall.

(5) Cleaning and dyeing shop.

(6) Frozen food lockers.

(7) Parking Garage (Public).  (30/12/57—*3671)

(8) Deleted 17/12/68—*4395.

(9) Office building.

(10) Parking area (public).

(11) Radio and television broadcasting and receiving masts and antennae (commercial).

(12) Radio broadcasting and receiving station for motor vehicles, trains, watercraft and aircraft.

(13) Restaurant (excluding a drive-in).

(14) Retail stores, business or undertaking catering for the day-to-day needs of residents of several neighbourhoods and comprising a large district of the City.

(15) School (business or commercial).

(16) Steam baths.

(17) Swimming pool (commercial).

(18) Dwelling units in conjunction with and in addition to any of the above uses provided that no portion of the first storey of a building to a depth of 35 feet from the front wall of the building and extending across the full width of the building shall be used for residential purposes except for entrances to such residential part.

(19) The keeping of not more than two boarders or lodgers or not more than five foster or day-care children in each dwelling unit.

(20) A building or use which is customarily accessory to the above principal building or uses, except for a building or use which is only listed as a principal use in the (M-1) or (M-2) schedules, provided that:
(a) All accessory buildings are located in a rear yard;
(b) All accessory buildings shall occupy an area of not greater than ten percent of the area of the site;
(c) No accessory building shall exceed one storey or 12 feet in height;
(d) No accessory building shall obstruct the daylight access as required by this by-law for any residential use;
(e) All accessory uses of the type which would not be permitted as principal uses under Section 1 of this schedule shall occupy an area of not more than 25 percent of the gross floor area of the principal use, and shall be located within the principal building.

B. Conditions of Use:
Every business or undertaking, shall be conducted wholly within a completely enclosed building except for parking and loading facilities, a gasoline service station, subject to the provision of Section 11(10) of this by-law, and signs and advertisements.

C. Front Yard:
No front yard shall be required.

D. Side Yard:
No side yard shall be required provided, however, that where a (C-2) Commercial District adjoins any R district without the intervention of a street or lane, the following side yards shall be provided:
(a) Three feet in the case of an RA, RS or RT district.
(b) Five feet in the case of an RM district.
If a side yard in a (C-2) district be provided where not required by the provisions of this By-law, the said side yard shall be not less than three feet in width.

E. Rear Yard:
A rear yard shall be provided of not less than 10 feet; provided however that where a building contains residential uses the building shall be set back not less than 25 feet over its full width from the rear line of the site, but such setback need not extend below the lowest storey containing residential uses; and provided further that where the rear line of a site adjoins a dedicated lane the minimum depth of the rear yard or setback, as the case may be, may be reduced by an amount equal to the distance from the ultimate centre line of the lane to the rear line of the site.

F. Height:
The height of a building shall not exceed 40 feet nor three storeys.
The Technical Planning Board may, in its discretion, permit a building at variance with subsection F of section 1 of this District
Schedule after having received a report thereon from the Director of Planning and after consultation with the Vancouver City Planning Commission and after notifying the adjoining owners. In the exercise of its discretion, the Technical Planning Board shall also have due regard to:

(a) the height and bulk of the building, and its location in relation to the site and surrounding streets and buildings;
(b) the amount of open space, plazas, overall design, and the general amenity of the area;
(c) the effect on traffic;
(d) the existing and permitted uses and the form and need of each C-2 zone including its relationship to any surrounding residential area. (22.9.70—*4511)

G. Horizontal Light Angle for Residential Use:

Where part of a building is used for residential purposes:

(1) The window of every habitable room shall be not less than 10 feet from the interior side boundary of the site onto which it faces.

(2) Every window shall permit of an unobstructed view for a distance of not less than 80 feet, measured horizontally from its centre at sill level. Such view shall extend through either a continuous horizontal arc of not less than 50 degrees, or through two or more horizontal arcs which in the aggregate contain an arc of not less than 70 degrees; provided however the above arcs may be reduced from 50 degrees to 40 degrees, and 70 degrees to 60 degrees, respectively, in the case of buildings of two storeys or less in height; for the purpose of this subsection the following shall be considered as obstructions:

(a) The theoretically equivalent buildings if located on any adjoining sites in any R district in a corresponding position by rotating the plot plan of the proposed building 180 degrees about a horizontal axis located on the property lines of the proposed site.

(b) Part of the same building including permitted projections.

(c) Accessory buildings located on the same site as the principal building.

(d) The maximum size building permitted under the appropriate C or M schedule if the site adjoins a C or M site.

(3) Where a window is greater in area than the minimum required under the Building By-law, the above conditions may be tested against the least restrictive portion of the window equal in area to the required minimum. For the purpose of this subsection, a kitchen shall not be counted as a habitable room unless its area is greater than ten percent of the total floor area of the dwelling unit in which it is situated, or 70 square feet, whichever is the greater.
H. Floor Space Ratio:
The floor space ratio shall in no case exceed 3.00 provided however that where a building is used in part for residential purposes every square foot of the floor area used for residential purposes shall be counted as the equivalent of 2½ square feet for the purposes of this section. For the purposes of this schedule, in computing the floor space ratio the floor area of the building shall include the total area of all the floors of all the buildings on the site, including accessory buildings (measured to the extreme outer limits of the building), except for areas of floors used for parking purposes and areas of cellars or basements which are not used as habitable accommodation or access to habitable accommodation.

In addition, balconies, canopies, sundecks and other appurtenances which, in the opinion of the Director of Planning, are similar to the foregoing, may be excluded from floor area measurement, provided that the total floor area of all such excluded items does not exceed eight percent of the permitted floor area.

(30/8/66—*4260)

J. Off-street Parking Spaces:
Off-street parking spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 12 of this By-law.

K. Off-street Loading Spaces:
Loading and unloading spaces shall be provided and maintained as required by, and in accordance with the provisions of Section 13 of this By-law.

2. Uses which may be permitted subject to special approval by the Technical Planning Board:
With the approval of the Technical Planning Board development permits may be issued for the following uses. If the development permit is granted it shall be subject to such conditions and regulations as the Technical Planning Board may decide.

(18/12/62—*4031)

A. Uses (Group A):
(1) Ambulance headquarters.
(1A) Animal hospital. (12/3/57—*3622).
(2) Automotive repair shop.
(3) Automobile and parts showroom.
(4) Bakery (manufacturing of bread, pies, and confectionery), other than as provided for in Section 1 of this schedule.
(5) Bowling alley.
(6) Building or use required by a public authority.
(7) Car sales lot.
(8) Church.
(9) Club, or Lodge (fraternal).
(10) Community centre.
(11) Deposit or extraction of material so as to alter the configuration of the land.

(12) Hall.

(13) Home craft or occupation.

(14) Hospital or personal care home, excluding a mental hospital. (21/6/62—*3995)

(15) Hotel, or Motel, provided all sleeping units and dwelling units conform to the daylight access provisions of Section 1 of this Schedule. (29/7/58—*3719)

(16) Institution of a religious, philanthropic, charitable or philo-zoic character.

(17) Kennels, or the keeping, breeding, raising, training or boarding of dogs or cats.

(18) Lithographing.

(20) Park or playground.

(21) Pet shop.

(22) Public utility.

(23) Restaurant: Drive-in (Car-service). (7/11/63—*4077)

(23A) Restaurant: Drive-in (Self-service). (7/11/63—*4077)

(24) School (public or private), kindergarten, day-care school, creche, or day nursery.

(25) School (trade).

(26) Sign and showcard writing.

(27) Stadium, curling rink, ice rink, roller rink, race track, gymnasium, or similar place of assembly.

(28) Stamp shop (rubber and metal).

(28A) Temporary Parking Area (Public). (10/11/64—*4139)

(29) Theatre (excluding a drive-in).

(30) Tires (retreading and rebuilding).

(31) Tourist court subject to the provisions of Section 11(5).

(31A) Trailer court subject to the provisions of Section 11(5A). (13/8/57—*3649)

(32) Undertaking establishment.

(33) Wholesale business (only to serve local or district needs).

(34) Any other building or use which is not specifically listed in any schedule of this By-law, and which, is similar to the foregoing buildings or uses; before granting a development permit for such building or use the Technical Planning Board shall have regard to the types of buildings and uses which specifically may be permitted in this schedule. (12/3/57—*3622)

(35) The use of a site for purely residential purposes, if the site has unusual peculiarities of location, such use to include one and two-family dwellings, apartments, boarding or rooming houses and fraternity or sorority houses.

(36) The conversion into dwelling units of an existing building other than one granted a development permit in accordance
with Section 1 of this schedule; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of Section 1 of this schedule and also to the amenity of the neighbourhood.

(37) The conversion of an existing building into housekeeping or sleeping units in any case where such existing building, by reason of its age and size, is deemed to be unsuitable for its present use; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of Section 1 of this schedule and also to the amenity of the neighbourhood.

(38) The conversion of an existing building into a boarding or rooming house in any case where such existing building, by reason of its age and size, is deemed to be unsuitable for its present use; before granting a development permit for such conversion the Technical Planning Board shall have regard to the regulations of the RM schedules and also to the amenity of the neighbourhood.

(39) A dwelling unit or housekeeping or sleeping unit other than one granted a development permit in accordance with this schedule which has been installed or used prior to June 18th, 1956, with or without one or more of the required City Permits may be granted a development permit limited in time.

(40) A building which has been altered or used for a boarding or rooming house, other than one granted a development permit in accordance with this schedule, which has been installed or used prior to June 18th, 1956, with or without one or more of the required City permits may be granted a development permit limited in time.

(41) Any building or use which can be considered as accessory to the above uses and to the uses listed in Section 1 of this schedule, other than those accessory buildings or uses for which provision is made in such Section, subject to:

(a) All accessory buildings occupying an area of not greater than ten percent of the area of the site.

(b) All accessory uses occupying an area of not greater than one-third the total gross floor area of all the buildings on the site.

B. Uses (Group B) which may only be granted by the Technical Planning Board after consultation with the Vancouver City Planning Commission: (15/9/64—*4125)

(1) Aircraft landing place.

(2) Building or use customarily accessory to the above uses.

3. Uses which may be permitted subject to special approval by the City Council:

(1) Elderly Citizens' Multiple Dwelling Unit Development (Apart-
A building to be occupied and used solely as a residence for elderly citizens may be approved as a conditional use subject to such conditions, regulations or relaxations as the Council may deem appropriate, having due regard to the height, bulk, density, overall size of development, or any other feature which, in the opinion of the Council may effect the general amenity and welfare of the area, and after Council has received a report regarding the proposed development from the Technical Planning Board and from the Vancouver City Planning Commission and provided the development meets the following conditions:

(a) that the development comprises only low rental housing units for the exclusive use of elderly citizens of low income who are unable to purchase adequate accommodation according to their needs;

(b) that the owner and operator of the project is a non-profit corporation within the meaning of the "Elderly Citizens' Housing Aid Act";

(c) that the development qualifies for a grant-in-aid from the Province of British Columbia under the provisions of the "Elderly Citizens' Housing Aid Act";

Before approving the issuance of a development permit for an elderly citizens' multiple dwelling unit development, the Council shall hold a special public meeting to hear representations concerning the proposed development from such adjacent owners of real property as the Council deems are likely to be affected; and the Council shall direct that due notice of the special public meeting shall be given to such adjacent owners. (8/11/60—*3884)

(2) Development permits may be issued for developments comprising the following uses subject to such uses first of all being approved by the City Council. Before giving such approval, Council shall refer the application for such permit to the Vancouver City Planning Commission and the Technical Planning Board for consideration and report. If a development permit is granted, it shall be subject to such conditions and regulations as the City Council may impose, having due regard to the amenity of the district and to the intent of the By-law:

(a) Gasoline service station, subject to the provisions of Section 11(10). (17/12/68—*4395; 22/4/69—*4423)
(M-1) INDUSTRIAL DISTRICT SCHEDULE: (Light)

1. Uses permitted, conditions and regulations:

Subject to all the provisions of this by-law on any site within any dis­
trict defined, designated or described in this by-law as an (M-1) Dis­
trict the only uses permitted, and the only uses for which development
permits may be issued are those contained in Sections 1 and 2 hereof,
provided, however, that development of any land abutting the streets
set forth in Schedule “C” to this by-law shall be subject to the addi­
tional special regulations contained in Section 11(2) to this by-law.

(2/1/63—*4032)

A. Uses:

(1) Advertisements, billboards and signs subject to the provisions
   of Section 10(21) of this By-law.
(2) Animal hospital.
(3) Deleted (17/11/59—*3812)
(4) Automotive repair shop.
(5) Automobile and parts salesroom.
(6) Deleted (17/11/59—*3812)
(7) Bag and sack cleaning.
(8) Bakery (manufacturing of bread, pies, confectionery).
(9) Battery manufacturing or rebuilding.
(10) Boat building (boats not to exceed 80 feet in length).
(11) Book bindery.
(12) Brewery and distillery.
(13) Broom and brush manufacturing.
(14) Candy manufacturing.
(15) Cannery (fruit and vegetables only).
(16) Cigarette and cigar manufacturing.
(17) Clothing and garment manufacturing.
(18) Cold storage plant.
(19) Cosmetics manufacturing.
(20) Dairy products manufacturing.
(21) Electric equipment manufacturing.
(22) Electro-plating.
(23) Excelsior manufacturing or storage.
(24) Feed and seed storage.
(25) Food products manufacturing, processing and packaging
    (excluding fish and a cannery).
(26) Frozen food lockers.
(27) Parking garage (public). (30/12/57—*3671)
(28) Gasoline service station, subject to the provisions of Section
    11(10). (22/4 69—*4423)
(29) Hemp and jute products manufacturing.
(30) Ice manufacturing.
(31) Institution of a religious, philanthropic, charitable or philo-
zoic character.
(32) Jewellery manufacturing.
(33) Kennels or the keeping, breeding, raising, training or boarding
of dogs or cats.
(34) Laboratory.
(35) Laundry, cleaning and dyeing establishment.
(36) Lithographing.
(37) Mattress manufacturing.
(38) Motion picture and television studio.
(39) Musical instrument manufacturing.
(40) Novelty and toy manufacturing.
(40A) Paper box and cardboard products manufacture.
    (12/3/57—*3622)
(41) Parking area (public).
(42) Poultry (dressed) wholesale and storage.
(43) Public utility on a site not less than 200 feet from any R
    District.
(44) Publishing plant.
(45) Radio and television broadcasting and receiving masts and
    antennae (commercial).
(46) Radio broadcasting and receiving station for motor-vehicles,
    trains, watercraft and aircraft.
(47) Restaurant.
(48) Sausage manufacturing.
(49) School (business or commercial).
(50) School (trade).
(51) Shoe or boot manufacturing.
(52) Sign manufacturing.
(53) Stamp shop (rubber or metal).
(54) Taxidermy.
(55) Tent and awning and allied products manufacturing.
(56) Textile manufacturing.
(57) Tires retreading or rebuilding.
(58) Tool (machine) manufacturing.
(59) Toy and novelty manufacturing.
(60) Deleted (17/11/59—*3812)
(61) Warehouse (general).
    (31/7/62—*4007)
(62) Wax products manufacturing (for derivation of products, see
    processing of fats, bones, animal products.)
(63) Window shade manufacturing.
(64) Wholesale business.
(65) A building or use which is customarily accessory to the above
    principal buildings or uses except for a building or use which
is only listed as a principal use in the (M-2) district, provided that:

(a) All accessory buildings shall occupy an area of not greater than 10 percent of the area of the site, and are not over 12 feet in height.

(b) All accessory uses shall occupy an area of not greater than one-third the total gross floor area of all the buildings on the site.

B. Front Yard:
No front yard shall be required.

C. Side Yard:
No side yard shall be required, provided, however, that where an (M-1) Industrial District adjoins any R District without the intervention of a street or lane, the following side yards shall be provided:

(1) Three feet in the case of an RA, RS, or RT District.
(2) Five feet in the case of an RM District.

If a side yard in an (M-1) District be provided where not required by the provisions of this By-law, the said side yard shall be not less than three feet in width.

D. Rear Yard:
A rear yard shall be provided the minimum depth of which shall be not less than 10 feet except as provided hereunder:

(1) Where the rear line of a site adjoins a dedicated lane the minimum depth of the rear yard may be reduced by an amount equal to the distance from the ultimate centre line of the lane to the rear line of the site.

(2) Where a site is sufficiently large and is located within an area where rear access to the site and adjacent sites is not likely to be required, the Director of Planning, in the exercise of his discretion, may waive the rear yard requirement.

E. Height:
The height of a building shall not exceed 100 feet. The Director of Planning, in the exercise of his discretion, may increase the height set forth herein, provided that the said building complies in all other respects with the regulations contained in this section.

F. Floor Space Ratio:
The floor space ratio shall in no case exceed 5.00.

For the purposes of this schedule, in computing the floor space ratio the floor area of the building shall include the total area of all the floors of all the buildings on the site, including accessory buildings (measured to the extreme outer limits of the building),
except for areas of floors used for parking purposes and areas of
cellars or basements which are not used as habitable accommoda-
tion or access to habitable accommodation.
In addition, balconies, canopies, sundecks and other appurtenances
which, in the opinion of the Director of Planning, are similar to
the foregoing, may be excluded from floor area measurement,
provided that the total floor area of all such excluded items does
not exceed eight percent of the permitted floor area.

(30/8/66—*4260)

G. Off-street Parking Spaces:
Off-street parking spaces shall be provided and maintained as
required by, and in accordance with the provisions of Section 12
of this By-law.

H. Off-street Loading Spaces:
Loading and unloading spaces shall be provided and maintained as
required by, and in accordance with the provisions of Section 13
of this By-law.

2. Uses which may be permitted subject to special approval by the Tech-
nical Planning Board:
With the approval of the Technical Planning Board development per-
mits may be issued for the following uses. If the development permit
is granted it shall be subject to such conditions and regulations as the
Technical Planning Board may decide, provided, however, that develop-
ment of any land abutting the streets set forth in Schedule “C” to
this by-law shall be subject to the additional special regulations con-
tained in Section 11 (2) to this by-law. (2/1/63—*4032)

A. Uses (Group A)
(1) Ambulance headquarters. (12/3/57—*3622)
(1A) Auction room (sale and storage).
(1B) Archery range, golf driving range and miniature rifle range
(in the open). (17/11/59—*3812)
(2) Automotive manufacture and body building.
(2A) Aviaries. (17/11/59—*3812)
(3) Billiard and pool hall.
(4) Bottling plant (milk or carbonated beverages).
(5) Bowling alley.
(6) Deleted (22/3/66—*4234)
(7) Buildings or runs for the hatching and raising of live poultry,
fowl, rabbits, frogs, fish, or worms.
(8) Building or use required by a public authority.
(9) Cannery (meat, poultry and pickles only).
(10) Car sales lot.
(11) Chemicals, manufacturing and mixing.
(12) Church.
line of the flanking street or lane and inclined at an average angle of 25 degrees to the horizontal.

For the purpose of computing the average angles of daylight obstruction on each side of the site, each angle shall be multiplied by the length of the applicable portion of the building or site over which such angle applies, and the sum of these products (angle times length applicable) shall be divided by the total length of the corresponding site boundary. For purposes of this section only the principal building shall be considered as an obstruction.

(21/7/64—*4119)

H. Floor Space Ratio

The maximum Floor Space Ratio shall be 1.00 provided however, this amount may be increased as follows:

(1) Where the site coverage is 50 percent or less an amount equal to 0.012 may be added for each one percent or fraction thereof by which such coverage is reduced below 50 percent.

(2) Where the area of a site exceeds 9,000 square feet and the frontage of such site is 75 feet or more, an amount may be added equal to 0.002 multiplied by each 100 square feet of site area in excess of 9,000 square feet, but in no case shall this amount exceed 0.25.

(3) Where parking spaces are provided within the outermost walls of a building or underground (but in no case with the floor of the parking area above the highest point of the finished grade around the building) an amount may be added equal to 0.20 multiplied by the ratio of parking spaces provided which are completely under cover, to the total required parking spaces.

(21/7/64—*4119)

In computing the floor space ratio, all floors, whether earth floors or otherwise, (with ceilings of more than 4 feet in height) of all buildings, shall be included, both above and below ground (measured to the extreme outer limits of the buildings) except for parking areas the floor of which is at or below the highest point of the finished grade around the building. For the purpose of this section the gross cross-sectional areas of stairways, fire escapes, elevator shafts, chimneys and any other services which, in the opinion of the Director of Planning, are similar to the foregoing, shall be included as floor area at each floor at which they are located; balconies, canopies, sundecks and any other appurtenances which, in the opinion of the Director of Planning, are similar to the foregoing, may be excluded from floor area measurement, provided the total floor area of all such excluded items does not exceed 8 percent of the permitted floor area.

Patios and roof gardens also may be excluded from floor area measurement provided that any sunroofs or walls forming part thereof are approved by the Director of Planning.

For purposes of this section site coverage shall be based on the
projected area of the outside of the outermost walls of all buildings.

In the case of a sloping site where a structure is located in or beneath a yard, such structure may be excluded from the site coverage calculation provided that the top of such structure (excluding required earth cover, permitted fence, etc.) is located beneath the average elevation of the portions of the streets, lanes or adjacent sites, located adjacent to such structure, provided in no case shall the top of any portion of such structure extend more than three feet above the adjoining streets, lanes or adjacent sites. (21/7/64—*4119)

J. Site Area
A site for a new apartment building, boarding or rooming house or fraternity or sorority house, or the relocation of an existing such building shall have an area of not less than 6,000 square feet except in the case of a lot of not less than 5,400 square feet on record in the Land Registry Office for the Vancouver Land Registration District prior to September 7, 1965. (9/9/65—*4196)

K. Off-street Parking Spaces
Off-street parking spaces for certain uses in this district shall be provided and maintained in accordance with the provisions of Section 12 of this by-law.

L. Off-street Loading Spaces
Loading and unloading spaces for certain uses in this district shall be provided and maintained in accordance with the provisions of Section 13 of this by-law.

M. Advertisements
No advertisements, bulletin boards or identification signs are permitted in the (RM-3) District, except as provided in Section 10 (21) of this by-law.

2. Uses which may be permitted subject to special approval by the Technical Planning Board:
With the approval of the Technical Planning Board development permits may be issued for the following uses. If the development permit is granted it shall be subject to such conditions and regulations as the Technical Planning Board may decide. (18/12/62—*4031)

A. Uses (Group A)
(1) Group Houses subject to the provisions of Section 11 (6) of this by-law.
(2) A new two-family dwelling or the relocation of an existing two-family dwelling on a site of less than 6,000 square feet, or a new apartment building, boarding or rooming house or fraternity or sorority house, or the relocation of an existing such building, on a site of less than 6,000 square feet.
(13) Clay and clay products manufacturing, excluding brick and tile.
(14) Cleaning and dyeing shop.
(15) Club, or Lodge (fraternal).
(16) Community centre.
(17) Concrete mixing operations or concrete products manufacturing.
(18) Cooperage works.
(19) Deposit or extraction of material so as to alter the configuration of the land.
(20) Film exchange.
(21) Fish market (wholesale).
(22) Flour mill.
(23) Furniture manufacturing and storage.
(24) Gypsum products manufacturing.
(25) Hall.
(26) Home craft or occupation.
(27) Deleted (5/5/60—*3840)
(28) Machine shop or blacksmith shop.
(28a) Marina (excluding boat building and major repairs to and overhaul of boats). (31/7/73—*4713)
(29) Monument or stone works.
(30) Office building, subject to it conforming to the vertical light angle provisions of the (C-3) Commercial District.
(31) Paint, oil shellac, turpentine or varnish manufacturing, mixing or storage.
(32) Park or playground.
(33) Pet shop.
(34) Plastic products manufacturing.
(35) Poultry (live) sales and distribution.
(36) Poultry slaughtering market.
(37) Public utility other than as provided for in Section 1 of this schedule.
(38) Radio and television broadcasting and receiving station (commercial).
(39) Retail store, business or undertaking.
(40) Sash and door manufacturing.
(41) School (public or private), kindergarten, day-care school, creche or day nursery.
(42) Sheet metal works.
(43) Stable, barn or the keeping, breeding, raising, training, boarding of horses, cattle, goats and sheep.
(44) Stadium, curling rink, ice rink, roller rink, race track, gymnasium, or similar place of assembly.
(45) Steam baths.
(46) Storage yard provided it is enclosed by a suitable fence which is painted and neatly maintained at all times.

(47) Swimming pool (commercial).

(48) Theatre (excluding a drive-in).

(49) Truck terminal.

(49A) Truck garden, field crop, nursery, berry or bush crops, orchard or pasture land. (17/11/59—*3812)

(50) Undertaking establishment.

(51) Deleted (31/7/62—*4007)

(52) Welding shop.

(53) Wiping rags and cotton waste (bulk storage).

(54) A dwelling unit for a caretaker or watchman or other persons similarly employed if such dwelling unit is considered to be essential to the operation of the business or the undertaking. (17/11/59—*3812)

(54A) Temporary Parking Area (Public). (10/11/64—*4139)

(55) Any other building or use which is not specifically listed in any schedule of this By-law, and which is similar to the foregoing buildings or uses; before granting a development permit for such building or use the Technical Planning Board shall have regard to the types of buildings and uses which specifically may be permitted in this schedule. (12/3/57—*3622)

(55A) A building which has been altered or used for a dwelling unit, housekeeping or sleeping unit, boarding or rooming house, prior to June 18th, 1956, with or without one or more of the required City permits.

(56) Any building or use which can be considered as accessory to the above uses and to the uses listed in Section 1 of this schedule, other than those accessory buildings or uses for which provision is made in such Section.

B. Uses (Group B) which may only be granted by the Technical Planning Board after consultation with the Vancouver City Planning Commission: (15/9/64—*4125)

(1) Aircraft landing place.

(2) Building or use customarily accessory to the above uses.
(CD-1) COMPREHENSIVE DEVELOPMENT DISTRICT SCHEDULE:

1. Uses Permitted:
   With the approval of the Technical Planning Board development permits may be issued for the following uses. If the development permit is granted it shall be subject to such conditions and regulations as the Technical Planning Board may decide. (18/12/62—*4031)

   (1) Comprehensive Unit Development subject to the provisions of Section 11(4) of this By-law.

   (Schedule of By-laws creating (CD-1) Comprehensive Development zoning and restricting the issuance of Development Permits to certain specified uses)

    (Amends By-Law No. 4065)
    (Amends By-Law No. 4065)
34. By-Law No. 4492, April 28th, 1970.
   (Amends By-Law No. 4065)
   (Amends By-Law No. 4497)
42. By-Law No. 4542, Mar. 2nd, 1971.
44. By-Law No. 4557, May 18th, 1971.
45. By-Law No. 4559, June 1st, 1971.
52. By-Law No. 4607, Mar. 7th, 1972.
   (Amends By-Law No. 4393)
   (Amends By-Law No. 4550)
54. By-Law No. 4613, April 10th, 1972.
   (Amends By-Law No. 4580)
   (Amends By-Law No. 4295)
   (Repeals By-law No. 4349)
   (Amends By-law No. 4680)
   (Amends By-law No. 4615)
Appendix to Chapter IV

**Printouts for Rezoning Types**

### TYPE 1 RS-1 to RS-2

<table>
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<tr>
<th>INDEPENDENT VARIABLE</th>
<th>ESTIMATED COEFFICIENT</th>
<th>STANDARD ERROR</th>
<th>T-STATISTIC</th>
<th>MEAN OF VARIABLE</th>
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*E-SCLADED = 0.4022*

**DUKIN-WATSON STATISTIC (ADJ. FOR C GAES) = 0.6166**

**NUMBER OF OBSERVATIONS = 172**

**SUM OF SQUARED RESIDUALS = 0.771643**

**STANDARD ERROR OP THE REGRESSION = 0.673727E-01**

**ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS**

\[
\begin{align*}
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-0.528E-04 & \times 106E-03 \\
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\]
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F-Square = 0.05950

Durbin-Watson Statistic (adj. for 1 gaps) = 2.3422

Number of Observations = 12

Sum of Squared Residuals = 93.5752

Standard Error of the Regression = 5.059C1

Estimate of Variance-Covariance Matrix of Estimated Coefficients

\[
\begin{bmatrix}
0.15e^F+C1 & -0.15e^F+C1 \\
-C.15e^F+C1 & 0.312e^F+C1
\end{bmatrix}
\]
### TYPE 3 RS-1 to CD-1

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**Mean of dependent variable is:** 4.2759

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**R-SQUARED =** 0.1311

**DURBIN-WATSON STATISTIC (ACJ. FOR 1 GAPS) =** 0.6462

**Number of observations =** 20

**Sum of squared residuals =** 180.577

**Standard error of the regression =** 3.16735

**Estimate of variance-covariance matrix of estimated coefficients**

\[
\begin{bmatrix}
0.1000 + 01 & -0.1000 + 01 \\
-0.1000 + 01 & 0.2000 + 01
\end{bmatrix}
\]

**SMPV VECTOR**

205 228
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R-SQUARED = 0.6624

LUEBIN-WATSON STATISTIC (ADJ. FOR 0 GAPS) = 1.0543

NUMBER OF OBSERVATIONS = 24

SUM OF SQUARED RESIDUALS = 6.4734

STANDARD ERROR OF THE REGRESSION = 1.65755

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

\[ \begin{bmatrix} 0.2111 \times 10^2 & -0.2111 \times 10^0 & -0.2111 \times 10^0 \\ -0.2111 \times 10^0 & 0.4613 \times 10^1 \end{bmatrix} \]
### Variables...

**174A65**

**C**

**ZONED**

**Mean of Dependent Variable is** 2.5615

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**F-Squared = 0.3940**

**Durbin-Watson Statistic (Adj. FEE for 0 GAPS) = 2.0454**

**Number of Observations = 18**

**Sum of Squared Residuals = 21.5537**

**Standard Error of the Regression = 1.16065**

**Estimate of Variance-Covariance Matrix of Estimated Coefficients**

- 0.135F+JC -0.135F+JC
- 0.135F+JC 0.202F+CC

**SVPL Vector**

247 256 525 529
VARIABLES...

74665 C
ZCRED

MEAN OF DEPENDENT VARIABLE IS 2.6714

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F-SQUARED = 0.7873

DURBIN-WATSON STATISTIC (ADJ. FOR 1 GAPS) = 2.3371

NUMBER OF OBSERVATIONS = 15

SUM OF SQUARED RESIDUALS = 4.56374

STANDARD ERROR OF THE REGRESSION = 0.592560

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

0.702E-01 -0.702E-01
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R-SQUARED = 0.4095

DURBIN-WATSON STATISTIC (ADJ. FOR 1 GAPS) = 0.5750

NUMBER OF OBSERVATIONS = 53

SUM OF SQUARED RESIDUALS = 154.753

STANDARD ERROR OF THE REGRESSION = 1.74194

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

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MEAN OF DEPENDENT VARIABLE IS 2.4454

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F-SQUARED = 0.0853

DUPPIN-WATSON STATISTIC (ADJ. FOR 1 GAPS) = 0.4220

NUMBER OF OBSERVATIONS = 32

SUM OF SQUARED RESIDUALS = 4.25337

STANDARD ERROR OF THE REGRESSION = 0.376535

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

\[ \begin{pmatrix} 0.945E-02 & -0.945E-02 \\ -0.945E-02 & 0.178E-01 \end{pmatrix} \]
VARIABLES

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R-SQUARED = 0.6258

DURBIN-WATSON STATISTIC (ADJ. FOR 0 GAPS) = 0.5104

NUMBER OF OBSERVATIONS = 163

SUM OF SQUARED RESIDUALS = 84.5102

STANDARD ERROR OF THE REGRESSION = 0.664521

ESTIMATE OF VARIANCE-COVARIANCE MATRIX OF ESTIMATED COEFFICIENTS

0.521E-02 -0.521E-02
-0.521E-02 0.103E-01
### Overall Zoning Effect

**Mean of Dependent Variable**: 2.4155

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**R-Squared**: 0.1799

**Durbin-Watson Statistic (Adj. for 0 Gaps)**: 0.6531

**Number of Observations**: 529

**Sum of Squared Residuals**: 1046.56

**Standard Error of the Regression**: 1.40921

**Estimate of Variance-Covariance Matrix of Estimated Coefficients**

\[
\begin{bmatrix}
0.758F-C2 & -0.756E-C2 \\
-0.758F-C2 & 0.15CF-C1
\end{bmatrix}
\]