NEIGHBOURHOOD CHANGE:

A CANADIAN PERSPECTIVE

Jonathan H. Mark

Michael A. Goldberg

Faculty of Commerce and Business Administration
University of British Columbia
Vancouver, B. C. V6T 1Y8

604-228-2191

Prepared for
Canada Mortgage and Housing Corporation
under
Grant CR 6585/G4

We wish to thank Jim Fitzsimmons and Mark Boyle for their computer assistance and the British Columbia Assessment Authority for providing us with data. We would also like to acknowledge the financial support of the Canada Mortgage and Housing Corporation, the Real Estate Council of British Columbia, the University of British Columbia and the British Columbia Youth Employment Program.

June, 1983

NEIGHBOURHOOD CHANGE: A CANADIAN PERSPECTIVE

I. Introduction

The problems of housing decay, declining tax base, and an inability to provide adequate public services in many American central cities have received much attention in the past decade. Many of these problems stem in large part from an exodus - particularly of family households and massive in many instances - of middle and upper income whites (and to a small degree - middle income blacks) from the central city to the suburbs. At a micro level, neighbourhood change and transition is an integral part of this macro scale population dynamic. As a result, several theoretical models have been developed to help understand this transition, and further, to provide some insights into what types of policies might be developed to slow down or reverse the process.

Many Canadian cities - particularly the younger western ones - face a different set of problems. Ghettos and slums are generally non-existent and few people (particularly relative to the U.S.) live in substandard housing. The housing price trends of the 1970's suggest that there has been in general no excess supply of housing in metropolitan areas and their central cities, but rather there has been either a stable or excess demand for housing. Thus, the neighbourhood transition process referred to above for the U.S., to the degree that it might exist, appears not to be motivated by racial factors and an outward movement of middle income households to the suburbs. Rather, it appears driven by rising expectations and excess demand, both of which represent different dynamics than are present in the U.S.

The research reported on here represents a more general model of neighbourhood change which we think provides some insights into the

process of neighbourhood change and stability in Canadian cities with implications for understanding U.S. changes also. We begin by first describing some of the U.S. derived models and then argue that Canadian cities are in fact different from U.S. cities. These two sections provide a basis for claiming that some factors other than those cited in U.S. models are relevant for the Canadian case. The fourth section presents the more general model, and describes the basic estimating equation and the hypotheses to be tested. The fifth section presents the results of our empirical test of these hypotheses. The final section discusses some of the consequences of our research for policy and for additional work on neighbourhood dynamics in both Canada and the U.S.

II. Some Existing Models of Neighbourhood Change

In this study, neighbourhood change refers to the "dynamic process whereby actual or expected changes in a neighbourhood's attributes (for example, income, race or density) result in the area becoming more or less desirable to its residents" (Cameron, 1979). This definition can accommodate stability and upward or downward change,and corresponds closely to Little's (1976) definition of passive filtering. The U.S. based models of neighbourhood change generally are employed only to explain neighbourhood decline; however, the other two neighbourhood dynamics (stability and improvement) are also important particularly since a major reason for studying decline is to develop policies to reverse it. This task is made difficult if we do not understand the dynamics of stability and improvement. Below, several models of neighbourhood change are discussed.

U.S. Based Studies

The models of Burgess, Park, and McKenzie (1925) and Hoyt (1939) suggest that the urban area should be viewed as a series of concentric rings and wedge-shaped sectors, respectively. Expansion takes place in an outward direction as incomes increase and as the CBD expands. As a result of both of these processes, inner-city residential neighbourhoods tend to become less desirable, under-maintained, and deteriorated and a succession of lower income households inhabit them. Obviously in a world of freeways and automobiles, these types of models of neighbourhood change are over-simplified. However, the basic notions that demand for housing services rises with income while the supply of housing services declines as housing units age remain valid for most U.S. cities. The filtering process which results depicts middle and upper income households (particularly families) moving out of the central city while the housing filters down through lower and lower income households.

The filtering notion is extended in the vintage model of neighbourhood change where change occurs in those areas with aging housing stocks (Muth, 1973). These areas are generally found in the cores of American cities. In the vintage model, it is reasoned that neighbourhoods with large quantities of older housing can provide lower quality housing services than other neighbourhoods. Therefore, these areas will attract lower income residents who cannot effectively compete for higher quality housing against middle and upper income households. Brueckner (1977) empirically tests the Muth model as an alternative to the Bailey model (discussed below) and argues that Muth's vintage model is preferable. However, Phillips (1981) argues that Brueckner's results are spurious.

One of the most insightful models of neighbourhood change was put forth by Bailey (1959), who in the context of examining zoning changes, presented a model with an explicit dynamic mechanism that could cause neighbourhood change. This model is the forerunner of model we have developed. He assumed two population groups, A and B, where the A type households prefer not to live near B type households and where the B's prefer to live near the A's. The groups may be assumed to be whites and blacks, high and low income, or owners and renters; however, no assumptions need be made regarding this. Assuming an initially segregated situation, the preference patterns described above lead to a situation in which the B's pay a premium to live near the boundary with the A's while the A's discount the properties near the border with the B's. If, for whatever reason, there is an increase in the demand for housing on the B side, then prices on the B side will be bid up. If prices are bid up to the point where the price on the B side of the boundary surpasses the price on the A side of the boundary, then transition from A type occupancy to B type occupancy will occur. Further, some of the properties on the interior of the A side will become boundary properties while boundary properties on the B side will become interior properties. Depending on the supply and demand assumptions made, the conversion process could continue, or an equilibrium with segregation or integration could be reached.

The arbitrage model developed in St. Louis (see Leven et al., 1976 for a detailed description and analysis), is an extension of the Bailey model. One of the primary assumptions of this model is that household preferences for housing are dependent on a larger range of

neighbourhood socio-economic attributes than in Bailey's model, as well as depending on a wide range of neighbourhood traits such as housing stock, access and public services, as well as the structural attributes of the unit itself. If these characteristics change, or if a household expects that they will change, then it is likely that a change in the pattern of occupancy and prices will occur. As a result, neighbourhoods can undergo transition. The primary contribution of this model is the explicit introduction of expectations, and the notion that if households expect changes in the racial composition of a neighbourhood in the future, then they may react by moving earlier than they would otherwise, thus speeding up the transition process. That expectations are important factors in neighbourhood change is not new; however, the arbitrage model incorporates expectations explicitly into the process. The importance of expectations as a determinant of housing values has been empirically supported in Little (1976), and Mark (1977a).

Anas (1980) examines neighbourhood change using random utility theory. Using this approach, he is able to explain both smooth and rapid income and racial change in the context of exogenous economic changes. In doing so, it is not necessary to rely on models of prejudicial behavior. Schnare and MacRae (1978) also examine neighbourhood change focusing on racial change and tipping points.

A study by Goetze (1979) also examines, via case studies, the role of expectations in neighbourhood change. He suggests that there are at least four dimensions which define the context in which change takes place: metropolitan dynamics, central city differentials, citizens expectations of government, and the local administrative context. For our purposes, Goetze's references to citizen's

expectations are most relevant. He contrasts the narrow view in which governments are expected to simply provide services to one which the government is expected to act in a welfare state redistributional context. He asserts that these factors affect expectations and attitudes regarding neighbourhood change, however the existence of these impacts are not tested using econometric techniques.

Anthony Downs (1981) examines neighbourhood change in a broad policy context. He argues that the housing which results from the neighbourhood change process is a necessary short run evil if low income households are to be housed. Downs' analysis is based on a five stage typology of neighbourhoods as described by Cannon et.al. (1977) as well as others. The five stages are (1) stable and viable, (2) minor decline, (3) clear decline, (4) heavily deteriorated, and (5) unhealthy and nonviable. Downs states specifically that change can occur in either direction in the above typology. This analysis is probably the most general study of neighbourhood decline of those reviewed thus far, however, there is little, if any, explicit discussion of the role of expectations.

Canadian Based Studies

Schliewinsky (1975) developed one of the few Canadian neighbourhood change models by examining change in a probabilistic sense. His model involves the typing of neighbourhoods into fifteen categories, and then examining the frequency of transition from each type to each of the fifteen types. This transition matrix is then converted into a matrix of probabilities that different types of change will occur. He suggests that the factors affecting stability (or instability) are not fully accounted for in the demographic and

housing stock characteristics he considers. The predictions of the model are successful in 71% to 90% of the cases studied. Despite its predictive accuracy (which would probably be considered relatively high given the variables on which it is based), a major shortcoming on this model is that it does not consider and analyze the various factors that cause change to occur - in particular, the influence of government policy.

A 1978 study by Moore examined the role of zoning in the neighbourhood change process in Toronto. His model relies heavily on the concepts of rent and reservation price, as defined by Whitbread and Bird (1973). In particular, change (in use or ownership) occurs if and when something causes the rent to exceed the reservation price. Such circumstances include many of the factors that have been reviewed above. Moore cites, in particular, "demographic aging (life cycle changes), dwelling obsolescence, environmental quality decline, city growth" (p. 336) among others. Moore asserts that zoning changes will affect the levels of both rent and reservation price, and therefore, the probability that a given site will change use. It is the aggregation of individual site changes that constitutes neighbourhood change in this model. The research reported on here helps to explain how the various factors cites by Moore affect neighbourhood change.

While not specifically a study on neighbourhood change, a study (Urban Land Economics Division, 1978) of neighbourhood filtering in the Vancouver metropolitan area provides an interesting backdrop for the current study. This filtering study examines housing price transactions in 1965, 1968, 1971, 1974, and 1977 in 47 areas within the Vancouver area. In each year, prices were standardized and the

areas ranked in descending order according to the standarized prices.The changes in rank during the three year intervals were taken as measures of filtering activity. Most Vancouver neighbourhoods showed remarkable relative stability when 1965 and 1977 rankings are compared, despite some significant changes in some of the three year intervals. The Fraser area (defined somewhat differently in the filtering study than in the current study) moved up only three positions in the overall ranking during the twelve year period. Kerrisdale - another area of interest here - performed similarly, although its rankings are considerably higher than those of Fraser. While the filtering study suggests that there is general stability, it is still the case that neighbourhoods do change, and thus, this study focuses on the factors affecting neighbourhood change at the micro level.

A final Canadian based study is that of Cameron (1979) which was carried out under the direction of the two present authors. Cameron's model begins to bridge the gap between the arbitrage model and a more general model based on the expectations held by households, developers, and retailers, among others. The empirical analysis focuses solely on the results of a change in zoning to a higher density in the Kerrisdale section of Vancouver. The current study extends this work by examining two additional neighbourhoods, and by considering a much broader range of government policies which might affect the relative desirability of a neighbourhood.

Summary

The U.S. based models reviewed above emphasize the role of race and expectations regarding racial change, as well as income and access in neighbourhood transition. Further, as noted earlier, the

models stress neighbourhood decline rather than stability or improvement. However, U.S. and Canadian cities are different and it is not to be expected that U.S. based models need apply in Canada. Accordingly, we now turn our attention to a short comparison of U.S. and Canadian cities to demonstrate that they are, in fact, quite different, and thus require a more general model to explain the dynamics of change in neighbourhoods in both countries.

III. Canadian and U.S. Cities Briefly Compared

Perhaps the major difference between the urban areas of Canada and the U.S. has to do with the viability of the central cities. (See Goldberg and Mercer, 1979 for details of what follows.) In most of the major U.S. cities, the inhabitants of the central cities are largely low income, blue collar or unemployed, ethnic minorities living in housing that is at the lower end of the quality spectrum. The middle and higher income households and especially families have generally left the U.S. central cities for the suburbs. This out-migration process has occurred in large part because of increased automobile ownership, construction of urban expressways, and income tax policy.

Canadian cities, on the other hand, tend to be much more compact and their central cities are viable. Income disparities are smaller, ethnic minorities do not face institutional discrimination, and urban highways are much less prevalent in Canadian cities than in their U.S. counterparts. Public transit patronage has generally increased in recent years. These factors explain in part why rental gradients tend to be steeper in Canadian cities.

Another important fact that must be taken into account is the role that senior levels of government play in urban affairs in both countries. As noted above, in the U.S., federal subsidization of urban expressways and homeownership have been a significant decentralizing "pulling" forces while urban renewal and public housing have been decentralizing "pushing" forces (see de Leon and Enns, 1973 for a discussion of highways). All of these have been destabilizing influences on central city investment (see Goldberg, 1977). Government intervention in U.S. cities has generally been on a very large scale. The effects of this intervention (whether by the federal, state, or local government) have been significant. Canadian cities have also been the subject of substantial government intervention, however primarily at the provincial and local levels due to the British North America Act (the Canadian constitution), which basically prohibits direct federal intervention in urban affairs. As a result of this set of circumstances, the various government programs in Canada have tended to be much smaller in scale in the absence of large-scale federal involvement. Urban renewal, highway construction, public housing, and neighbourhood preservaton programs are all generally smaller in scale than their U.S. counterparts. No income tax program to benefit homeowners exists, however, the Clark government briefly proposed one in 1979. Finally, urban policy cannot be imposed on Canadian cities by the federal government, and although the provinces are by law allowed to dictate urban policy, the political process tends to mitigate this and decentralize urban policy to the local governments themselves (Goldberg, 1978). The result is a much more fragmented, locally based and smaller scale series of urban policies and programs than in the U.S.

In summary, it is evident that Canadian and U.S. cities are different in many ways. As a result, it is reasonable to expect that models which explain the dynamics of change in one context may not be adequate and appropriate in another context. Thus, in the next section we extend the arbitrage model in an attempt to accommodate the two contexts described above.

IV. An Extended Model

The arbitrage model described above assigns a primary role to the expectations of households concerning the changing broad socio-economic characteristics of neighbourhoods. In particular, the empirical analysis associated with the arbitrage model focuses on the expectation of racial change (and implicitly, income change) in neighbouring areas. That empirical work substantiates the hypothesis that such expectations are important in affecting price change, which is the measure of neighbourhood change that is employed in these studies.

While the arbitrage model emphasizes the role of expectations regarding racial change as they affect house prices, it is our belief that expectations should be examined in a broader context. Private and public investment (or reinvestment as the case may be) or lack there of, is the way in which change often occurs. Thus, it is of interest to examine the relationship between such investment and the expectations of households, retailers, and developers. The role of governments in helping to shape these expectations is of particular importance here. At its simplest level, the expectation of improvement (or stability) should lead to increased investment. Generally,

such investment would lead to the improvement itself. This is in the nature of a self-fulfilling prophecy.

The decision to invest typically depends on the risk associated with the investment. Our observations of cities and neighbourhood change in Canada and the United States lead us to believe that as the scale of a government's project or policies increase and given the on-again, off-again nature of these policies, uncertainty is created and risk is increased. As examples, large-scale federally imposed projects such as urban renewal, highway construction, and public housing might be expected to increase uncertainty and risk (despite the fact that urban renewal was supposed to reduce uncertainty and spawn private investment). Alternatively, smaller scale projects which are carried out locally and aimed at individual investors and homeowners, such as neighbourhood revitalization and housing rehabilitation programs, are less likely to create such uncertainty and risk.

Freeways illustrate nicely the point we are making. In the U.S. evidence is growing that federally-funded urban freeways have had enormous impacts on central city neighbourhoods. By continually expanding the scale of urban areas they functionally expand the supply of urban land. This expanded land supply disadvantages existing areas and encourages movement to suburban areas newly advantaged with freeway access. The outward movement of households lowers central city residential demand, thereby lowering expectations of existing residents about the viability of their neighbourhoods and particularly about the wisdom of investing or reinvesting in their neighbourhoods. These lowered expectations are further buffeted by the physical destruction of existing neighbourhoods which accompanies urban

expressway construction. Taken together and combined with federal tax program in the U.S. on mortgage interest and property tax deductibility, the stage is set for additional suburbanization and further declines in the expectations of central city neighbourhood dwellers (and potential dwellers).

This situation contrasts quite markedly with the Canadian case where urban expressways have been much less prevalent. In our study area (Vancouver) there are no expressways whatsoever in the central city. The absence of freeways (and of the ability of the federal government to fund them readily) has meant that urban development has had to proceed more incrementally and that central city areas can maintain their competitive edge vis- -vis suburban competition. In such an environment, central city residents have greater expectations of continued neighbourhood stability, risk is reduced and investment and reinvestment encouraged. If this dynamic is at work we should expect to see considerably greater demand over time for building permits for renovations, updated heating and plumbing systems, and for new construction, in Vancouver's central neighbourhoods, than we would expect to see in analogous neighbourhoods in the U.S.

In direct contrast with the foregoing scenario are such voluntary locally based programs as RRAP (Residential Rehabilitation Assistance Program), which builds directly on homeowner confidence, and reinforces that confidence. Combined with the NIP (neighbourhood Improvement Program) approach which seeks to improve the physical infrastructure of the neighbourhood, RRAP presents a much less intrusive and risky government program when compared with larger scale freeway (and urban renewal) interventions. If our argument holds, then we should be able to observe the difference in reinvestment and

investment behavior under conditions of varying scales of senior government intervention.

This discussion suggests several hypotheses regarding factors which affect neighbourhood change as follows:

1) the smaller the scale of government intervention in a neighbourhood, the less likely it is that expectations and property values will be negatively affected.
2) as development, building, and retailing permit applications increase, there are expectations of neighbourhood improvement and property values increase.
3) designation of an area as a neighbourhood improvement area (NIP) or residential rehabilitation assistance program area (RRAP) will positively affect housing values.
4) increasing neighbourhood income levels leads to increases in housing values.
5) government rezonings from single to multiple family use will cause an initial increase in uncertainty, but will positively affect housing and property values in the longer run.
6) provincial and federal policies designed to increase the ability of households to purchase housing (NHA loans, provincial second mortgages, for example) will lead to increases in housing values.

In the next section, the variables that are used to test these hypotheses will be discussed.

In Section II, neighbourhood change was defined in terms of a neighbourhood becoming more or less desirable to its residents through time. Little (1976) has related this definition to house prices by formulating a model in which neighbourhood price levels are indicators of preferences and satisfaction. It follows that changes in price levels may be taken as indicators of changes in the preferences of residents. The empirical analysis to be described below examines the factors which affect changes in neighbourhood price levels over time.

V. Empirical Methodology and Data Description

The primary data base to be used in this study was obtained from the British Columbia Assessment Authority. Detailed information was collected on over 7,200 single family housing units in three Vancouver, B.C. neighbourhoods covering the period from 1955 to 1980, inclusive.[1] This data set provides detailed information on virtually every single-family housing unit in these three neighbourhoods, as well as providing the sale price for any sales which took place for each of the housing units.[2] This data has been supplemented by extensive information obtained from Statistics Canada describing the socio-economic and housing stock characteristics of the neighbourhoods and from the Vancouver City Planning Office describing residential rehabilitation and neighbourhood improvement activities. Other data describing government policy changes, zoning changes and macroeconomic policy have also been incorporated into the data set.

The methodology used to test the hypotheses outlined above is as follows:

1) For those units actually selling in 1957, 1961, 1966, 1971, 1976 and 1980, a hedonic price equation is estimated in

which the dependent variable is sale price, while the independent variables include measures describing structural characteristics, lot size, and neighbourhood indicators.[3] The variables considered for use in these equations are defined in Table 1. This is stage 1 of the estimating process.

2) Using the coefficients determined above, a predicted price is obtained for each housing unit in each of these years.

3) In stage 2 of the estimating process, an equation is estimated in which the dependent variable is the difference in the predicted prices for each of the housing units from 1957 to 1961, 1961 to 1966, 1966 to 1971, 1971 to 1976, and 1976 to 1980. Thus, five series of difference equations are estimated. The independent variables used in these equations are defined in Table 2 and provide information about lagged sale prices, turnover rates, private reinvestment, rezonings, designation of the area as NIP and RRAP, as well as extensive census information. These variables, in each case, correspond to the same period as does the dependent variable, except for LAGPRICE.

The LAGPRICE variable is included as a measure of expectations on the assumption that past price changes will affect buyer and seller behaviour. The variable indicating the proportion of units which were improved is also an expectations measure. Government policies and actions are measured by two variables indicating the presence of rezonings, variables indicating the designation of the area as a NIP or RRAP area, public and non-market housing variables, census variables, and government lending policies. The census variables are

used to describe the subneighbourhood at the beginning of each period. For example, mean household size in 1961 is used in the regression which explains price changes between 1961 and 1966. These variables will be discussed again in the next section when the results are presented.

VI. Empirical Results

Table 3 presents the results of the first stage of the estimating process. The variables included and their significance levels show inconsistency among the six years.[4] The estimated signs are generally consistent across the years, except for RMZONE, STRATH, and the constant. The adjusted R^2 values are respectable in most cases, although the 1980 value is much lower than the others and is certainly lower than is desirable. The inconstency could occur because of a structural change in the demand for housing over time, or simply because the composition of the units actually sold changes from year to year.

The more important results for this study are shown in Table 4 where the second stage estimates are presented. As in the stage one results, there are some inconsistencies with respect to included variables, and magnitudes and signs of the estimated coefficients. LAGPRICE was expected to have a positive sign suggesting that the larger the price increase in the previous period, the larger the price increase in the current period. This was obtained for only one of the three years in which the variable was retained. It was unclear what to expect for TURNOVER, although the results clearly indicate that an increased turnover rate is negatively related to price changes. IMPROVES behaves as expected - as the proportion of units improved

increases, the price change increases. This suggests that positive externalities and expectations may be created by this type of private reinvestment behavior. Both of the rezoning variables have mixed signs,[5] however if there was any expectation, it probably would have been that an increase in density for an existing use (REZONED2) would lead to larger price changes. This in general, is substantiated by the results. NIPAREA is relevant for only the last two periods, while RRAPAREA is relevant for only the last period. In both periods, NIPAREA is positive as expected. RRAPAREA does not enter the equation because the correlation coefficient between it and NIPAREA is .94. It was expected that DVNHA would be positive based on the belief that if the mean neighbourhood sales price is less than the implicit NHA maximum, then it would make mortgage money easier to obtain and therefore make the area one which is relatively attractive. A bidding up of prices and changes in prices would then occur. However DVNHA consistently appears with a negative sign. Perhaps this result is obtained because NHA financing is not seen as being relatively attractive, or that purchasers simply rely on second mortgages to make up the difference between the NHA first mortgage amount and the downpayment. Alternatively, the specification of this variable may be a problem.

Two variables are included to examine the effects on price changes of the British Columbia Homeowner's Grant. This grant is used to reduce the property taxes which are payable on owner occupied housing. It was expected that both would be positive indicating that as the ratio of grants to predicted price increased, the change in predicted values also increases. The expected result is obtained in

all five periods for HOG1, the ratio in the first year of the study. However HOG2, which is the ratio in the last year of the study, is consistently negative. This may result from the specification of the variable in that, for example, changes in HOG2 would result primarily from a change in the opposite direction of the predicted price in the denominator because the grant amount is relatively stable. However, the predicted price and change in price (the dependent variable) should be highly correlated in the positive direction. Thus HOG2 and the dependent variable would tend to move in opposite directions; thus, a negative sign. The same argument could be made for HOG1, however it would be weaker because the correlation between the predicted price in the first period and the change in price over the period would be much weaker.

There are four variables to measure the impact of subsidized or public housing on the same block as or on adjacent blocks to the housing unit. Two of the variables indicate the actual number of units, while two indicate simply the presence or absence of such units. It was unclear what sign should be expected, although based on the United States experience, a negative sign might have been expected. These variables appear as significant seven times in the results, and only two of the coefficients are negative. This certainly suggests that the presence of such housing does not in general create negative expectations or externalities.

The remainder of the variables considered for inclusion in the equation are variables which describe the population and housing stock in the area at the beginning of the time period. The results here are generally mixed with only UNIVED and MEANY appearing consistently with

the expected sign. DEPEND and NONENG appear with both signs, while OLDUNITS appears with the unexpected sign.

All in all, the results provide evidence in support of most of the hypotheses that were discussed earlier. The hypothesis regarding the scale of government intervention is partially supported in that the NIP and RRAP programs do not negatively affect values while to some degree the larger scale intervention in the form of public housing may negatively affect values. The second hypothesis regarding permit applications and expectations was only indirectly tested through the use of IMPROVES, however its sign is as expected and thus, the hypothesis is indirectly substantiated. The third hypothesis regarding NIP and RRAP is also substantiated. The fourth hypothesis regarding the effects of neighbourhood income also receives support by virtue of the positive sign for the coefficient of MEANY. Hypothesis five concerns the effect of rezoning land from single-family to multi-family. We have tested that indirectly by including REZONED2 which had a positive sign in three of the four periods where it appears. This provides some support for this hypothesis. Finally, the last hypothesis regarding policies to increase the ability of households to purchase housing is generally unsupported by virtue of the results for DVNHA, HOG1 and HOG2.

In general the empirical results provide support for the hypotheses which summarize the basic expectations model. The final section of the papers discusses some of the implications of the results.

VII. Implications of the Findings

The foregoing have significant implications for public policy and for the technical people who advise urban policy decisionmakers. First, these results imply that planners and policymakers can and do have significant impacts on the health of urban neighbourhoods, as they create the environment within which private investment behaviour takes place and expectations are formed. Second, these impacts need not always be in the direction desired. For example, our results suggest that large-scale planning interventions in the areas of urban renewal, transportation improvements (freeways, subways or other transit) and zoning may lead to significant neighbourhood change, sometimes for the worse as often appears to be the case in the U.S. and sometimes for the better as appears frequently to be the case in Canada.

Third, and in summary, planning and policy action and the program initiatives that implement plans can have dramatic impacts - both good and bad - on urban neighbourhoods. The results suggested by the foregoing analysis lead us to strongly urge planners and other urban policy people to carefully examine the impact of their decisions on the expectations of current investors and homeowners, as well as upon potential investors and homeowners. By carefully tracing through the effects of planning and other related decisions on expectations about neighbourhood change and stability, decisions which might be well intentioned but which negatively effect expectations can be eliminated at the outset so that negative consequences of positive planning action can be greatly minimized.

This final point about expectations is sufficiently important that it should be stressed, and its implementation into planning

practice outlined. The past decade has seen a dramatic rise in public input to the planning process. Important and vital strides have been made in this area and planning practice guided by the wisdom of the affected public has become more sensitive and effective. Our findings suggest that such public participation exercises be widened to include members of the development community as well as members of the general public, and simultaneously that the exercise be narrowed somewhat to focus upon questions of expectations and likely investment/ reinvestment behaviour resulting from contemplated planning decisions. Such an expanded public participation process combined with such a well focused question (i.e., expectation and investment behaviour) carries with it the potential for moving the urban planning and public decision-making process ahead into the 1980's as it has moved us successfully through the 70's.

TABLE 1

VARIABLE NAMES, EXPECTED SIGNS, AND DEFINITIONS
FOR STAGE 1 EQUATIONS

VARIABLE NAME	EXPECTED SIGN	DEFINITION
PRICE	dependent variable	actual sale price in dollars
GRDFLR	+	size of main floor in square feet
AGE	-	age of housing unit in years
BASEMENT	+	dummy variable for basement (1 = full, 0 = other)
FLRMAT	+	dummy variable for floor material (1 = hardwood, 0 = other)
PLUMBS	+	number of plumbing connections
HEATTYPE	?	dummy variable for type of heat (1 = gas, 0 = other)
HEATMOD	+	dummy variable for heating having been modernized (1 = yes, 0=no)
LOTSIZE	+	size of lot in square feet
ROOMS	+	number of rooms
GARAGE	+	dummy variable for garage (1 = yes, 0 = no)
FIREPL	+	dummy variable for fireplace (1 = yes, 0 = no)
ALTERS	+	dummy variable for alterations having been done (1 = yes, 0 = no)
ROOF	+	dummy variable for type of roof (1 = slate or tile, 0 = other)
STRATH	-	dummy variable for location in Strathcona (1 = yes, 0 = no)
KERRIS	+	dummy variable for location in Kerrisdale (1 = yes, 0 = no)
CZONE	?	dummy variable indicating parcel is zoned for commercial use (1 = yes, 0 = no)

TABLE 1
VARIABLE NAMES, EXPECTED SIGNS, AND DEFINITIONS
(continued)

MZONE	?	dummy variable indicating parcel is zoned for industrial use (1 = yes, 0 = no)
CDZONE	?	dummy variable indicating parcel is zoned for comprehensive development (1 = yes, 0 = no)
RMZONE	?	dummy variable indicating parcel is zoned form multi-family use (1 = yes, 0 = no)
RTZONE	?	dummy variable indicating parcel is zoned for duplex use (1 = yes, 0 = no)
DISTCBD	+	straightline distance from the primary intersection in the CBD to the centre of the block containing the parcel, measured in centimeters (1 centimeter = .25 miles)

TABLE 2

VARIABLE NAMES, EXPECTED SIGNS, AND DEFINITIONS
FOR STAGE 2 EQUATIONS

VARIABLE NAME	EXPECTED SIGN	DEFINITION
DPRICE	dependent variable	change in predicted price of the unit over the time period
LAGPRICE	+	% change in mean sale price of units in the subneighbourhood lagged one period (not available for the 1957 to 1961 period)
TURNOVER	?	turnover rate in the subneighbourhood during the period
IMPROVES	+	proportion of units in the subneighbourhood improved during the period
REZONED1	?	dummy variable indicating a rezoning allowing change in use in the subneighbourhood during the period (1 = yes, 0 = no)
REZONED2	?	dummy variable indicating a rezoning allowing increase in density with no change in use during the period (1 = yes, 0 = no)
NIPAREA	+	dummy variable for location in a NIP designated area in the 1971 to 1976 and 1976 to 1980 periods (1 = yes, 0 = no)
RRAPAREA	+	dummy variable for location in a RRAP designated area in the 1976 to 1980 period (1 = yes, 0 = no)
DVNHA	+	dummy variable indicating that in a majority of years in that period, the implicit maximum NHA price exceeds the mean sale price in the subneighbourhood (1 = yes, 0 = no)
HOG1	+	ratio of B.C. Homeowner Grant to predicted price in first year of the period
HOG2	+	ratio of B.C. Homeowner Grant to predicted price in last year of the period

TABLE 2
VARIABLE NAMES, EXPECTED SIGNS, AND DEFINITIONS
(continued)

PHOUSON	?	number of units of public or subsidized housing on the block during the time period (not relevant for 1957 to 1966)
PHOUSADJ	?	number of units of public or subsidized housing on adjacent blocks during the time period (not relevant for 1957 to 1961)
DVPHON	?	dummy variable indicating presence of public or subsidized housing on the block during the time period (not relevant for 1957 to 1966) (1 = yes, 0 = no)
DVPHADJ	?	dummy variable indicating presence of public or subsidized housing on adjacent blocks during the time period (not relevant for 1957 to 1961) (1 = yes, 0 = no)
HHSIZE	?	mean household size in the enumeration area containing the housing unit in 1961, 1966, 1971, and 1976
DEPEND	?	proportion of population over 65 or under 18 in the enumeration area containing the housing unit in 1961, 1966, 1971, and 1976.
NONENG	-	percent of households containing the housing unit in the enumeration area with non-English mother tongue in 1961, 1971, and 1976
RENTAL	-	percent of units in the enumeration area containing the housing unit which are renter occupied in 1961, 1971, and 1976
UNIVED	+	percent of population over 15 years old with more than a high school education in the enumeration area containing the housing unit in 1961, 1971, and 1976.

TABLE 2
VARIABLE NAMES, EXPECTED SIGNS, AND DEFINITIONS
(continued)

MEANY	+	mean family income in the enumeration area containing the housing unit in 1961 and 1971
OLDUNITS	-	percent of units over 15 years old in the enumeration area containing the housing unit in 1961

TABLE 3

FIRST STAGE RESULTS[1]

	1957	1961	1966	1971	1976	1980
GRDFLR	8.16	8.86	5.70	13.28	18.79	30.15
AGE	-36.20	-50.92	-79.90	-152.04	-181.55	-571.88
BASEMENT			1127.52[3]		3390.51[2]	
FLRMAT		965.44[2]				
PLUMBS	696.28	354.13	1040.25	1416.47	1463.23	7447.55
HEATTYPE						
HEATMOD						
LOTSIZE	.14	.12	.76	.56	2.11	.69[3]
ROOMS		342.68				
GARAGE		600.79[3]				
FIREPL	787.61[3]				3616.58	
ALTERS	720.50[3]				2169.23[3]	
ROOF			96590.76	10931.98[2]		
STRATH		1964.81[3]		-15225.86		
KERRIS	1355.09	1528.27	3318.10	4694.19	11650.83	45615.04
CZONE						
MZONE				10420.77		
CDZONE					-23059.64	
RMZONE	2028.61[2]	-2116.59[3]		14200.58		
RTZONE						
DISTCBD		188.03[3]			862.94	
CONSTANT	-947.05	-3008.13	160.46	3470.10	5708.02	38172.80
ADJUSTED R^2	.64	.68	.48	.77	.79	.25
SAMPLE SIZE	191	252	767	305	260	371

[1] all t values $\geq$ 1.96 unless indicated
[2] $1.65 \leq t < 1.96$
[3] $t < 1.65$

TABLE 4

SECOND STAGE RESULTS[1]

	1957 to 1961	1961 to 1966	1966 to 1971	1971 to 1976	1976 to 1980
LAGPRICE			16.51	-12.77	-41.34
			(3.8)	(3.8)	(8.5)
TURNOVER	-6.34	-26.69	-25.68		-126.65
	(78.3)	(3.5)	(2.8)		(5.3)
IMPROVES			53.17		37.47
			(6.4)		(1.6)
REZONED1	56.15	356.67		-1354.91	-947.95
	(2.1)	(2.5)		(6.2)	(2.0)
REZONED2	433.15	-649.75	2927.19	1566.29	
	(11.9)	(3.3)	(3.9)	(5.0)	
NIPAREA				5511.08	1016.71
				(8.2)	(2.1)
RRAPAREA					
DVNHA	-442.04	-1112.61	-5126.49	-3662.48	-14610.71
	(14.9)	(3.6)	(18.1)	(18.8)	(13.4)
HOG1	9049.55	8915.81	4245.70	5053.60	58343.46
	(61.2)	(18.5)	(14.0)	(27.1)	(19.1)
HOG2	-7125.33	-4768.20	-9386.79	-52857.80	-177310.00
	(5.3)	(27.4)	(38.4)	(74.4)	(60.2)
PHOUSON			-39.69		
			(5.5)		
PHOUSADJ		7.25	-8.31		
		(2.5)	(4.3)		
DVPHON				2834.38	3060.86
				(3.5)	(1.3)
DVPHADJ				5474.80	1971.29
				(13.3)	(1.7)
HHSIZE			1579.72		
			(5.8)		
DEPEND			-188.14	36.55	
			(6.0)	(2.4)	
NONENG				-33.17	61.36
				(5.2)	(1.9)
RENTAL					
UNIVED		124.23			
		(10.8)			
MEANY				.62	
				(31.4)	
OLDUNITS		10.10			
		(3.0)			
CONSTANT	2315.80	2624.50	21601.92	54403.90	107131.62
ADJUSTED R^2	.55	.17	.32	.84	.76
SAMPLE SIZE	6454	6564	6175	6230	6437

[1] t values in parentheses

FOOTNOTES

1. The three neighbourhoods are Kerrisdale, Strathcona, and Fraser/Kensington, for which there are 1500, 763, and 5008 observations, respectively. Over the 25 year period, these are 2441, 859, and 6891 sales in the three neighbourhoods, respectively.

2. An attempt was wade to delete non-arm's length transactions, however some may have been retained due to lack of information. It is reasonable to assume that they would constitute a very small percentage of all sales.

3. An equation including these independent variables is probably underspecified, particularly relative to equations of this type as specified in Mark (1977a, 1980). However, these effects should be picked up in the second stage of the estimating procedure.

4. This inconsistency is consistent with the results described in Mark (1983).

5. This inconsistency is similar to what is found by Mark and Goldberg (1982).

REFERENCES

Anas, A., "A Model of Residential Change and Neighborhood Tipping," Journal of Urban Economics, Vol. 7, 1980.

Bailey, M., "A Note on the Economics of Residential Zoning and Urban Renewal", Land Economics, 1959.

Brueckner, J., "The Determinants of Residential Succession," Journal of Urban Economics, Vol. 4, 1977.

Burgess, E.W., R.E. Partk and R.D. McKenzie, eds., The City, (Chicago: University of Chicago Press), 1925.

Cameron, J.G., "An Expectations Model of Neighbourhood Change", M.Sc. Thesis, University of British Columbia, 1979.

Cannon, D.S., M.L. Lachman, A.S. Bernhard, "Identifying Neighborhoods for Preservation and Renewal", Growth and Change, January, 1977.

de Leon, P., J. Enns, The Impact of Highways Upon Metropolitan Dispersion: St. Louis, Rand Corporation Report P-5061, 1973.

Downs, A., Neighborhoods and Urban Development, (Washington, D.C., The Brookings Institution), 1981.

Goetze, R., Understanding Neighborhood Change: The Role of Expectations in Urban Revitalization, (Cambridge: Ballinger Publishing Co.), 1979.

Goldberg, M.A., "Housing and Land Prices in Canada and the U.S.", in Public Property?: The Habitat Debate Continued, (Vancouver: The Fraser Institute), 1977.

Goldberg, M.A., "The BNA Act, NHA, CMHC, MSUA etc.: Nymophobia and the On-going Search for an Appropriate Canadian Housng and Urban Development Policy", in Canadian Confederation at the Crossroads (Vancouver: The Fraser Institute), 1978.

Goldberg, M.A. and J. Mercer, "Canadian and U.S. Cities: Basic Differences, Possible Explanations and Their Meaning for Public Policy", unpublished paper, University of British Columbia, 1979.

Hoyt, H., The Structure and Growth of Residential Neighborhoods in American Cities, (Washington, D.C.: U.S. Government Printing Office), 1939.

Johnston, J., Econometric Methods, (St. Louis: McGraw Hill), 1972.

Leven, C.L., J.T. Little, H.O. Nourse, R.B. Read, Neighborhood Change: Lessons in the Dynamics of Urban Decay, (New York: Praeger Publishing Co.), 1976.

Little, J.T., "Residential Preferences, Neighborhood Filtering, and Neighborhood Change", Journal of Urban Economics, 1976.

Mark, J.H., Externalities and Housing Values, Ph.D. Dissertation, Washington University (St. Louis), 1977a.

Mark, J.H., "Determinants of Urban House Prices - A Methodological Comment", Urban Studies, Vol. 14, No. 3, October, 1977b.

Mark, J.H., "A Preference Approach to Measuring the Impacts of Environmental Externalities", Land Economics, February, 1980.

Mark, J.H., "Identifying Neighborhoods for Preservation and Renewal: Comment", Growth and Change, August, 1980.

Mark, J.H., "An Empirical Examination of the Stability of Housing Price Equations Over Time", Journal of the American Real Estate and Urban Economics Association, 1983.

Mark, J.H. and M.A. Goldberg, "The Impacts of Zoning on Housing Values: A Time Series Analysis", unpublished working paper, University of British Columbia, 1982.

Moore, P.W., "Zoning and Neighbourhood Change in the Annex in Toronto", unpublished Ph.D. thesis, University of Toronto, 1978.

Muth, R. "A Vintage Model of the Housing Stock", Papers and Proceedings of the Regional Science Association, 1973.

Phillips, R.S., "A Note on the Determinants of Residential Succession," Journal of Urban Economics, Vol. 9, 1981.

Schnare, A.B. and C.D. MacRae, "The Dynamics of Neighborhood Change," Urban Studies, Vol. 15, No. 3, October 1978.

Urban Land Economics Division, University of British Columbia, The Filtering Process in Housing, a report prepared for the Housing and Urban Development Association of Canada, December, 1978.

Whitbread, M. and H. Bird, "Rent, Surplus, and the Evaluation of Residential Environments", Regional Studies, Vol. 7, 1973.