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The Timing, Patterning, & Forms of Gentrification & Neighbourhood Upgrading in Montreal, Toronto, & Vancouver, 1961 to 2001

R. Alan Walks and Richard Maaranen

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Executive Summary

Gentrification is a sub-set of the neighbourhood upgrading process. While upgrading has some positive effects on neighbourhoods, when gentrification occurs, the benefits of upgrading are not likely to be experienced by low-income residents. Gentrification is associated with declining stocks of affordable rental housing, displacement of the working class from the communities where they have traditionally lived, the conversion of inner-city neighbourhoods from production to consumption spaces for the upper middle class, and speculative real-estate markets that drive up the cost of housing across the metropolitan area.

Gentrification typically proceeds in stages, although the nature and timing of these stages is changing over time. Each stage provides the context for subsequent waves of gentrification in nearby neighbourhoods. There is an ongoing debate about the role of new construction in gentrification, and about whether it should be understood as a form of gentrification.

This study uses census data to trace how the residential population and housing stock in gentrified and gentrifying neighbourhoods in three Canadian cities have changed over the period and compares these shifts with the population and housing stock in areas that did not gentrify. The research also shows which neighbourhoods have gentrified because of transitions within the existing prewar housing stock, new construction (often called "new-build gentrification"), conversions of older buildings to new residential uses, or combinations of these changes.

The research demonstrates that gentrification and upgrading have had significant effects on the central cities of Montreal, Toronto, and Vancouver. Gentrification has affected more than 36 percent of prewar inner-city neighbourhoods, where affordable housing has traditionally been located. This poses a problem for low-income households, who have fewer housing choices available in the inner cities, and who often must settle for accommodation that is less accessible by public transit, farther from work, and where fewer public services are available.

If the trends outlined in our research continue, the inner cities of Canada's three largest metropolitan areas will increasingly become the preserve of elites, while the poor – who gain the greatest marginal utility from living in an inner-city location − are relegated either to less accessible fringe locations or to inner-city neighbourhoods containing concentrations of high-density rental apartments. This process portends an increasingly segregated and fragmented urban realm, rather than an inclusive one.

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1. Introduction

Gentrification is one of the most salient trends affecting the contemporary inner cities of large metropolitan regions in both the developed and developing worlds (Atkinson and Bridge, 2005). It is an urban phenomenon with important policy implications, associated with declining stocks of affordable rental housing, with displacement of the working class from the communities where they have traditionally lived and accessed services, with the conversion of inner-city neighbourhoods from production to consumption spaces for the upper middle class, and with speculative real-estate markets that drive up the cost of housing across the metropolitan area (Lees, Slater, and Wyly, 2007).

Gentrification is no stranger to Canadian cities. Early well-known examples of neighbourhood gentrification that have received academic attention include Yorkville, Don Vale/Cabbagetown, and Riverdale in Toronto (Dantas, 1988; Sabourin, 1994), the Plateau and Vieux Montreal in Montreal (Germaine and Rose, 2000), and Kitsilano and Fairview Slopes in Vancouver (Ley, 1986, 1996; Mills, 1988, 1993). Ley (1986, 1992, 1996) has shown that early forms of gentrification began close to existing middle-class and elite areas, historic neighbourhoods, accessible districts to the CBD, in areas with the oldest (typically Victorian) architectural styles, and in proximity to amenities such as parks, waterfronts, theatres, and beaches, as well as institutions such as universities, museums, art galleries, and hospitals. These findings mirror to an extent those uncovered by Clay (1979) in U.S. cities.

At first, gentrification appeared confined to only a few areas of the city, mere “islands of renewal in seas of decline” (Berry, 1985). However, as it progressed gentrification has affected many inner-city neighbourhoods not previously considered “gentrifiable,” leading Ley (1992, 1996) to suggest that virtually any inner-city neighbourhood in Canada’s largest cities could be prone to gentrification.

There is now a significant literature on the processes that spur gentrification in Canadian cities, including the growth of tertiary- and quaternary-sector jobs in central business districts, the effects of real-estate speculation, the settlement strategies of “new” middle-class professionals, and the effects of municipal policies intended to bolster property tax revenue and “solve” local social problems (Filion, 1991; Ley, 1996, 2003; Podmore, 1998; Slater, 2004a, 2004b). There is even evidence that it may be accelerated through strategic marketing of local ethnic assets and communities (Hackworth and Rekers, 2005). Although perhaps most evident in Toronto, Mont-

real, and Vancouver, gentrification and upgrading have also been detected in the inner cities of smaller metropolitan areas such as Ottawa, Regina, Halifax, and Kitchener-Waterloo (Bunting, 1987; Figueroa, 1995; Ley, 1986, 1992; Millward, 1988).

Analyses of gentrification typically take the form either of case studies of a particular city (or of particular neighbourhoods within a single city), or of cross-sectional analyses of the correlates, location, or characteristics of gentrified and gentrifying neighbourhoods in a set of cities at one point in time or over a single period (often a census decade). While such studies can tell us much about gentrification in one place or time, few studies trace the evolution of gentrification patterns across space and over multiple time periods, and it is rare for such studies to reach very far back into the past. Gentrification progresses through various stages, with each stage providing context for subsequent waves of gentrification in nearby neighbourhoods, therefore in order to gain a better understanding of the extent and evolution of gentrification, it is necessary to track neighbourhood changes within and across a succession of these waves.

Furthermore, debate continues about how to define gentrification, the forms that it may take, and how different forms of gentrification interact in the housing market to produce long-term neighbourhood trends. The use of narrow definitions and short time frames (often themselves the result of a lack of historical data) has limited the degree of comparability between different studies, and precluded the more holistic view demanded of a true “geography of gentrification” (Lees, 2000).

In this report, we present and apply a method for detecting and classifying different neighbourhood gentrification and upgrading trajectories over the postwar period, using Canada’s three largest central cities as case studies. This method fills the gaps evident in previous empirical research that used cross-sectional data or single time periods to detect gentrification, limited their analysis to recent decades, or failed to distinguish between different trajectories of gentrification and upgrading. It traces how the residential population and housing stock in gentrified and gentrifying neighbourhoods have changed over the period and compares these shifts to the population and housing stock in areas that did not gentrify. This research is meant to provide an empirical foundation for future studies examining gentrification and upgrading in Canadian cities from more critical and qualitative perspectives (Slater, 2006).

We also outline a method for using custom-tabulated census tables to identify the housing market forms producing gentrified space within neighbourhoods. We delineate which neighbourhoods have gentrified due to transitions within the existing prewar housing stock, to the construction of housing (termed “new-build gentrification” in the literature), or to conversions of older buildings to new residential uses, as well as combinations of these changes. We examine the importance of each of these forms of gentrification, and assess the effects of such housing market processes on key residential and housing stock variables.

2. Conceptualizing gentrification and neighbourhood upgrading

Gentrification is but one form of neighbourhood upgrading. While the connotations of upgrading are usually positive – including higher levels of environmental and commercial amenity, improvements in building quality and aesthetics, reduced local levels of crime and other social problems, and increased or at least stable property values – under gentrification such benefits are not likely to be enjoyed by the lower-income residents of affected neighbourhoods. This is because gentrification leads to a reduction in affordable housing in the inner city, and tends to displace, either directly or indirectly, low-income populations to lower-amenity and less-accessible neighbourhoods as it progresses, as well as the services and amenities that the low-income residents who remain depend on.

The term gentrification was coined in the early 1960s in reference to the rehabilitation of both working-class neighbourhoods and previously downgraded "larger Victorian houses" originally built by and for the middle class in London, but occupied by the working class (Glass, 1964). Central to Glass's definition of gentrification is the notion that through the deconversion of multiply-occupied and -tenanted properties back to single-family homeownership, the working class was being displaced from the neighbourhoods where they traditionally were able to find affordable housing. Importantly, "once this process of 'gentrification' starts in a district it goes on rapidly until all or most of the original working class occupiers are displaced and the social character of the district is changed" (Glass, 1964, xviii). The process, she noted, is driven by the combined actions of homebuyers, landlords, and developers. Thus, from the beginning, the gentrification literature has retained a focus on class, and referred to three important processes tied to the renovation of older residential areas in the cores of cities:

- change in the tenure status of the housing in the neighbourhood;
- increases in relative land and dwelling values and concomitant declines in affordability;
- upgrading in the social class character of the neighbourhood from predominantly working class to middle class or higher.

Studies of gentrification and upgrading have employed a myriad of definitions and methods, typically focusing on only one of the above three processes when tracking the extent of gentrification. This is partly due to data limitations, and to the different emphases placed by scholars on the various attributes of gentrification. For instance, Ley's concern for understanding the socio-cultural aspects of the process have led him to operationalize gentrification as social status upgrading within neighbourhoods (1986, 1992, 1996, 2003), as reflected in his social status index which tracks changes in occupation and education levels.

On the other hand, Smith's (1996) emphasis on the production and elimination of rent gaps by the capitalist land market highlights uneven access to space due to income, changes in land values, and gentrification's consequent effects on housing affordability. This approach is reflected in the indicators adopted by others working with this framework (Badcock, 1989; Clark, 1987; Kary, 1988; Sabourin, 1994; Wyly and Hammel, 2004). Yet other scholars have emphasized physical changes in the inner-city housing stock, particularly tenure conversions and evidence of renovation activity, either alone or in combination with one of the other processes (Bunting, 1987; Dantas, 1988; Hammel and Wyly, 1996; Hamnett and Randolph, 1986; Millward, 1988; Sabourin, 1994).

Although each of these methods may work sufficiently well on its own to detect gentrification in a given place and at a given time, the relevance and composition of these factors may change as the neighbourhood gentrifies. A holistic understanding of gentrification thus needs to take into account simultaneously each of the three related processes of tenure change, changes in land values and affordability, and social class upgrading.

A well-developed literature identifies the stages that gentrification is said to involve (for instance, Gale, 1984). The first, often termed the "pioneer" stage, involves the invasion of artists and other counter-culture types who may have incomes similar to or even lower than the original working-class inhabitants. By investing their own labour into the design and upkeep of the housing and patronizing local establishments, these initial groups bring a certain aesthetic identity to the neighbourhood that increases its cachet for others and makes it easier for landlords to rent space. In the next stage, those with more locational options are attracted to the neighbourhood, including wealthier tenants. Through further renovation of the housing stock, either by these in-migrants or their landlords, land values begin to rise, prompting speculation and developer interest, while nearby commercial strips attract those living outside the neighbourhood. Working-class tenants and even the "pioneer" artists find themselves displaced by rising rents.

In later stages, more risk-averse groups of residents (professionals and managers), retailers, and developers buy up property in the neighbourhood as it becomes perceived as a safer investment. Rising property values encourage the deconversion of former rental housing stock to homeownership, and the renovation of commercial properties, displacing not only the remaining tenants, but also many of the amenities and services on which they depended. Near the end of the process, with virtually all the social and economic risk eliminated, the most risk-averse bourgeois households then make their home in the neighbourhood. Remaining tenanted buildings are de-converted, both housing and retail are re-renovated, and the neighbourhood completes its transformation, potentially into one of the most "desirable" locations in the city.

As Ley (1996, 2003) and Caulfield (1994) have demonstrated, in its early stages, gentrification is typically associated with in-movers employed in public-service occupations requiring high lev-

els of education, and thus holding significant stores of what Bourdieu (1986) calls social and cultural capital, but often not high incomes. They in turn often support policies facilitating enhanced social interaction and local diversity, and work to maintain the community supports, amenities, and services that working-class residents depend on. This was particularly true during the 1970s, even though these in-migrants unintentionally displaced many low-income residents (see Ley, 1996). However, as gentrification continues and the neighbourhood becomes a less risky investment, those employed in more entrepreneurial occupations with higher incomes (that is, those with higher stores of economic capital) replace many of the original left-liberal "pioneer" gentrifiers. They fight to maintain their property values, spurn difference, and keep strangers out of their neighbourhood (see also Filion, 1991).

Of course, the state also plays a key role in encouraging, bankrolling, or conversely, preventing, gentrification. As Smith noted early on (1979, 1987), early state-led forms of gentrification were premised on the necessity of reviving the sagging property and development sectors in the older cores of postwar industrial cities, a process often jump-started through urban renewal programs. In Canadian cities, the threat to resident working-class populations (and to the low-density Victorian housing beloved of early gentrifiers) posed by urban renewal led a number of municipal planning departments under the tutelage of reform-minded councils in the mid-1970s to enact anti-"white painting" ordinances and anti-speculation taxes. However, with the persistence of gentrification and the rise of fiscal crises and neoliberal orthodoxy, state policies have shifted toward a supportive regulatory role, rather than intervention.

There is thus evidence that the role and timing of both state and private-sector activities in the field of inner-city development have changed since the original stage models were first articulated. As real-estate speculators, developers, and the state actively search out new places to invest in anticipation of new rounds of gentrification, it is thus perhaps not surprising that the predictive power of the various locational attributes and amenities identified by Ley has diminished over time. The new metaphor sees "islands of decay in seas of renewal" (Wyly and Hammel, 1999). Indeed, gentrification has been documented in rural and suburban areas (Badcock, 2001; Phillips, 1993, 2004).

Gentrification has thus shifted and adapted as economic and political circumstances have changed, with each new wave layered on top of previous ones. In the U.S. context, Hackworth and Smith (2001, see also Hackworth, 2002) trace three distinct waves of gentrification:

- an early wave from the late 1960s to the mid-1970s marked by sporadic but direct state projects which assembled (and cleared) land, if they did not also invest directly in new building;
- a second wave from the early to late 1980s characterized by the rollback of state interventions and the resulting dependence on private market forces for the production of gentrified space;
- a third wave which emerged after the early 1990s recession, in which an entrepreneurial neoliberal state actively encouraged gentrification through market-friendly policies and public-private partnerships.

Recently, Lees, Slater, and Wyly (2007) suggest that gentrification may have entered a fourth wave after 2001, driven by weakness in productive sectors and the shifting of speculative investment into the resale housing market. It is not yet clear if the bursting of the speculative housing bubble in 2007, led by the collapse of the sub-prime mortgage market in the United States, will have an impact on the forms of, and processes fashioning, gentrification in North American cities.

Alongside this evolution of neighbourhood change (and with it, the evolution of the gentrification literature), debates have arisen concerning which processes represent gentrification. Bourne (1993a, 1993b) emphasizes that forms of elite and middle-class upgrading (including upgrading in areas that have traditionally been middle-class) should be considered conceptually distinct from the gentrification of neighbourhoods traditionally occupied by the working class. It has also been questioned whether infill development within inner-city districts, often called "new-build gentrification," should be conceptualized as gentrification. Bourne (1993a) and Boddy (2007) argue that infill developments on greyfield sites and the conversion of non-residential spaces into new dwellings do not directly displace existing residents, and thus do not share the negative externalities (and perhaps should not share the negative connotations) associated with standard forms of gentrification.

Davidson and Lees (2005; following Smith, 1996), on the other hand, argue that such forms of development nonetheless change the character of an area, transforming it into a consumption space for the middle class. Even if no direct displacement results, there is clearly room for what Marcuse (1986) calls "exclusionary displacement," whereby increases in land costs prevent the neighbourhood from housing low-income working-class residents in the future, thus indirectly displacing them. Infill development and conversions from non-residential uses can facilitate gentrification of the pre-existing housing stock in the immediate vicinity if they have the effect of increasing the desirability of the area and the cost of land, as this will stimulate future deconversions and real estate speculation.

This is what Davidson (2007) argues is occurring along the Thames in London, where new building is causing ripple effects throughout the older stock nearby. Curran (2007) likewise discusses the displacing effect that the removal of older industrial spaces has on working-class quarters in Williamsburg. Ilves (2007) suggests that new-build gentrification may feed back into neighbourhood transformation processes through the political sphere, as the residents of the new condominiums engage in NIMBY politics, support neoliberal policies, elect politicians on the right of the political spectrum, and crowd out the political voices of low-income residents.

The debates about condominium conversions and new-build or infill development thus partly depend on how these neighbourhood changes influence the housing market in older residential areas and interact with more standard forms of residential renovation and displacement. If newly constructed housing and conversions of non-residential properties to residential use are located in the same neighbourhoods in which the older housing stock is being transformed, or if they act as a catalyst for reinvestment in the older stock or as a stage linking the overall transformation of the district to the displacement of affordable rental housing, there is clearly reason for arguing that they play a role in the gentrification of the city.

Despite much speculation in the literature, as yet little empirical research has traced in a systematic way how the forms and spatial patterning of gentrification have shifted over the postwar

period in Canadian cities as the context changes and subsequent waves take the process further afield into new spaces. This report is thus intended to provide a broad, holistic, and long-range view of the timing, spatial patterning, and dominant forms of gentrification in the largest Canadian cities over the postwar period. We take as a starting point the spirit of Glass's definition, and track neighbourhood changes over each decade from 1961 to 2001 (we also examined the 1951 census, but did not uncover any instances of inner-city gentrification in the 1951-1961 period).

The first section documents the timing and patterning of gentrification and other forms of neighbourhood upgrading across the study period in the three cities, employing strict criteria for assessing the extent and nature of the shifts in evidence. The second section describes the different forms in which gentrification is expressed in each of those neighbourhoods where it was uncovered. Changes in six key indicators are examined among each of the different types of gentrification based on both the timing of its onset, and the housing market forms it takes.

3. Measuring gentrification and upgrading

This section details the methods used to detect and classify neighbourhood gentrification and upgrading. The data for this section come from the census of Canada. Census tracts (CTs) were used as a proxy for neighbourhoods, as they allow for historical comparisons across censuses in built-up areas and their relatively small size allows for the study of people, families, households, and dwellings located relatively close to one another – the local spatial context. Statistics Canada defines census tracts as small geographic units with relatively stable boundaries that follow easily identifiable features like major streets, waterways, and railway lines. Census tracts have an average population size of about 4,000, ranging from about 2,500 to 8,000 people (with rare exceptions, predominantly in high-density neighbourhoods). Conceptually, however, census tracts may not correspond to sociological notions of a neighbourhood as the locus of daily activity space (this would require detailed and unavailable small area data).[1]

One problem involved in time-series analyses of neighbourhood change such as this relates to the tendency for the boundaries of the spatial units representing neighbourhoods (in our case, census tracts) to be modified and subdivided over time and to be assigned new identifiers as local populations grow. For instance, Statistics Canada has often split census tracts or modified their boundaries once the local populations exceed the upper limit of about 8,000 people. This study opts for a GIS-based area interpolation technique to deal with this problem (for more information, see Martin, 2002). It traces the attributes of a consistent total of 1,130 census tracts from all three central cities of Toronto, Montreal, and Vancouver between the censuses of 1961, 1971, 1981, 1991, 1996, and 2001.[2] The 2001 tract boundaries are used as the "cookie cutter" – that is, the census tract geographies from previous censuses were made to match the boundaries of the 2001 census. This method of studying neighbourhood change over time presents lit-

1 Below the census tract level, historical data exists for enumeration areas (redefined as dissemination areas in the 2001 Census), but due to radical geographic reconfigurations in each census period, limited numbers of variables, and a high suppression rate, they are not a feasible alternative for a long-term study of social change.

2 The variables in this study derive from the 20 percent "long form" sample (1 in 5 households sampled) for 1961, 1981, 1991, 1996 and 2001. For 1971 this was a 33 percent sample (1 in 3 households).

tle likelihood of introduced error, because each of our study cities has continued growing throughout the postwar era, and because much of this growth is located outside the central-city boundaries, leaving the census tract geography mostly intact over the study period.[3] Because we mapped the earlier census tract boundaries to those in 2001, this entailed the construction of a digital boundary file for 1961, and interpolation of the 1961 census geography to the 2001 boundaries.[4]

The first section of the paper presents a taxonomy of neighbourhood gentrification and upgrading occurring in stages over each decade of the 1961–2001 period. A Principal Components Analysis (PCA) is used to uncover multivariate composite trends of upgrading occurring among the 1,130 census tracts (pooled in a single PCA) by inter-census time period. This analysis makes it possible to determine the decade of the onset of upgrading and the strength of neighbourhood transition. This analysis is followed by user-defined algorithms that classify each census tract identified in the PCA according to the genesis, nature, and temporal extent of these composite trends. The second step allows us to separate gentrification trends from larger processes of upgrading and to delineate between "incomplete" forms of gentrification (in which the average income of the neighbourhood remains below the metropolitan average), and "complete" forms (in which neighbourhoods that began the period with below-average incomes attain above-average incomes by the end of the period).

To detect the presence of gentrification and upgrading, we selected a series of indicators related to the three inter-related processes identified by Ruth Glass in her original work and by others in the early literature concerning gentrification (see also Hartman, 1974, 1984): tenure de-conversion, shifts in housing values and rents, and social class upgrading. Related to each of these three processes are changes in income, which are also used to adjudicate between complete and incomplete forms of gentrification and upgrading (as mentioned above).

3 The alternative, the aggregation of census tracts back to previous (1971 or 1961) boundary definitions, risks smoothing out important geographic detail among adjacent neighbourhoods with diverging trends occurring after the tract has been split into smaller units. Also, aggregating back to the 1971 boundaries would exclude a number of areas that were populated mostly after 1971. The area interpolation technique employed here to map the census geography in previous years onto the 2001 boundaries requires assumptions about how the various attributes of census tracts are internally distributed. The most common option, which is adopted here, is to assume an even attribute density distribution (that is, assume that an attribute is evenly distributed across the neighbourhood in the base year). Thus, the assumption is that an attribute (e.g. household income) had been distributed equally across all sub-units of the mother tract before it was split. The alternative option is to assume an uneven attribute density distribution, requiring the density distribution of each attribute to be estimated from the uneven distribution evident in subsequent years after the data has been disaggregated. The accuracy of our interpolated values is best in the built-up cores of the fives CMAs that experienced very few census tract splits since 1971. Moreover, the focus of this study is on the gentrification of traditionally, working-class neighbourhoods which existed in the early postwar period. If a tract is split and both halves have nearly identical attribute proportions or ratios (strong positive autocorrelation), then the error of our estimated values for the resulting spatial units is low. If the splits have very different characteristics (strong negative autocorrelation), there is the possibility of considerable error. If there has never been a split over the study period, there is zero error involved. The majority of tracts in our central cities have not been split, hence justifying our assumption of an even density distribution.

4 Data from the 1951 census was also examined, but as there was little significant change in the inner cities over this time, it did not warrant the creation of a separate 1951 digital boundary file. The 1976 and 1986 censuses contain a number of problematic variable definitions, an inadequate variable selection compared to other years and in 1976, missing boundary specifications. In light of these issues, data for these census decades were not included the analysis.

A total of six indicators related to these three processes were calculated and used to detect the presence, timing, and forms of upgrading in Canadian cities:

1. Changes in neighbourhood income are tracked by analysing average personal income from all sources of earnings of persons 15 and over as a ratio to the average personal income in the CMA[5] where the tract is located. This variable was selected over average household income because the latter is significantly influenced by differences in household size between inner-city and suburban neighbourhoods. As household size is diverging among census tracts in Canadian metropolitan areas, the use of household income can mask real differences in the quality of life indicated by income measures.[6] Average personal income, however, is not influenced by household size, and therefore presents a better window into neighbourhood economic capital.

2. Changes in social class/social status were detected through an index representing the composite of the location quotient (LQ) for those at least 20 years old with a university degree and the LQ of the proportion of the labour force employed in professional and managerial occupations (including occupations in health, education, engineering and applied science, law, religion, and social work). This is similar to Ley's (1986, 1996) social status index, except that artists are not included in our social status index, but are analyzed separately (Ley includes them in his social status index).

3. Changes in the location quotient of artists (artistic, recreational, and literary occupations) are here analyzed separately, in order to examine questions regarding artists' role as "pioneers" in the early stages, and as harbingers of potential future gentrification.

4. The de-conversion from rental to owner-occupation is uncovered through an analysis of changes in the proportion of the housing stock that is rented.

Changes in land and housing values, and related housing affordability within neighbourhoods, were examined using two indicators (both calculated as a ratio of the census tract to the CMA averages for the central city in which the census tract was located):

5. Average monthly rents.

6. Average dwelling values.

Rates of change in the study variables are calculated as the simple difference in attribute percentages, and were determined separately for each inter-census period.

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5 The Census Metropolitan Area (CMA) average is used to calculate income, rent, and dwelling value ratios rather than the central city average because it is more representative of the urban labour and housing market which reaches beyond the central city to include its outer suburbs.

6 For instance, household incomes can be augmented, even in the face of declining personal incomes, by having more members of the household take on marginal employment, and/or by having two or more households double up (share the same dwelling space). For the 1961 to 1971 decade, we analysed average employment income, because neither personal nor household income were available in comparable form in the 1961 census.

The study of neighbourhood change is built upon Principal Components Analysis (PCAs). Measures for the rates of change in the above indicators across each decade between 1971 and 2001 (but not the cross-sectional values indicating the starting and ending positions), were included in the PCAs.[7] A set of PCA solutions were tested, containing the first four, the first five, and all six of the variables listed above, as well varying combinations of components. In each case, the first four components that result from the PCA solutions are virtually identical, and when mapped reveal the same patterning of neighbourhood upgrading and gentrification.

It is the results of the smaller and more easily interpreted PCA solutions that were used to inform the subsequent analysis. The most parsimonious and easily interpreted PCA solutions were selected for five components, and these are shown here. The analytical categories assigned to census tracts (regarding the wave of gentrification and upgrading they belong to) were derived through comparison of the five-variable and four-variable PCA solutions (the results of the expanded six-variable PCA solution, which includes average dwelling values, are included in the appendix).[8]

The first of these examined changes in the first five variables described above:

- change in the percentage of dwellings rented;
- change in the social status index;
- change in the proportion of the labour force employed as artists;
- change in the average personal income ratio;
- change in the average monthly rent ratio.

The four-variable solution removed the last variable, average monthly rents. In both cases, five components were extracted, accounting for almost 50 percent of the total variance in the data. A varimax rotation[9] facilitated interpretation of each component by sorting out the overlap among

7 The PCAs were conducted using the data for the decades between 1971 and 2001. The variables published in the 1961 census are not strictly comparable to those that followed, and thus were left out of these PCAs. In addition to the lack of personal or household income (see note 4 above), the occupation and education variables available in 1961 are not comparable to those in later censuses, and artists are not included as a separate occupational category. For these reasons, we decided to analyze changes occurring over 1961 − 1971 in a separate step. As our analysis discovered, upgrading that began in the 1960s was part of the same wave that continued into the 1970s. Each of the neighbourhoods that we identify as upgrading in the 1960s was also identified as upgrading through the 1970s. Thus, the PCA reported on here also nicely happens to account for those neighbourhoods that began gentrifying or upgrading in the earlier decade (1961−1971).

8 Difficulties in interpretation between the different PCA solutions mainly pertain to the last components in each PCA set (component 5 in the four- and five-variable PCAs, and components 5 through 8 in the six-variable PCA), particularly when dwelling values are included in the analysis. This is partly due to the significantly greater number of variable interactions involved with the latter, and to the effects of shifts in dwelling values resulting from the development of condominiums with small units in gentrifying neighbourhoods, bringing down both the average dwelling size and unit costs in a some but not all inner-city tracts, even though such dwellings are often highly valued on a per-square-foot basis. (The land value per square foot would have been useful, but this information is not available in the census.) When dwelling values in the ownership sector are removed from the analysis, the resulting components are much easier to interpret. Furthermore, when the more complex component structure resulting from the expanded six-variable PCA is aggregated to a smaller number of components, the result matches closely the component solutions of the smaller PCAs in which dwelling values were removed. See Tables 9 and 10 in the appendix for the expanded PCA.

9 Varimax rotation is an orthogonal rotation of the component axes to maximize the variance of the squared loadings of a component (column) on all the variables (rows) in a component matrix, which has the effect of differentiating the original variables by extracted component. Each component will tend to have either large or small

different time periods within the same component.[10] The resulting five-component solutions not only produced the most parsimonious outcomes, but they also conform well to the four time periods represented in the PCA. They thus provide a good match between the decade-by-decade changes in the selected indicators and the different waves of upgrading and gentrification.

Table 1: The Five-Variable Principal Component Analysis (PCA) Solution, Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cum. %	Total	% of Variance	Cum. %	Total	% of Variance	Cum. %
1	2.220	11.102	11.102	2.220	11.102	11.102	2.106	10.529	10.529
2	2.191	10.954	22.056	2.191	10.954	22.056	2.073	10.363	20.891
3	1.840	9.201	31.256	1.840	9.201	31.256	1.896	9.482	30.373
4	1.425	7.126	38.383	1.425	7.126	38.383	1.558	7.788	38.161
5	1.388	6.941	45.323	1.388	6.941	45.323	1.432	7.162	45.323
6	1.203	6.015	51.338						
7	1.101	5.505	56.844						
8	1.056	5.280	62.124						
9	0.985	4.923	67.048						
10	0.908	4.542	71.590						
11	0.864	4.321	75.910						
12	0.821	4.106	80.016						
13	0.799	3.997	84.013						
14	0.664	3.322	87.335						
15	0.631	3.154	90.489						
16	0.571	2.853	93.342						

Source: Calculated by the authors from Census of Canada, various years

Note: Census tracts are the units of analysis. The principal components analysis involved a pooled analysis of 1,130 census tracts from across the three central cities of Montreal, Toronto and Vancouver.

What mainly differentiates the five- and four-variable solutions is the last component – the first four components are virtually identical. Of the two PCA solutions highlighted here, the five-variable solution (Table 1) reveals slightly lower levels of explanatory power (accounting for about 45 percent of the variation in the data). The first component represents upgrading during the 1980s (between the 1981 to 1991 censuses), with strong positive loading on all variables in that decade except changes in housing tenure (which shows no correlation with the component). The second component represents upgrading over the 1970s (1971 to 1981 census), with again high loadings on all variables except artists (the loading here is moderate, at 0.39) and

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loadings of any particular variable. A varimax solution yields results which make it as easy as possible to identify each variable with a single component. This is the most common rotation option.

10 Component scores above 1.00 are considered unusually high ratings, providing evidence of a good match between the changes occurring in the census tract and the properties of the component, while negative scores indicate that the census tract trajectory is opposite to that of the overall component.

tenure. The more minor (negative) loading on changes in tenure (-0.21) reflects the smaller correlation between gentrification and deconversion of rental housing at a time when the rental sector was still growing, even in many gentrifying neighbourhoods (see Table 2).

Table 2: The Rotated Component Matrix, Five-Variable Pooled PCA for Montreal, Toronto, and Vancouver

Variables	Component				
Change in	1	2	3	4	5
Artist Proportion 71 to 81	0.106	**0.385**	-0.018	**0.496**	-0.152
Artist Proportion 81 to 91	0.129	0.059	0.065	0.071	**0.694**
Artist Proportion 91 to 96	0.077	0.063	0.143	**0.562**	-0.387
Artist Proportion 96 to 01	-0.021	0.137	-0.051	-0.064	**0.434**
Social Status 71 to 81	0.047	**0.789**	-0.035	0.176	0.080
Social Status 81 to 91	**0.687**	-0.006	-0.007	0.204	**0.269**
Social Status 91 to 96	-0.017	0.090	**0.681**	-0.135	0.017
Social Status 96 to 01	-0.130	-0.246	-0.230	**0.505**	**0.408**
Rental Share 71 to 81	-0.080	-0.208	-0.148	0.217	-0.065
Rental Share 81 to 91	0.066	-0.145	0.023	-0.104	**0.438**
Rental Share 91 to 96	0.031	-0.030	**0.526**	0.043	-0.164
Rental Share 96 to 01	-0.099	0.006	-0.070	**-0.366**	0.021
Income Ratio 71 to 81	0.028	**0.787**	0.010	0.034	-0.089
Income Ratio 81 to 91	**0.812**	0.042	0.049	0.128	0.106
Income Ratio 91 to 96	0.079	0.119	**0.799**	0.025	-0.012
Income Ratio 96 to 01	0.057	0.035	-0.018	**0.573**	0.015
Rent Ratio 71 to 81	-0.238	**0.680**	0.051	-0.091	0.069
Rent Ratio 81 to 91	**0.851**	-0.094	-0.116	-0.051	-0.125
Rent Ratio 91 to 96	-0.236	-0.173	**0.610**	0.114	0.208
Rent Ratio 96 to 01	-0.229	0.062	-0.129	**0.276**	0.196

Source: Calculated by the authors from Census of Canada, various years

Note: The results shown are after Varimax rotation with Kaiser Normalization. The component loadings are the correlation coefficients between the variables (rows) and components (columns). The units of analysis are 1,130 census tracts from the central cities of Montreal, Toronto, and Vancouver.

The third and fourth components both relate to changes mainly occurring over the 1990s. Component three shows strong positive loadings on changes in income (0.79), social status (0.68), and average rents (0.61), over the early 1990s (1991 to 1996), combined with a moderate positive correlation with increasing rental (0.53), which may reflect the renting out of condominiums at the height of the early 1990s recession. Interestingly, there is virtually no correlation with concentrations of artists in the early 1990s, suggesting that gentrification occurring during this wave had de-coupled somewhat from traditional stage models showing artists as pioneers.

The fourth component suggests an incipient upgrading that began but stalled during the 1970s, but which revived again during the 1990s. This component shows moderately strong positive loadings on artists in both the 1970s (1971−1981) and late 1990s (1995−2001) periods (0.50 and 0.56, respectively). However, in this component all other important loadings occur only in

the late 1990s, including change in social status (0.51), income (0.57), weaker loadings on average rents (0.28) and change in rental stock proportions (-0.37), suggesting that deconversion in neighbourhoods scoring highly on this component occurred mainly during the late 1990s.

The fifth, and last, component extracted in the five-variable solution suggests an incipient upgrading that began in the 1980s but stalled during the 1990s, but (as in component four) that begins to pick up again in the late 1990s. It shows a strong loading on growth in artists over the 1980s (0.69), and then more moderately again in the late 1990s (0.43), coupled with weaker but positive loadings on social status change in the two periods (0.27 and 0.41, respectively). However, this component also loads positively on the change in renters (0.44) in the earlier period (1980s). The concomitant growth in renters (who are more likely to be lower-income) may be one reason why gentrification and upgrading may have stalled among neighbourhoods scoring high on this component. This component fits nicely the category of "incomplete" upgrading and gentrification for the 1980s (see below).

The four-variable PCA solution provides slightly greater explanatory power than the five-variable solution (accounting for approximately 50 percent of the variance in the data, see Table 3). The component structure of this solution is very similar to the five-variable solution, with the exception of the fifth (last) component. In this case, the fifth component is interpreted to represent potential areas of future gentrification.

Table 3: The Four-Variable Principal Component Analysis (PCA) Solution, Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cum. %	Total	% of Variance	Cum. %	Total	% of Variance	Cum. %
1	2.03	12.66	12.66	2.03	12.66	12.66	1.78	11.11	11.11
2	1.82	11.39	24.05	1.82	11.39	24.05	1.75	10.92	22.02
3	1.57	9.82	33.87	1.57	9.82	33.87	1.67	10.44	32.46
4	1.34	8.36	42.24	1.34	8.36	42.24	1.45	9.03	41.49
5	1.20	7.48	49.71	1.20	7.48	49.71	1.32	8.22	49.71
6	1.18	7.40	57.12						
7	1.03	6.44	63.56						
8	0.97	6.03	69.59						
9	0.85	5.30	74.89						
10	0.84	5.26	80.15						
11	0.79	4.97	85.12						
12	0.66	4.12	89.24						
13	0.58	3.64	92.87						
14	0.48	2.99	95.87						
15	0.39	2.42	98.29						
16	0.27	1.71	100.00						

Source: Calculated by the authors from Census of Canada, various years

Note: Census tracts are the units of analysis. The PCA involved a pooled analysis of 1,130 census tracts from across the three central cities of Montreal, Toronto, and Vancouver.

The rotated component matrix for the four-variable solution is presented in Table 4. In this solution, the first component reveals upgrading over the 1970s (1971 to 1981 census). It shows a strong correlation with change in social status (0.88), change in income (0.83), and, to a smaller degree, change in artists (0.44), over this decade. Again, there is a minor (negative) loading on changes in housing tenure (-0.20), reflecting limited deconversion of rental housing at this time. In the four-variable solution, there is only one component (component 3) indicating upgrading over the decade of the 1980s. This third component reveals high variable loadings for changes in social status (0.92) and changes in income (0.80), between the 1981 and 1991 censuses. This component subsumes both the entire component 1 from the five-variable solution (showing upgrading over the 1980s), but also part of the fifth component reflecting incipient but stalled upgrading that began during the decade. In this four-variable solution, the loadings for change in artists (0.38) and change in rental share over the decade (0.35), suggest that in some areas witnessing gentrification, rising social status levels and incomes were also met not only by the growing concentration of artists (which conforms to the stage models of gentrification), but also by increases in rental tenure, rather than de-conversion.

Table 4: The Rotated Component Matrix, Four-Variable Pooled PCA for Montreal, Toronto, and Vancouver

Variables	**Component**				
Change in	**1**	**2**	**3**	**4**	**5**
Artist Proportion 71 to 81	**0.437**	0.026	0.055	**0.532**	-0.047
Artist Proportion 81 to 91	0.018	0.014	**0.382**	-0.019	**0.563**
Artist Proportion 91 to 96	0.146	0.085	0.164	**0.391**	-0.572
Artist Proportion 96 to 01	0.083	0.021	-0.097	0.153	**0.724**
Social Status 71 to 81	**0.879**	-0.036	0.048	0.052	0.081
Social Status 81 to 91	0.013	-0.056	**0.815**	0.119	0.023
Social Status 91 to 96	-0.031	**0.764**	-0.065	-0.007	0.161
Social Status 96 to 01	-0.171	-0.401	0.096	**0.360**	**0.259**
Income Ratio 71 to 81	**0.834**	0.035	-0.053	-0.038	-0.057
Income Ratio 81 to 91	0.042	0.061	**0.803**	0.103	-0.085
Income Ratio 91 to 96	0.076	**0.803**	0.079	0.044	0.025
Income Ratio 96 to 01	0.015	-0.027	0.053	**0.655**	0.079
Rental Share 71 to 81	**-0.207**	-0.182	-0.094	0.292	-0.018
Rental Share 81 to 91	-0.085	-0.108	**0.349**	**-0.394**	0.110
Rental Share 91 to 96	-0.040	**0.536**	-0.016	0.059	-0.125
Rental Share 96 to 01	0.018	-0.074	-0.126	**-0.390**	0.019

Source: Calculated by the authors from Census of Canada, various years

Note: The results shown are after Varimax rotation with Kaiser Normalization. The component loadings are the correlation coefficients between the variables (rows) and components (columns). The units of analysis are 1,130 census tracts from the central cities of Montreal, Toronto, and Vancouver.

Both the second and fourth components in the four-variable solution point to upgrading occurring over the 1990s. The second component is strongly related to changes evident in the early 1990s (between the 1991 and 1996 censuses), while the fourth component relates primarily to

shifts occurring in the late 1990s (from the 1996 to the 2001 census). The second component scores strongly on changes in income (0.80), social status (0.76), and to a lesser extent, shifts in rental tenure (0.54). This mirrors very closely component 3 from the five-variable solution, with upgrading in the early 1990s associated with increasing proportions of rental housing, but absent any association with concentrations of artists. Again, this suggests that gentrification in the early 1990s may have bypassed or modified the traditional stage models (for instance, neighbourhoods in this group may have received speculative investment capital based on the relative inexpensiveness of the housing market during the early 1990s recession). The fourth component also mirrors closely its counterpart from the five-variable solution, with moderate loadings on artist concentration in both the 1970s and 1990s, moderate negative loadings on rental change over the 1980s, and strong positive loadings on income change in the late 1990s. Again, this suggests incipient but stalled upgrading beginning in the 1970s, followed by its full resumption in the late 1990s.

The main differentiating feature of the four-variable solution is again the fifth (last) variable that is extracted. In the four-variable solution, this fifth component explains only a small proportion of the total variance, and loads strongly only on one variable – artists. Importantly, it would seem to indicate a situation in which the very early stages of gentrification began in the 1980s but effectively stalled during the early 1990s recession, as indicated by a positive correlation with change in artist proportions over the 1980s (0.56) but a negative correlation of equal strength in the early 1990s (-0.57). However, this component also suggests areas where incipient gentrification may have begun again, denoted by a strong positive loading for change in artists during the most recent period under study (1996−2001) (0.72), coupled with a weak but positive shift in social status (0.26) over the same recent period. However, this component reveals no association with shifts in income or rental housing, leaving the question of whether such potential concentrations of artists will actually lead to continued upgrading (and the analysis discussed below demonstrates that both income and the proportion owner-occupied housing has continued to decline for neighbourhoods scoring high on this component during the late 1990s). Thus, it is not clear whether the initial shifts in artists and social status will reverse, as they did in the 1980s, or continue to progress through the various stages of gentrification. Thus, we suggest that this component indicates areas where there would appear the potential for gentrification to take hold in the future.

A taxonomy of gentrification and upgrading was derived from comparison of the above five-variable and four-variables PCA solutions. While extracted in a different order, the first four components in each case are virtually identical. When mapped, these two solutions produce virtually identical patterns, with only very minor differences. Namely, for a couple of tracts, the five-variable solution is more likely to date the onset of upgrading and gentrification in later decades, likely due to the lag effect of incipient gentrification on changes in average rents (included only in the five-variable solution), which tend to occur in secondary stages of the gentrification process. Furthermore, this distinction mostly pertains to differences in the dating of the onset of upgrading in the 1980s or 1990s.[11] As it is our interest to date the earliest onset of upgrading, in

11 The differences regarding how the two PCA solutions date the onset of upgrading in each neighbourhood are minor. Some census tracts that are dated as witnessing the onset of upgrading in the 1980s in the four-variable solution (as indicated by high scores on component 3), instead score highly on the 1990s wave in the five-variable solution (component 3 or 4 in that PCA). However, many of these tracts also score highly on component 5 in the five-variable solution, which we interpret as indicating stalled upgrading in the 1980s. Thus, when com-

cases where there is a discrepancy between the PCA solutions, we have chosen the earlier date of the two. As well, we interpret component 5 in the four-variable solution to indicate census tracts where upgrading and gentrification may potentially occur in the future.

Following the literature (Hackworth and Smith, 2001), three distinct "waves" of gentrification and upgrading are identified by the decade witnessing the first onset of upgrading from our PCA. The first three components of our five-variable and four-variable PCA solutions were used as the basis for establishing the first (late 1960s and 1970s), second (1980s), and third (1990s) waves, respectively. Note that a number of census tracts scored high (above +1.00) on more than one component. In such cases, they are classified according to the earliest wave detected (for instance, if a tract scores high on both the first and third waves, it is classified as belonging to the first wave). Tracts that load strongly on the fourth component (incipient but stalled upgrading in the 1970s, followed by the resumption of upgrading in the late 1990s) were classified according to how they scored on the other components. In most cases, they also scored high on the 1970s component, thus allocating them to the first wave, but those who only scored highly on the components indicating upgrading in the 1990s were classified as part of the third (1990s) wave. Finally, component 5 of the four-variable solution suggests places that may potentially experience gentrification in the future (depending on the continued presence of artists and other forms of neighbourhood change to spur future investment). Tracts that score highly on this component (alone) are therefore labelled "potential future gentrification."

The PCA analyses thus identified groups of tracts with unusually high levels of changes in key variables in each decade. The first wave dates from the late 1960s and early 1970s. The second wave lasted from the end of the early-1980s recession until the onset of recession in 1989, while the third wave occurred over the 1990s. The first wave can be further divided into neighbourhoods that began gentrifying in the (late) 1960s and those in which initial changes began after 1971. This was detected by analyzing changes in social status and employment income between the 1961 and 1971 censuses separately from the PCA. A small subset of census tracts that our PCA suggests began gentrifying over the study period saw significant increases in these two variables over the 1960s. Every single one of these tracts also scored above +1.00 on the first (1970s) component in our PCA (if not also other components), confirming our decision to include the two periods of gentrification and upgrading as subsets of the same (1960s and 1970s) wave.[12] The literature suggests that any incipient gentrification uncovered over the 1961–1971 period is likely confined to the late 1960s (Ley, 1996; Sabourin, 1994).

The second step involves applying strict and consistent criteria to classify census tracts according to different types of upgrading and gentrification. As gentrification is meant to apply only to the transformation of traditionally working-class communities, it is here reserved for those neighbourhoods that were clearly working class in the early postwar period as indicated by be-

ponent 5 is taken into account, very few census tracts are categorized differently between the two PCA solutions. In cases where any difference remains, the four-variable solution typically dates the onset of upgrading earlier. This is likely because of the inclusion in the five-variable solution of changes in average rent ratios, which are more likely to increase in the second or third stage of gentrification instead of the first stage and thus suggest a later date of onset.

12 This is further supported by our finding that there were no census tracts located in the prewar (pre-1946) inner cities of either Toronto, Vancouver, or Montreal that experienced upgrading in social status and income solely over the 1961−1971 period. Every tract (outside of the new suburbs) that saw upgrading over the 1960s also continued to upgrade in the 1970s.

low-average rents, levels of social status and employment income, and above-average proportions of the housing stock in rental tenure (compared to the CMA averages) in both the 1951 and 1961 censuses (1951 is the first census to contain data aggregated at the census tract level). If a census tract scores high (above +1.00) on one of the components, but by the end of the entire period (2001) has not yet attained a personal income ratio greater than that for the metropolitan area as a whole, it is deemed to be an instance of "incomplete" gentrification. Either the gentrification process has stalled in these neighbourhoods, or it is taking place only slowly (and therefore the neighbourhood is still in the process of gentrifying). If, on the other hand, a tract's personal income ratio in the 2001 census (which contains income data for the year 2000) exceeds the metropolitan average, it is considered to have completed its metamorphosis to "gentrified" status.

Census tracts that scored higher than +1.00 on one of the components in the PCA, but that were clearly middle class in both 1951 and 1961 (with above-average employment incomes and social status), are not defined as instances of gentrification, but instead of "upgrading." Three types of upgrading are identified here.

First are the elite and middle-class tracts that have always had above-average incomes and social status. A good many of these experienced continual upgrading during several (and in some cases, every single one) of the inter-census periods. Thus we characterize such areas as undergoing a process of "elite and middle-class consolidation."

Second are those tracts containing a traditionally middle-class profile that score high on the second, third or fourth PCA components, but in which income levels dipped below the metropolitan average for part of the postwar period (including the 1970s) before coming back up above the average income for the region in either 1991 or 2001. These are classified here as instances of "middle-class recapture."

Third are tracts that fall into the upgrading category of "recapture," but in which the average income had not returned to the metro-wide average by the end of the period (2001). These areas are classified as "potential future recapture." In each of these cases, the census tract trajectory suggests it will surpass the metropolitan-wide average income over the next decade, although of course this is contingent upon the continuation of upgrading trends.

As might be expected, many of the tracts classified here as "recaptured" are located in postwar suburban locations, although some (such as the Toronto Island community and part of Mimico in Toronto) are in areas built up before the Second World War. The average income ratios must decline and remain below the metropolitan average for at least two census periods in order for a tract to be classified as an instance of "recapture" (otherwise, it remained as a middle-class neighbourhood and would be an example of elite or middle-class consolidation). This latter criterion disqualifies several neighbourhoods (including census tracts in Mount Pleasant and High Park in Toronto, and parts of Kitsilano in Vancouver) that have been previously cited as experiencing gentrification over the 1971 to 1981 period based on analyses that went only as far back as 1971 (i.e., Ley, 1988; Meligrana and Skaburskis, 2005).[13] The 1971 census is peculiar in that

13 Such measures are scale-dependent. When analysed at the census tract scale, neighbourhoods classified here as middle-class or elite consolidation were found to have housed a middle-class population (on average) in the early postwar period, thus making them invalid as sites of gentrification (which requires that they have been

a number of traditionally middle-class neighbourhoods (such as Mount Pleasant in Toronto) temporarily dipped below the CMA average income. Comparison with the earlier (1951 and 1961) censuses allows us to distinguish more accurately distinct trajectories of upgrading other than gentrification.

The result of this second classificatory step is a 13-category taxonomy of neighbourhood trajectories (see Table 5). The three waves of gentrification are each divided into complete and incomplete categories, while a separate category identifies neighbourhoods that may potentially gentrify in the next wave. The first wave of gentrification is further subdivided into earlier (1960s) and later (1970s) subsets (note that none of the neighbourhoods in the first wave that began gentrifying in the 1960s remained cases of "incomplete" gentrification in 2001).

In addition to tracts classified as "potential future gentrification" and the three types of upgrading discerned (elite and middle-class consolidation; middle-class recapture; and potential or future recapture), two other categories are identified, although they are not the subject of this report. One includes neighbourhoods that witnessed a consistent decline in the main indicators (not only income, but also social status and changes toward rental tenure) over the study period, as indicated by negative component scores across each census decade, which suggest a particular form of persistent neighbourhood decline (but should not be interpreted as the best indicator of multiple deprivation, which is outside the scope of this study). Only a small proportion of tracts (6 percent) fell into this category. The final category contains the remainder of neighbourhoods within the central cities characterized by only minor fluctuations or stability (as indicated by marginal non-negative PCA scores for each component). These areas constitute the majority of census tracts in each study city, and thus act as the control group against which gentrification and upgrading are compared.

Detecting different forms and pathways to gentrification

We are also interested in detecting different forms of gentrification and ordered a custom data set from Statistics Canada for the census years 1981, 1991, and 2001 for this purpose. This data contains cross-tabulated information about condominiums, rental dwellings, and owner-occupied non-condominium dwellings by average income and year of construction. Unfortunately, the census from 1981 to 2001 identifies only owner-occupied condominiums and cannot separate rental condos from other forms of rental units, thus preventing us from analyzing in this study the extent to which condominiums are rented.

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working-class settlements). It may still be that when analyzed at smaller scales (such as the enumeration area, or dissemination area), certain blocks within middle-class census tracts did gentrify according to our definition. For this study, gentrification is defined as the transformation of whole neighbourhoods. Individual houses or small groups of houses in single street blocks that shift from working class to middle class may not by themselves constitute the critical mass of residential housing and other land uses that is the heart of conceptualizing neighbourhoods. In any event, only minimal data is available at such scales even in recent census periods, with virtually no data available for earlier periods, and the boundaries of the enumeration/dissemination districts changed radically with each new census, thus preventing us from analyzing neighbourhood trends over time at the smaller enumeration/dissemination area scale.

Table 5. Summary of Gentrification and Upgrading Groups, for Montreal, Toronto, and Vancouver Census Tracts, 1961−2001

	Montreal			Toronto			Vancouver			All Three Cities		
Type of change	**CTs**	**% of CTs**	**% of Dwell-ings**	**CTs**	**% of CTs**	**% of Dwell-ings**	**CTs**	**% of CTs**	**% of Dwell-ings**	**CTs**	**% of CTs**	**% of Dwell-ings**
Gentrification – Complete & Incomplete:	105	20.8	14.2	85	16.4	17.2	18	17.1	23.4	208	18.4	16.8
Wave 1a − 1960s Gentrification	5	1	0.6	16	3.1	3	-	-	-	21	1.9	1.7
Wave 1b − 1970s Gentrification	14	2.8	2	13	2.5	3.1	7	6.7	9.6	34	3.0	3.4
Wave 2 − 1980s Gentrification	8	1.6	1.3	7	1.4	1.7	4	3.8	5.1	19	1.7	1.9
Wave 3 − 1990s Gentrification	2	0.4	0.1	4	0.8	0.7	1	1	1.3	7	0.6	0.6
Wave 1 − 1970s Incomplete Gentrification	16	3.2	2.4	12	2.3	2.9	-	-	-	28	2.5	2.4
Wave 2 − 1980s Incomplete Gentrification	35	6.9	4.3	20	3.9	3.5	2	1.9	2.8	57	5.0	3.7
Wave 3 − 1990s Incomplete Gentrification	25	4.9	3.5	13	2.5	2.2	4	3.8	4.6	42	3.7	3.0
Potential Future Gentrification	35	6.9	6.3	15	2.9	3.2	3	2.9	3.4	53	4.7	4.5
Other Upgrading:	60	11.8	11.4	74	14.3	14.5	26	24.8	24.4	160	14.2	14.4
Elite Consolidation	33	6.5	5.7	59	11.4	11.8	13	12.4	11.7	105	9.3	9.3
Elite/Middle-Class Recapture	7	1.4	1.4	6	1.2	1	3	2.9	3.1	16	1.4	1.4
Potential Future/Incomplete Recapture	20	3.9	4.3	9	1.7	1.7	10	9.5	9.6	39	3.5	3.7
Multiple and Persistent Decline	30	5.9	7.2	35	6.7	6.8	3	2.9	2.4	68	6.0	6.4
Mixed Trends/Minor Fluctuations/Stability	276	54.6	60.9	310	59.7	58.6	55	52.4	46.4	641	56.7	58.1
Central City Totals	506	100.0	100.0	519	100.0	100.0	105	100.0	100.0	1,130	100.0	100.0

Source: Calculated by the authors from Census of Canada, various years.

Note: Dwelling percentages are for private occupied dwellings in 2001 in the different types of neighbourhoods and do not indicate the percentage of the city's housing that has specifically gentrified, upgraded, or declined. Note also that the category of "Multiple and Persistent Decline," identified here by the existence of negative PCA scores on each of the main upgrading components, connotes a very particular and severe form of neighbourhood decline, and should not be taken as a general indicator of neighbourhood decline or multiple deprivation (for which there are many more tracts).

For each of these three census dates (the only ones for which this specific data was available), the relative income levels of those living in each of these three tenure types can be compared against those in previous decades. We measured the proportion of new condo, rental, and non-condo owner-occupied dwellings that appeared in the decades before and between each of these census years, and gauged the number of newly built (or "new-build") owner-occupied condo and non-condo dwellings that were constructed in each census tract over the 1971 to 2001 period. This data allowed us to estimate the number of dwelling units contained in older (pre-1961) buildings that have been converted to residential use from non-residential uses, including those that have been converted to condominiums.

Condominium legislation did not appear in Canada until the very late 1960s (and then only in a few provinces). Thus, no condominium dwellings were built before 1961, and very few were built before 1971. However, "new" residential dwelling units, many in condominium tenure but located in buildings with construction dates before 1961, appear in the census data published in recent decades. Applying a tolerance of +/− 30 units per tract to control for random error (the census information is self-reported) and for the random rounding of basic counts, we used this data to estimate the number of potential conversions of old non-residential stock to residential use (in most cases, this represents "loft" conversions of old warehouses), and conversions of non-condo buildings to condominium tenure (i.e., the "condo-ization" of mainly prewar rental apartments).

Our analysis of the cross-tabulated custom data on housing tenure, condominiums, age of housing, and the income of dwelling occupants makes it possible to classify the range of forms and pathways that residential gentrification has taken in each of the census tracts in which gentrification occurred. There are three main forms.

- The first involves "standard" articulations of gentrification marked by the renovation and deconversion of older residential housing stock from tenancy to owner-occupation.
- The second represents infill development, often termed "new-build gentrification" in the literature (Davidson and Lees, 2005) and is characterized by the construction of new owner-occupied housing. This includes both instances in which new housing has been created in areas that were not previously residential, as well as redevelopment in which old structures have been demolished and replaced with new ones.
- The third involves conversions in one of two forms – that of older non-residential buildings converted to owner-occupied residential use (either condo and non-condo owner-occupied), and that of older residential apartments to condominium tenure. (We cannot identify conversions from non-residential uses to rental apartments accurately, and so have had to ignore this third potential type of conversion.)

These different forms of gentrification over the study period are identified using a set of classification rules that take into account:

- the proportions of old (pre-1971) and new (constructed 1971−2001) housing in each tract;
- a comparison of the income ratios in new and old housing stock over time;
- the presence of converted (pre-1961) owner-occupied condominiums.

If there are at least 30 owner-occupied condominium units with a construction date before 1961 (that is, long before condominium legislation was introduced), we assumed that this represents

at least some conversions of prewar buildings (either rental or non-residential) to owner-occupied residential use. If at least 10 percent of the housing stock was constructed after 1971 and the average income in this new housing is greater than average income of the tract in 1971, it is assumed the tract contains at least some "new-build" gentrification.[14] If incomes in the older (pre-1971) housing stock increased in a tract that our method (informed by the PCA analysis) identifies as experiencing gentrification, it is characterized as an example of (at least some) standard processes of de-conversion and renovation of the older housing stock.[15] Of course, these processes may be present in any combination, and it is possible for all three forms of gentrification to be present in a single tract. However, we did not find any instances in which conversions alone accounted for the gentrification of a census tract.

14 If 90 percent or more of the housing stock in a gentrifying neighbourhood was built after 1971, or if post-1971 housing makes up at least 10 percent of the total stock and incomes in this new stock were higher in 2001 than the average for the total stock in 1971, then the tract is classified as having at least some "new-build" forms of gentrification.

15 If more than 90 percent of the housing stock in a tract was built before 1971 and incomes in the post-1971 stock are lower than the average income of the total stock in 1971, and/or the shift in income was solely limited to the pre-1971 stock in a tract, it is classified as exhibiting only this "standard" form of gentrification.

4. The timing and patterning of gentrification and neighbourhood upgrading in Canadian cities

Out of 1,130 census tracts analyzed in the three central cities, 18.4 percent (208 tracts) have experienced some form of gentrification (see Table 5). These tracts contain 16.5 percent of all dwellings in the three central cities. Gentrification has affected the greatest proportion of the housing stock in Vancouver, followed by Toronto, and then Montreal. However, the actual numbers of dwellings present in gentrified and gentrifying neighbourhoods is highest in Toronto (158,437), followed by Montreal (113,420) and then Vancouver (55,246).

Gentrification was present in some form in 17 percent of the census tracts within the City of Vancouver, which together contain 23.4 percent of all dwellings. Other forms of upgrading affected a similar number of neighbourhoods, such that all told, some form of upgrading occurred in neighbourhoods housing slightly less than half of the city's total stock. Gentrification affected 16.4 percent of the City of Toronto's neighbourhoods (housing a proportionate number of dwellings), and a similar proportion witnessed other forms of upgrading. Gentrification and upgrading are only slightly less noticeable on the Island of Montreal, where the roughly 21 percent of census tracts it touched contain 14 percent of the city's dwellings; while upgrading affected just over 11 percent of tracts and dwellings.

The majority of census tracts in all three cities experiencing gentrification nonetheless ended the study period with below average incomes, leaving the gentrification process incomplete. Of the 18.4 percent of tracts touched by gentrification, 7.2 percent were fully gentrified by 2001, while in the other 11.2 percent, the gentrification process had either tapered off or was still continuing but slowly (and thus remaining incomplete). Census tracts in Montreal were more likely to reveal instances of incomplete gentrification (15 percent of tracts, vs. only 5.7 percent for the complete category), whereas the opposite is true in Vancouver (5.7 vs. 11.4 percent fully gentrified), while roughly equal proportions of the two are found in Toronto (8.6 vs. 7.7 percent, respectively).

As might be expected, first-wave gentrification represents a smaller proportion of the central city than subsequent waves (7.3 vs. 11.0 percent, respectively), as gentrification spread out from these initial "islands of renewal." In both Montreal and Vancouver, just under 7 percent of all tracts began gentrifying in the first wave (both complete and incomplete), whereas 13.8 and 10.5 percent of tracts, respectively, began gentrifying in the second or third waves. The excep-

tion is Toronto, where gentrification received an earlier boost from subway development, so that the first wave (at 7.9 percent) is almost as prevalent as later waves (8.5 percent). As neighbourhoods in earlier waves had more time to consolidate their position, it is not surprising that a greater proportion of them had fully gentrified by 2001 (66.3 percent) than tracts in subsequent waves (20.8 percent). Tracts where our method indicated potential future gentrification were more common in Montreal (6.9 percent) than in Toronto or Vancouver, where they represented 2.9 percent of all central-city tracts.

Other forms of upgrading are also noticeable, although to a lesser extent than gentrification. In the three cities, 105 tracts (9 percent) fall into the elite and middle-class consolidation group, 16 tracts (1.4 percent) have been “recaptured,” and another 39 (3.5 percent) suggest the potential for future “recapture.” Elite consolidation is a prominent feature of both Toronto and Vancouver, while middle-class recapture and potential future recapture are most noticeable in Vancouver.

Meanwhile, persistent and multiple downgrading occurred (defined here by negative scores across each of the components, rather than personal income decline) in 68 tracts (6 percent of the all three central cities). Tracts in this multiple-decline category are most evident in Toronto (6.8 percent), particularly in its aging inner suburbs, although two tracts in this category were also found in the inner city (in St. Jamestown and part of the South Parkdale neighbourhood). They are also present in Montreal (30 tracts, or 5.9 percent), while in Vancouver they are concentrated in only three tracts (2.9 percent). We would note here that our PCA was not intended to provide a measure of impoverishment, decline, or multiple deprivation, and thus the measure cited here may not be the best indicator of such concepts (the latter is a topic for a separate report). The remaining 57 percent (641 tracts across the three cities) represent those areas of the city with trends that do not register strongly on any of the PCA components.

Alternative Measures of the Extent of Gentrification

The analysis above has measured the extent of gentrification in comparison with all census tracts contained in the three central cities. This includes many fringe neighbourhoods that remained as greenfield sites and effectively undeveloped for urban residential use until long after the process of devaluation and gentrification had begun affecting traditional working-class areas near the core. A different picture emerges when the extent of gentrification is restricted to existing prewar inner-city neighbourhoods (see Table 6). If we compare the number of tracts that experienced some form of gentrification against the available tracts contained within those inner-city areas already built up before the Second World War and thus containing the oldest housing, the proportion of tracts affected by gentrification rises to over one-third. The 208 tracts experiencing some form of gentrification represent 36.6 percent of the 569 tracts contained within this more restricted definition of the “inner city.”

As a proportion of the pre−Second World War inner city, gentrification is most common in Toronto, both in its extent and in its strength (as revealed by the proportion of neighbourhoods which fully gentrified). In this case, it is mostly neighbourhoods in the former (pre-amalgamation) cities of Toronto and York, and the Borough of East York, and the former small towns of Mimico and New Toronto (amalgamated into Etobicoke in 1963), that were developed before 1946 (Walks, 2001). All 85 census tracts in Toronto which have experienced some form of gentrifica-

tion were located in these areas, representing 39.2 percent of neighbourhoods within Toronto's available inner-city areas. Of these, 18.4 percent are fully gentrified, and the remaining 20.7 percent have experienced incomplete forms of gentrification.

Table 6: The Extent of Gentrification by Comparison Area and Level of Completion

	Entire Central City (n = 1,130 tracts)			Pre-WWII Inner City (n = 569 tracts)			Low-Income pre-WWII Inner City (n = 425 tracts)		
Central City	**Total**	**Complete**	**Incomplete**	**Total**	**Complete**	**Incomplete**	**Total**	**Complete**	**Incomplete**
Montreal	20.8	5.7	15.0	35.7	9.9	25.9	46.7	12.9	33.8
Toronto	16.4	7.7	8.6	39.2	18.4	20.7	57.8	27.2	30.6
Vancouver	17.1	11.4	5.7	24.0	16.0	8.0	33.9	22.6	11.3
Total	18.4	7.2	11.2	36.6	14.2	22.3	48.9	19.1	29.9

Source: calculated by the authors.

Note: The above percentages indicate the proportion of census tracts that experienced gentrification within each comparison area. These figures do not refer to the proportion of dwellings or households potentially affected. Pre−Second World War tracts are those lying within the boundaries of districts or municipalities (old and new) that were developed before 1946. In the Toronto region this includes the former municipalities of Toronto, York, East York, Mimico, and New Toronto. In the Montreal region, this includes the former or present municipalities of Westmount, Outremont, Verdun, Hampstead, Côte St. Luc, Lachine, Montreal Ouest, and the large area south of Boulevard Crémazie in the old City of Montreal. In the Vancouver region, this includes the City of Vancouver, minus the 30 tracts located in the south-east of the city that were developed after 1946.

A similar, although slightly lower, estimate is obtained when we restrict the definition of Montreal's inner city to the 294 census tracts within the former municipalities of Verdun, Westmount, Outremont, Hampstead, Côte St. Luc, Lachine, Montreal Ouest, and the old southern portion of the City of Montreal. This represents areas that were already developed by the end of the Second World War. When compared against this base, 36 percent of Montreal's inner city is found to have experienced some form of gentrification; almost 10 percent are fully gentrified by 2001 and the other 26 percent show signs of incomplete gentrification.

Likewise, when we remove the 30 census tracts in the City of Vancouver that were largely built up after 1945 from the central city totals, we found that gentrification had touched a full 24 percent of Vancouver's "inner-city" neighbourhoods, 16 percent of which have fully gentrified.

An even more striking estimate is attained if we restrict our sample further to only those tracts within the inner cities that began the period with below-average incomes.[16] It is these areas that functioned as working-class neighbourhoods in the early postwar period, and thus, it is only

16 This is determined through examination of the 1971 average per capita income of each census tract. The tract is not considered a candidate for gentrification unless its average per capital income was below the CMA average in 1971. The counts of tracts below this level are determined using the 2001 census tract boundaries, rather than the 1971 boundaries. This provides a more conservative estimate of the extent of gentrification than if the 1971 boundaries were used to determine the counts, because the number of census tracts is lower in 1971 than in 2001 (because census tracts are typically split into two or more tracts if their populations have expanded, and there have been no amalgamations of census tracts).

these areas that can be “true” candidates for gentrification according to the definition we outline here. Remarkably, almost half (49 percent) of these potential candidates witnessed some form of gentrification in the study period, and over 19 percent of these candidate neighbourhoods gentrified fully.

Toronto is revealed as experiencing the most extensive and deepest penetration of gentrification into its stock of low-income inner-city neighbourhoods. A clear majority (just under 59 percent), of the 147 census tracts that fall into this category experienced some form of gentrification (27 percent fully gentrifying, while 31 percent remain incomplete).

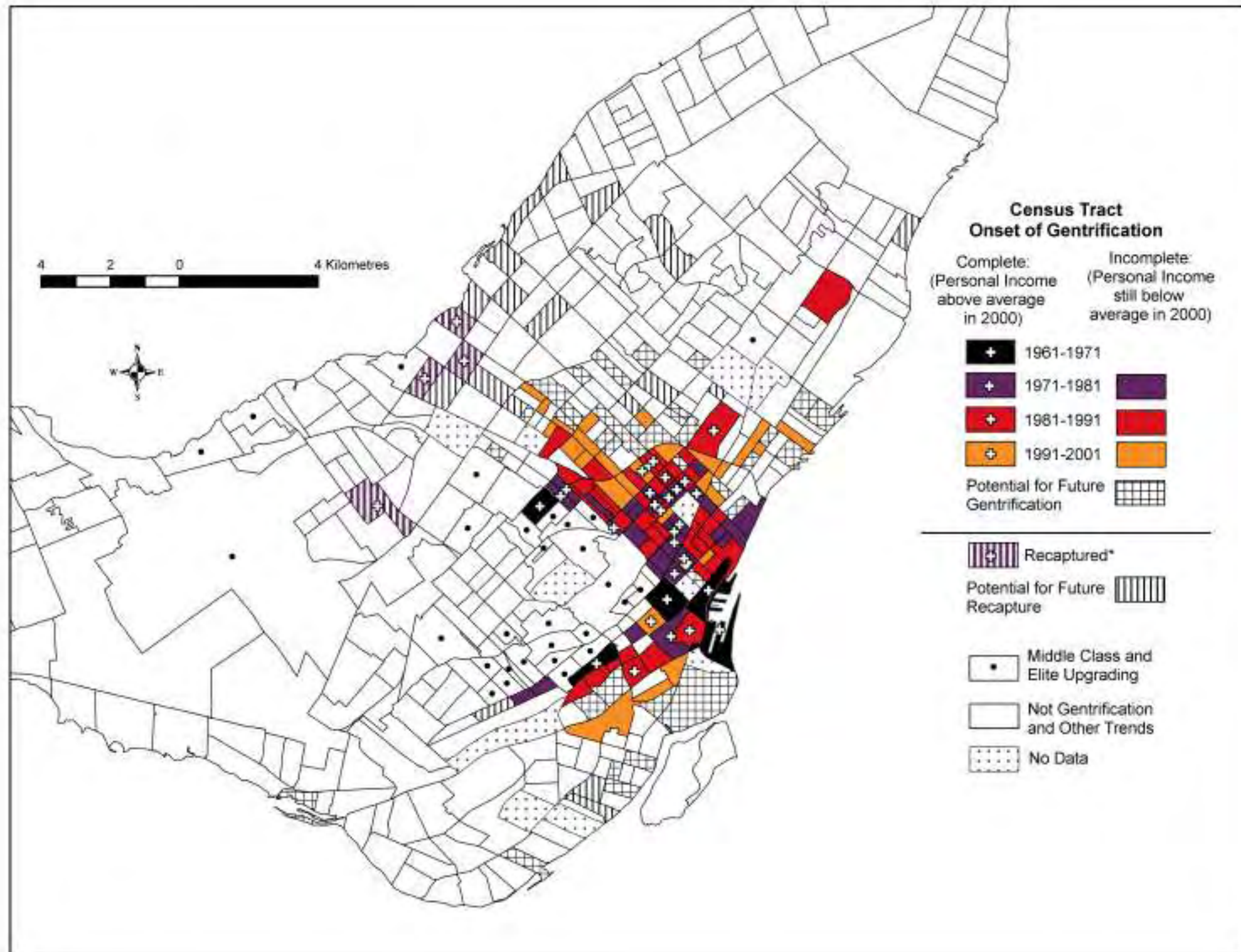
Meanwhile, this method suggests that over 46 percent of the 225 low-income neighbourhoods identified at the beginning of the period in Montreal’s inner city experienced some form of gentrification (almost 13 percent of which fully gentrified, while over 33 percent remained incomplete).

Vancouver’s pre−Second World War inner city has always contained significant numbers of middle-class neighbourhoods, and in turn has had fewer available low-income neighbourhoods to offer as candidates for gentrification at the beginning of the study period. Nonetheless, almost 34 percent of the 53 census tracts that fit this more limited criteria experienced some form of gentrification. Of these, 22.6 percent fully gentrified, while 11.3 percent ended the period in a state of incomplete gentrification. These results demonstrate the significant impact that gentrification has had on the Canadian inner-city landscape.

Mapping Gentrification

Figures 1, 2, and 3 demonstrate how the different types of gentrification and upgrading map onto the diverse inner-city landscapes of Montreal, Toronto, and Vancouver, respectively. There is a clear geography to the timing of both gentrification and upgrading, with gentrification concentrated in the oldest parts of the inner cities (as might be expected), while upgrading and recapture are a feature of older suburbs and well-established elite areas. Significant spillover effects into adjacent neighbourhoods are evident. Neighbourhoods that began gentrifying in the early part of the first wave (i.e., in the late 1960s) are clearly associated with proximity to elite tracts, waterfront areas, and subway lines in Toronto and Montreal, which spurred much redevelopment at higher densities. Tracts that began gentrifying in the later part of the first wave (i.e., the 1970s) are all contiguous either to existing elite or middle-class neighbourhoods or to areas that experienced gentrification in the 1960s. Later waves emanate outward from these earlier waves, in a concentric form. Third-wave neighbourhoods are more distant from the first gentrified neighbourhoods than those in the second wave, etc.

Figure 1: The timing and patterning of gentrification and upgrading, Montreal Urban Community (MUC), 1961–2001



Source: Created by the authors from Census of Canada, various years. Note: Only that portion of the Montreal Urban Community containing instances of gentrification is shown. Recapture and potential future recapture refer to instances of neighbourhood upgrading in which a census tract regains its prior above-average income status after spending a minimum of two consecutive census decades below the metropolitan average.

Montreal

Gentrification is found in a tightly concentrated pattern to the south and east of the mountain on Montreal Island. Gentrification that by 2001 was complete is concentrated in the places where it is well-known (Germain and Rose, 2000), namely in and around Old Montreal and the port area, in the downtown core, in the plateau (see Figure 1), and those areas bordering well-established elite areas at the base of the mountain to the east as well as Westmount and Outremont to the west and north respectively. Surrounding these pockets are areas of incomplete gentrification, which predominate along The Main (St. Laurent Blvd.) and in the Centre-Sud neighbourhood.

Recapture is a feature of several neighbourhoods along the metro line and along the north river separating Montreal from Laval. Meanwhile, several areas east of Centre-Sud, in central Verdun, and northwest of the plateau indicate initial increases in the number of artists and in social status in the most recent census, which suggest they may gentrify in the future. Less-accessible areas with older housing, such as those in Lachine or the Côte de Neiges district around the University of Montreal, are surprisingly devoid of any sign of gentrification.

Thus, while extensive, gentrification in Montreal is mainly concentrated in certain sections of the old inner city. The earliest onset of gentrification in Montreal occurred in Old Montreal near the port, and near McGill University to the northwest of Old Montreal, with two other nodes in Outremont and southern Westmount. From this base it spilled over into the downtown and across the plateau, although in a somewhat patchy pattern.

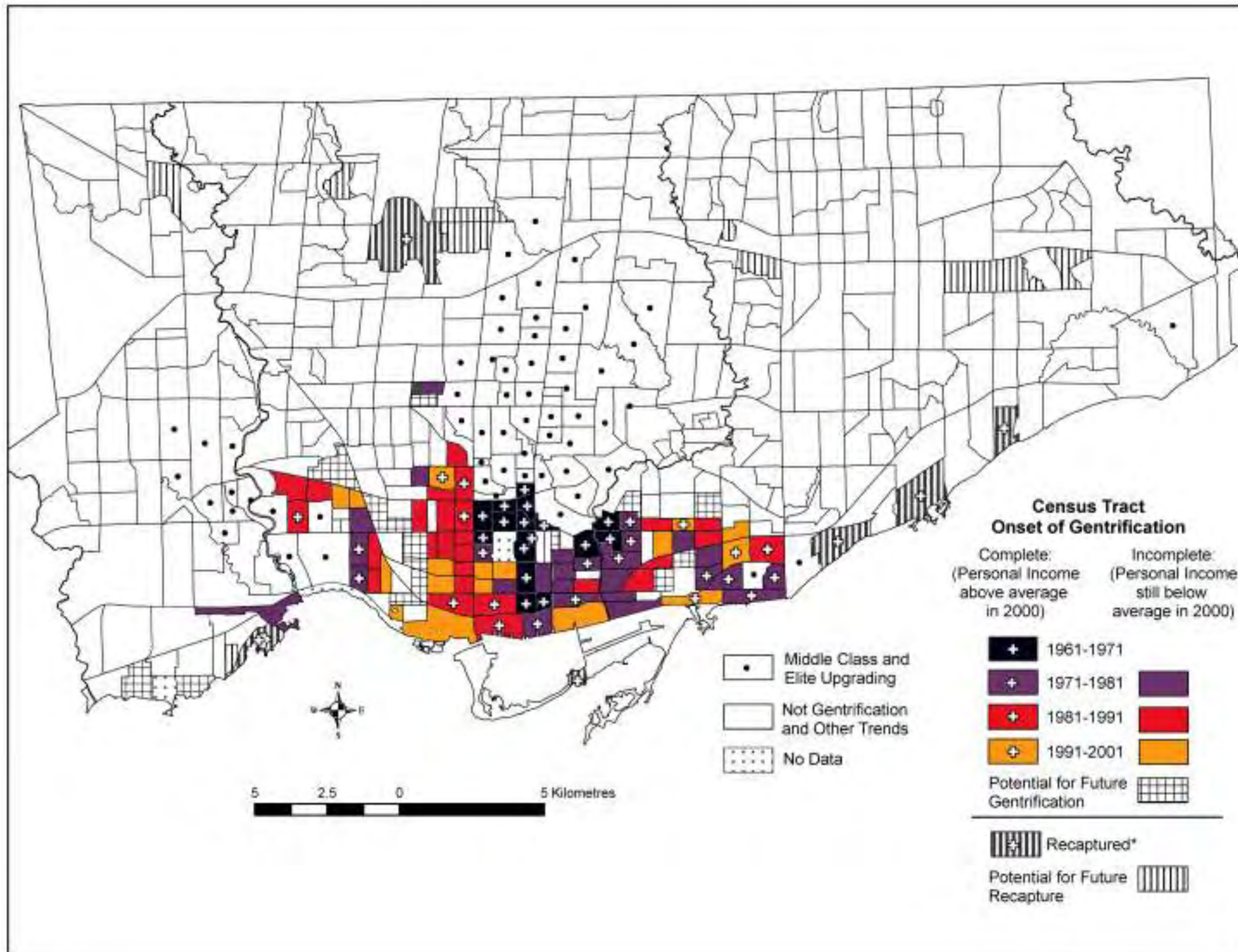
Toronto

Gentrification and upgrading are virtually ubiquitous across Toronto's inner city (Figure 2). By 2001, only a handful of prewar neighbourhoods had completely escaped gentrification, particularly the concentration of neighbourhoods in the old City of York (Mount Dennis and Rogers Road areas) to the north of the Junction. The first wave of gentrification is clearly associated with proximity to elite areas, and accessibility to the subway system, which first opened in 1956 and continued expanding through the early 1970s.

In addition to well-known examples of early gentrification, such as Don Vale/Cabbagetown, Riverdale, Playter Estates, the Annex, and Yorkville, our analysis has uncovered significant gentrification along the north-south subway line (all reveal below-average indicators in the 1951 and 1961 censuses). These neighbourhoods were the first areas to benefit from the construction of the first part of the subway system, and many received substantial investment in new building over the 1960s.

This first wave continued into the 1970s, when a number of tracts near the first set, as well tracts near High Park along Roncesvalles, in South Riverdale, and in the Beaches neighbourhood, first started gentrifying. Many of these tracts were fully gentrified by 2001. Gentrification then began to expand from these areas into new territory in the 1980s and 1990s. In the majority of neighbourhoods that began gentrifying in the second and third waves, incomplete gentrification predominates.

Figure 2: The timing and patterning of gentrification and upgrading, City of Toronto, 1961–2001



Source: Created by the authors from Census of Canada, various years. Note: Recapture and potential future recapture refer to instances of neighbourhood upgrading in which a census tract regains its prior above-average income status after spending a minimum of two consecutive census decades below the metropolitan average income.

Tracts in the second and third waves that fully gentrified are located near existing gentrified and elite areas, such as Seaton Village to the west of the Annex, and Bloor West Village, between High Park and Swansea. In the spaces between the pockets of incomplete gentrification are many areas our analysis suggests may gentrify in the future.

If gentrification and other forms of upgrading continue on the course we have identified here, eventually there will be few inner-city neighbourhoods remaining untouched in Toronto's inner city, except perhaps for those located to the northwest, in Mount Dennis and the City of York.

Vancouver

In Vancouver, gentrification follows a much more concentrated pattern. Once again, shifts began close to established elite and middle-class areas and spilled over from there into nearby neighbourhoods. Beginning in the early 1970s in parts of Fairview and Kitsilano (which has a popular beach, and where a number of tracts have always housed above-average income populations), gentrification moved into the CBD in the 1980s, and then into Gastown to the east, south into Yaletown, and across the Main Street divide into Strathcona bordering Chinatown and the Downtown East Side. Some gentrification is also evident in the 1980s in the Grandview-Woodlands area, which contains the Commercial Drive district.

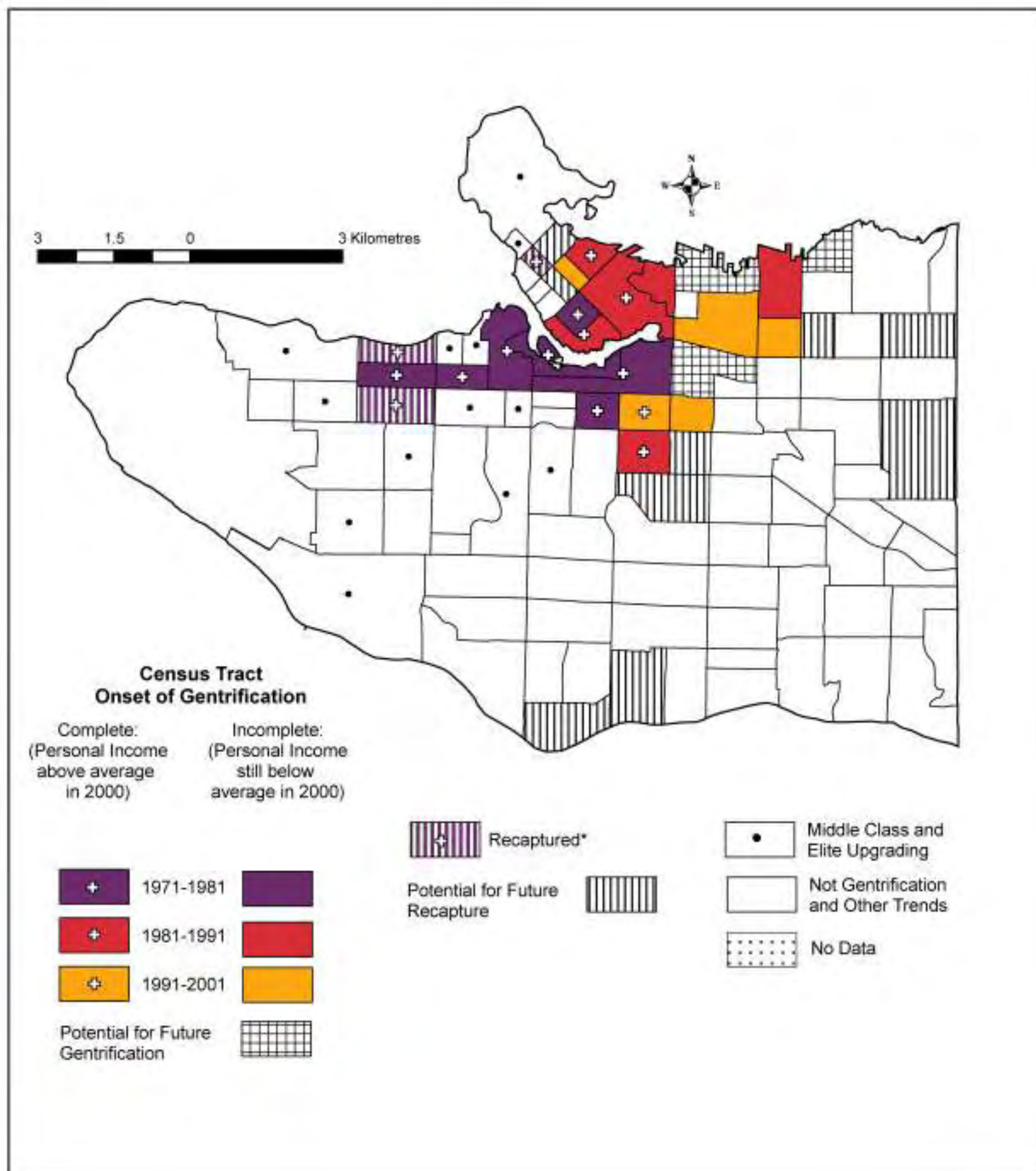
Nevertheless, in all areas east of Main, gentrification remains incomplete. The Downtown East Side, the poorest neighbourhood in Vancouver (and Canada as a whole), and an ongoing focus of struggle over urban redevelopment projects, single-room occupancy (SRO) hotels, and safe-injection sites (Blomley, 2004; Hassan and Ley, 1994; Lees, Slater and Wyly, 2007, 263-271), shows up in our analysis as an area that may begin showing statistical signs of gentrification in the future.

Gentrification frontiers

In each study city, there is a clear geography to both complete and incomplete forms of gentrification. As Ley has already noted (1986), neighbourhoods close to elite areas, large institutions (universities and hospitals), urban amenities (parks and beaches), and rapid transit routes (a subway or metro) began to gentrify first. These areas were in turn most likely to become fully gentrified by the end of the study period, and as discussed in the next section, to attract multiple forms of gentrification (new construction, loft and condominium conversions, etc).

Neighbourhoods experiencing incomplete gentrification tend to be contiguous to previous waves, often clustering together and forming a "gentrification frontier" which makes further investments in previous waves safer and helps to solidify their status. The concept of a gentrification frontier belongs to Smith (1996; Smith et al., 1989), and denotes the line beyond which gentrification is encroaching through the effects of land speculators, real estate agents, developers, and investors. In each city, there is a clear frontier characterized by incomplete gentrification from the 1980s or 1990s; areas just beyond this frontier show up in our analysis as areas of "potential future gentrification." Such a frontier can be estimated for each city as it existed at the end of the study period (2001).

Figure 3: The timing and patterning of gentrification and upgrading, City of Vancouver, 1961–2001



Source: Created by the authors from Census of Canada, various years

Note: Recapture and potential future recapture refer to instances of neighbourhood upgrading in which a census tract regains its prior above-average income status after spending a minimum of two consecutive census decades below the metropolitan average income.

In Montreal, the gentrification frontier is located in a number of places. The main frontier runs north along the Main and east of the Plateau, beyond the Grand Trunk rail spur that arcs around the north and east of the Plateau, one of Montreal's two main centres of gentrification. A second frontier is evident south east of the Plateau into the Centre-Sud neighbourhood to the east of the CBD and north-east of the Port (the other main centre of gentrification). A third frontier, meanwhile, can be found southwest of the downtown and Westmount, into the Notre-Dame-de-Grace district of Montreal, the eastern portion of Verdun and the industrial areas to the west of the port area, and along the eastern portion of the Lachine canal.

In Toronto, one of the main remaining frontiers is located in little Portugal and South Parkdale, between the Grand Trunk railway line to the west and Dovercourt Road to the east. This area is clearly being squeezed from both sides. Gentrification began west of Roncesvalles in the 1970s, spread east in the 1980s, and then all the way to the Grand Trunk line in the 1990s. Incomplete gentrification from Bathurst to Dovercourt is also evident from the 1980s and 1990s waves, which flow into areas showing "potential future gentrification" on the west side of Dovercourt. Little Portugal and South Parkdale still housed extensive low-income populations in 2001, so future gentrification would displace many needy people.

A second frontier is evident in Leslieville and Little India, an area squeezed by gentrification in Riverdale to the west, and the Beaches neighbourhood to the east. A third frontier can be discerned north of the Danforth in the old Borough of East York, particularly north of the Playter Estates and North Riverdale neighbourhoods between Broadview and Pape, and again in the area between Greenwood and Woodbine roads. Two other emerging frontiers are evident: in the Junction and Bloordale areas in the west end (between High Park to the west, Hillcrest to the north, Seaton Village to the east, and Bloor street to the south), and in the New Toronto/Long Branch areas at the south end of Etobicoke along the lakefront in the City's southwest.

The main gentrification frontier in Vancouver is the Downtown East Side. Gentrification is encroaching to the east of Gastown and the City Hall, and from incomplete forms of gentrification in Strathcona to the south, and Grandview-Woodlands to its east (as well as farther to the east of Grandview-Woodlands, in the north-west of Hastings-Sunrise, and south of Strathcona). Of the neighbourhoods in Vancouver, therefore, it is in the Downtown East Side that our analysis predicts gentrification will begin showing up statistically in the near future if current trends continue (and if resistance is not strong enough).

Of course, such scenarios depend to a great deal on how political resources are mobilized, and how the state responds. The Downtown East Side neighbourhood contains the largest concentration of low-income and marginalized groups in Vancouver, and developments in the area have always been highly politicized (Blomley, 2004; Hassan and Ley, 1994). On the one hand, the British Columbia provincial government has moved to purchase a series of SRO (single-room occupancy) hotels in the Downtown East Side in order to turn them into social housing in face of the gentrification threat (Ley and Dobson, 2007). On the other hand, the conversion of the large Woodwards department store into over 700 residential units, approximately three-quarters of which have been sold as owner-occupied condominiums (200 remain non-market rentals), may work to plant gentrification firmly in the neighbourhood, in addition to heightening the level of local social polarization (Lees, Slater and Wyly, 2007, 270; Smith, 2003).

5. Stage effects and the indicators of gentrification

As discussed above, the literature on gentrification suggests that it occurs in stages. The early literature implied that the process would take roughly the same length of time in each neighbourhood touched by gentrification. However, more recent literature suggests a diversity of experiences among gentrifying neighbourhoods. Some might evolve from a concentration of artists, but others quickly gentrify into consumption spaces for those employed in higher-income occupations such as legal or financial services (Butler, 2003b; Butler and Robson, 2001; Davidson and Lees, 2005; Lees, Slater and Wyly, 2007). There is also considerable diversity in the amount of time between the onset of gentrification and the time at which the neighbourhood joined the ranks of middle-class neighbourhoods with incomes above the CMA average (see Figures 4, 5 and 6).

In all three cities, two census decades (from 11 to 20 years) is both the mean and median amount of time between the date of onset and the date when the CMA average income is surpassed for neighbourhoods that fully gentrified. Across all three cities:

- 14 percent of the neighbourhoods touched by gentrification made the transition to above-average incomes only one census decade after the first signs of gentrification;
- 15 percent took two census decades;
- 9 percent took three decades;
- 2 census tracts in Toronto (or 1 percent) took four decades;
- 3 tracts in Toronto (1.4 percent of gentrifying neighbourhoods) went immediately from having virtually no residential population to an above-average income population, due to new-build forms of gentrification (discussed below).

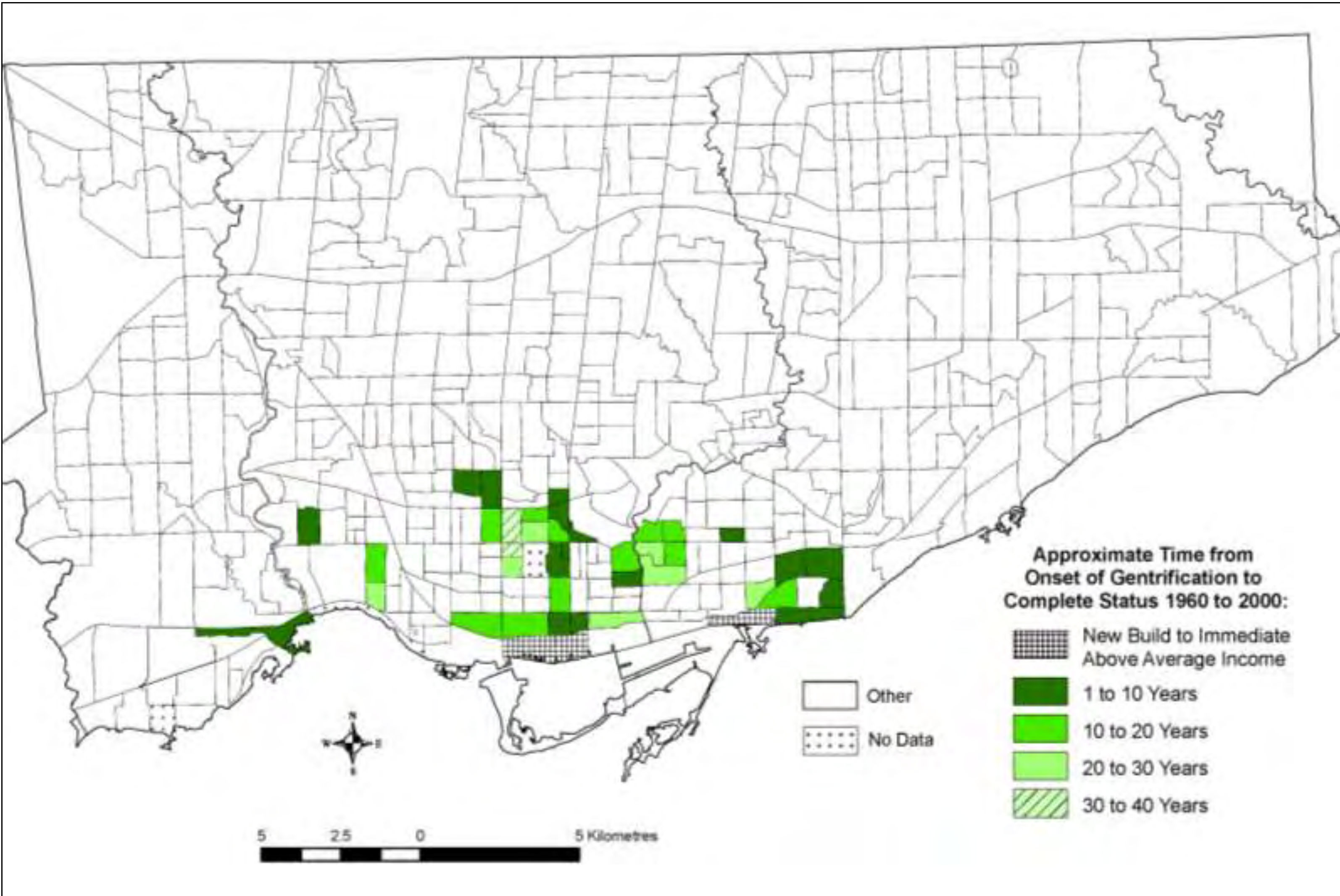
The remainder (61 percent) of tracts experiencing gentrification remained in an incomplete state of transformation at the end of the study period in 2001.

Figure 4: Time from the Onset of Gentrification to Complete Status, Montreal Urban Community (MUC), 1961–2001

Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered “complete” once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

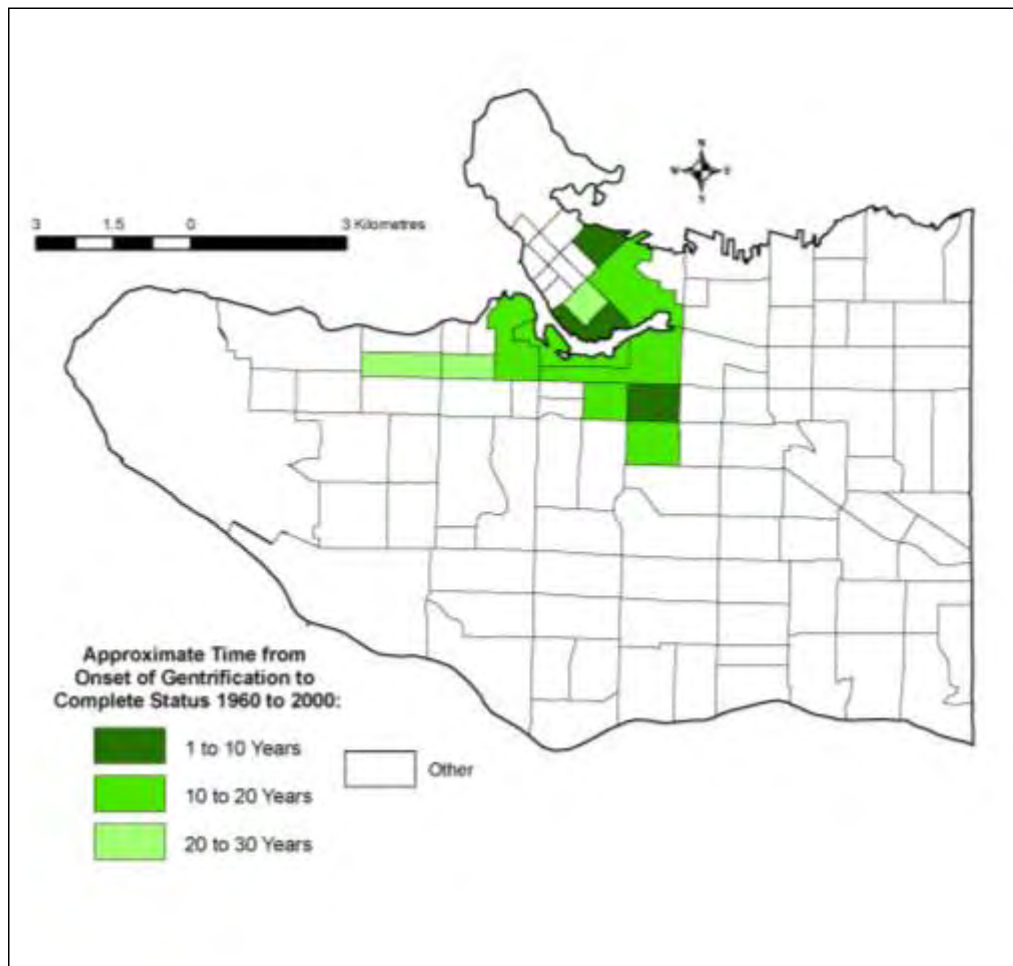
Figure 5: Time from the Onset of Gentrification to Complete Status, City of Toronto, 1961–2001



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered "complete" once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

Figure 6: Time from the Onset of Gentrification to Complete Status, City of Vancouver, 1961–2001



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered "complete" once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

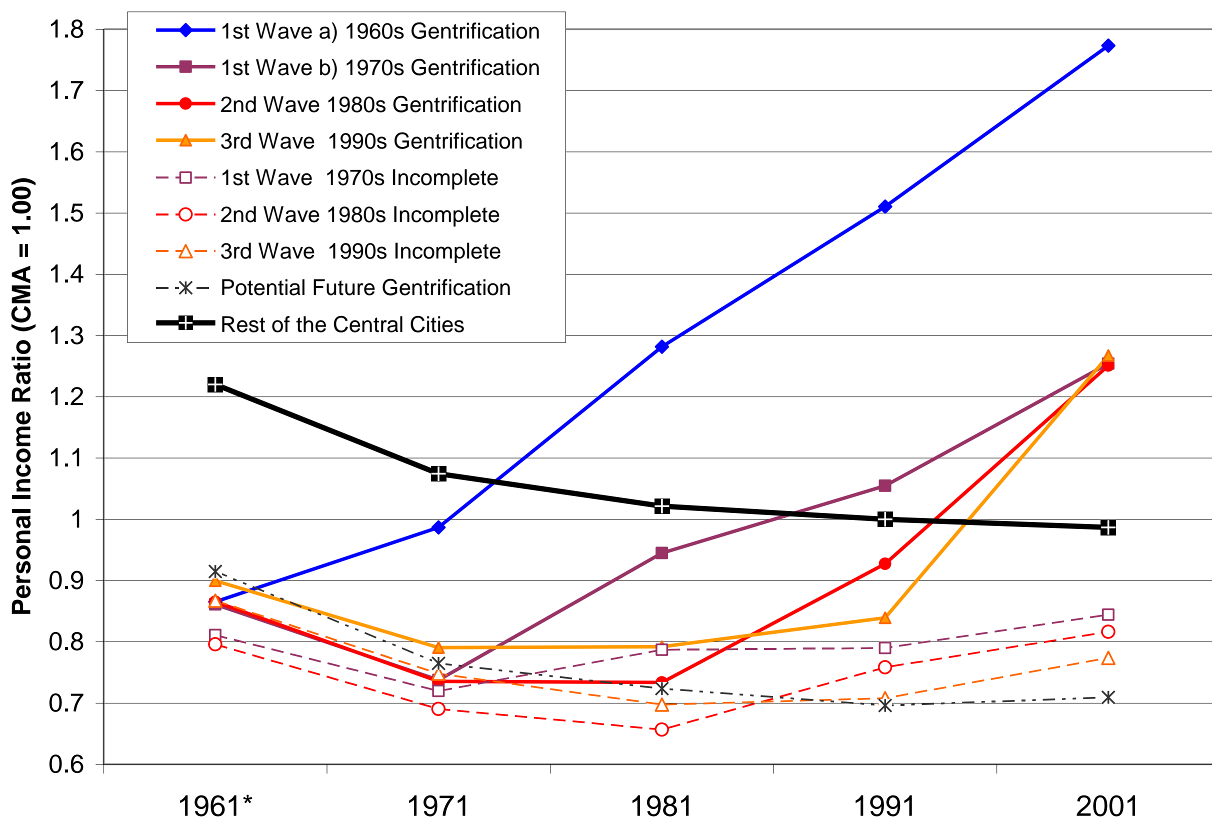
In Toronto we find the greatest variance in length of time from onset, and there is no clear pattern to these differences in length of time to gentrification. In many cases, tracts that gentrified rapidly are either near existing middle-class areas, or early instances of gentrification. On the other hand, many neighbourhoods that began gentrifying early on surpassed the CMA average income benchmark only in the final (2001) census decade.

The trajectories of neighbourhood gentrification come into greater focus through analysis of changes in the key indicators of gentrification and upgrading. The analysis that follows demonstrates how the stages of gentrification have changed over time, and how each new wave of gentrification mirrors and yet modifies patterns of change evident in previous waves.

Income

Perhaps the most telling indicator of gentrification is income. Figure 7 aggregates the mean income values for the neighbourhood types across all three central cities. It shows clear stage effects in the shifts in mean incomes over time. Inner-city neighbourhoods that experienced some form of gentrification all began the period with similar average employment incomes in 1960, well below that for the rest of their central cities. Average incomes relative to the CMA as a whole declined between 1960 and 1970 in all but those tracts witnessing the onset of gentrification in the 1960s, and continued to gain in income until 2000, when they were almost as wealthy as the groups of neighbourhoods classified as middle-class and elite consolidation.

Figure 7: Average Personal Income (Ratio to CMA Mean), All Three Central Cities, 1961–2001



Source: Calculated by the authors from Census of Canada, various years

Note: The average personal income ratio compares the average income from all sources of those aged 15 and over in each census tract to that in the Census Metropolitan Area (CMA) where it is found. Note, however, that only average employment income (ratio) is available in 1961. The above charts the mean values in each category for all three study cities.

Similarly, all neighbourhood gentrification types except those in the first wave of gentrification experienced relative income decline over the 1960s and 1970s. This trend repeats across each period: income typically continues to decline until the onset of gentrification. (In fact, the only

exception to such a trend is the continual income upgrading of neighbourhoods classified as elite and middle-class consolidation over the study period). It generally takes gentrifying neighbourhoods (in the fully gentrified category) two census periods to make it to above-average income from the time they began to gentrify. The exception is the 1990s, when gentrification occurred more quickly, with incomes shooting up to the same level as both the 1970s and 1980s groups in a single decade. Many areas that gentrified during the 1990s also experienced some minimal upgrading in the 1970s, but this stalled until the 1990s, at which point investment began to flow in to these neighbourhoods, some of whom saw extensive construction of new up-market condominiums and single-family housing. By 2000, all of the fully gentrified groups have incomes well above the central city average.

Areas of incomplete gentrification, on the other hand, show only marginal and gradual increases in their average income levels, bringing them up to just about where they would appear to have been in 1960 after experiencing income decline through the 1970s.

The remaining tracts in the three central cities (the majority "control group" that indicated mixed trends over time) reveal slow aggregate declines in income levels, to a point in 2001 just below the average for their respective census metropolitan areas (CMAs). Thus while much of the inner city gentrified, the remainder of the central city (particularly areas outside of established elite and middle-class areas) experienced relative income decline. This supports the hypothesis that gentrification in the inner city is linked to the decline of postwar suburban areas, as lower-income households who traditionally would have resided in the inner cities are priced out of the core and forced to settle in more distant neighbourhoods.

Such an hypothesis is further confirmed through examination of changes in the income of households within gentrified and gentrifying census tracts (Table 7). In each of the three central cities, low-income households (with incomes less than $30,000 per year in 2001 constant dollars), drastically declined as a proportion of all households in all areas which fully gentrified, and in most areas of incomplete gentrification as well. Meanwhile, the proportion of households with high incomes (those with over $90,000, in 2001 constant dollars) grew much faster in gentrifying areas than elsewhere in the central cities.

Trends for middle-income households (between $30,000 and $90,000 a year in 2001 constant dollars) vary between cities and across neighbourhood types, depending upon the rapidity of the gentrification process in each place, its stage in the gentrification cycle, and the displacement of low-income households. Generally, the longer that gentrification has taken place, the greater the likelihood that middle-class households have declined as a proportion of the total household population over the 1990s. Each of those neighbourhoods that began gentrifying in the first wave, for instance, has seen declines in the middle-income group over the 1990s. This suggests that any proportionate increases in middle-class households is only temporary and part of the staging cycle characterizing most gentrifying neighbourhoods. These results suggest that gentrification is not likely to lead to increases in the income mix of households, but just the opposite: as gentrification progresses it leads to a more homogenous mix of incomes weighted toward the upper end of the income spectrum. Gains in middle-income neighbourhoods are thus likely to be only temporary, and eroded as the neighbourhood continues to fully gentrify and join the elite residential neighbourhoods.

Table 7: Change in the Proportion of Households with Low, Middle, and High Incomes (expressed in 2001 constant dollars)

% Households	% Low-Income ($0-29,999)				% Middle-Income ($30,000-89,999)				% High-Income ($90,000+)				Change in % in each Category 1971-2001		
	1971	1981	1991	2001	1971	1981	1991	2001	1971	1981	1991	2001	Low	Middle	High
MONTREAL	39.6	36.8	39.9	42.0	52.9	51.2	48.0	44.9	7.5	12.0	12.1	12.9	2.4	-8.0	5.4
1960s Gentrification	39.8	34.1	31.6	21.6	47.0	45.8	44.9	32.7	13.1	20.1	24.0	45.8	-18.2	-14.3	32.7
1970s Gentrification	57.2	49.3	44.1	36.6	40.5	42.3	47.7	46.6	2.3	8.4	8.2	16.8	-20.6	6.1	14.5
1980s Gentrification	54.8	56.8	41.4	33.6	43.2	36.5	52.9	51.1	2.0	6.7	5.7	15.3	-21.2	7.9	13.3
1990s Gentrification	62.3	65.8	56.1	55.3	36.9	34.2	42.7	24.9	0.8	0.0	1.2	19.9	-7.0	-12.0	19.1
1970s incomplete Gentrification	58.0	52.9	55.5	49.2	39.4	42.8	40.0	44.5	2.6	4.3	4.5	6.2	-8.8	5.1	3.6
1980s incomplete Gentrification	62.1	60.4	52.7	50.8	36.5	36.0	44.2	43.4	1.4	3.6	3.1	5.8	-11.3	6.9	4.4
1990s incomplete Gentrification	53.3	56.2	59.4	57.4	44.5	41.8	38.2	38.1	2.2	2.0	2.4	4.6	4.1	-6.4	2.4
Potential Future Gentrification	46.8	49.9	55.5	54.6	50.9	47.5	41.0	42.2	2.3	2.6	3.5	3.2	7.8	-8.7	0.9
Elite & Middle-Class Upgrading	21.1	21.7	20.7	19.2	48.2	44.3	41.5	38.7	30.7	34.0	37.8	42.1	-1.9	-9.5	11.4
Recapture	33.0	34.3	35.0	29.2	60.4	53.3	51.9	53.9	6.6	12.4	13.1	16.9	-3.8	-6.5	10.3
Potential Future Recapture	34.4	40.2	45.0	44.7	61.1	52.8	47.4	47.3	4.5	7.0	7.6	8.1	10.3	-13.8	3.6
Multiple & Persistent Decline	25.9	33.3	40.2	45.7	66.5	57.0	50.5	46.6	7.6	9.7	9.3	7.7	19.8	-19.9	0.1
Mixed Trends/Rest of the City	30.7	32.7	37.1	40.8	61.1	54.7	50.0	46.5	8.2	12.6	12.9	12.7	10.1	-14.6	4.5
TORONTO	26.1	26.4	25.7	27.7	61.6	52.1	54.2	48.5	12.4	21.5	20.1	23.8	1.6	-13.1	11.4
1960s Gentrification	38.3	35.6	27.9	23.4	50.7	44.4	51.5	43.5	11.0	20.0	20.6	33.1	-14.9	-7.2	22.1
1970s Gentrification	38.1	28.5	22.5	22.4	54.4	49.3	55.3	43.5	7.5	22.2	22.2	34.2	-15.7	-10.9	26.7
1980s Gentrification	35.6	31.5	25.9	21.6	56.1	51.3	54.5	47.3	8.3	17.2	19.6	31.1	-14.0	-8.8	22.8
1990s Gentrification	34.5	29.6	29.0	22.2	58.6	52.7	54.4	37.3	7.0	17.7	16.6	40.5	-12.3	-21.3	33.5
1970s incomplete Gentrification	48.4	42.8	39.8	38.2	46.6	44.9	48.2	46.8	5.0	12.3	12.0	15.0	-10.2	0.2	10.0
1980s incomplete Gentrification	35.9	32.0	29.6	29.5	56.8	56.9	55.9	49.2	7.3	11.1	14.5	21.3	-6.4	-7.6	14.0
1990s incomplete Gentrification	41.0	39.8	37.9	34.6	51.8	49.2	52.9	48.7	7.2	11.0	9.1	16.8	-6.4	-3.1	9.6
Potential Future Gentrification	33.1	34.4	37.2	36.5	60.6	53.7	54.4	50.0	6.3	11.9	8.4	13.5	3.4	-10.6	7.2
Elite & Middle-Class Upgrading	20.4	19.6	16.9	14.5	52.5	47.7	47.1	36.7	27.1	32.7	36.0	48.9	-5.9	-15.8	21.8
Recapture	20.6	24.4	24.7	21.2	73.5	56.5	56.9	51.5	5.9	19.1	18.4	27.3	0.6	-22.0	21.4
Potential Future Recapture	19.9	30.1	30.5	29.1	69.8	53.9	53.9	52.8	10.4	16.0	15.6	18.1	9.2	-17.0	7.7
Multiple & Persistent Decline	17.8	28.9	30.3	35.3	70.3	55.2	55.3	50.7	11.9	15.9	14.4	14.0	17.5	-19.6	2.1
Mixed Trends/Rest of the City	20.2	23.8	26.2	28.9	67.9	57.8	55.9	50.8	11.9	18.4	17.8	20.2	8.7	-17.1	8.3
VANCOUVER	40.0	34.2	36.4	33.6	51.9	50.0	48.5	47.6	8.1	15.8	15.2	18.8	-6.4	-4.3	10.7
1970s Gentrification	61.6	42.9	32.8	30.9	35.8	44.5	54.4	50.3	2.6	12.6	12.8	18.8	-30.7	14.5	16.2
1980s Gentrification	65.3	64.7	51.1	30.1	31.8	29.1	36.6	49.9	2.9	6.2	12.3	20.0	-35.2	18.1	17.1
1990s Gentrification	59.0	48.4	46.4	34.1	39.7	43.5	46.0	50.8	1.3	8.1	7.6	15.1	-24.9	11.1	13.8
1980s incomplete Gentrification	69.9	53.0	53.2	73.9	28.1	43.0	39.2	23.1	2.0	3.9	7.6	3.0	4.0	-5.0	1.0
1990s incomplete Gentrification	62.8	47.6	52.2	49.2	35.5	49.0	44.6	43.9	1.7	3.4	3.2	6.8	-13.6	8.4	5.1
Potential Future Gentrification	50.7	51.0	64.0	61.6	47.0	46.3	32.8	33.0	2.3	2.7	3.2	5.4	10.9	-14.0	3.1
Elite & Middle-Class Upgrading	38.2	30.8	27.6	21.8	48.1	47.3	48.6	46.1	13.7	21.9	23.8	32.1	-16.4	-2.0	18.4
Recapture	43.7	34.3	32.3	26.7	51.2	48.7	52.4	50.6	5.1	17.0	15.3	22.7	-17.0	-0.6	17.6
Potential Future Recapture	40.4	37.6	35.9	35.1	56.6	51.3	53.4	51.3	3.0	11.1	10.7	13.6	-5.3	-5.3	10.6
Multiple & Persistent Decline	14.2	16.4	21.2	29.2	52.5	46.4	41.6	39.8	33.3	37.2	37.2	31.0	15.0	-12.7	-2.3
Mixed Trends/Rest of the City	35.4	32.0	33.2	33.4	57.6	51.5	50.5	48.9	7.0	16.5	16.3	17.7	-2.0	-8.7	10.7

Source: calculated from custom tabulated census data for the years 1971, 1981, 1991 and 2001, provided from by Statistics Canada (Table E982). Values other than central city totals are from census tract averages.

Social status

An index of social status is often used to detect potential gentrification (Ley, 1986, 1993, 1996). Here we analyze social status changes separate from shifts in income levels. Social status may increase without incomes increasing for one or both of two reasons:

- the income structure becomes more polarized, as the higher incomes of gentrifiers are offset by declining incomes among the working class;
- the area attracts people with higher levels of cultural capital (usually in the form of education) but little economic capital, such as students, those just starting their careers, or underemployed professionals.

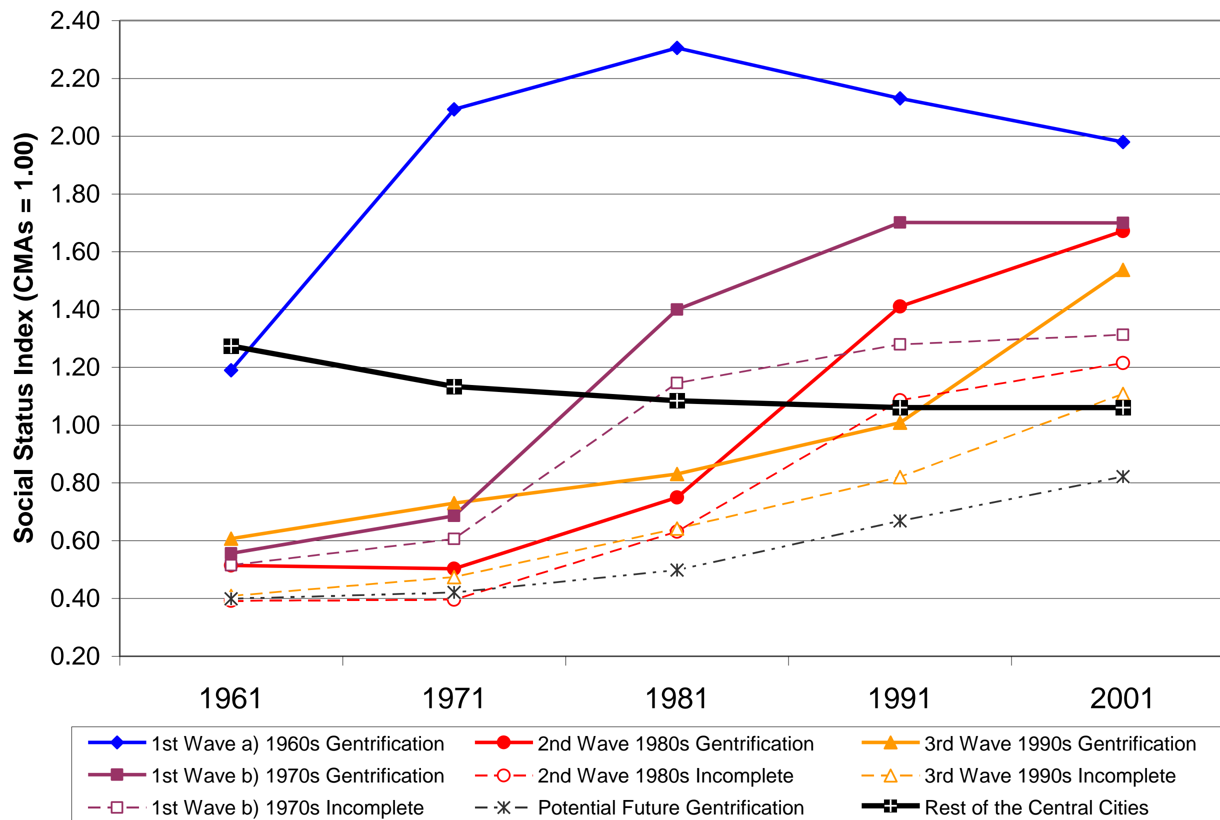
Rising social status may pre-date income growth if an area is populated by younger workers who remain in the neighbourhood while moving up the salary scale. Likewise, incomes may remain high while social status (measured in this way) declines, if people with professional credentials and education are displaced by the independently wealthy, the self-employed, retired businesspeople (who may be less likely to have a professional occupation or university degree), or wealthy members of occupational groups not included in the social status index (such as service occupations). Thus, shifts in social status may present a different story from that of income.

Figure 8 shows how social status levels have changed over the study period for each wave of gentrification (measured as the mean aggregate ratio of the tract index to its the home CMA). All but the 1960s gentrification group show very low levels of the social status index in 1961 and 1971, particularly compared to the rest of the central cities where it is above 1.00 (the early postwar period was a time of white-collar suburban settlement). Note, however, that the 1961 census does not separate artists from other professionals – thus, these above-average levels may be due to greater concentrations of artists at the beginning of the gentrification cycle.

Stage effects are clearly present in the trends. Social status increases rapidly at the beginning of the gentrification process, slows down in the middle stages, and either stabilizes or declines in the last stages, when the neighbourhood completes its transformation into an elite neighbourhood. A drop in measured status is likely due to the replacement of the professional middle-classes with an elite and independently wealthy or self-employed (global) business class.

As we might expect, milder stage effects are present in neighbourhoods in which gentrification remained incomplete. Interestingly, gains in social status appear to have slowed immensely in incompletely gentrified neighbourhoods that began gentrifying in the 1970s (indicating that gentrification may have stalled in such areas), whereas in the more recent incompletely gentrified neighbourhoods, status continues to increase (suggesting continuing but slow gentrification). Nonetheless, period effects are evident in the results: the earlier the onset of gentrification, the higher the level of social status in 2001. Thus, neighbourhoods that began gentrifying in the 1960s have the highest social status indices, followed in order by areas which gentrified in the 1970s, 1980s, and then 1990s. A similar pattern is found among areas of incomplete gentrification, all of which exhibit above-average social status levels in 2001 (yet combined with below-average incomes).

Figure 8: Social Status Index, All Three Central Cities, 1961−2001



Source: Calculated by the authors from Census of Canada, various years

Note: The social status index is a composite of the location quotient (LQ) of those with a university degree, and the location quotient for those employed in professional, managerial, health, engineering and applied science, law, religion and social work occupations. Excluded occupations include clerical/ secretarial, sales and services, all primary and secondary sector (i.e. agricultural and industrial) occupations, trades, and other occupations dependent upon manual labour. In 1961 artists are also included in this index, which may partly explain the above-average index values for the first-wave 1960s gentrification group in 1961.

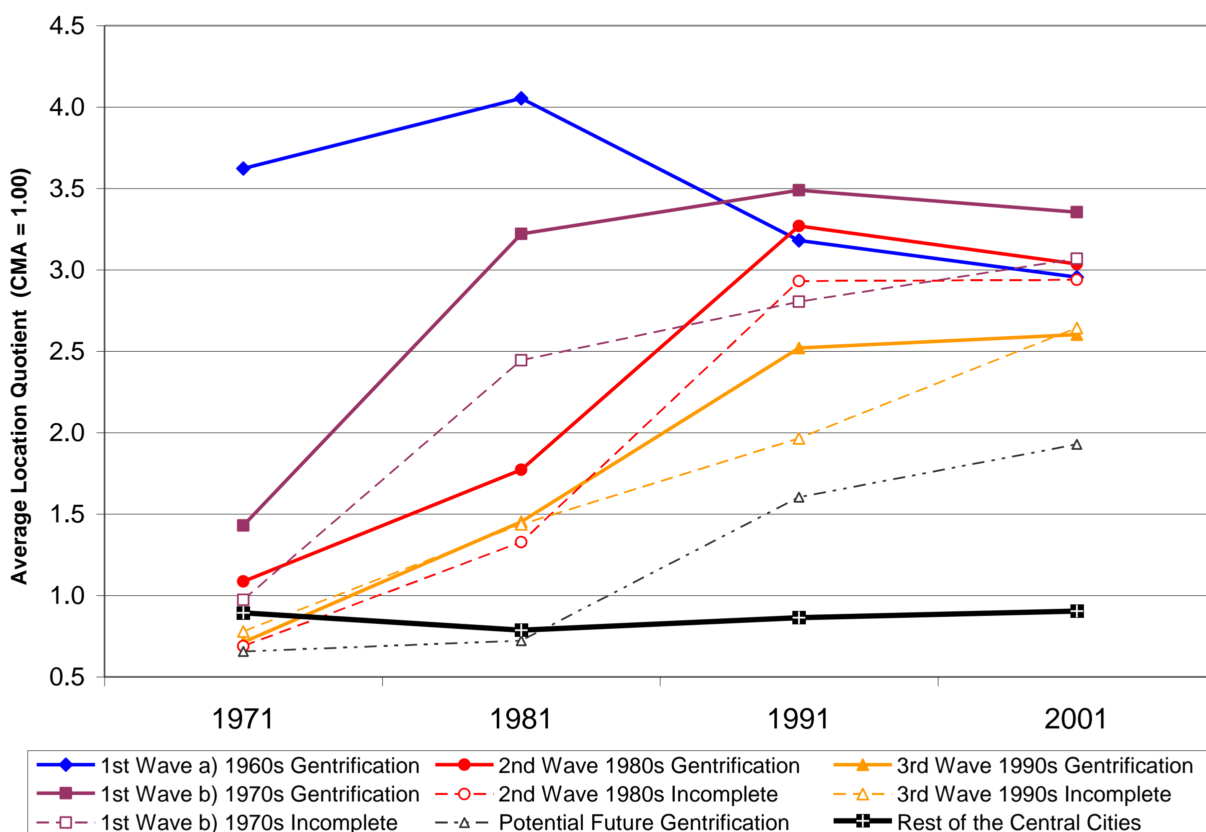
Artists

Artists, broadly defined, can be tracked separately but only back to 1971 (see Figure 9; note that the variable also includes those employed in literary and recreational occupations). Stage effects are clearly present in the shifting levels of artist residency, similar to those for social status. The difference is that the location quotient for artists at the onset of gentrification is typically above 1.00 one decade before the onset of gentrification (as detected using the methodology employed here), confirming that above-average concentrations of artists typically precede subsequent stages of gentrification, if not also helping to induce them (Ley, 2003).

Areas of incomplete and full gentrification tend to move in step in terms of changes in location quotients for artists, but fully gentrified areas consistently have higher levels of artistic concentration in 1971, while incompletely gentrified areas began the study period with below-average

measures. Interestingly, the areas that were fully gentrified by 1990 (neighbourhoods in the first and second waves) all experienced declines in the location quotients (LQ) for those employed in the arts over the 1990s (for those neighbourhoods that began gentrifying in the 1960s, the decline in the LQ for artists began in 1981), while areas of incomplete (or potential future) gentrification continued to show increasing concentrations of artists (as the rest of the city remained flat). This confirms that artists may be displaced in the advanced stages of gentrification. These findings also suggests that, at least when it comes to artists, gentrification processes would appear to have accelerated over the postwar period, so that each new gentrification group has taken a shorter amount of time to reach advanced stages than those that preceded it.

Figure 9: Average Location Quotient (LQ) for Artistic, Literary, and Recreational Occupations, All Three Central Cities, 1971–2001



Source: Calculated by the authors from Census of Canada, various years

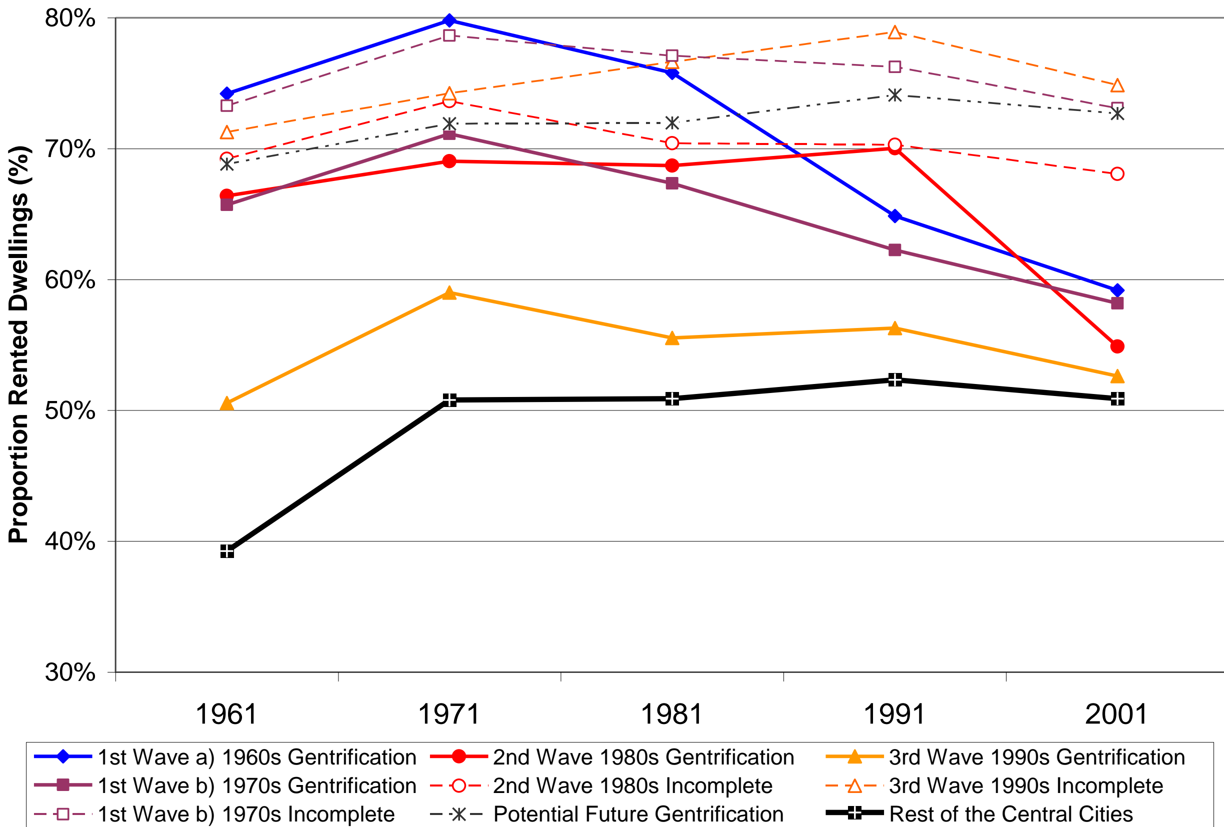
Note: Values are the mean location quotient for each gentrification group calculated in comparison with the CMA in which it is found.

Housing stock

In addition to the social composition of the neighbourhood, gentrification is associated with changes in the housing stock. One aspect of the gentrification process involves the deconversion of rental stock into forms of homeownership. While it is difficult to trace the number of units that were deconverted, we can show how the proportion of the stock in rental tenure has

changed over the period (see Figure 10). Stark differences are revealed between areas of incomplete and full gentrification. It seems that gentrification remained incomplete in the former group because of the persistently high proportions of the population housed in rental accommodation (over 68 percent on average). This contrasts with the pattern of declining rental stock in areas that have gentrified fully, particularly in the period since their peak levels of tenancy (which in most cases date to 1971).

Figure 10: Proportion of Dwellings Rented, All Three Central Cities, 1961−2001



Source: Calculated by the authors from Census of Canada, various years

Note: Shown is the mean proportion of all dwellings that are rented for each gentrification group.

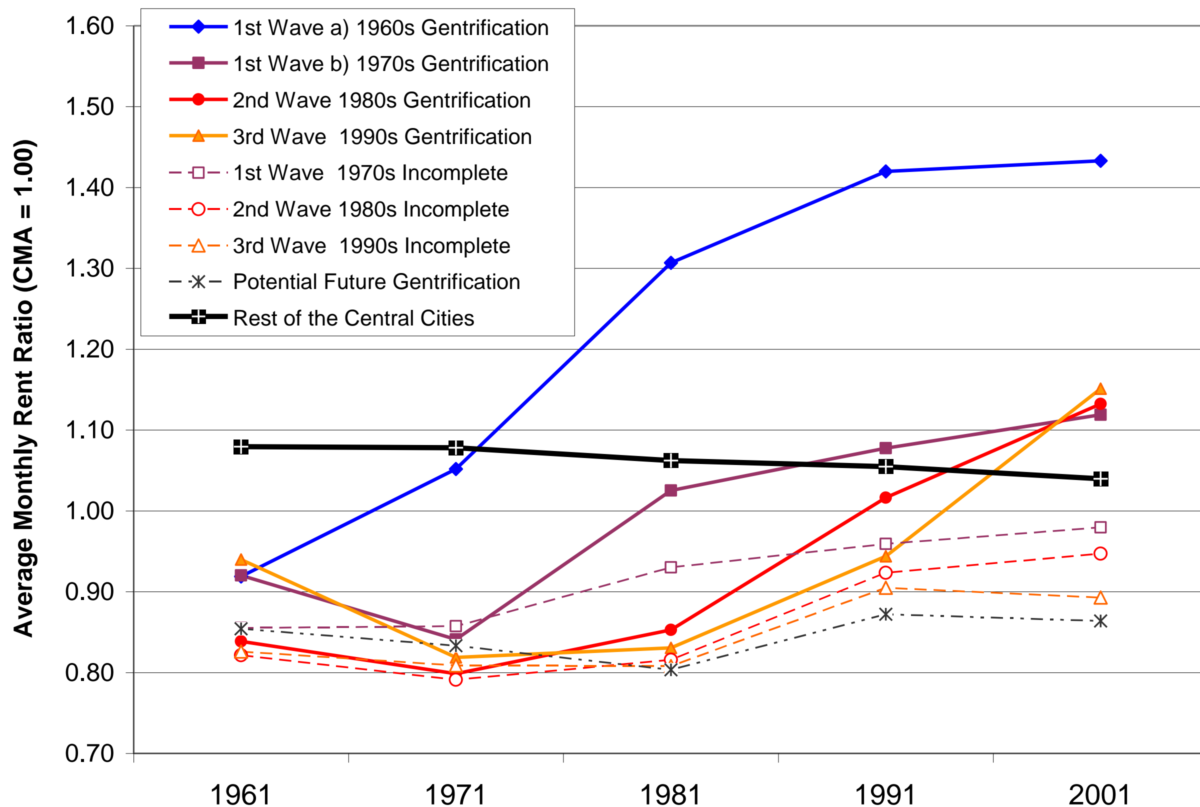
Clear patterns differentiate each wave of gentrification. During the first wave (1960s and 1970s) there were increases in rental housing (as in nearly all areas of the central cities), but consistent declines afterwards, so that by 2001 only 59 percent of the population consisted of renters (down from 75 and 66 percent for the 1960s and 1970s groups, respectively). Neighbourhoods in the second wave began the period with similar rental levels to the 1970 group, but the proportion of residents who rented their dwellings remained stable during the first decades. Indeed, tenant concentrations actually increased during the first decade (1980s) before falling drastically in the 1990s. Areas in which gentrification began in the 1990s (the third wave) began the study period with much lower levels of rental tenure on average than other areas (about 50 percent). These levels increased over the 1960s, but fell back again to approximately 54

percent by 2001. Although they started the period with significantly greater concentrations of rental housing, by 2001 gentrifying inner-city areas contained only slightly greater proportions of rental than found elsewhere, including low-density neighbourhoods in the inner suburbs. If such trends continue, homeowners could conceivably become the majority in the inner city of the future.

Rent levels

Gentrification is also reflected in the average rents charged for inner-city housing (Figure 11). In 1961, all the areas that would later gentrify were characterized by below-average rents (relative to their CMAs), although it might be noted that the areas that would later gentrify fully were right from the start of the period able to attract higher rent payments than neighbourhoods of incomplete gentrification. However, although this distinction is clear from the beginning, the timing of gentrification cannot be predicted from the average monthly rent in 1961, as each of the first and third wave groups began the period with the same average rent levels and rents are almost indistinguishable among areas that would incompletely gentrify.

Figure 11: Average Monthly Rent (Ratio to CMA Mean), All Three Central Cities, 1971–2001



Source: Calculated by the authors from Census of Canada, various years

Note: The average rent ratio is calculated for each census tract in relation to the average rent in the CMA in which it is found. This chart traces the mean rent ratios for each gentrification group. Rents include both market and non-market housing, which the Census cannot separate.

Stage effects in the timing of gentrification are, however, evident in the rent data. For instance, in the 1960s, rents declined throughout the inner city, except for the areas that began gentrifying in that decade. Likewise, inner-city rents remained mostly stagnant throughout the 1970s, except in areas of first-wave gentrification (both 1960s and 1970s groups). While rents slightly increased throughout the inner cities over the 1980s, the effects were felt most strongly among the first two waves. During the 1990s, however, rents remained stable or changed more slowly across the inner cities, including among the first-wave gentrification groups. The exception is areas of third-wave gentrification, which rapidly joined the ranks of above-average rental among other fully gentrified neighbourhoods. By 2001, neighbourhoods that had started gentrifying in the 1960s had the highest rents, followed by all other fully gentrified neighbourhoods regardless of the wave of gentrification, for which rent levels were roughly equal (at about 10 percent higher than their CMA average). Areas of incomplete gentrification were more affordable, with rents from 87 to 98 percent of their CMA averages, although they are still less affordable than they were as late as 1981.

Dwelling values

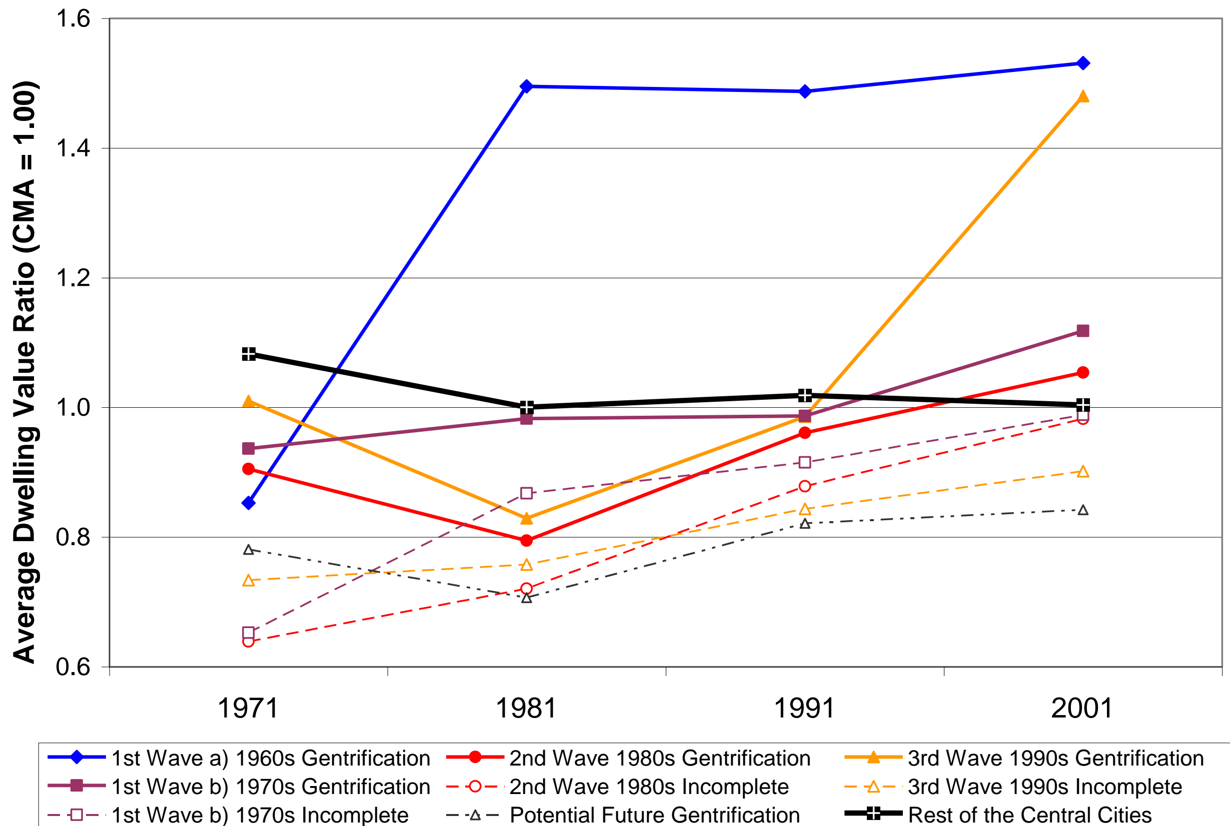
As might be expected, gentrification is also reflected in the changes to average dwelling values (see Figure 12), although these are only traceable in the census from 1971 onwards. Dwelling values in the ownership sector are more affected by changes in the size of units, the number of bedrooms, and the square footage of properties, than are rents in the rental stock. Thus, as condominiums are built in gentrifying neighbourhoods, the dwelling values per unit may not increase (and may even decline), even as the land value per square foot rapidly increases. Unfortunately, the census contains data only on the average dwelling value per unit.

Once again, stage effects are present in the data. The rapid rise of values in areas that began gentrifying in the 1960s is pronounced, while it is only areas of first-wave gentrification that experienced growth in average house prices in the aggregate over the 1970s. Neighbourhoods that began gentrifying in the 1970s show more modest increases in that decade. Areas of second- and third-wave gentrification show a similar, albeit delayed, trend, with dwelling values falling during the 1970s, followed by consistent increases between 1981 and 2001. Neighbourhoods in the third wave saw further rapid growth in average prices over the 1990s. Very expensive infill developments with larger houses dating from the late 1990s in some of these neighbourhoods in Toronto and Montreal explain the rapid nature of this latter shift. Such infill has more influence over aggregate changes, since this group contains fewer tracts than in the other waves.

Areas of incomplete gentrification show similar shifts, but to a more muted degree. Nonetheless, by 2001, there is a clear hierarchy of dwelling values which can be predicted by the timing and level (complete or incomplete) of gentrification. Areas that fully gentrified all have above-average dwelling values, and prices remain below-average in all of the groups of incomplete gentrification. Furthermore, in all cases except one (the higher values for fully gentrified neighbourhoods of the third wave), a consistent rule seems to apply: the earlier the wave, the higher the prices. Yet, while neighbourhoods at the two extremes (areas of 1960s gentrification at the top end, and potential future gentrification at the bottom end) show stable house prices during the 1990s, gentrification is clearly associated with growing values elsewhere. This is im-

portant, considering that the rest of the central cities reveal declining prices over this decade. At this rate, if areas of incomplete gentrification continue to increase in value, by the next census they will have surpassed both the central city and CMA averages, pricing out average-income owner-occupier households.

Figure 12: Average Dwelling Value (Ratio to CMA Mean), All Three Central Cities, 1971−2001



Source: Calculated by the authors from Census of Canada, various years

Note: The average dwelling value ratio is calculated for each census tract in relation to the CMA in which it is found. This chart traces the mean ratios for each gentrification group. Comparable variables for dwelling values are not available in the 1961 census.

6. The different housing market forms of gentrification and upgrading

Gentrification in Canadian inner cities takes different forms and involves different processes of neighbourhood transformation. One of the debates within the literature concerns the importance of new construction within gentrifying neighbourhoods and its effects in stimulating reinvestment and displacement. However, except for a few case studies within a few U.K. or U.S. cities, little is known about this phenomenon, or how it interacts with other forms of gentrification to produce gentrified landscapes. Within Canadian cities, it is not yet known what proportion of gentrifying neighbourhoods have been affected by new construction in relation to other processes of renovation and deconversion of the older stock. Nor do we understand how the different forms of gentrification affect the indicators of neighbourhood change in Canadian cities. In this section, we delineate the different forms of upgrading and gentrification, where they are occurring within Canadian central cities, and their effects on the indicators of neighbourhood change.

Upgrading and gentrification within the housing stock can take (at least) three different forms:

- the "standard" form (most common in the literature), characterized by the renovation and deconversion of older housing stock;
- "new-build" gentrification, driven by the construction of new dwellings (which may or may not involve the demolition of previously existing residential dwellings);
- conversions of non-residential buildings to owner-occupied residential use (typically lofts and condominiums), and/or the conversion of old rental apartments to owner-occupied condominiums.

To be sure, one form of gentrification can stimulate investment into other forms, so that some neighbourhoods exhibit more than one process over time as market conditions favour more intense and higher-density developments. (At the same time, if and when local residents mobilize to prevent development "for higher and better uses" in gentrifying neighbourhoods, the extent of new development, demolitions, and conversions in such neighbourhoods may be limited).

Table 8 provides the number and proportion of each city's census tracts categorized by the form of gentrification or a combination of forms, disaggregated by the level and date of onset of gentrification. The standard process, by which old housing is renovated and deconverted to ownership status, is the most common form that gentrification has taken in the three central cities. Of

Table 8: Forms of Gentrification, by Gentrification Trajectory and CMA

Trajectory/Place	Standard (in Older Residential Stock)		New Build		New Build + Standard		Standard + Conversions		New Build + Conversions		Standard + New Build + Conversions		Total
	# CTs	% of City	# CTs	% of City	# CTs	% of City	# CTs	% of City	# CTs	% of City	# CTs	% of City	# CTs
Montreal Total	**40**	**38.1**	**8**	**7.6**	**17**	**16.2**	**21**	**20.0**	**3**	**2.9**	**16**	**15.2**	**105**
1960s Gentrification	1	1.0	0	0.0	1	1.0	1	1.0	0	0.0	2	1.9	5
1970s Gentrification	1	1.0	0	0.0	2	1.9	5	4.8	0	0.0	6	5.7	14
1980s Gentrification	1	1.0	1	1.0	0	0.0	3	2.9	0	0.0	3	2.9	8
1990s Gentrification	1	1.0	0	0.0	0	0.0	1	1.0	0	0.0	0	0.0	2
1970s Incomplete	9	8.6	1	1.0	0	0.0	2	1.9	2	1.9	2	1.9	16
1980s Incomplete	9	8.6	3	2.9	12	11.4	9	8.6	0	0.0	2	1.9	35
1990s Incomplete	18	17.1	3	2.9	2	1.9	0	0.0	1	1.0	1	1.0	25
Toronto Total	**49**	**57.6**	**10**	**11.8**	**9**	**10.6**	**6**	**7.1**	**7**	**8.2**	**4**	**4.7**	**85**
1960s Gentrification	5	5.9	4	4.7	3	3.5	1	1.2	2	2.4	1	1.2	16
1970s Gentrification	8	9.4	2	2.4	3	3.5	0	0.0	0	0.0	0	0.0	13
1980s Gentrification	4	4.7	0	0.0	0	0.0	0	0.0	2	2.4	1	1.2	7
1990s Gentrification	2	2.4	1	1.2	0	0.0	1	1.2	0	0.0	0	0.0	4
1970s Incomplete	9	10.6	0	0.0	2	2.4	0	0.0	0	0.0	1	1.2	12
1980s Incomplete	15	17.6	1	1.2	1	1.2	2	2.4	0	0.0	1	1.2	20
1990s Incomplete	6	7.1	2	2.4	0	0.0	2	2.4	3	3.5	0	0.0	13
Vancouver Total	**3**	**16.7**	**3**	**16.7**	**5**	**27.8**	**1**	**5.6**	**4**	**22.2**	**2**	**11.1**	**18**
1970s Gentrification	0	0.0	2	11.1	3	16.7	0	0.0	1	5.6	1	5.6	7
1980s Gentrification	0	0.0	1	5.6	1	5.6	0	0.0	2	11.1	0	0.0	4
1990s Gentrification	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	5.6	1
1980s Incomplete	2	11.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2
1990s Incomplete	1	5.6	0	0.0	1	5.6	1	5.6	1	5.6	0	0.0	4
All Three Total	**92**	**44.2**	**21**	**10.1**	**31**	**14.9**	**28**	**13.5**	**14**	**6.7**	**22**	**10.6**	**208**
1960s Gentrification	6	2.9	4	1.9	4	1.9	2	1.0	2	1.0	3	1.4	21
1970s Gentrification	9	4.3	4	1.9	8	3.8	5	2.4	1	0.5	7	3.4	34
1980s Gentrification	5	2.4	2	1.0	1	0.5	3	1.4	4	1.9	4	1.9	19
1990s Gentrification	3	1.4	1	0.5	0	0.0	2	1.0	0	0.0	1	0.5	7
1970s Incomplete	18	8.7	1	0.5	2	1.0	2	1.0	2	1.0	3	1.4	28
1980s Incomplete	26	12.5	4	1.9	13	6.3	11	5.3	0	0.0	3	1.4	57
1990s Incomplete	25	12.0	5	2.4	3	1.4	3	1.4	5	2.4	1	0.5	42

Source: Calculated by the authors using custom-ordered data (Table E0985) and the public files from the Census of Canada, 1961, 1971, 1981, 1991, 1996, 2001. Note: Percentages are of the total number of tracts in each central city (or the aggregate of all three cities in the bottom case).

the 208 tracts experiencing some form of gentrification, in 173 (83 percent) this standard form was present, and almost half (44.2 percent) have seen this form of gentrification only.

While only 21 tracts (10 percent of the total) gentrified solely due to new-build forms, over 40 percent (88 tracts) contained at least some new-build gentrification. Of these, 33 tracts (almost 16 percent of the total, and 37.5 percent of those containing at least some new-build housing), began gentrifying in the 1960s or 1970s. This calls into question the statement by Lees, Slater and Wyly (2007, 141) that "new-build gentrification first emerged in the 1980s."

Large Canadian cities like Toronto and Montreal are notable for the way in which their urban cores were redeveloped by private investment during the 1960s, particularly in neighbourhoods close to new subway systems (Bourne, 1967). Our analysis suggests that some of these neighbourhoods, including those along the Yonge Street subway corridor in Toronto, exhibit the attributes of new-build forms, in similar fashion to those gentrifying in later years.

Conversions of non-residential or old rental apartments to condominiums and lofts are the least prevalent of the three forms of gentrification. In no tracts were conversions identified as the only source of gentrification. Thus, conversions would appear to be stimulated mainly by investment in other forms, and thus a reactive process rather than the driver of gentrification in Canadian cities. This is not to say, however, that conversions are uncommon or unimportant. Indeed, they were present in over 30 percent (64 tracts) of gentrifying neighbourhoods across the three central cities and in some places would appear to have significantly contributed to the full gentrification of the local neighbourhood.

The processes affecting the housing stock clearly differ between the three cities. The standard process of renovation and deconversion is the predominant way that gentrification is articulated in Toronto. This was present in approximately 58 percent of those census tracts that experienced gentrification. Toronto had smaller proportions of tracts revealing the presence of some form of conversions (20.0 percent) or new construction (35.3 percent).

Vancouver is at the other extreme. In 78 percent of all gentrifying tracts, new construction either dominates or at least is a significant presence. Conversions were also more prevalent in Vancouver, found in 39 percent of gentrifying neighbourhoods.

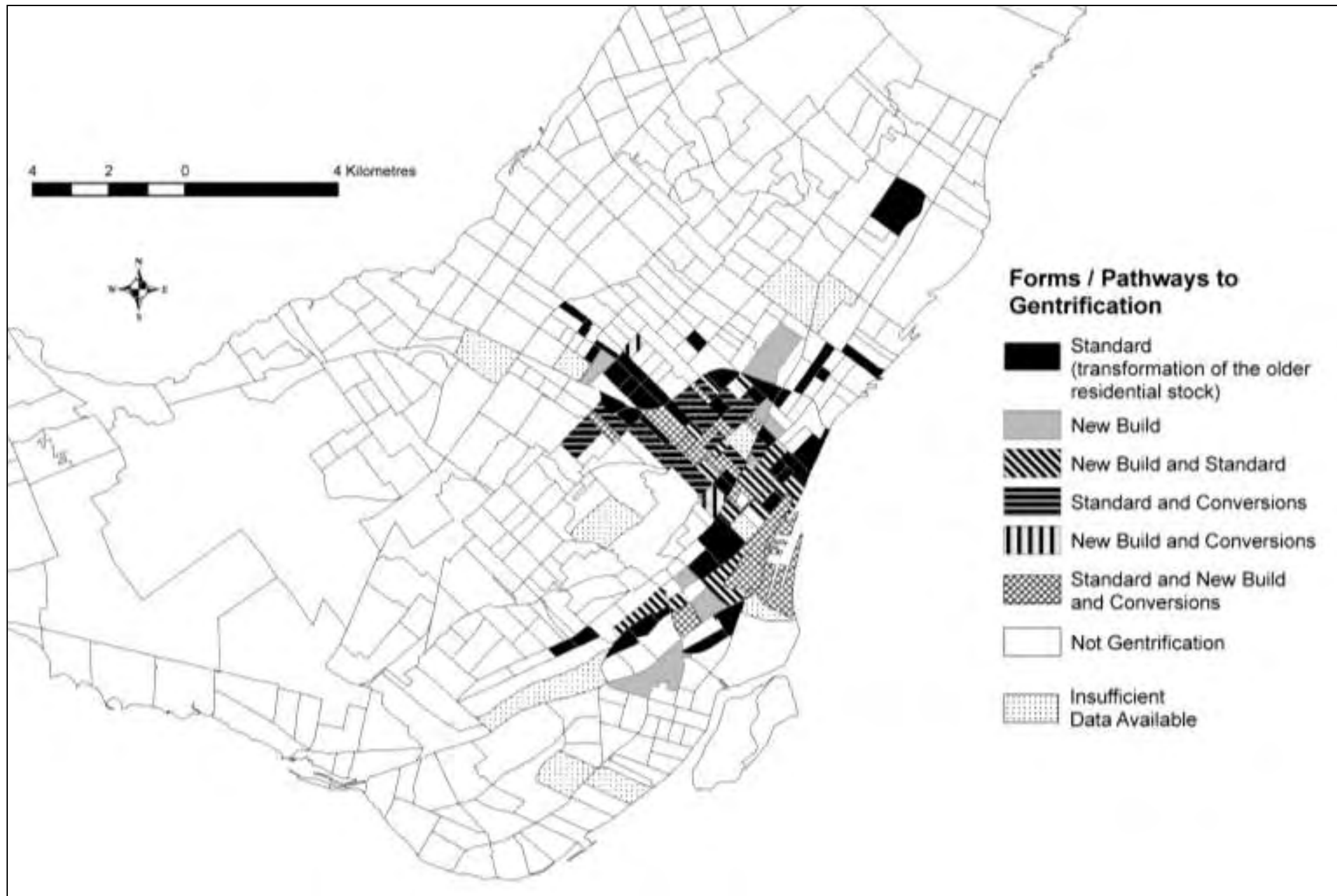
Montreal is in something of a middle position. Although the patterns are generally closer to those in Toronto, the level of conversions in Montreal is similar to Vancouver (found in 38 percent of all tracts experiencing some form of gentrification). Montreal also has the highest proportion of gentrifying tracts (15.2 percent) in which all three forms are present simultaneously.

Each of these three processes interacts with the built form in a distinctive way, producing unique geographies of gentrification in each city.

Montreal

In Montreal, the standard processes affecting older stock are mostly confined to the edges of the larger area subject to gentrification (Figure 13). The most accessible areas near the centre of gentrified districts, found in the port area and Old Montreal as well as along St. Denis, the Main, and the Plateau, exhibit all three forms simultaneously. New construction mostly fills in the

Figure 13: Gentrification forms and pathways, Montreal Urban Community



Source: Created by the authors from custom tabulations (E0985) of the Census of Canada, various years

Note: Census tract boundaries are for 2001. Forms of gentrification are shown only for gentrifying areas.

spaces between and around the downtown core as well as in Centre-Sud, while conversions are more prevalent throughout the rest of the Plateau and to the west into Outremont.

In very few tracts is new construction present on its own, suggesting that except in a few locations (such as the tract in the southwest near the redeveloped Lachine Canal), new construction in Montreal cannot be separated from other processes of gentrification.

Toronto

A different pattern is evident in Toronto (Figure 14). Here, standard forms of gentrification dominate, particularly in those neighbourhoods best known as sites of "classic" gentrification, including Cabbagetown (Don Vale), North Riverdale, Bloor West Village, Hillcrest Village, Roncesvalles, much of the Annex/Seaton Village, and most of the Beaches. Part of the explanation for this pattern resides in the strong political voice of middle-class gentrifiers in the city which has enabled them to preserve their neighbourhoods and limit redevelopment, coupled with the ward system, which keeps politicians focused on local issues (Filion, 1991; Magnusson, 1983).

Mixtures of standard forms with new construction are also found in and around these areas, particularly near Don Vale, in South Riverdale, and in the Beaches (much of which is low-rise infill). Conversions are rarer and occur mostly in areas with some older industrial fabric bordering districts containing standard forms of renovation and deconversion, or in areas (such as the Annex) where older residential apartments have been turned into condominiums.

Areas exhibiting all three processes are rare, and largely occur in areas of mixed land-use bordering other gentrifying tracts.

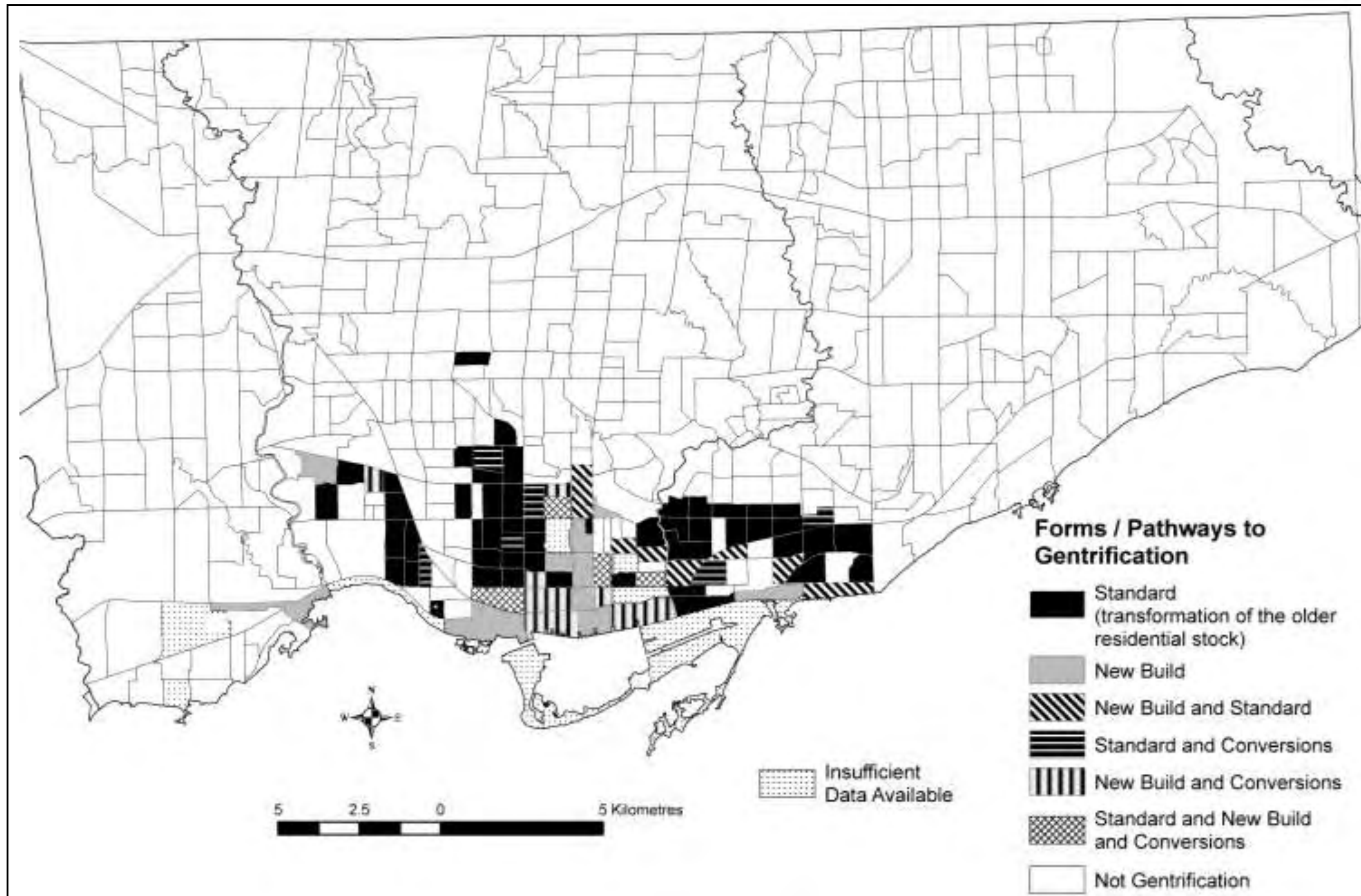
There is a clear geography to "new-build gentrification" in Toronto. While new development occurs through Toronto's inner city, new construction is particularly notable in two key areas.

One area is the waterfront, where new construction is present on sites that were either extended using landfill, or where industrial lands (or, in one case, an old horse-racing track) have been cleared and redeveloped. In older industrial areas directly to the east and west of the downtown, conversions of mostly non-residential uses to lofts and condominiums are also evident.

The second main area of new-build gentrification is found along the Yonge Street corridor where the first stretch of Toronto's subway was built in the late 1950s and early 1960s. These areas housed low-income populations before and after the Second World War, but have largely been transformed by access to the subway. The corridor began gentrifying in the 1960s right after subway construction ended. The area south of Bloor is dominated by new construction, while areas north of Bloor (including Yorkville and neighbourhoods to its north), exhibit a mixture of standard and new-build forms of gentrification. Much of this new construction involves the building of high-rise apartments and condominiums in the core, and has occurred on sites previously occupied by low-rise prewar housing.

While this second area clearly falls within the definition of gentrification, since it traditionally housed a significant working-class tenant population, it could be argued that neighbourhoods in the first (along the waterfront) are not easily classified according to accepted notions of gentrification, because they previously housed very small residential populations. We have categorized

Figure 14: Gentrification forms and pathways, City of Toronto



Source: Created by the authors from custom tabulations (E0985) of the Census of Canada, various years
Note: Census tract boundaries are for 2001. Forms of gentrification are shown only for gentrifying areas.

them as instances of gentrification, since both were clearly spaces of working-class employment and/or consumption and are contiguous to areas that did house significant working-class populations in the past. Furthermore, new construction has been instrumental in transforming the housing market in these nearby residential areas close to the CBD, in turn creating space for progressively wealthier households there.

Vancouver

The pattern in Vancouver is distinct (again) from those in Toronto or Montreal (Figure 15). New construction has played a much more significant role in Vancouver than elsewhere. While recent waves of gentrification are associated with older architectural styles and battles over demolitions, new development and condo conversions are evident as far back as the early 1970s (Ley, 1996). Vancouver's tight land market, coupled with at-large elections, which reduces the political attention paid by councillors to local land-use battles, means that new construction and conversions have typically followed standard processes of gentrification wherever it has begun. The exceptions include Gastown (pre-2001) and one section of Grandview-Woodlands, where high levels of non-market housing have deterred investors looking to locate new condominiums (Ley and Dobson, 2007).

Areas dominated solely by new construction are relatively rare, and found nearby other areas where gentrification has taken a diversity of forms. New construction (and demolitions) would seem intertwined with other market processes operating in the housing market to gentrify a number of previously working-class neighbourhoods, including areas south of the central business district and Coal Harbour, as well as Mount Pleasant, close to the City Hall. The production and conversion of space into higher-end condominiums drives up neighbourhood dwelling values, fuelling speculative investment and leading to the disappearance of affordable housing close to downtown. This is the main form that gentrification has taken in and around Vancouver's CBD.

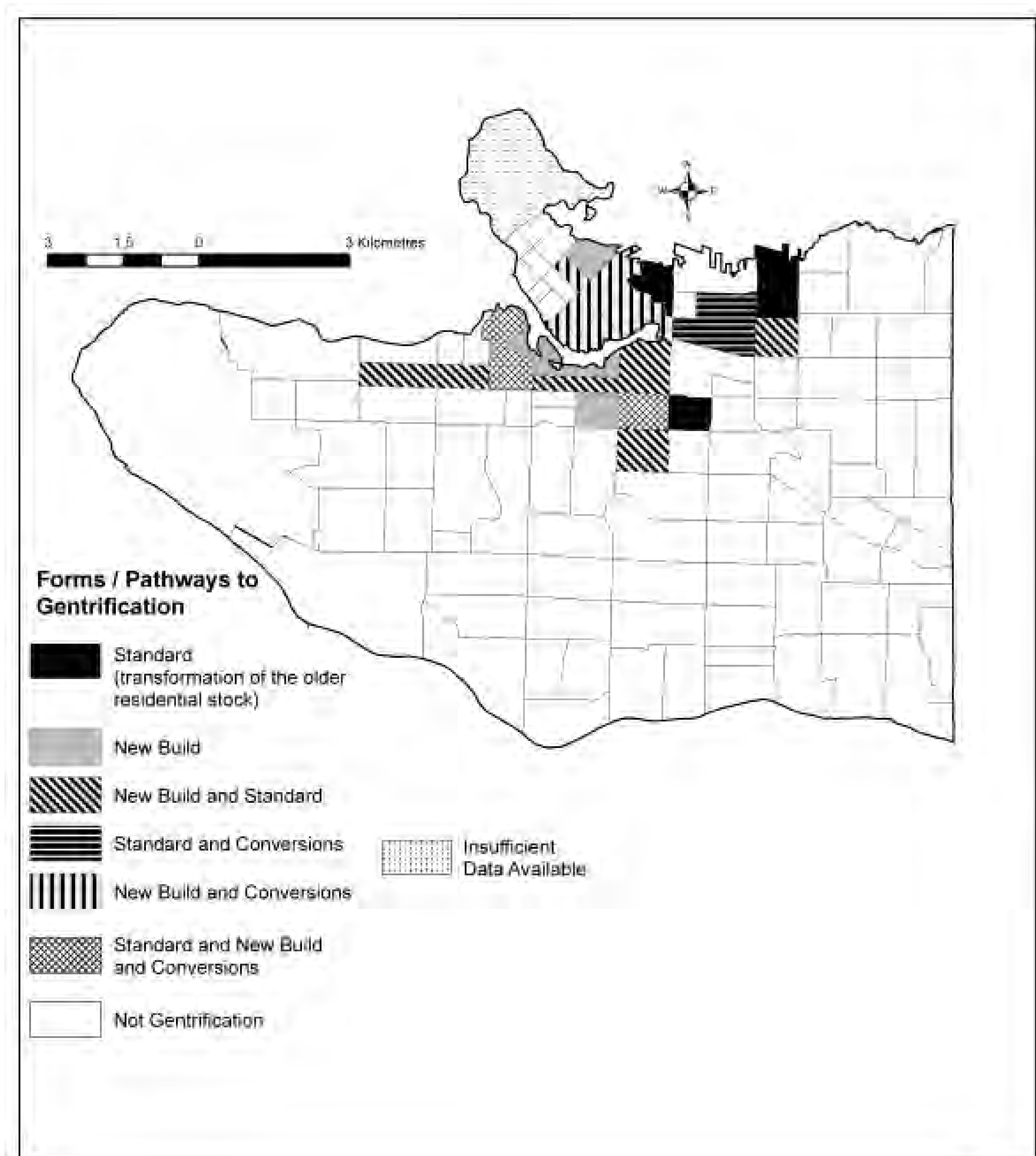
Interactions between the Timing, Forms, and Degree of Gentrification

This section examines how the timing, forms, and level of gentrification are associated in producing gentrified landscapes in Canadian cities. As yet it is unclear how changes in neighbourhood status, housing tenure, and rent levels may be affected by the different forms of gentrification outlined above. There are a number of trends to note, many of which are present across all three central cities.

Gentrification and new-build construction

There is a clear association between the level of gentrification and the presence of both new-build forms and conversions. In Toronto and Vancouver, areas that have gentrified fully are more likely to contain new developments (either alone or in conjunction with conversions or more standard transitions in the housing stock) than areas experiencing incomplete gentrification, while in Montreal the association is mainly between the presence of conversions and full gentrification status. Gentrifying areas created solely by standard processes of upgrading in the

Figure 15: Gentrification forms and pathways, City of Vancouver



Source: Created by the authors from custom tabulations of the Census of Canada, various years
Note: Census tract boundaries are for 2001. Forms of gentrification are shown only for gentrifying areas.

older housing stock, meanwhile, are more likely to remain in an incomplete stage of gentrification. This suggests that new construction and conversions are key factors affecting the degree of gentrification and in transforming a neighbourhood.

Furthermore, the longer gentrification has been occurring and the more fully gentrification has taken root, the more new-build construction is likely to be present. While new-build construction had occurred (either alone or in combination) in approximately one-third of neighbourhoods experiencing incomplete forms of gentrification (29, 35, and 33 percent of such tracts in the 1970s, 1980s, and 1990s, respectively), in areas that fully gentrified, the proportion of tracts containing new construction is 62 percent (1960s), 59 percent (1970s), 58 percent (1980s), and 29 percent (1990s). The presence of new-build forms would seem a powerful predictor of the extent and degree of future gentrification. The pattern for conversions, on the other hand, is virtually the opposite, with areas that began gentrifying later experiencing more conversions than earlier areas. Again, this suggests that conversions reveal a reactive process, representing new avenues for accumulation and profit only after opportunities in the existing stock, or for new construction, have been exhausted or become too costly (financially or politically).

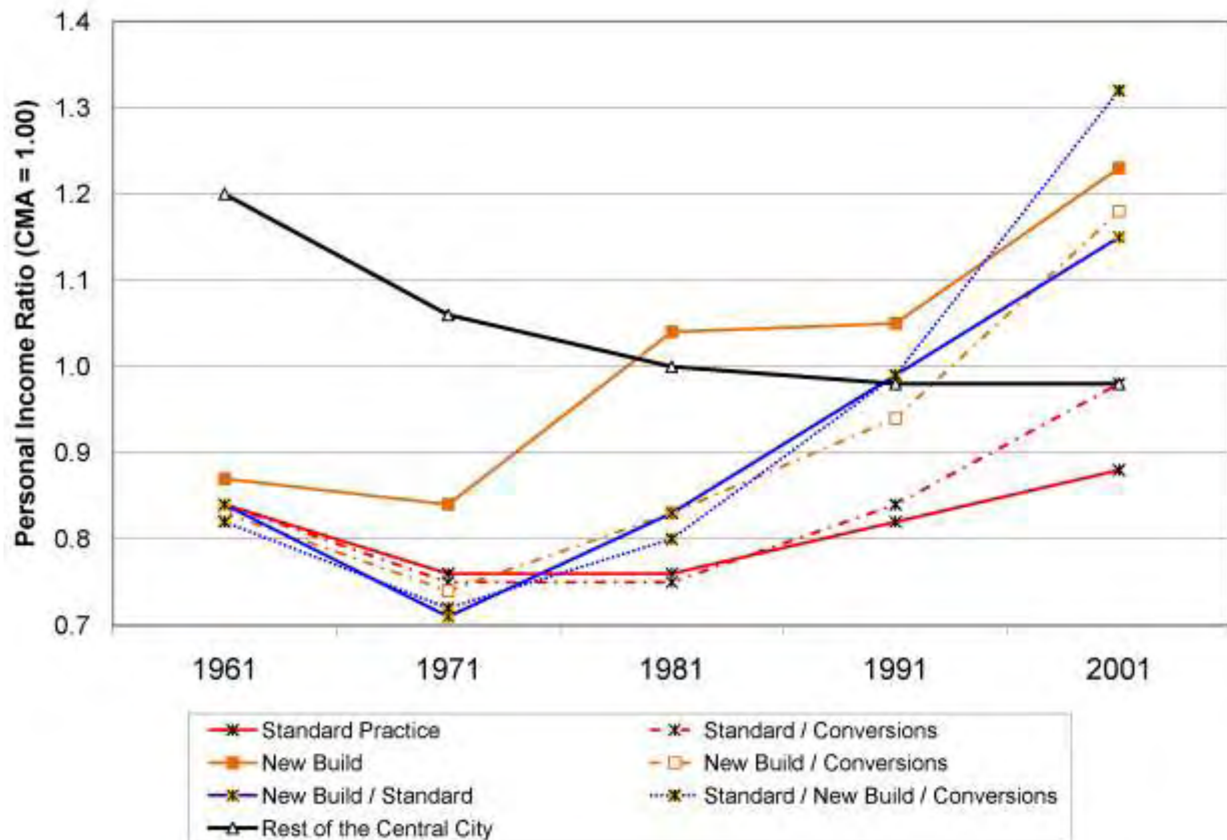
Although they primary occur in neighbourhoods known to contain old warehouse districts, areas of incomplete gentrification reveal less conversion activity than areas in which the process is complete. For instance, 33 percent of tracts that began gentrifying in the 1960s, 38 percent of those that began in the 1970s, 58 percent of those that began in the 1980s, and 42 percent of those that began in the 1990s contain some conversions. This can be compared with the 22 to 25 percent of those in the incomplete gentrification groups. This suggests that conversions have occurred in areas where previous investment performance is proven, and supports the hypothesis that conversions contribute to pushing the neighbourhood beyond a marginal or incomplete gentrification status. The higher prevalence of conversion activity in the 1980s confirms that Canadian cities have been influenced by some of the global forces and trends associated with gentrification activity in global cities located in other countries (Podmore, 1998; Zukin, 1989).

These hypotheses are borne out by an analysis of changes in the main census indicators. Across all three cities, census tracts in which gentrification has taken the form of at least some new construction, whether alone or in combination with other forms, show more rapid increases in income levels since the 1980s, and end the period with significantly higher income levels than neighbourhoods characterized by other forms of gentrification (see Figure 16).

This finding contrasts with those tracts in which new-build forms are absent (in which gentrification takes the form of transformation in the older housing stock alone, with or without conversions), where on average personal income levels remained below the CMA average in 2001.

This is not to say that all tracts in which gentrification takes only standard forms remained incompletely gentrified. In Toronto, for instance, many areas in which gentrification is extensive and (virtually) complete are the result of only standard forms: for example, Don Vale and Cabbagetown, much of the Beaches, Bloor West Village, and North Riverdale. However, even in Toronto, the majority of tracts characterized solely by standard housing market forms of gentrification (or by standard forms coupled with conversions) ended the period in a state of incomplete gentrification.

Figure 16: Average Personal Income, by Type of Gentrification, All Three Central Cities, 1961–2001



Source: Calculated by the authors from Census of Canada, various years

Note: The average personal income ratio compares the average income from all sources of those aged 15 and over in each census tract to that in the Census Metropolitan Area (CMA) where it is located. Note, however, that only the average employment income (ratio) is available in 1961 and this may affect the accuracy of the 1961-1971 rate of change. The above charts the mean values in each category for all three study cities.

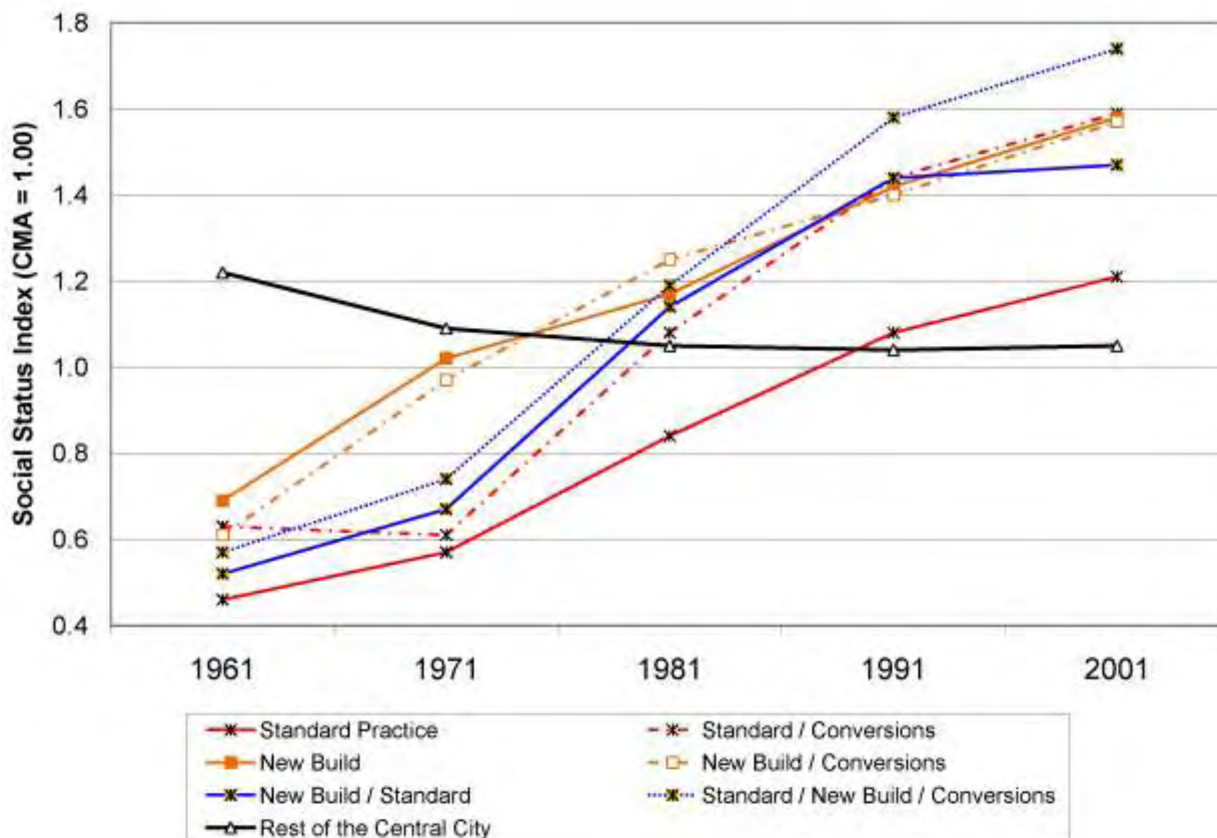
The same is not true for tracts in which some new construction is present, the vast majority of which were characterized by above-average incomes by 2001. Only in Montreal is the average income by the end of the period for areas containing new-build forms below that for the CMA, and even here, the average income is still higher than areas characterized solely by standard forms of housing market transition (changes in average incomes broken down by each city are included in the appendix).

The forms of gentrification and social status

All forms of gentrification are associated with increases in social status indices (Figure 17). Mirroring to some extent the trends in income, areas containing at least some new-build forms display the highest indices, while areas characterized solely by standard forms of gentrification

have the lowest. However, when aggregated across all three cities, the differences between groups is only minor. Whatever form gentrification has taken, social status indices at the end of the period are significantly above the average for both the rest of our central cities and the remainder of the CMAs.

Figure 17: Social Status Index, by Type of Gentrification, All Three Central Cities, 1961−2001



Source: Calculated by the authors from Census of Canada, various years

Note: The social status index is a composite of the location quotient (LQ) of those with a university degree, and the location quotient for those employed in professional, managerial, health, engineering and applied science, law, religion and social work. Excluded occupations include clerical/secretarial, sales and services, all primary and secondary sector (i.e. agricultural and industrial) occupations, trades, and other occupations dependent upon manual labour. In 1961 artists are included in the variable for professional occupations, and thus are also included in this index.

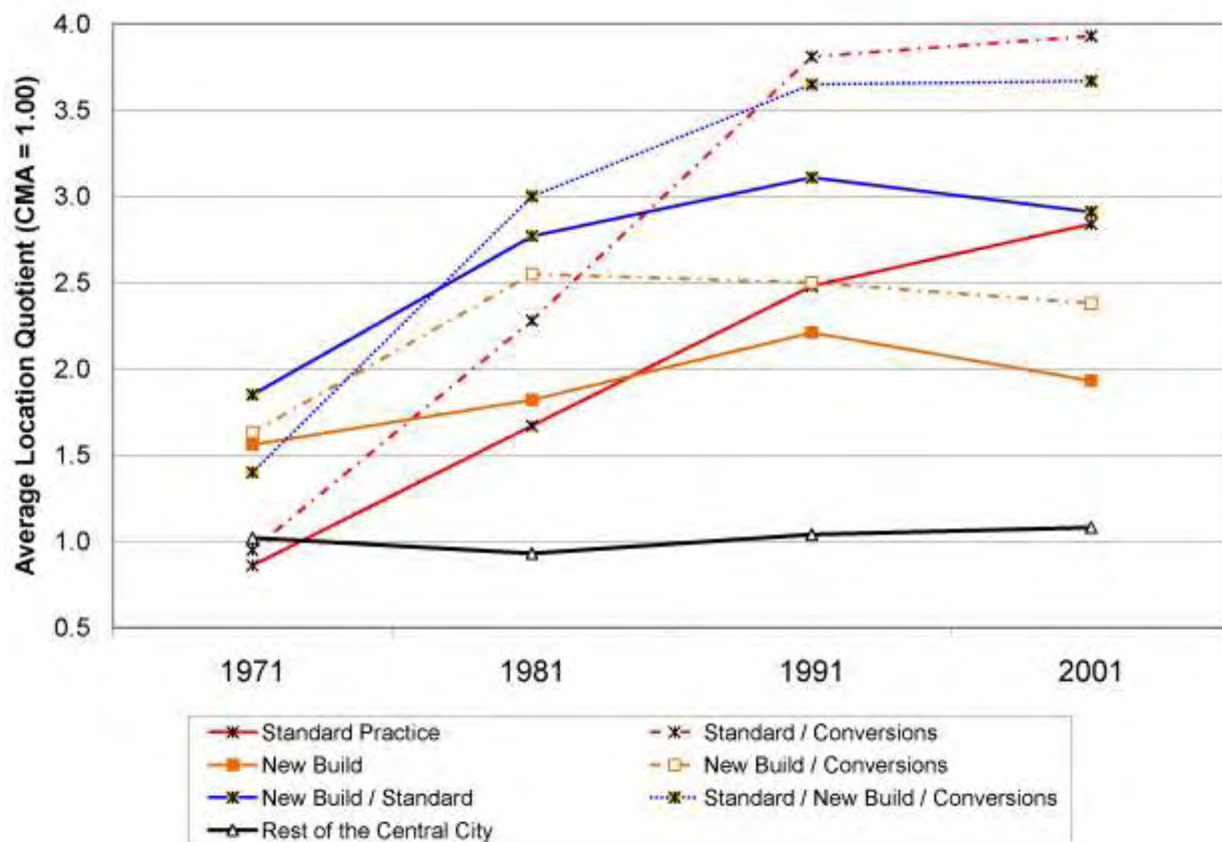
Furthermore, the pattern of change is almost identical across the different forms, with one minor exception − areas of new-build gentrification show more rapid increases in social status during the 1960s and slower increases over the 1970s. When each city is examined separately (see Figure 40 in the appendix), Vancouver diverges slightly from these patterns. That is, areas devoid of any new-build forms of gentrification show slower increases in the social status index than elsewhere, and remain below both the City and CMA averages. There would appear to be

a clear correlation between rapid upward shifts in social status and the introduction of new-build forms of gentrification in gentrifying neighbourhoods.

The forms of gentrification and artists

Artists are often considered early pioneers in the gentrification process, and are known to prefer “authentic” neighbourhoods and forms of housing, particularly those characterized by prewar and Victorian architecture, instead of newer and more modern forms of housing (Ley, 2003). The trends showing the concentration of artists in gentrifying neighbourhoods in our three cities support these assertions (see Figure 18).

Figure 18: Average Location Quotient (LQ) for Artistic, Literary and Recreational Occupations, by Type of Gentrification, All Three Central Cities, 1971–2001



Source: Calculated by the authors from Census of Canada, various years

Note: Values are the mean location quotient for CTs in each gentrification group calculated in comparison with the CMA in which they are found.

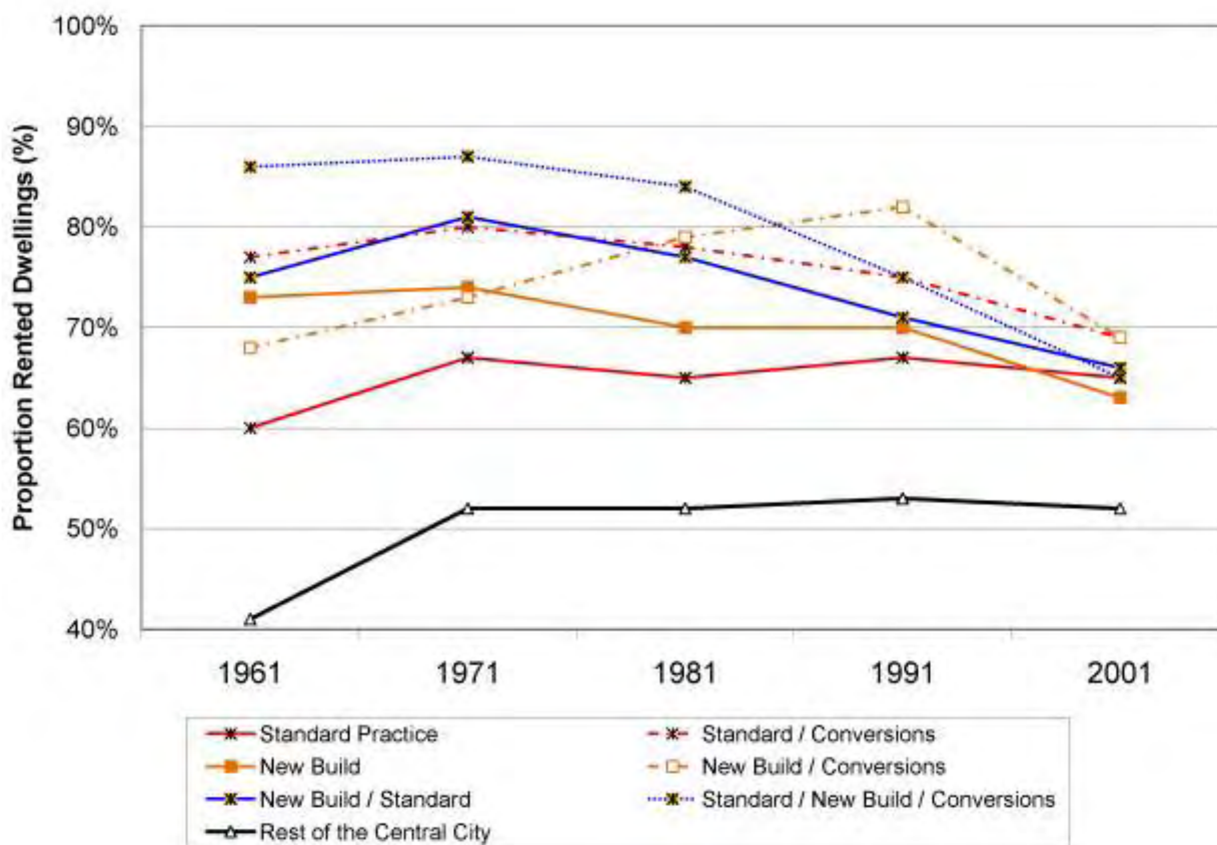
Artists are significantly more concentrated in tracts containing all forms of gentrification than elsewhere. Even so, they are still more likely to be found in neighbourhoods characterized by standard processes of transition in the older stock, particularly if this is coupled with conversions (confirming the association between artists and “loft living” − see Podmore, 1998). They are

least likely to live in new-build-only areas (among areas that exhibit gentrification). This pattern persists when disaggregated by city, with only minor differences.

The forms of gentrification and housing tenure

In most tracts exhibiting gentrification, the proportion of the housing stock in rental tenure has declined. However, there are a minority of tracts in Toronto (particularly those that began gentrifying in the 1980s) in which the proportion of rental housing has grown. Among the different forms of gentrification, neighbourhoods containing some conversions have on the whole retained higher proportions of housing in rental tenure, and areas characterized by new-build forms, the lowest proportions (see Figure 19). This is as might be expected, considering that new construction typically takes the form of owner-occupied condominiums and townhouses. The exception is in Montreal, where there appears to be little relationship between the form of gentrification and shifts in tenure (see Figure 42 in the appendix).

Figure 19: Proportion of Dwellings Rented, by Type of Gentrification, All Three Central Cities, 1961−2001



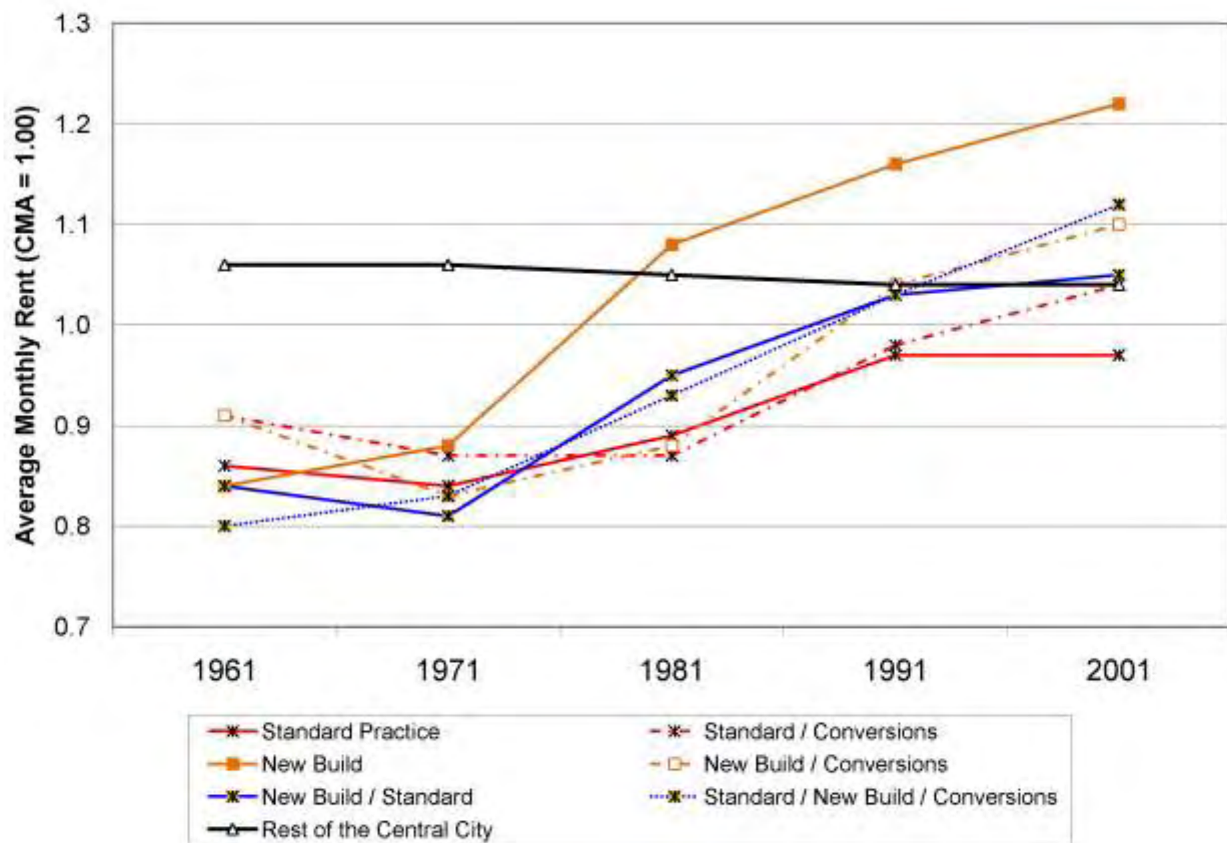
Source: Calculated by the authors from Census of Canada, various years

Note: Shown is the mean proportion of all dwellings that are rented for each gentrification group.

The forms of gentrification and rents

The association between the forms of gentrification and rent increases is strong across all three cities, but the direction of the relationship depends on the context (Figure 20). Importantly, neighbourhoods containing new construction report the highest average rents in both Toronto and Vancouver, but conversely the lowest in Montreal. One explanation for this divergence may relate to policies maintained by the City of Montreal and the Province of Quebec, who have continued to support the construction of social housing, and that require the inclusion of affordable housing as part of new infill developments on brownfield sites.

Figure 20: Average Monthly Rent (Ratio to CMA Mean), by Type of Gentrification, All Three Central Cities, 1971–2001



Source: Calculated by the authors from Census of Canada, various years

Note: The average rent ratio is calculated for each census tract in relation to the average rent in the CMA in which it is found. This chart traces the mean rent ratios for each gentrification group. Rents include both market and non-market housing which the Census cannot separate.

Meanwhile, the opposite trend is evident for conversions: rents in Montreal are highest in areas containing some conversions, but in Toronto and Vancouver they have remained relatively low, similar to average rents in areas that have gentrified solely as a result of standard processes (rent trends disaggregated by city are found in Figure 43 in the appendix).

One trend is consistent across all three cities – average rents are lowest in areas experiencing only standard processes of transition in the older housing stock (followed by those witnessing a combination of standard forms and conversions), a finding that mirrors those for changes in income. These trends may be due to the tendency for gentrification to spur the deconversion of higher-rent properties first. This finding does not imply that most areas which have gentrified as a result of the standard processes have kept rent levels down. Indeed, many such areas have very high rents, and as Figure 20 shows, rents have risen considerably over the postwar period even in areas of incomplete gentrification. However, in most cases, it is in areas containing a combination of new-build and other forms that monthly rents have risen the most.

The forms of gentrification and dwelling values

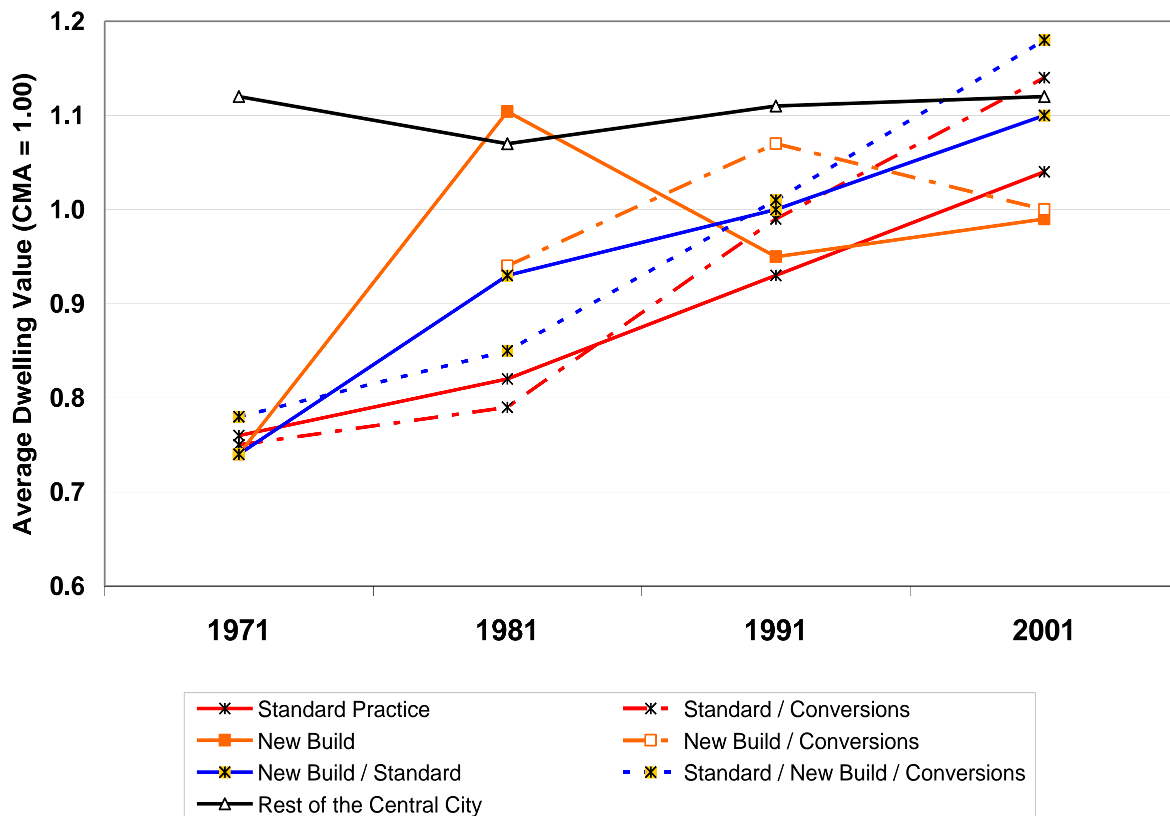
As mentioned above, dwelling values in the ownership sector are affected to a much greater degree by shifts in the size of units, the number of bedrooms, and the square footage of properties, than are rents in the rental stock. One effect of gentrification in Canadian cities has been to spur the construction of high-density owner-occupied condominiums, often on lots formerly occupied by older single and semi-detached houses. Thus, in many neighbourhoods where gentrification has proceeded, the average size of housing units has declined, in some places drastically.

This trend affects average dwelling values, which (because they are measured by unit, rather than on a square-foot basis) appear to decline even during periods of intense gentrification, when the land value per square foot has rapidly increased. Unfortunately, the census does not contain information on the square footage of residential land uses. Even still, the information provided by the census indicates that gentrification is associated with rapid increases in dwelling values per unit (see Figure 21).

When measured on a per-unit basis, areas characterized by new-build forms (or some combination of new-build and conversions) have the lowest dwelling values. This finding is clearly a function of the introduction of higher-density, smaller condominium and loft units in such neighbourhoods. Furthermore, these trends vary considerably between CMAs (see Figure 44 in the appendix). New-build areas in Toronto experienced rapid relative increases in values over the 1970s (after bottoming out in 1971), while dwelling values mostly remained flat or declined over the 1970s in Vancouver (excepting those areas characterized by combinations of standard and new-build forms).

Likewise, while in most areas dwelling values grew over the 1990s, in Vancouver neighbourhoods in which conversions had taken place experienced decreases in dwelling values. Such shifts reflect changes in dwelling unit size (and concomitant declines in the size of households occupying these units), which mask increases in land values in square footage terms, although the published census data does not allow us to measure the latter.

Figure 21: Average Dwelling Value (Ratio to CMA Mean), by Type of Gentrification, All Three Central Cities, 1971–2001



Source: Calculated by the authors from Census of Canada, various years

Note: The average dwelling value ratio is calculated for each census tract in relation to the CMA in which it is found. This chart traces the mean ratios for each gentrification group. Unfortunately, the variable for dwelling values is not comparable in the 1961 census.

The forms of gentrification and investment

These results suggest a relationship between the level and timing of gentrification and the presence of housing market processes that diverge from the standard process of converting old rental stock to freehold owner occupation. Obviously, strong trends toward population turnover, land-price inflation, and middle-class demand that characterize standard forms of gentrification induce new investment in the residential sector, much of which will take the form of new development, redevelopment, or conversion. This new investment then helps invigorate the local housing market, further stimulating new rounds of gentrification and investment that remove affordable housing from a neighbourhood and complete the gentrification cycle.

Neighbourhoods that began the process earlier are the most likely to consistently attract new investment, particularly higher-end development, since much of the investment risk has been removed in prior rounds. In its standard form, gentrification typically begins in areas with gentrifiable housing stock that are distant from industrial areas; this process encourages and acceler-

ates investment in new developments (or, if rental apartments with architecturally appealing styles are present, the conversion of older rental structures to condos). As gentrification proceeds, it moves into areas previously not considered desirable, usually characterized by less architecturally appealing housing, proximity to traditional industrial areas, or non-residential buildings in need of upkeep. In these areas, investment is more likely to flow into the conversion of non-residential buildings to residential spaces (such as lofts).

Not only does the standard process of renovation and rental deconversion act as a stimulus to new construction, but new-build forms likewise act as a stimulus to standard forms of gentrification. This can be seen in the Yonge Street corridor in Toronto, which abuts the first subway line and which our analysis suggests began gentrifying in the 1960s. Once the subway was established, investment flowed into adjoining neighbourhoods in the form of new high-end apartments and condominiums, and many tenanted old houses were demolished to make room for them.

This new investment invigorated standard forms of gentrification in nearby areas, and prompted the conversion of older apartments to condos and of non-residential buildings (some of which housed squatters and artists) into lofts − a practice which has become augmented by policies removing land-use controls from older non-residential buildings. These processes led to the displacement (either direct or indirect) of the tenant groups who had occupied these neighbourhoods at least since the 1951 census. In neighbourhoods that have received such forms of investment, any working-class housing remaining in the private sector is likely to be rapidly gentrified, and therefore wherever new construction occurs, other forms of gentrification are likely to be found nearby. In this way, “new-build developments act as beachheads from which the tentacles of gentrification can spread into the surrounding neighbourhoods” (Lees, Slater and Wyly, 2007, 141).

Together, these findings suggest that while analytically distinct, in practice there are complex connections between new-build construction, conversion processes, and standard forms of gentrification. They are likely to be complementary in stimulating investment flows into a neighbourhood. Although they are important to varying degrees in different places, all three forms of gentrification are part of the same overall process of neighbourhood transformation. Only in four tracts along the Toronto waterfront, and perhaps one tract near the Lachine Canal in Montreal, where very little prior residential population is registered in early censuses, is there any justification for conceptually separating investments in new construction from other forms of gentrification. Yet these represent only a small minority (6.8 percent) of the 88 census tracts identified as containing some form of “new-build” gentrification in the three central cities, and the transformation can nonetheless still be understood as the creation of space for the middle class out of previously working-class employment or consumption spaces.

7. Conclusion

Gentrification is an important facet of the contemporary landscape of large Canadian cities. It involves the transformation of older working class neighbourhoods, where lower-income households and new immigrants could traditionally find affordable rental housing, into neighbourhoods housing and servicing middle and high-income households. While there are many potentially positive features of neighbourhood upgrading (higher levels of amenity and services, improved building quality, potentially lower levels of crime, etc.), these benefits are not likely to be enjoyed by lower-income populations. Gentrification is tied to the displacement of low-income households from the inner city, declining levels of housing affordability in older neighbourhoods, and lower levels of accessibility for those who are then forced to find housing in remote locations.

This report has presented a method for delimiting the timing, patterning, and forms taken by gentrification and upgrading over the postwar period, using the Canadian cities of Montreal, Toronto, and Vancouver as case studies. Gentrification is distinct from other forms of upgrading, including elite consolidation and middle-class recapture, each of which covers a distinct subset of neighbourhoods in these three cities. Gentrification exhibits a clear geography in each place, starting in a few core areas and spilling over from there into contiguous neighbourhoods in each subsequent wave or decade. A gentrification frontier is identified in each place, suggesting where gentrification is statistically likely to emerge in future decades.

On the whole, gentrification is present in more than 18 percent of all central-city tracts, and more than 36 percent of tracts within the (more strictly defined) prewar inner-city areas of our three study regions. A further 14 percent of all central-city tracts experienced other forms of upgrading. Gentrification has touched a similar proportion of the housing stock in Toronto and Montreal, whether measured against their entire central cities (14-16 percent) or the more restricted prewar inner city totals (38-40 percent). Gentrification is more spatially concentrated near the CBD in Vancouver (affecting 17 percent of all central city tracts, 24 percent of the older prewar inner city), mainly because a large proportion of Vancouver's neighbourhoods have always housed a middle-class or elite residential population, and are thus classified as experiencing middle-class upgrading rather than gentrification. Nonetheless, at 24 percent, the proportion of the City of Vancouver's housing stock contained within gentrifying neighbourhoods is substantial.

Statistical evidence from the 1996–2001 census period suggests that another 5 percent of all tracts in the three central cities (over 9 percent of those in the prewar inner cities) may be at or near the onset of gentrification, which could conceivably be detected in future years.

Stage effects are evident among gentrifying neighbourhoods. At the onset of gentrification, income levels typically decline while concentrations of artists grow. Social status, income, dwelling values, and rents typically increase with each decade of gentrification, although the first variable may decline in the last stages as professionals are replaced by high-income self-employed or independently wealthy households, as was found to be the case in our three central cities.

A distinction was uncovered between areas that are fully gentrified and areas in which gentrification remains incomplete. In the latter case, tenants remain as a large proportion of the total population, suggesting that policies enhancing the ability to stay put (particularly the importance of secure and affordable rental housing) as a key factor limiting the extent and impact of gentrification in such neighbourhoods.

Of the three cities, Toronto has seen the greatest number of its neighbourhoods fully gentrify to join the ranks of middle-class and elite neighbourhoods. While smaller in number, the proportion of tracts that fully gentrified in Vancouver is similar to that in Toronto (slightly higher compared with the central city totals, slightly lower if compared with the more restricted set of prewar inner-city neighbourhoods). In Montreal, almost three-quarters of the tracts experiencing some gentrification remained in an incomplete state by the end of the study period (2001), potentially due to the greater state of original disinvestment in inner-city Montreal. Gentrifying tracts had to bridge a greater rent gap in Montreal than in the other two cities. Provincial and municipal policies of siting new social housing and rental apartments in such neighbourhoods may have also prevented them from gentrifying as fast as they might have otherwise. The marginality of Montreal's position within the global economy and its more limited occupational transformation (Rose, 1996; Van Criekengen and Decroly, 2003) may also have played a role in limiting gentrification.

This report also identified the main forms that gentrification has taken within Canadian inner-city neighbourhoods. Combinations of three different forms are identified in each city:

- standard processes of the deconversion of older lower-rise housing stock to owner-occupation;
- new construction ("new-build"), either on greenfield or brownfield sites, the latter potentially involving the demolition of residential units to make room for new units;
- conversions of non-residential uses to residential use, and of rental apartments to owner-occupied condominiums.

Combining information on the forms of gentrification with the timing and extent of neighbourhood transformation produces a complex geography of gentrification and upgrading in each city. It is notable that new construction is rarely spatially distinct from other forms of gentrification, but occurs either in the same neighbourhoods as standard forms of transition in the existing housing stock, or is associated with the invigoration of more standard processes of gentrification in contiguous or nearby neighbourhoods. It appears that housing market activities in the older stock and on new (or redeveloped) sites are closely linked in both time and space.

Areas of new construction represent an opportunity to counteract the negative effects of property speculation and deconversion of the older stock wrought by gentrification, and in turn prevent the disappearance of affordable rental housing. Unfortunately, this has been a mostly lost opportunity, as the vast majority of new construction has taken the form of higher-cost (per square foot) owner-occupied housing, which has further spurred gentrification in inner-city neighbourhoods. Thus, in most cases, our research suggests that new construction and tenure conversions are but elements of the larger gentrification of the inner city.

Gentrification poses a problem for public policy, as it displaces low-income households, who have fewer housing choices available in the inner cities and who often must settle for accommodation that is less accessible by public transit, farther from work, and where fewer public services are available. If the trends outlined in our research continue, the inner cities of Canada's three largest metropolitan areas will increasingly become the preserve of elites, while the poor – who gain the greatest marginal utility from an inner-city location − are relegated either to less accessible fringe locations or to the few neighbourhoods concentrating high-density rental apartments. Unless such trends can be reversed, this portends an increasingly segregated and fragmented urban realm, rather than an inclusive one.

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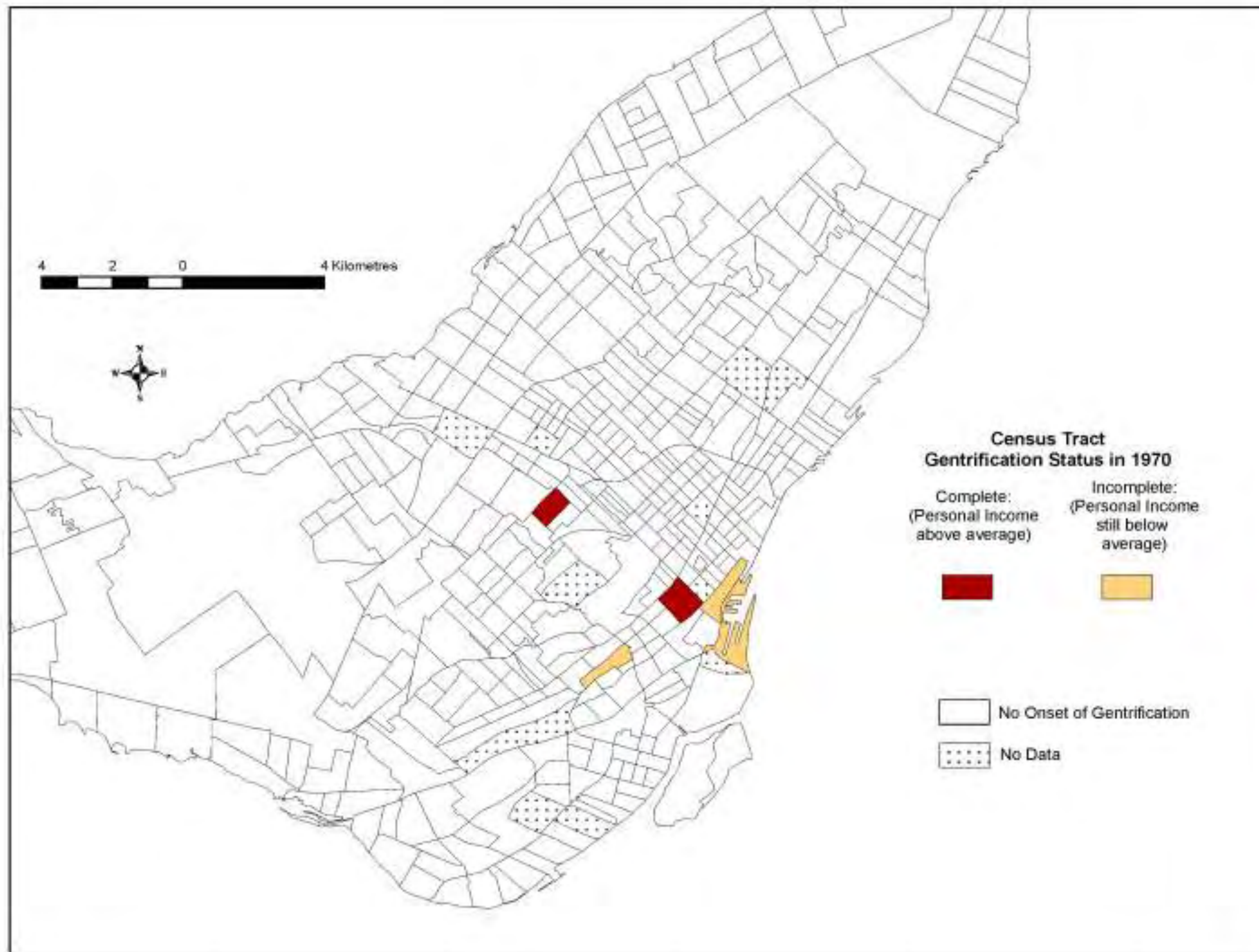
Appendix

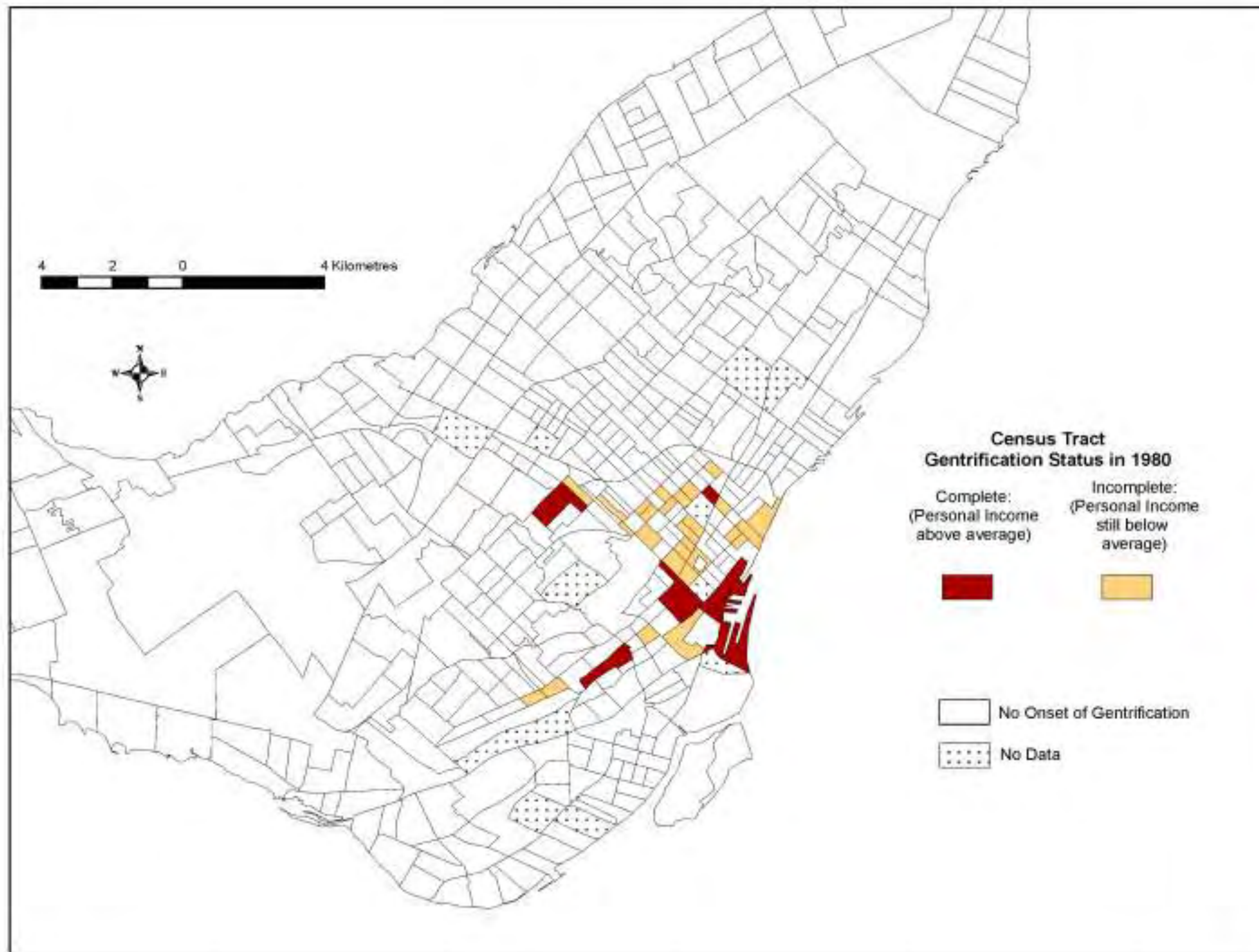
Figure 22: Gentrification Complete and Incomplete, Montreal Urban Community, 1970



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

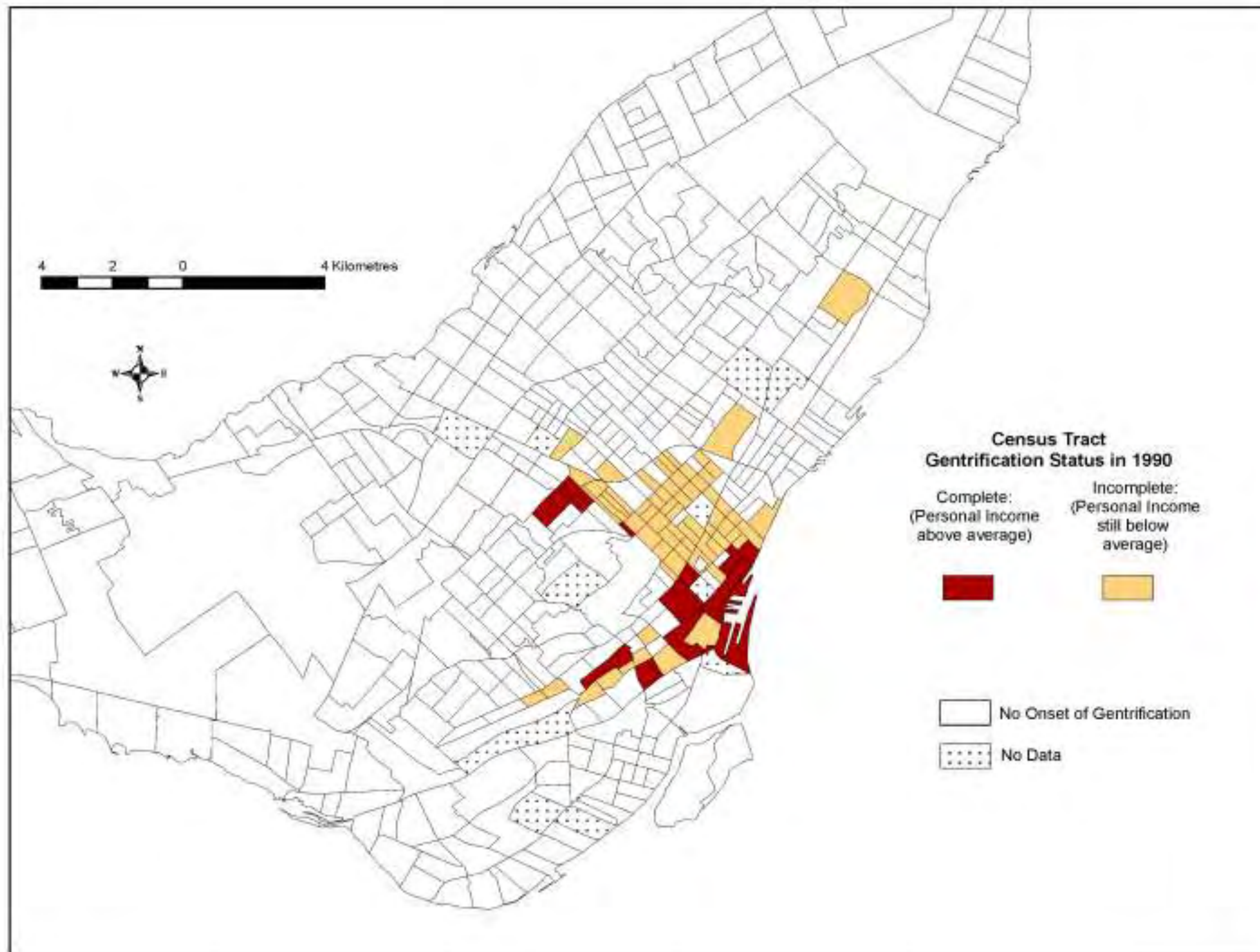
Figure 23: Gentrification Complete and Incomplete, Montreal Urban Community, 1980



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

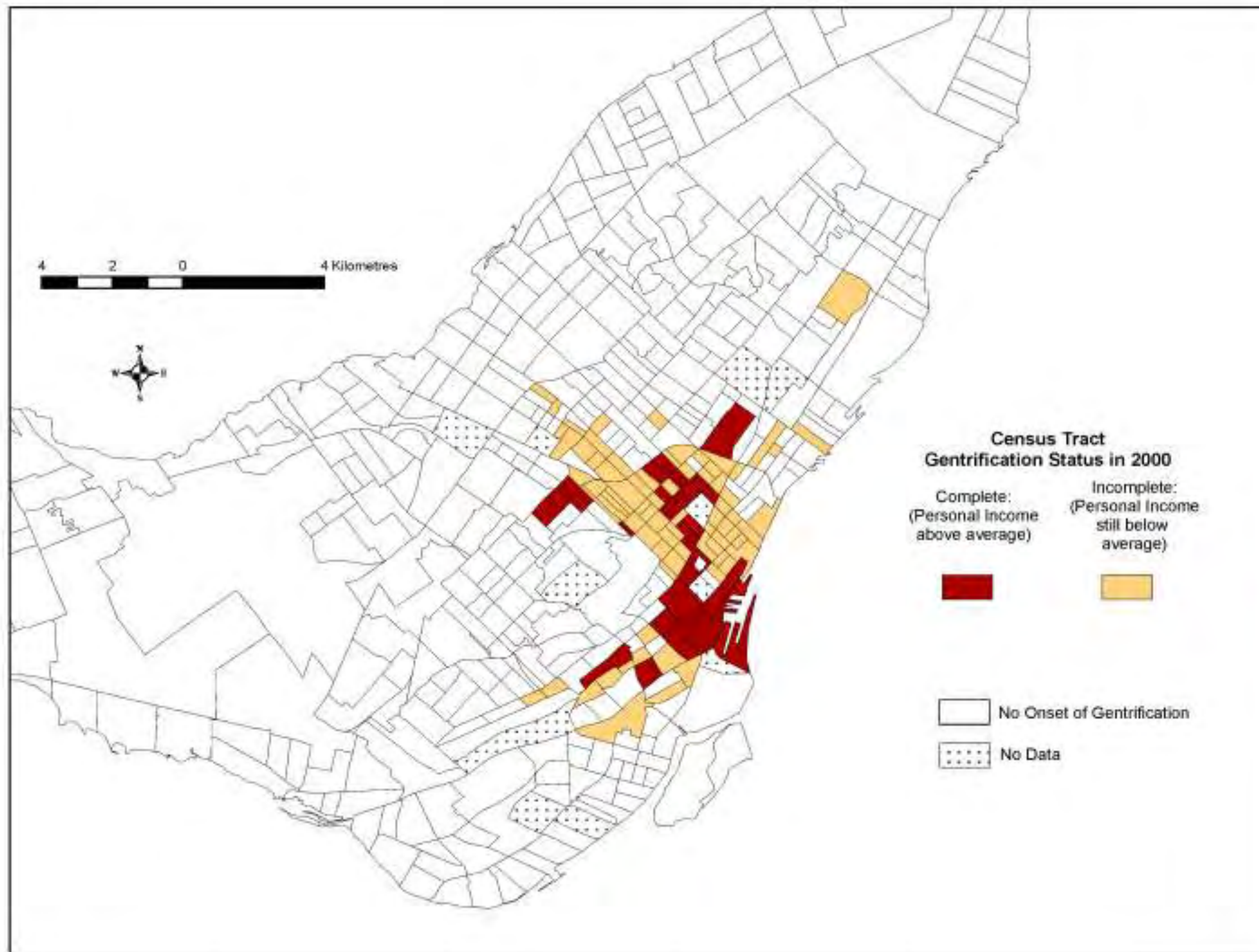
Figure 24: Gentrification Complete and Incomplete, Montreal Urban Community, 1990



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

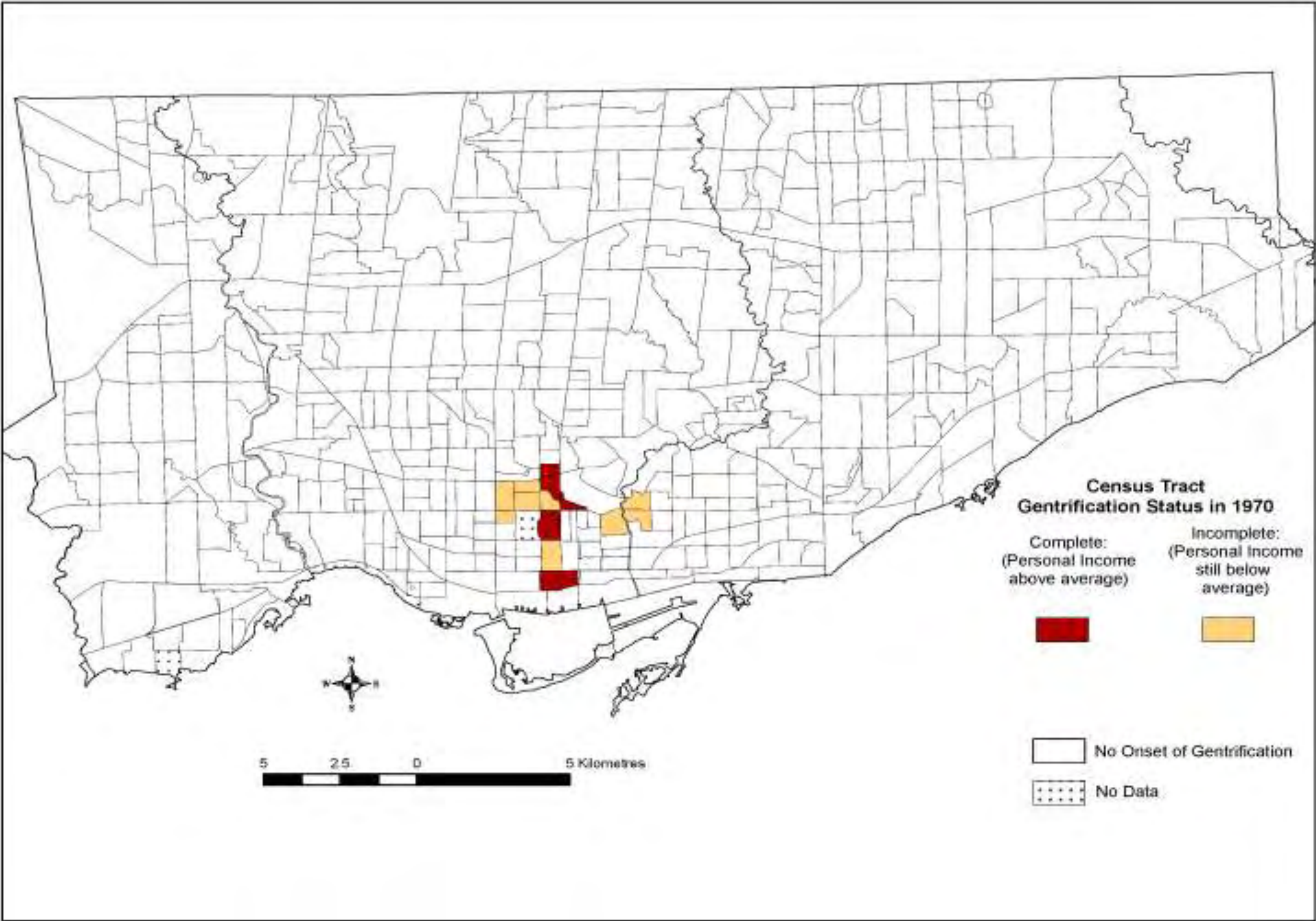
Figure 25: Gentrification Complete and Incomplete, Montreal Urban Community, 2000



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

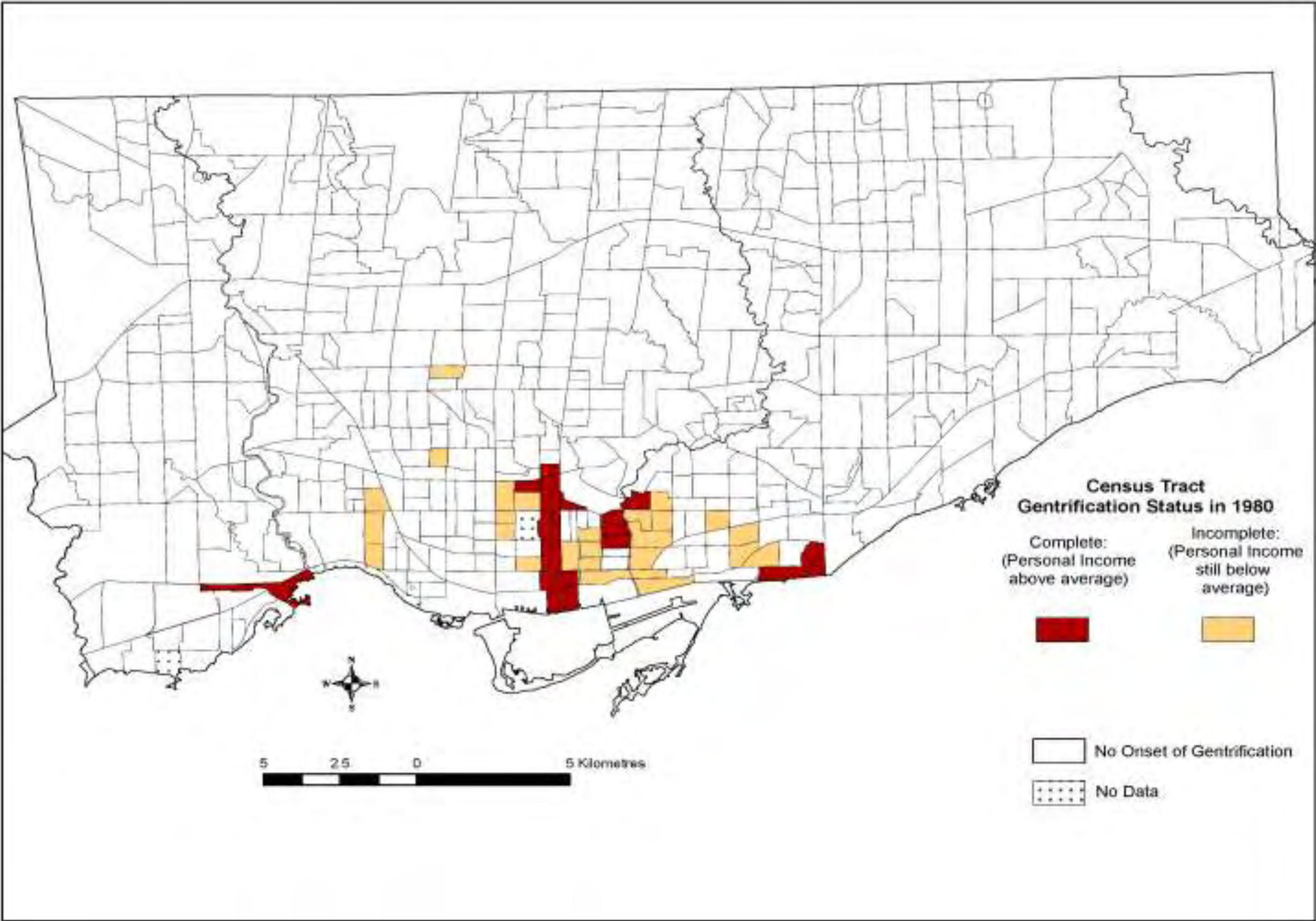
Figure 26: Gentrification Complete and Incomplete, City of Toronto (Metropolitan Toronto), 1970



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

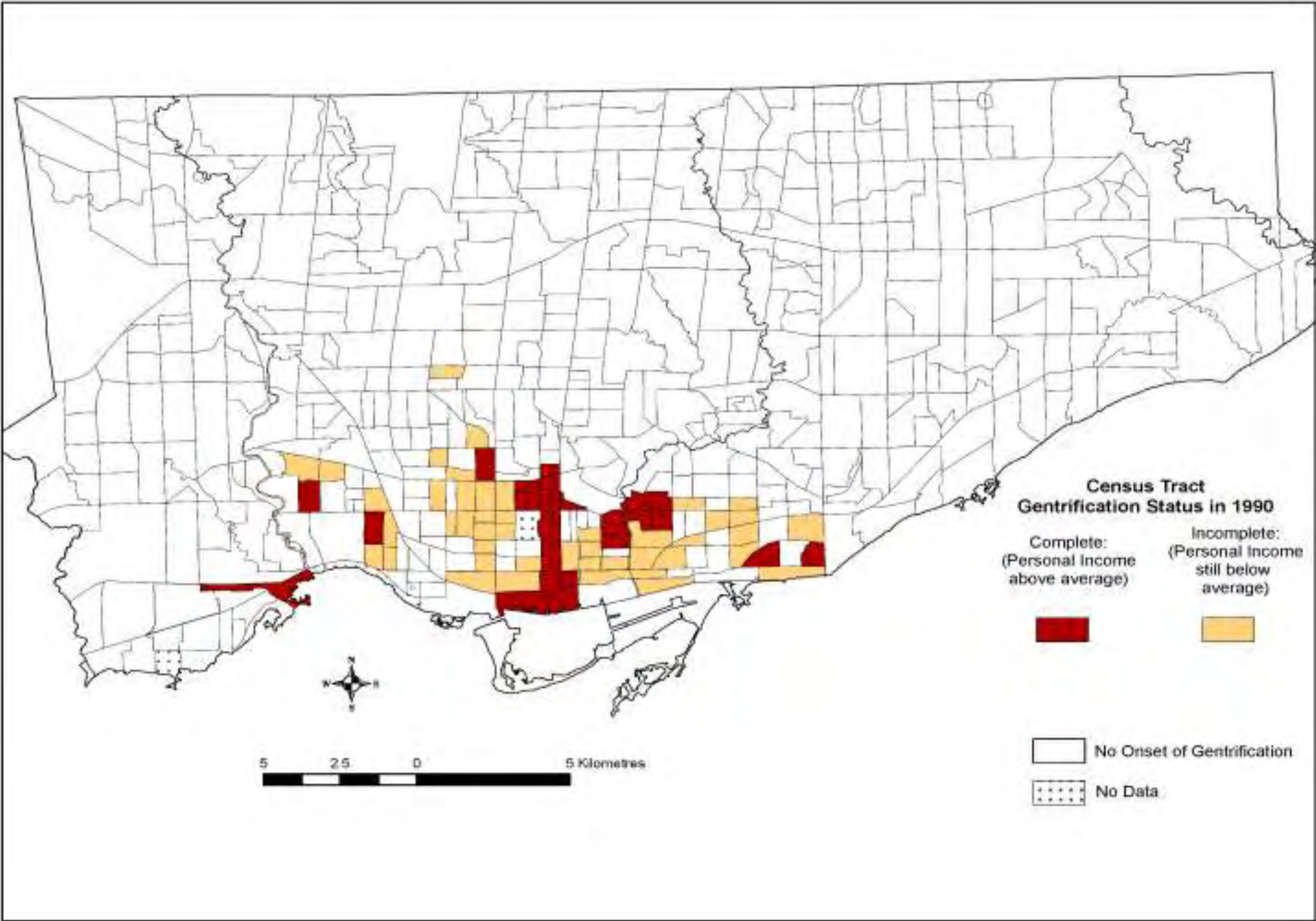
Figure 27: Gentrification Complete and Incomplete, City of Toronto (Metropolitan Toronto), 1980



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

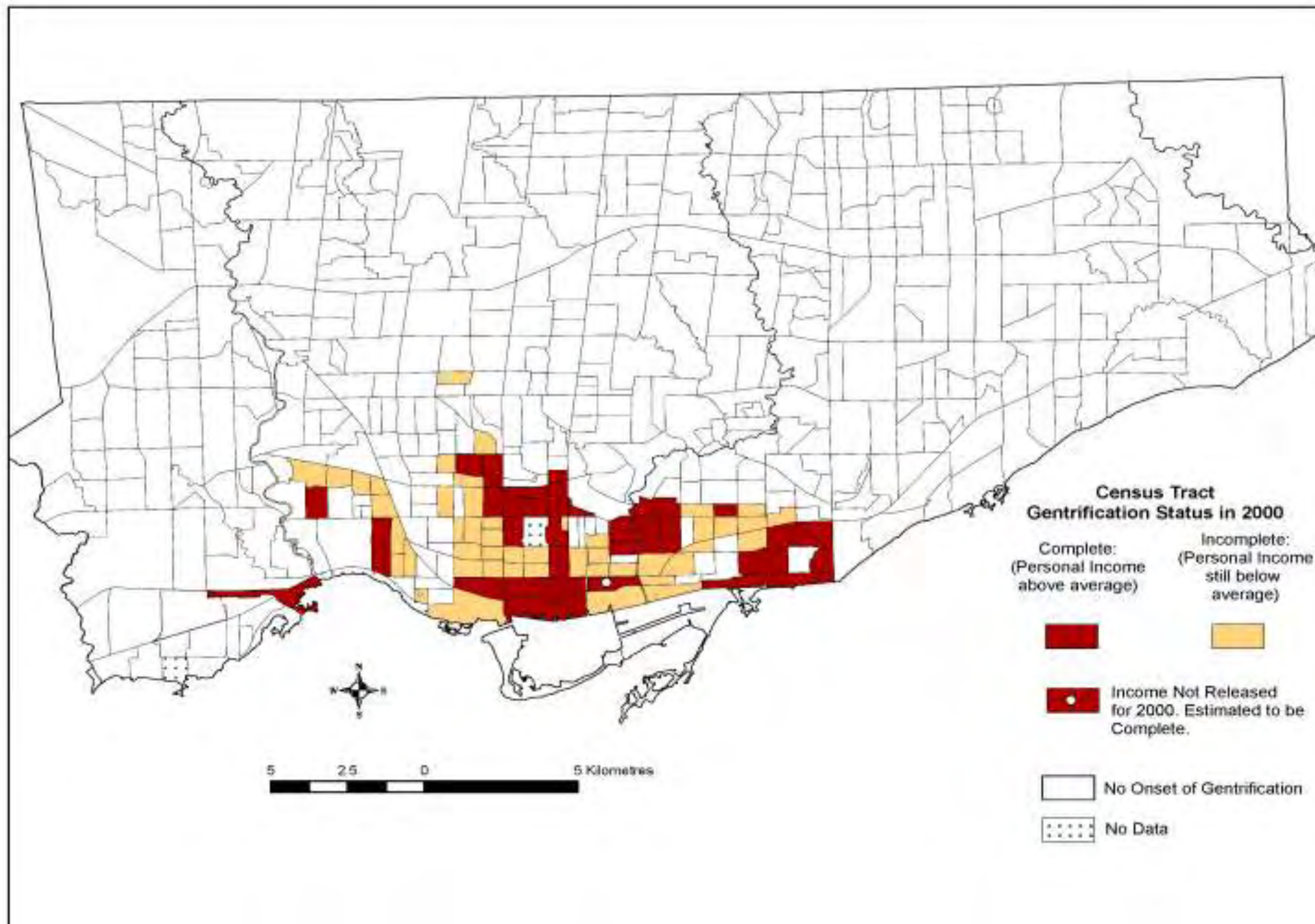
Figure 28: Gentrification Complete and Incomplete, City of Toronto (Metropolitan Toronto), 1990



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered ‘complete’ once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

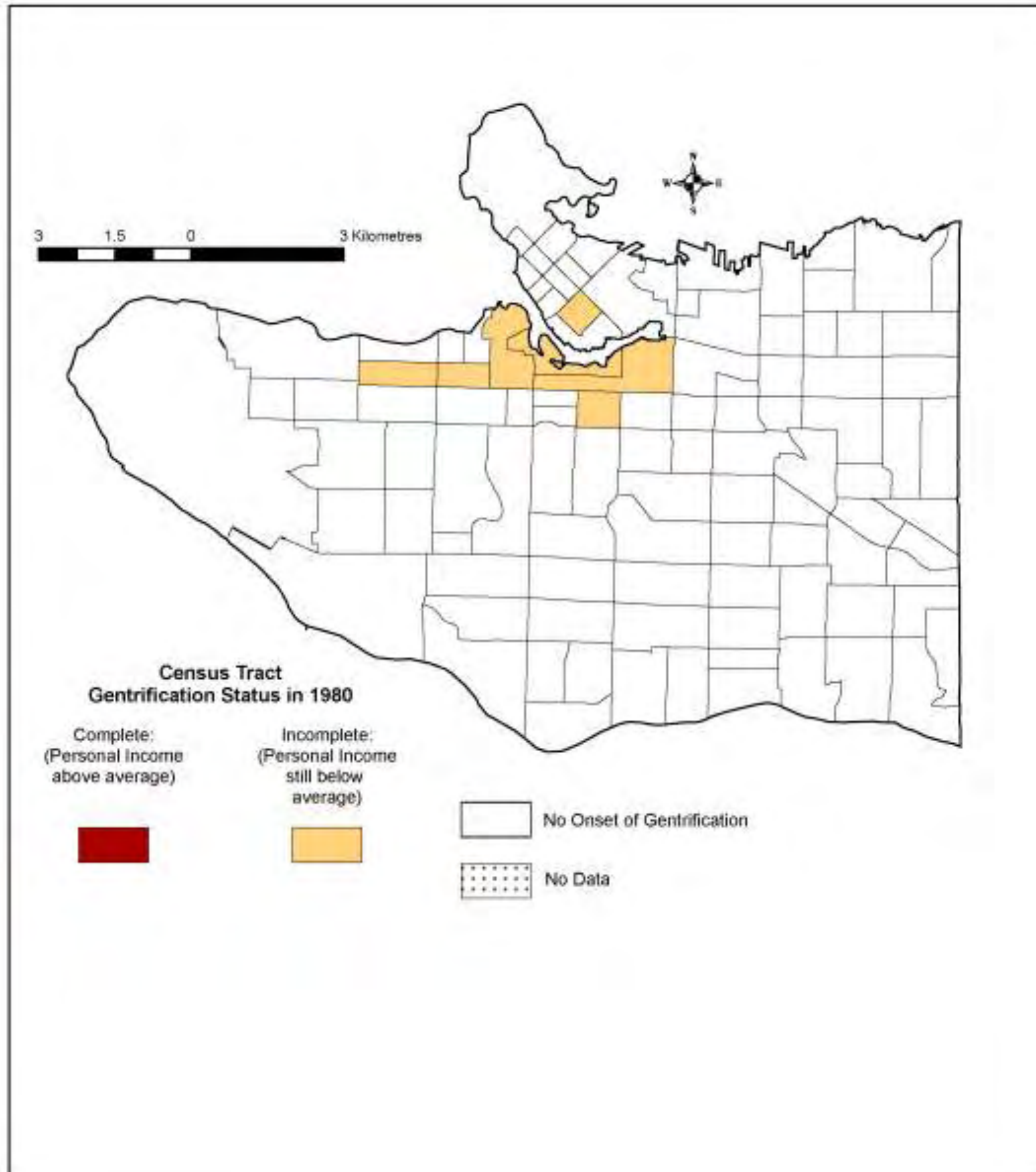
Figure 29: Gentrification Complete and Incomplete, City of Toronto (old Metropolitan Toronto), 2000



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

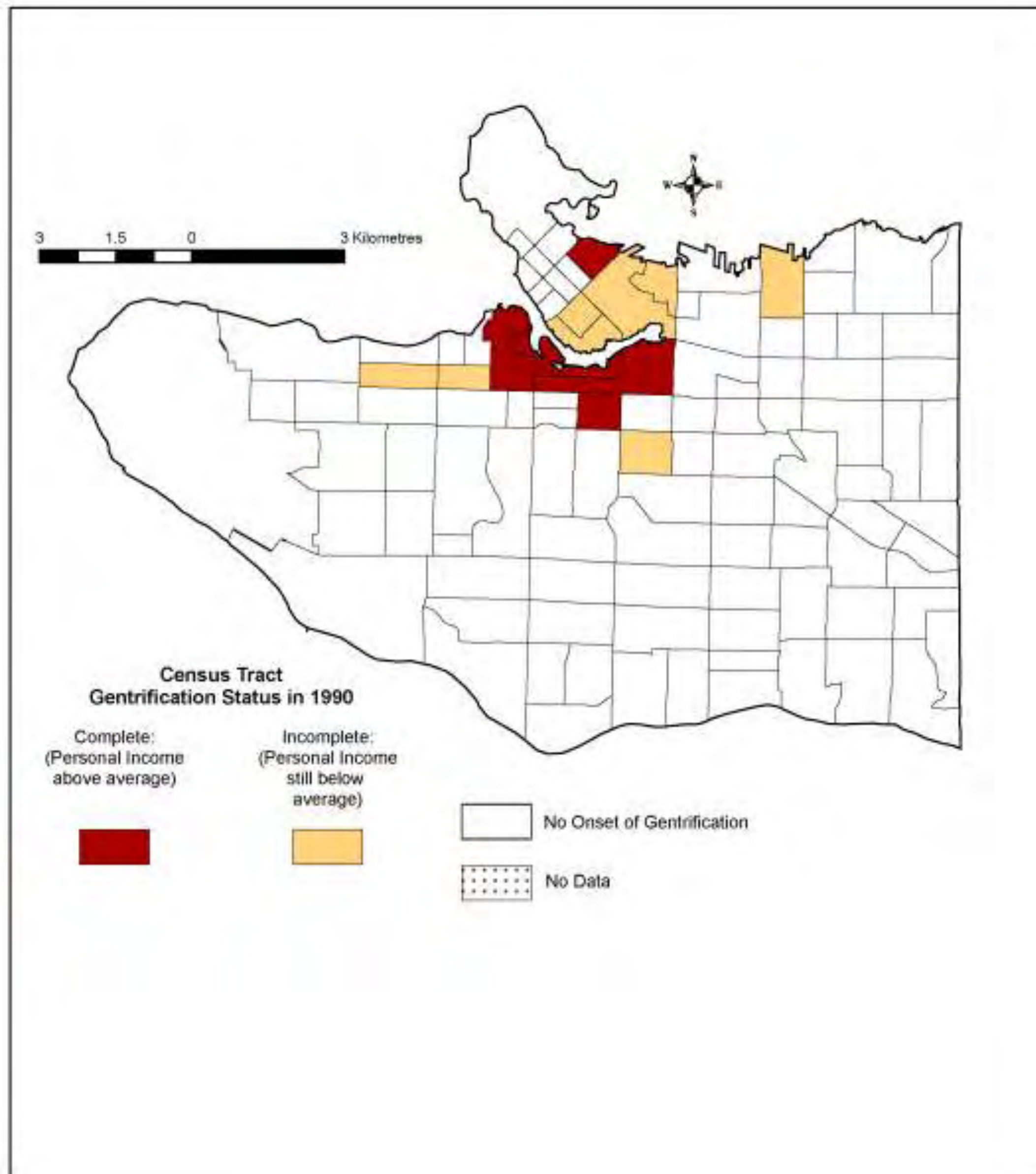
Figure 30: Gentrification Complete and Incomplete, City of Vancouver, 1980



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

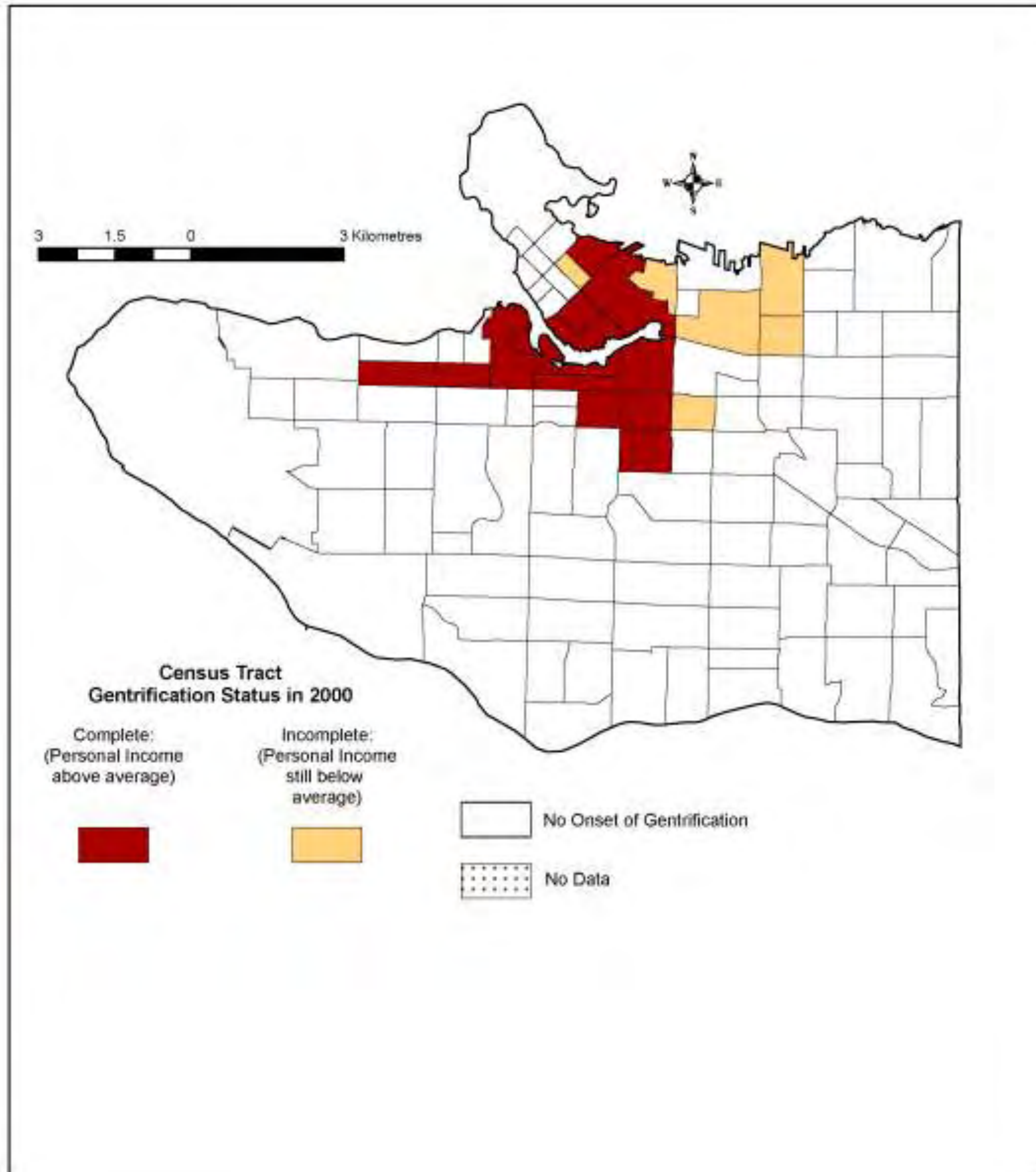
Figure 31: Gentrification Complete and Incomplete, City of Vancouver, 1990



Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

Figure 32: Gentrification Complete and Incomplete, City of Vancouver, 2000

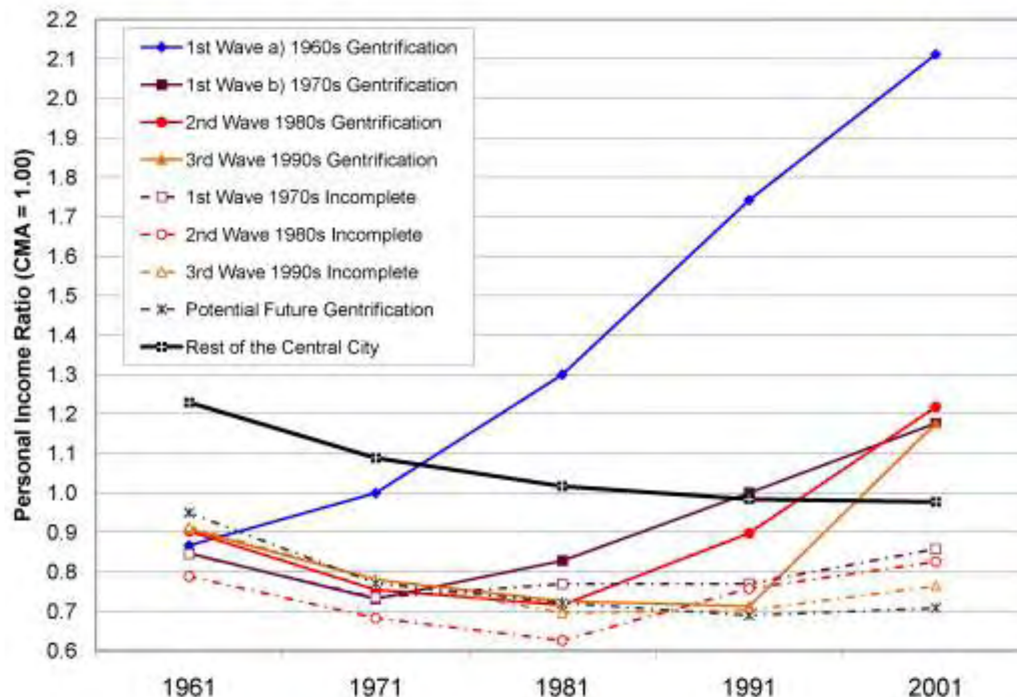


Source: Created by the authors from the Census of Canada, various years.

Note: Gentrification is considered 'complete' once the census tract average individual income of persons aged 15 and over rises above the Census Metropolitan Area (CMA) average. Tract boundaries shown are for 2001.

Figure 33: Average Personal Income (Ratio to CMA Mean), by City, 1961 – 2001

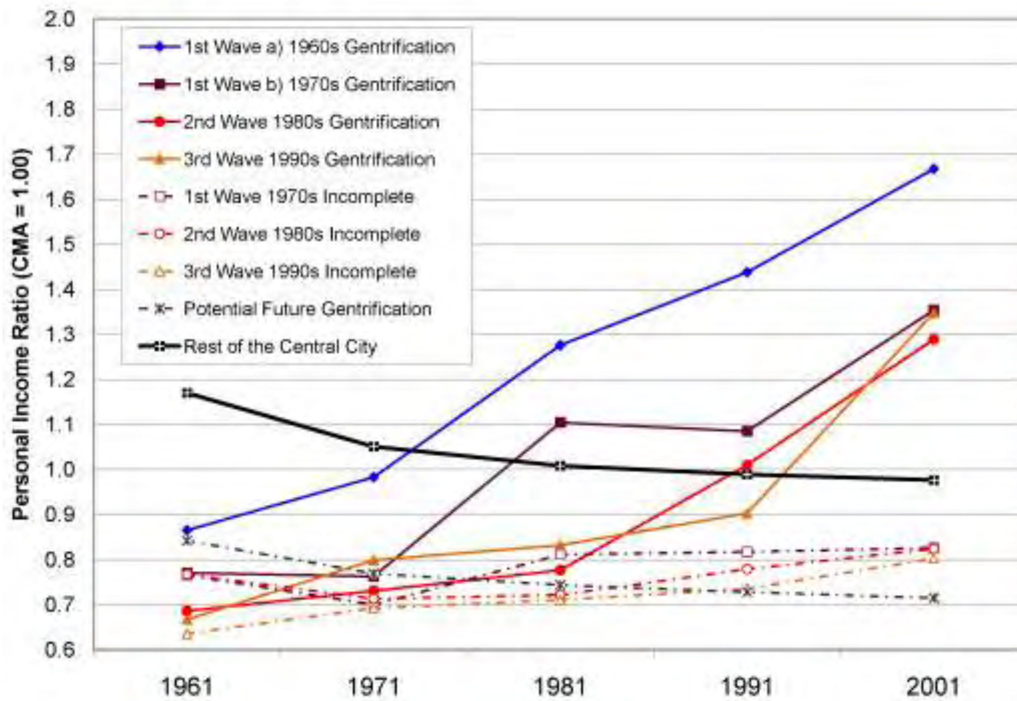
33 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: The average personal income ratio compares the average income from all sources of those aged 15 and over in each census tract to the Census Metropolitan Area (CMA). (*)Note, however, that only average employment income (ratio) is available in 1961 and this may affect the accuracy of the 1961-1971 rate of change. The above chart the mean values in each category for all three study cities.

33 b) City of Toronto



33 c) City Vancouver

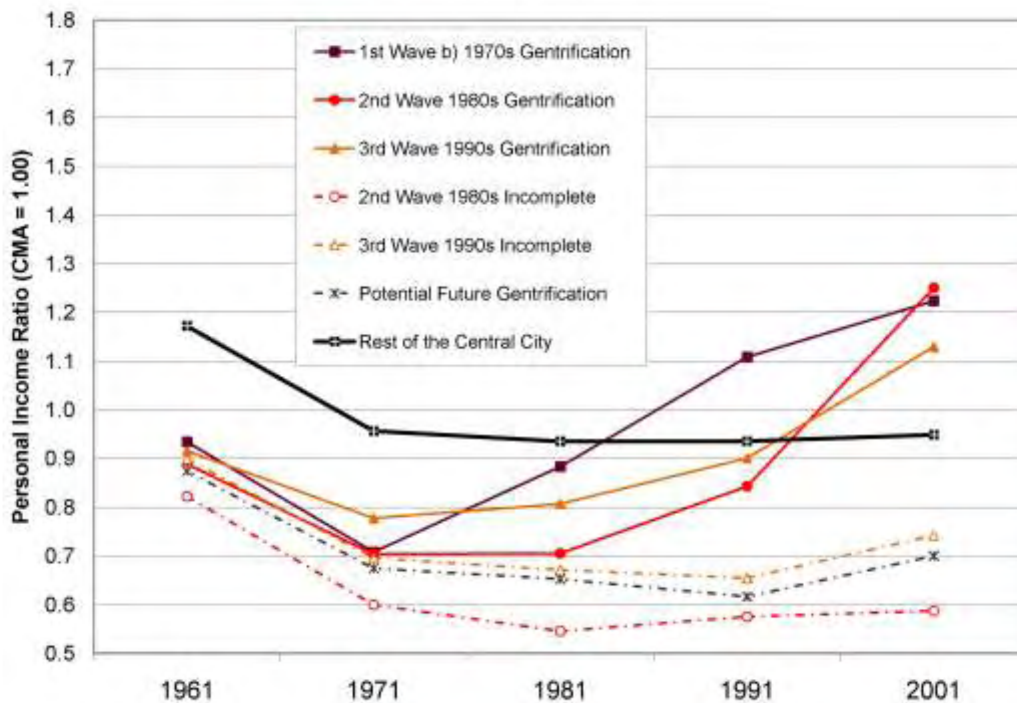
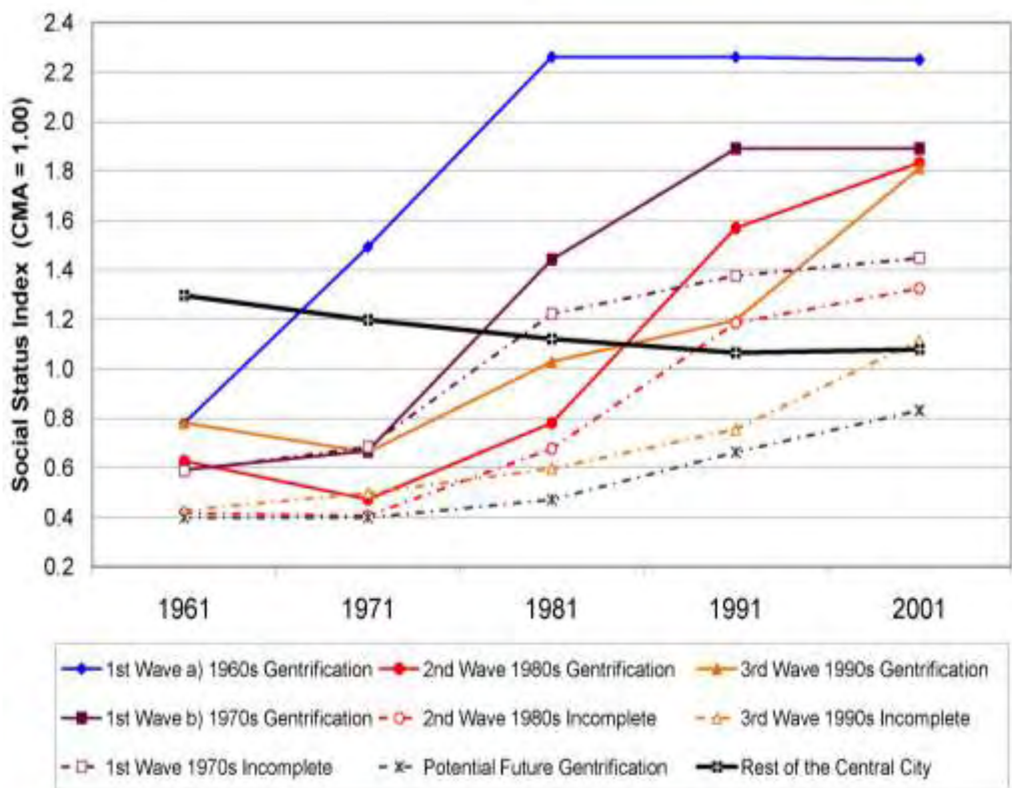


Figure 34: Social Status Index, by City, 1961 – 2001

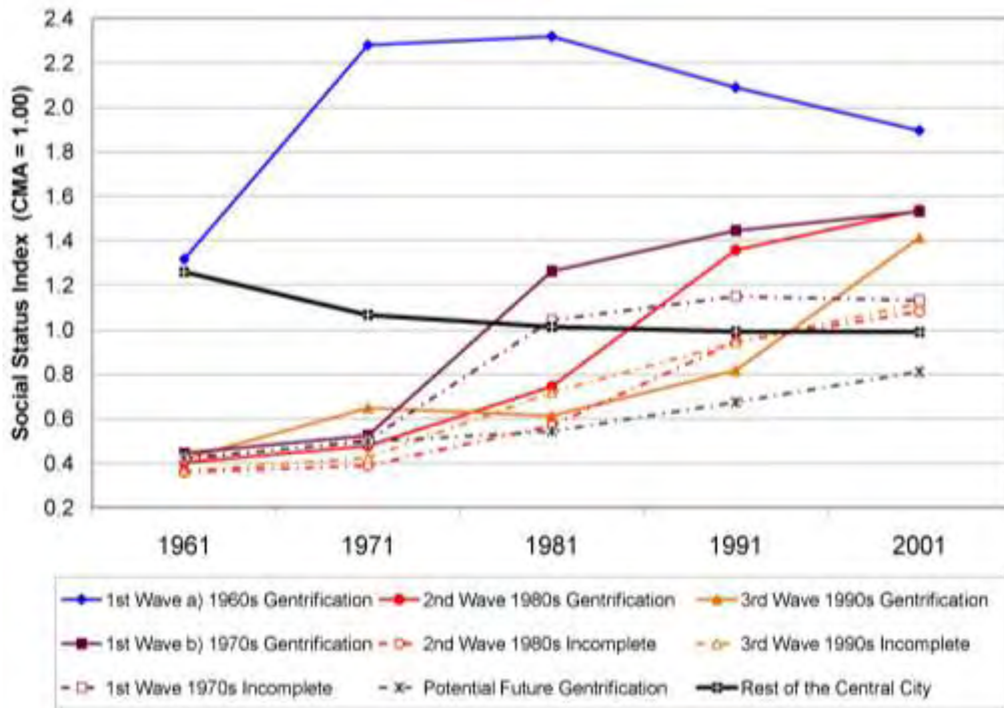
34 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: The social status index is a composite of the location quotient (LQ) of those with a university degree, and the location quotient for those employed in professional, managerial, health, engineering and applied science, law, religion and social work. Excluded occupations include clerical/secretarial, sales and services. In 1961 artists are also included in this index, which may partly explain the above-average index values for the 1st wave 1960s gentrification group in 1961.

34 b) City of Toronto



34 c) City Vancouver

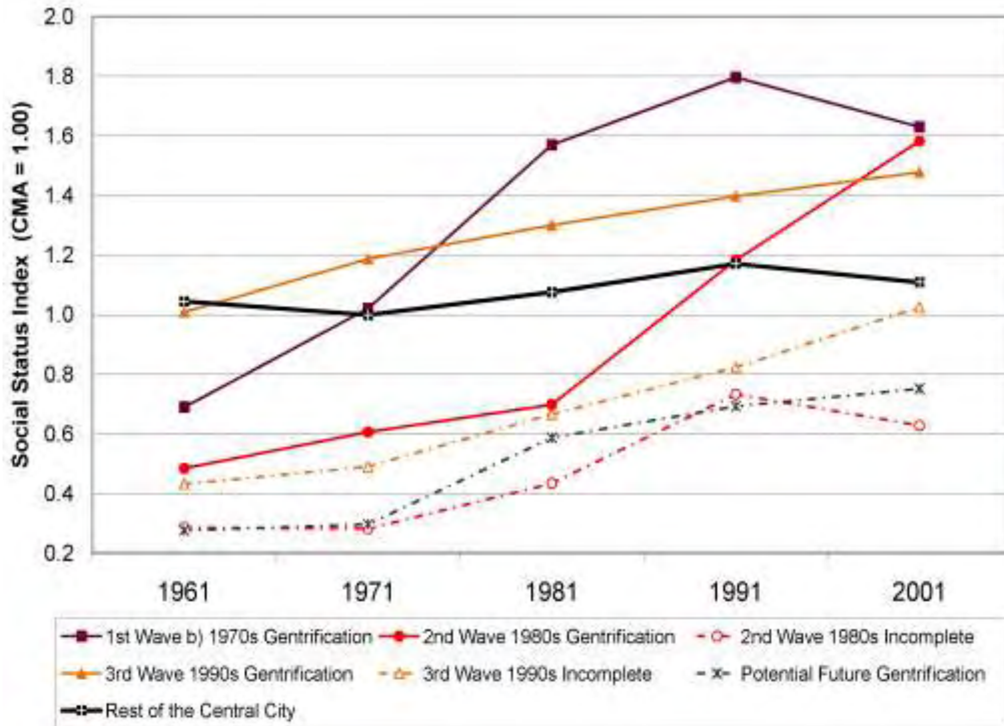
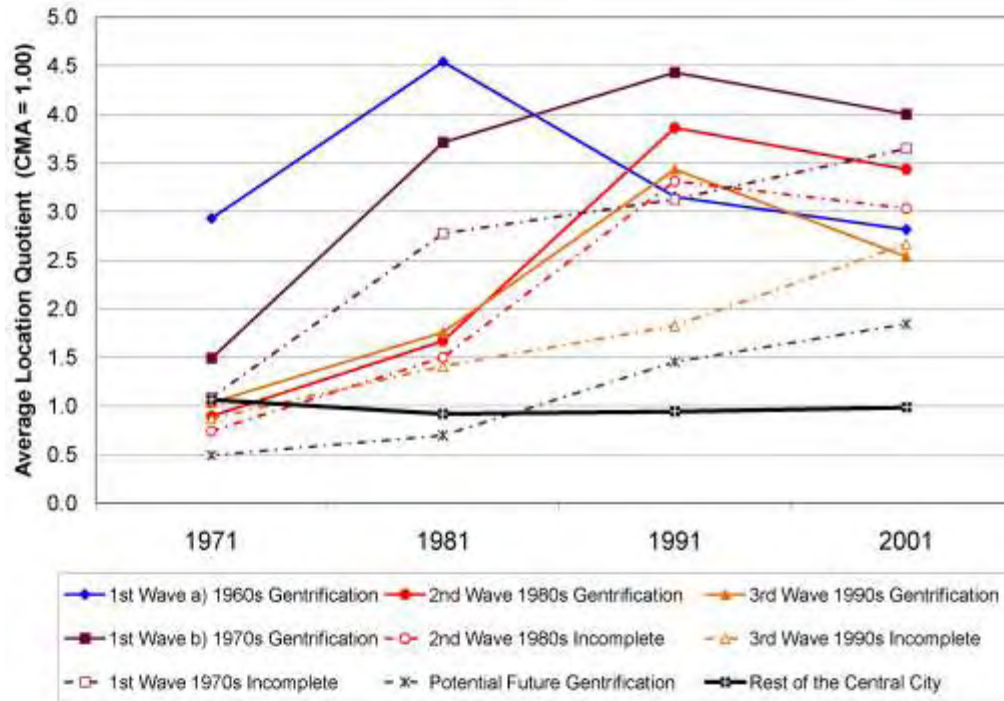


Figure 35: Average Location Quotient (LQ) for Artistic, Literary and Recreational Occupations, by City, 1971 − 2001

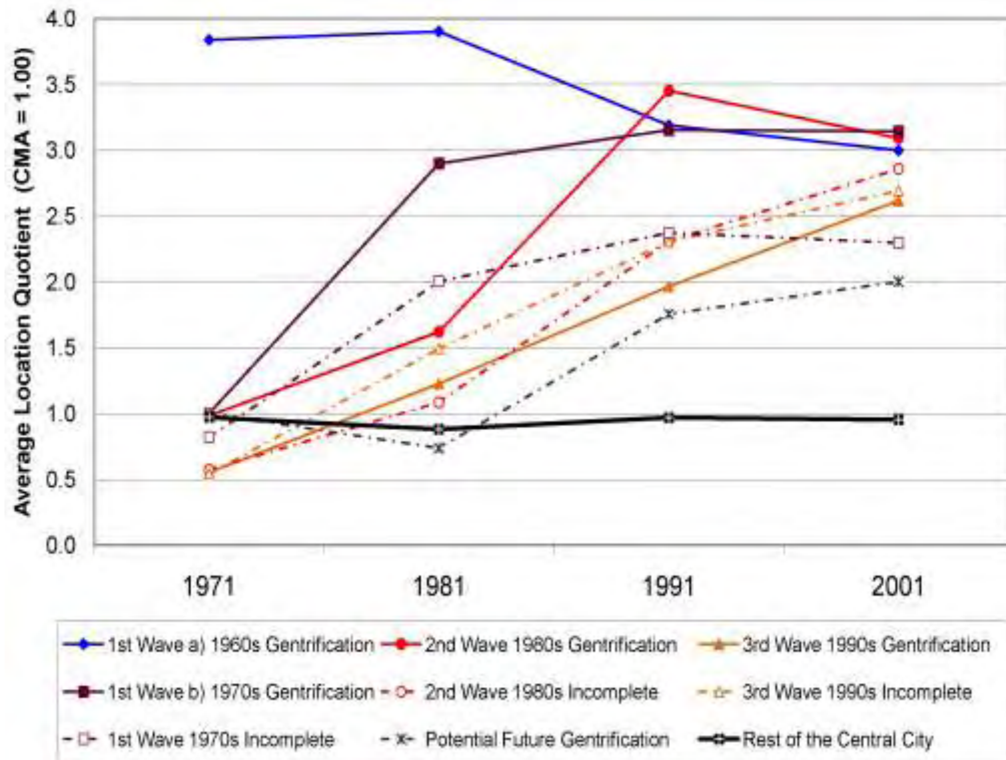
35 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: Values are the mean location quotient for each gentrification group calculated in comparison with the CMA.

35 b) City of Toronto



35 c) City Vancouver

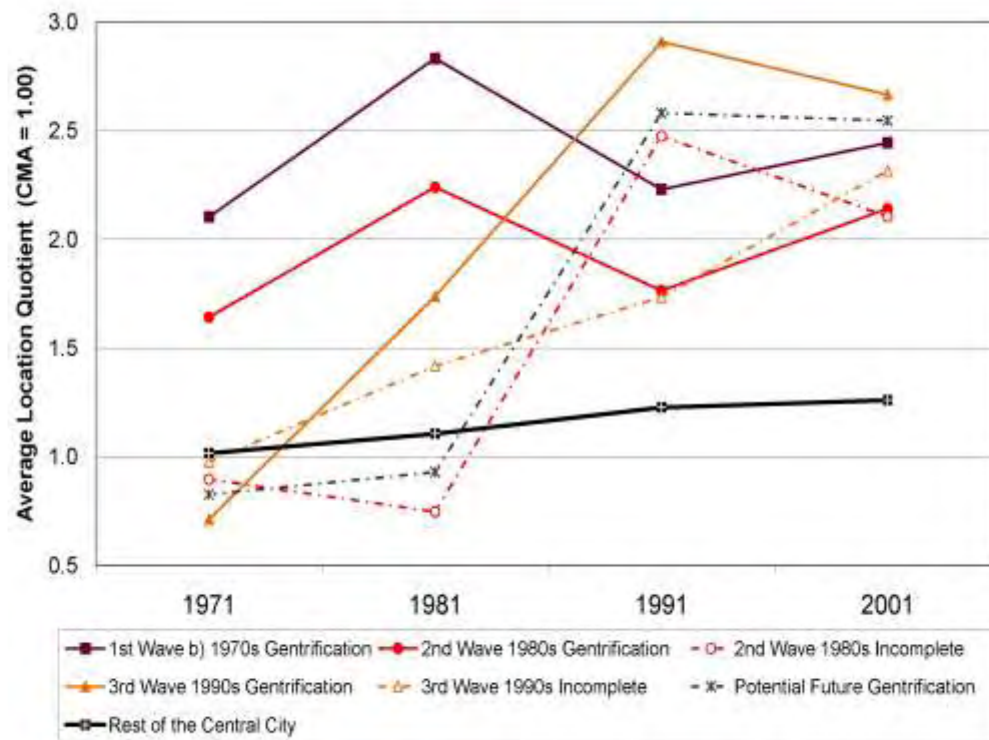
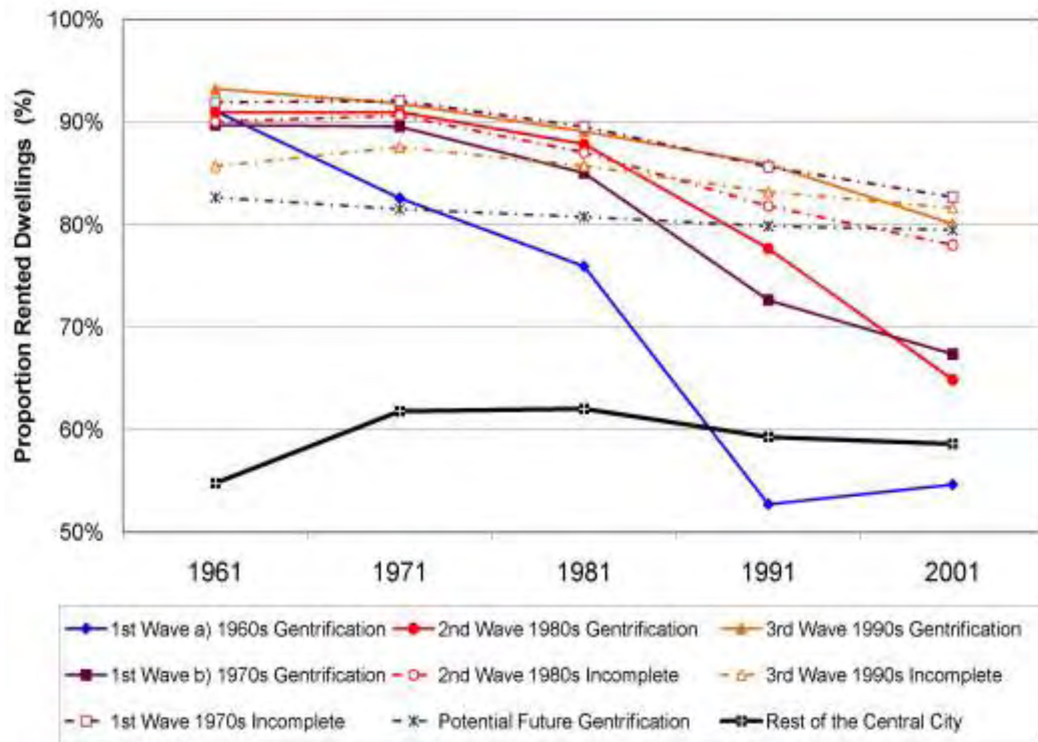


Figure 36: Proportion of Dwellings Rented, by City, 1961 – 2001

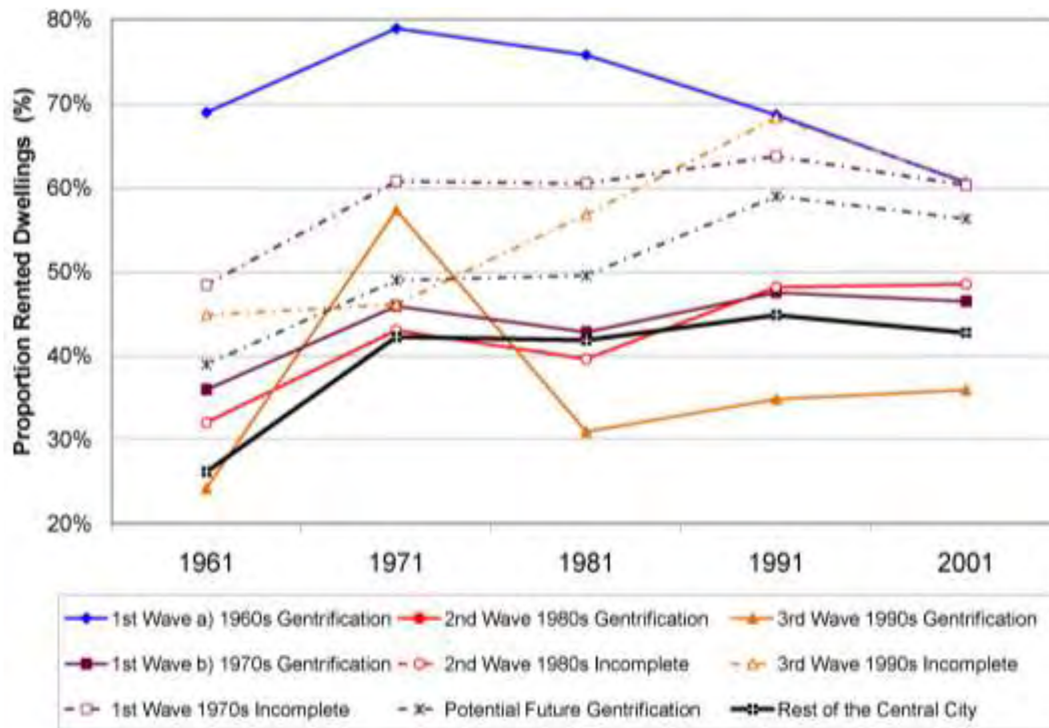
36 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: Shown is the mean proportion of all dwellings that are rented for each gentrification group.

36 b) City of Toronto



36 c) City Vancouver

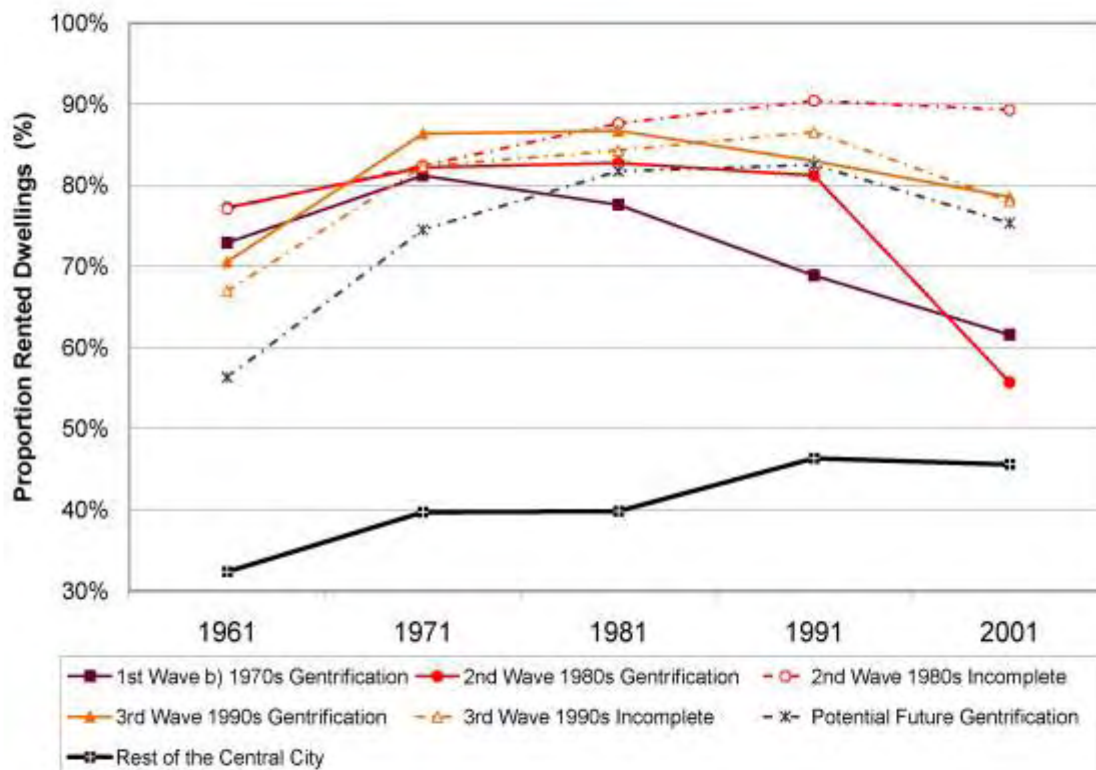
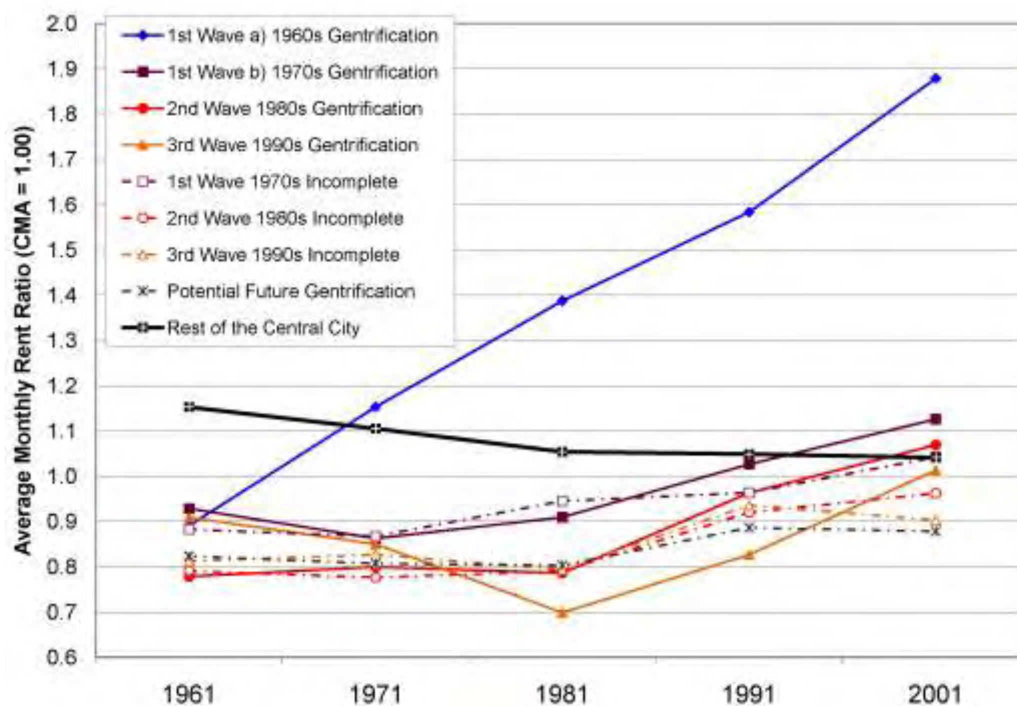


Figure 37: Average Monthly Rent (Ratio to CMA Mean), by City, 1971 – 2001

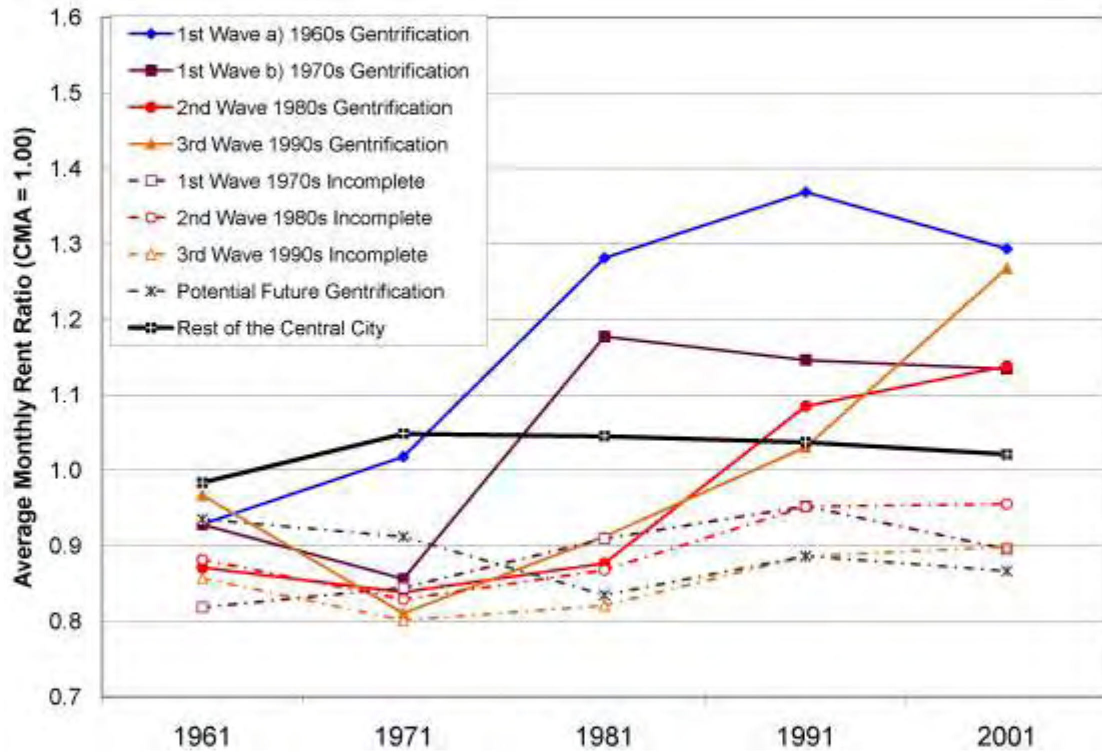
37 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: The average rent ratio is calculated for each census tract in relation to the average rent in the CMA. This chart traces the mean rent ratios for each gentrification group. Rents include both market and non-market housing which the Census cannot separate.

37 b) City of Toronto



37 c) City Vancouver

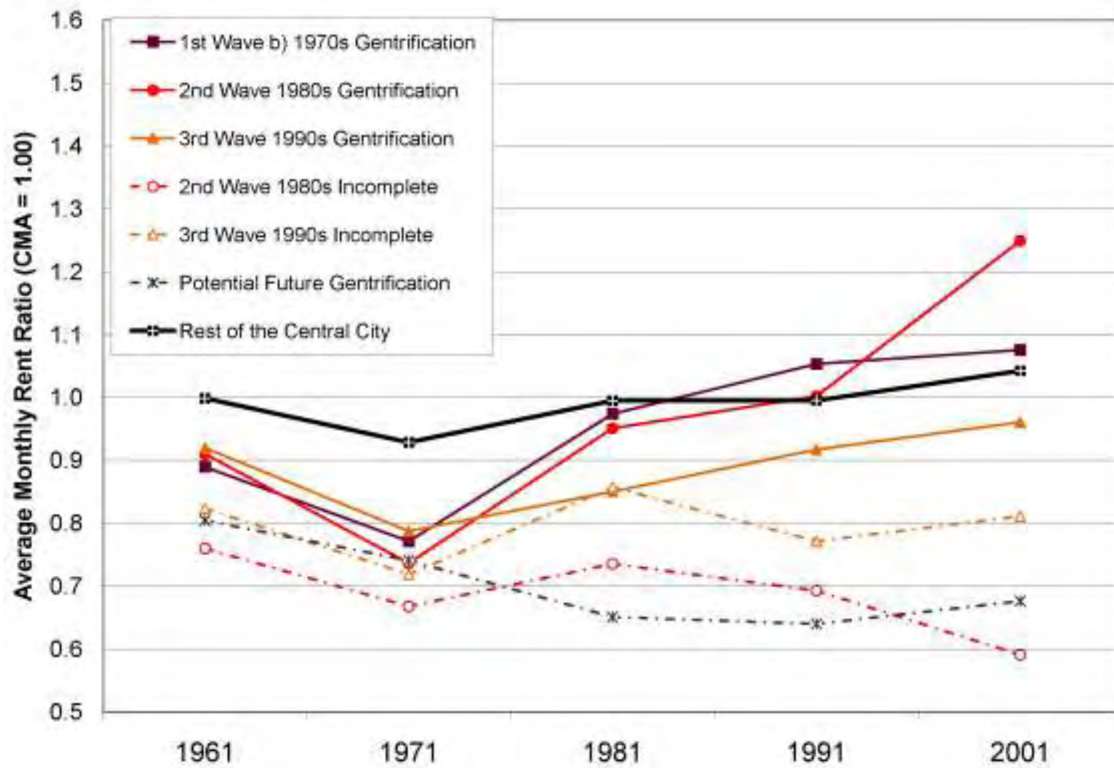
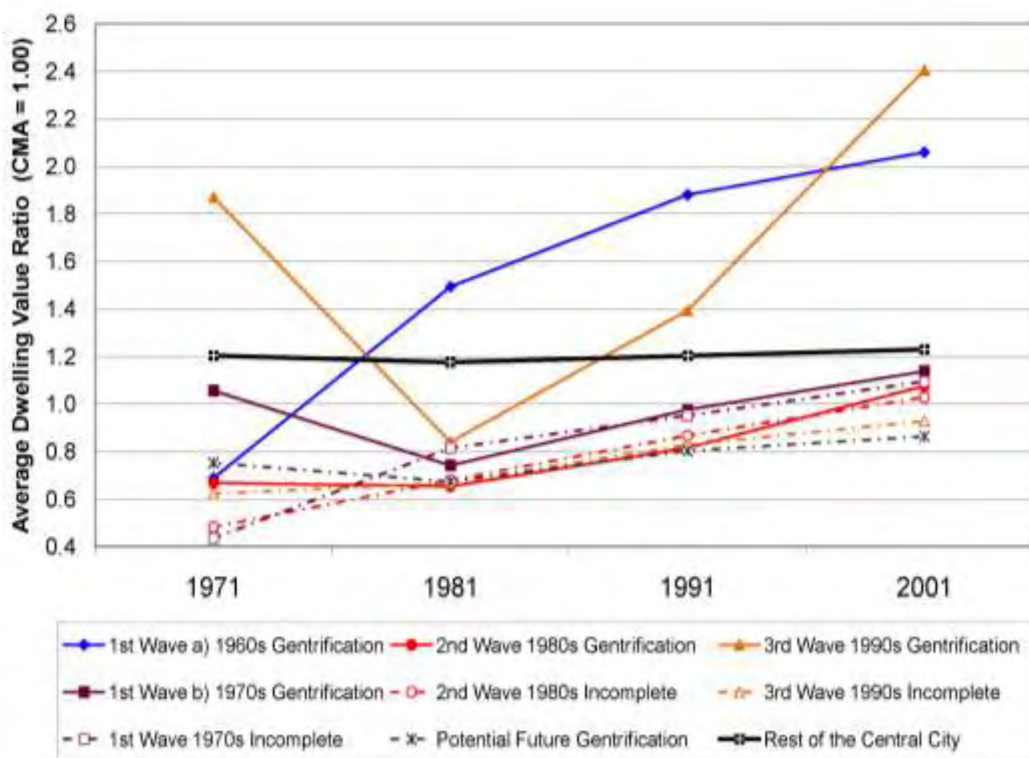


Figure 38: Average Dwelling Value (Ratio to CMA Mean), by City, 1971 – 2001

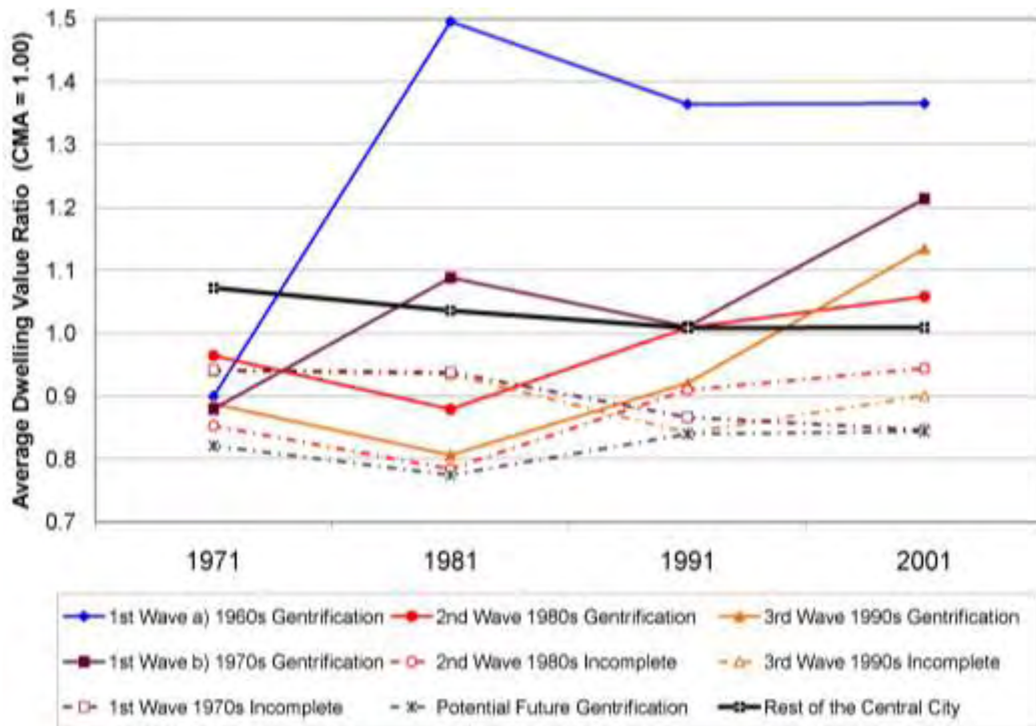
38 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: The average dwelling value ratio is calculated for each census tract in relation to the CMA. This chart traces the mean ratios for each gentrification group. Dwelling values are not adequately comparable from the 1961 census onwards.

38 b) City of Toronto



38 c) City Vancouver

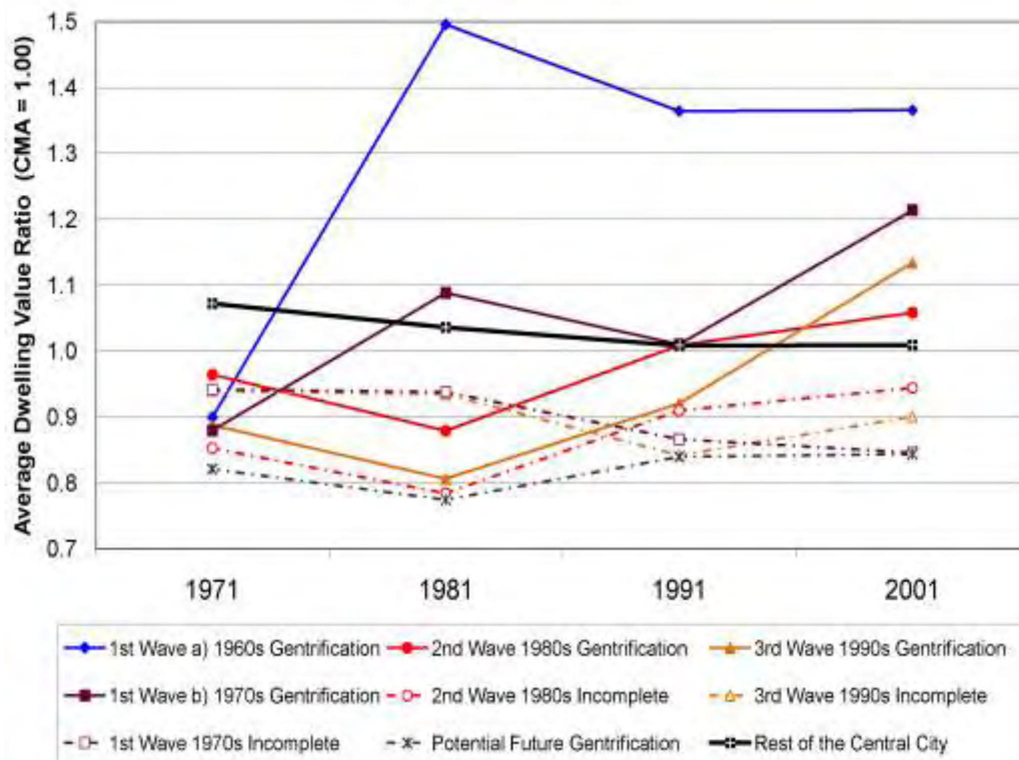
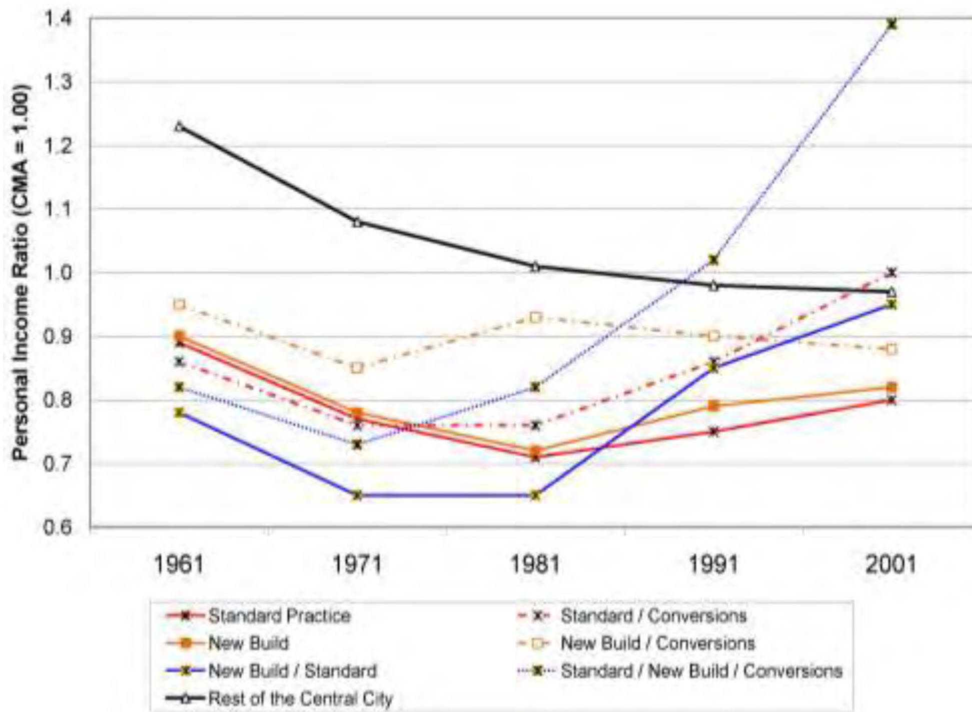


Figure 39: Average Personal Income (Ratio to CMA Mean), by Form of Gentrification, by City, 1961 – 2001

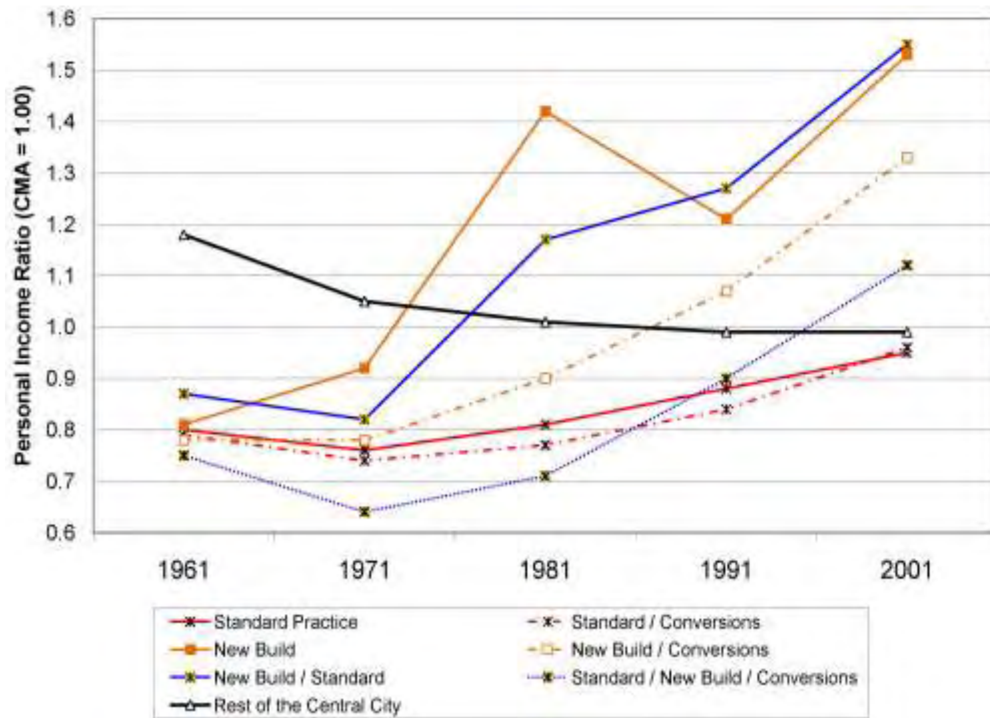
39 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: The average personal income ratio compares the average income from all sources of those aged 15 and over in each census tract to the Census Metropolitan Area (CMA). (*)Note, however, that only average employment income (ratio) is available in 1961 and this may affect the accuracy of the 1961-1971 rate of change. The above chart the mean values in each category for all three study cities.

39 b) City of Toronto



39 c) City of Vancouver

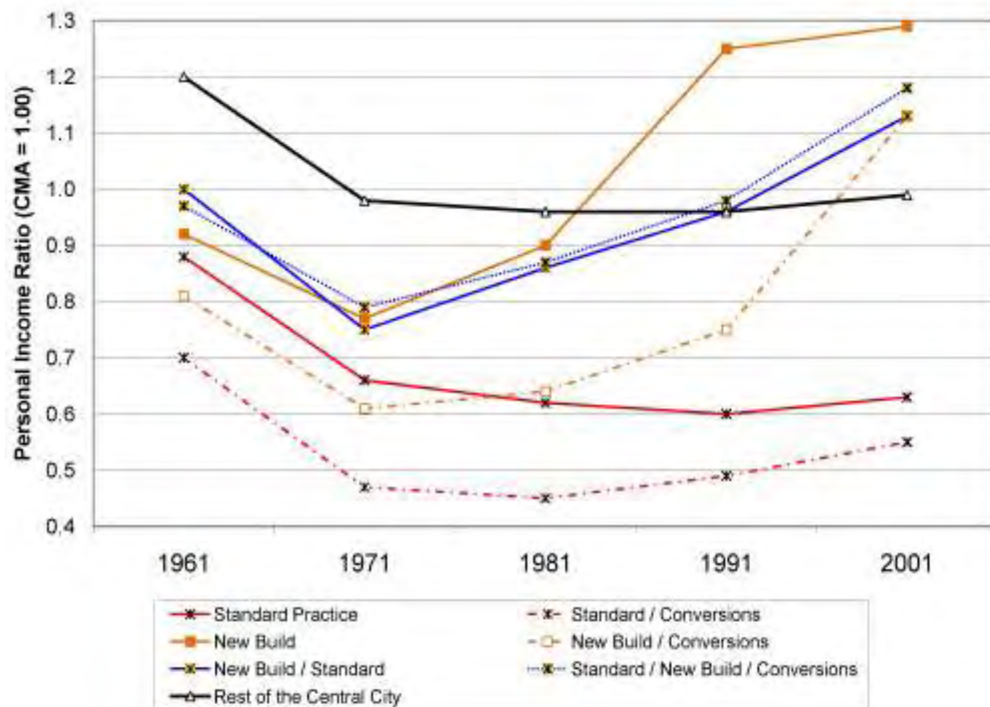
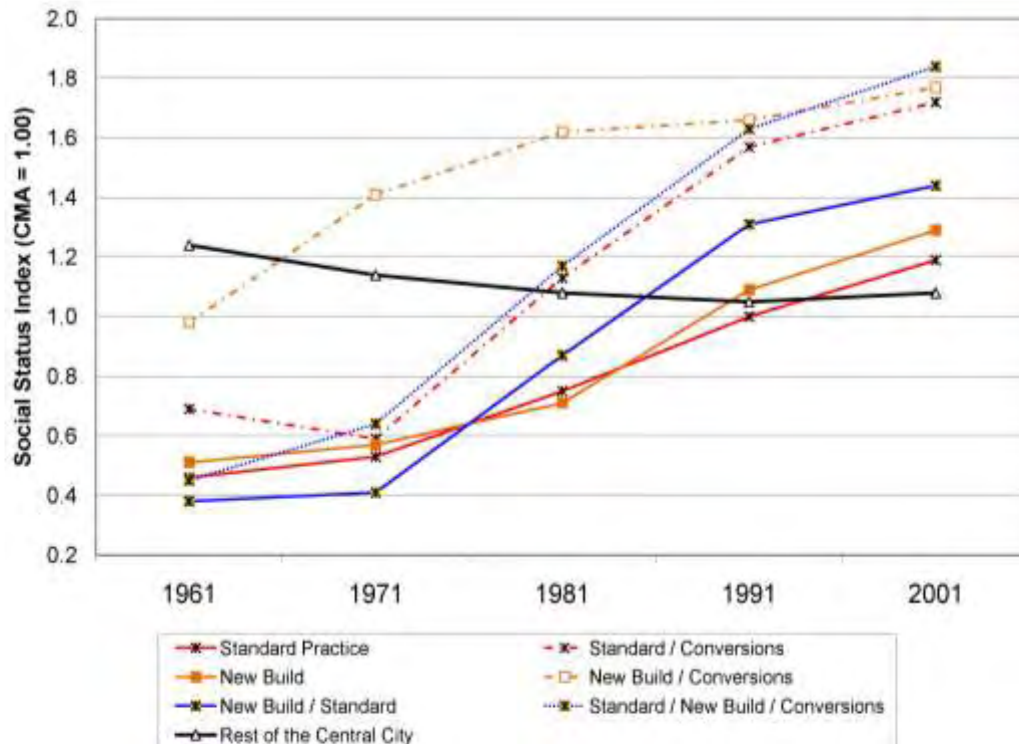


Figure 40: Social Status Index, by Form of Gentrification, by City, 1961 – 2001

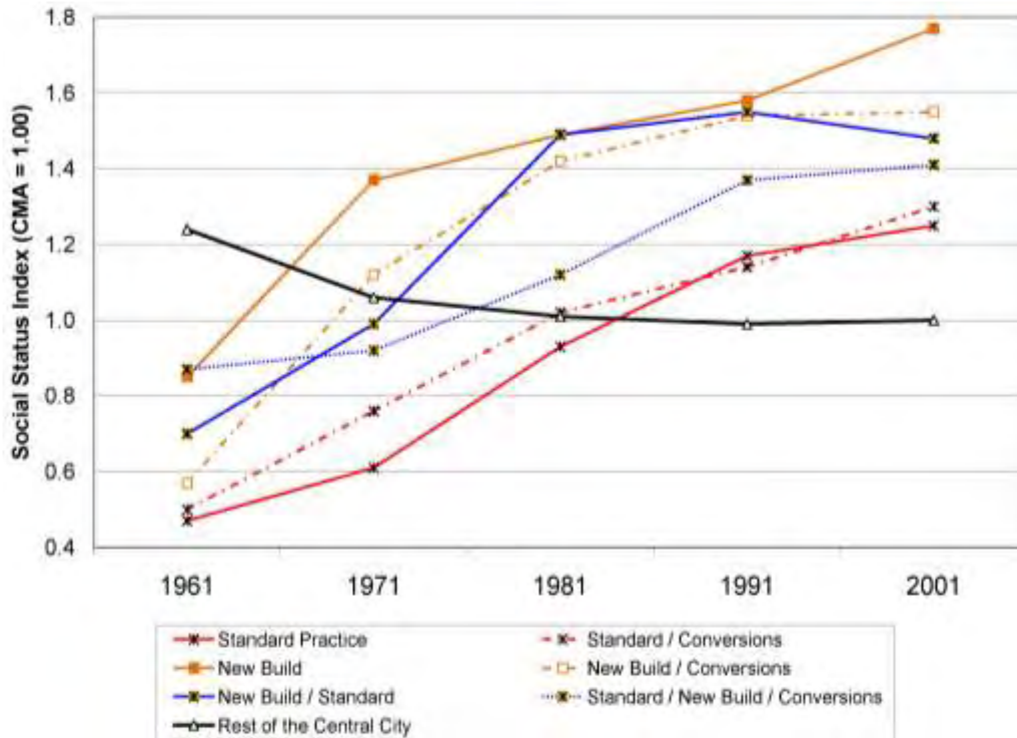
40 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: The social status index is a composite of the location quotient (LQ) of those with a university degree, and the location quotient for those employed in professional, managerial, health, engineering and applied science, law, religion and social work. Excluded occupations include clerical/secretarial, sales and services. In 1961 artists are also included in this index, which may partly explain the above-average index values for the 1st wave 1960s gentrification group in 1961.

40 b) City of Toronto



40 c) City of Vancouver

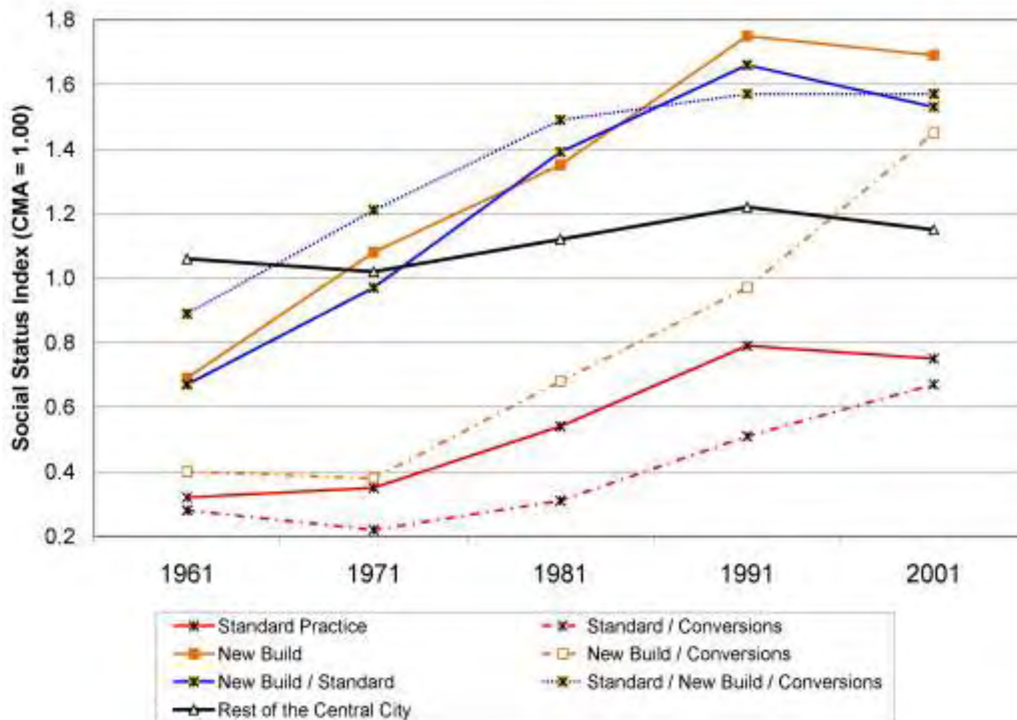
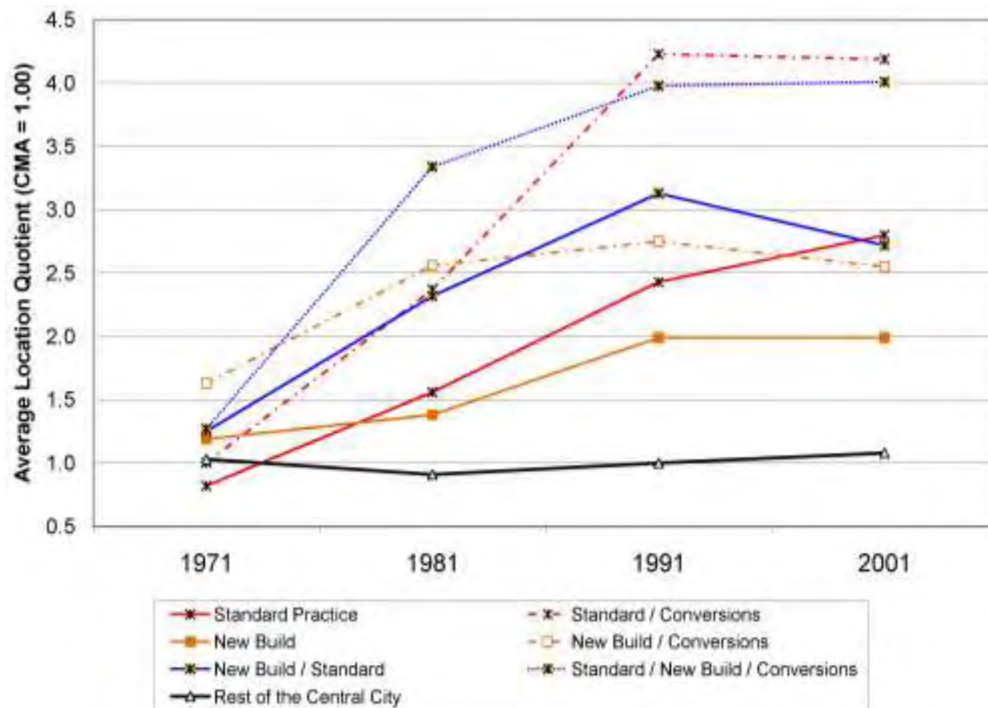


Figure 41: Average Location Quotient (LQ) for Artistic, Literary and Recreational Occupations, by Form of Gentrification, by City, 1971 – 2001

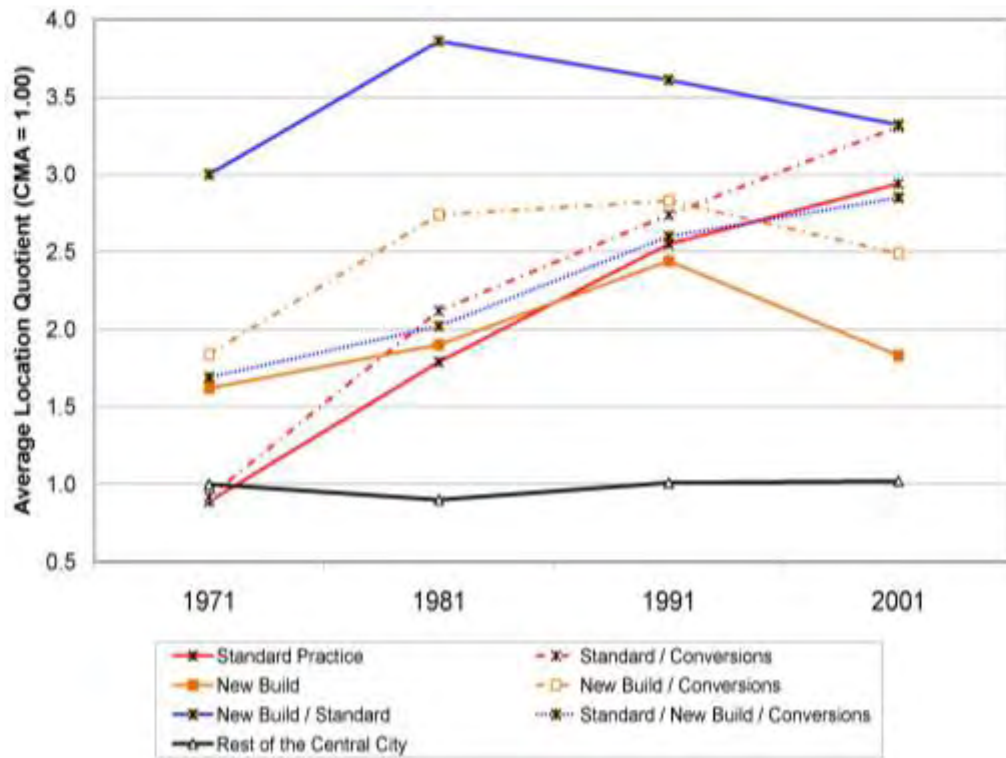
41 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: Values are the mean location quotient for each gentrification group calculated in comparison with the CMA.

41 b) City of Toronto



41 c) City of Vancouver

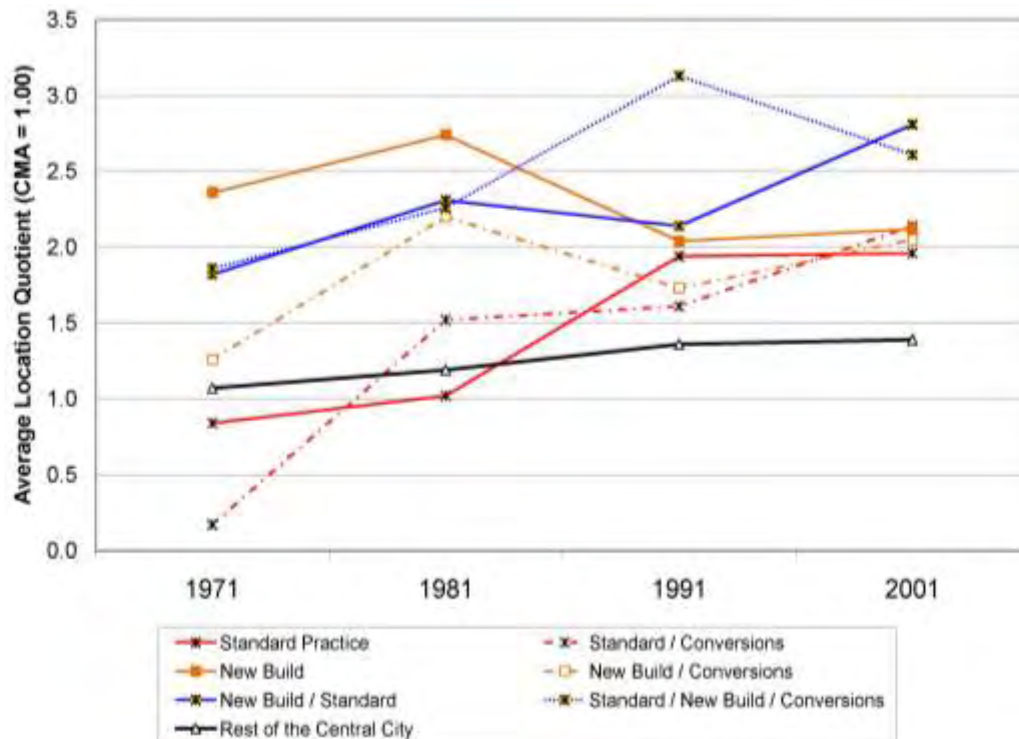
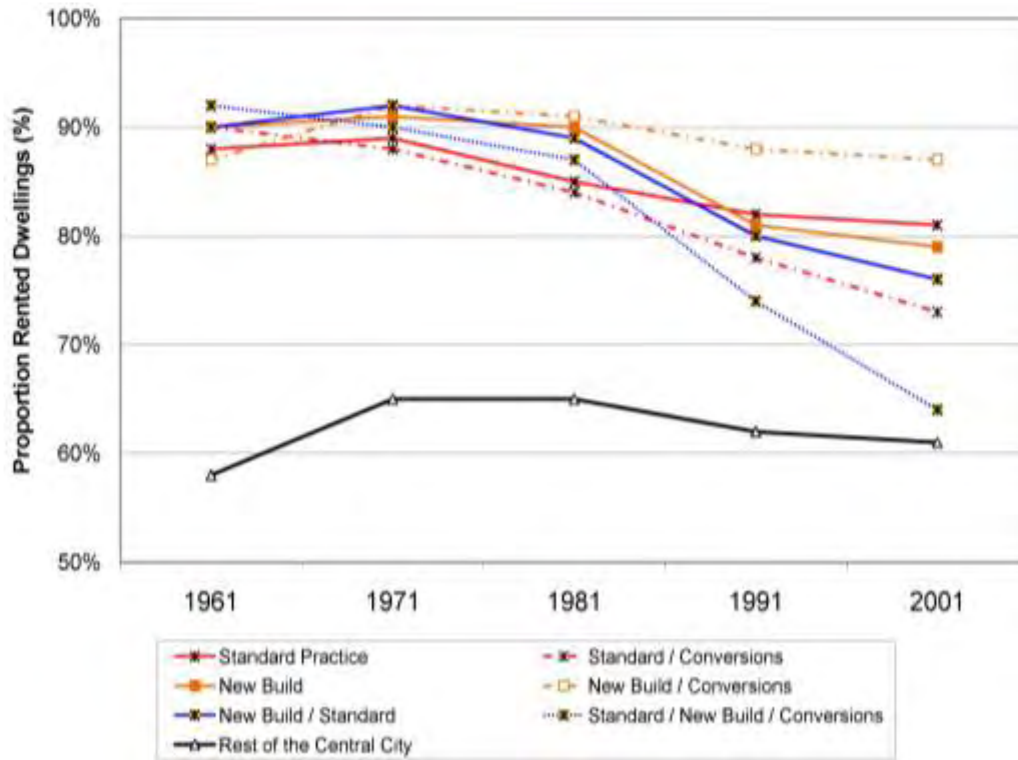


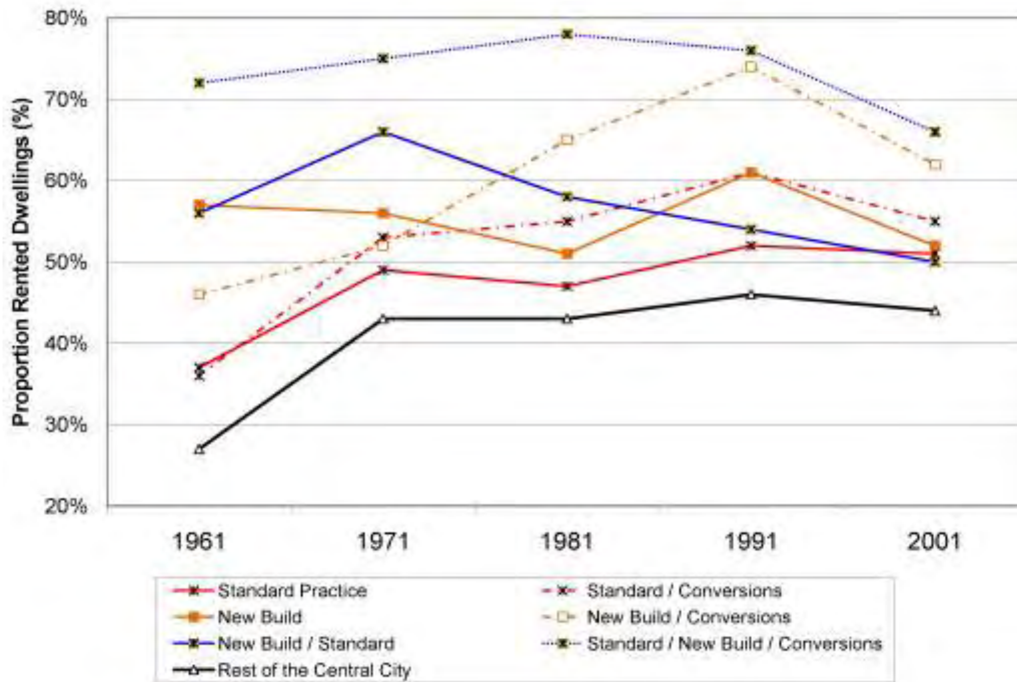
Figure 42: Proportion of Dwellings Rented, by Form of Gentrification, by City, 1961 – 2001

42 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years
Note: Shown is the mean proportion of all dwellings that are rented for each gentrification group.

42 b) City of Toronto



42 c) City of Vancouver

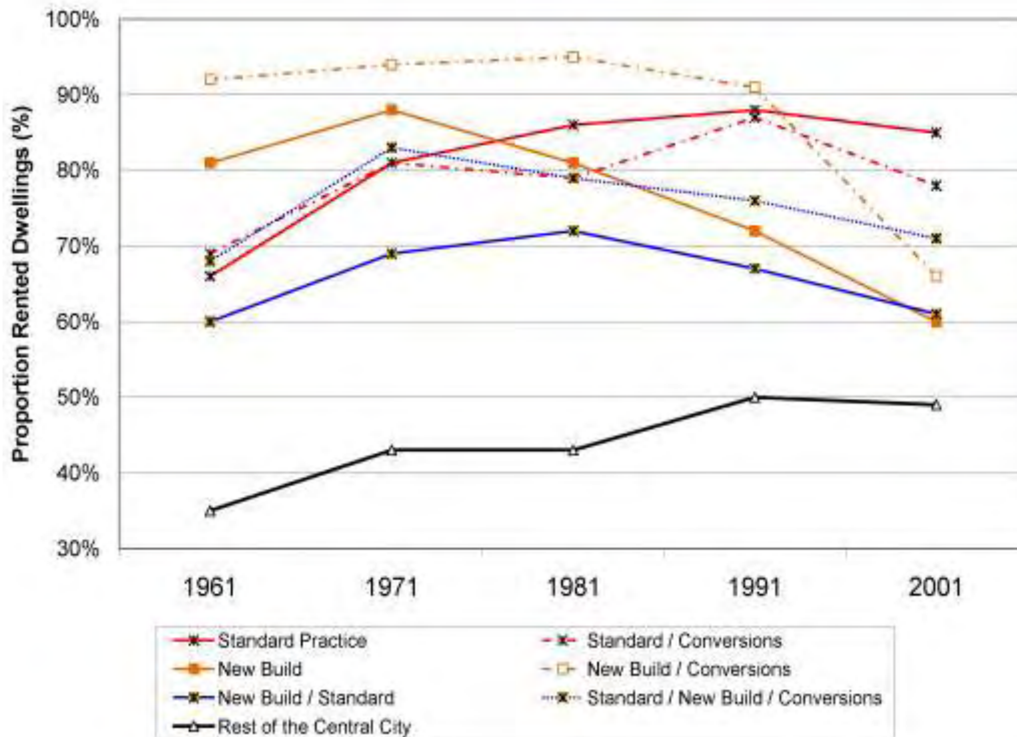
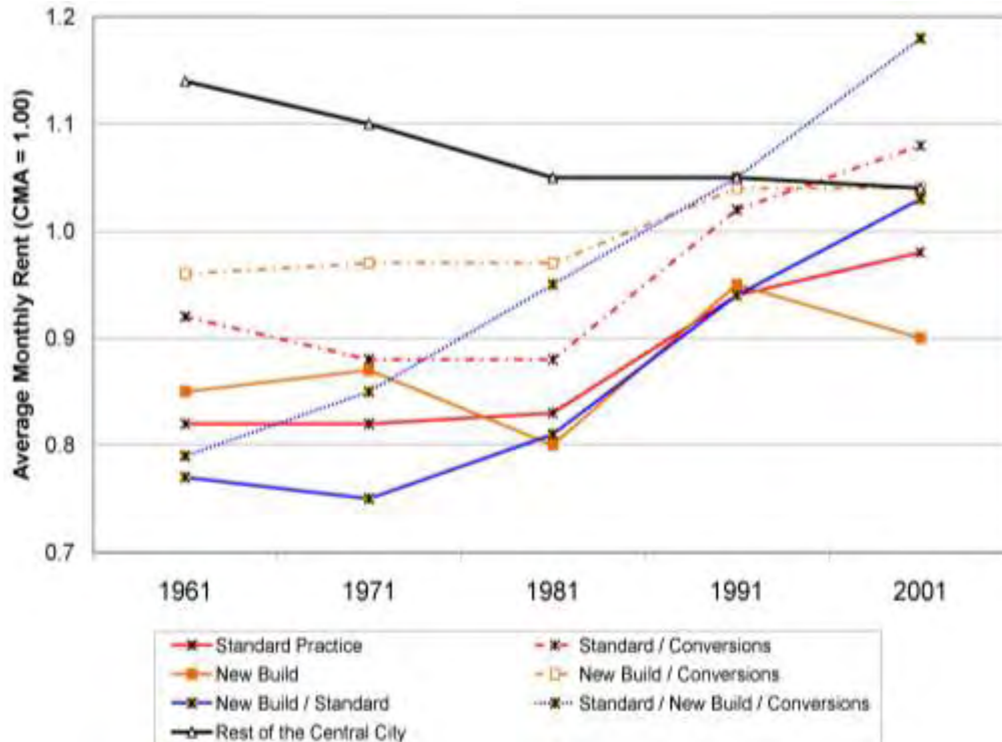


Figure 43: Average Monthly Rent (Ratio to CMA Mean), by Form of Gentrification, by City, 1971 − 2001

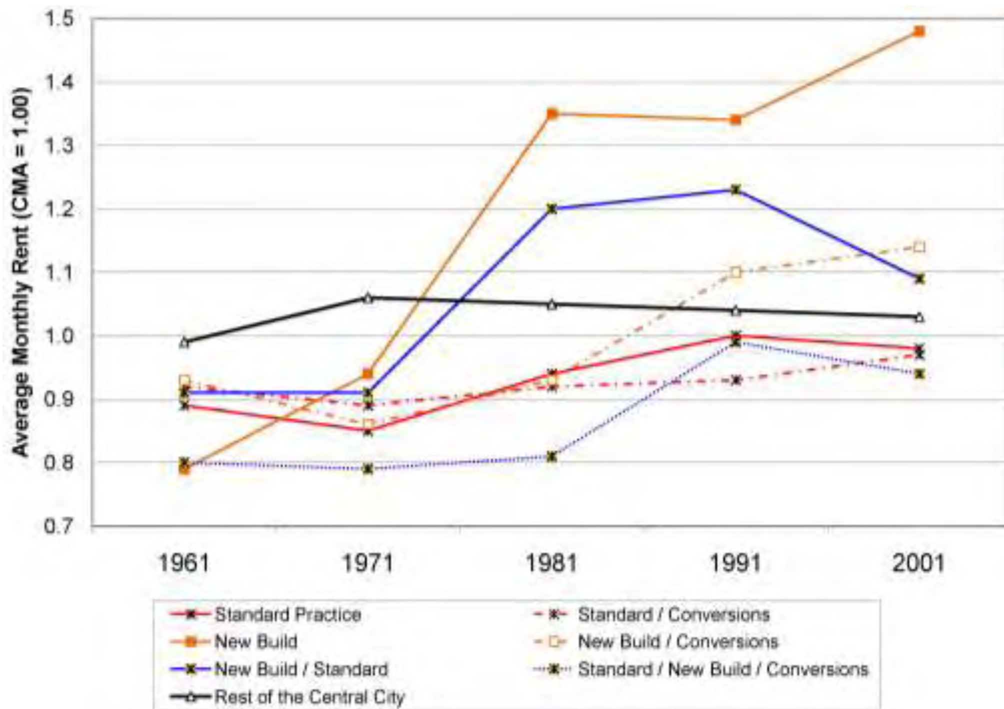
43 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: The average rent ratio is calculated for each census tract in relation to the average rent in the CMA. This chart traces the mean rent ratios for each gentrification group. Rents include both market and non-market housing which the Census cannot separate.

43 b) City of Toronto



43 c) City of Vancouver

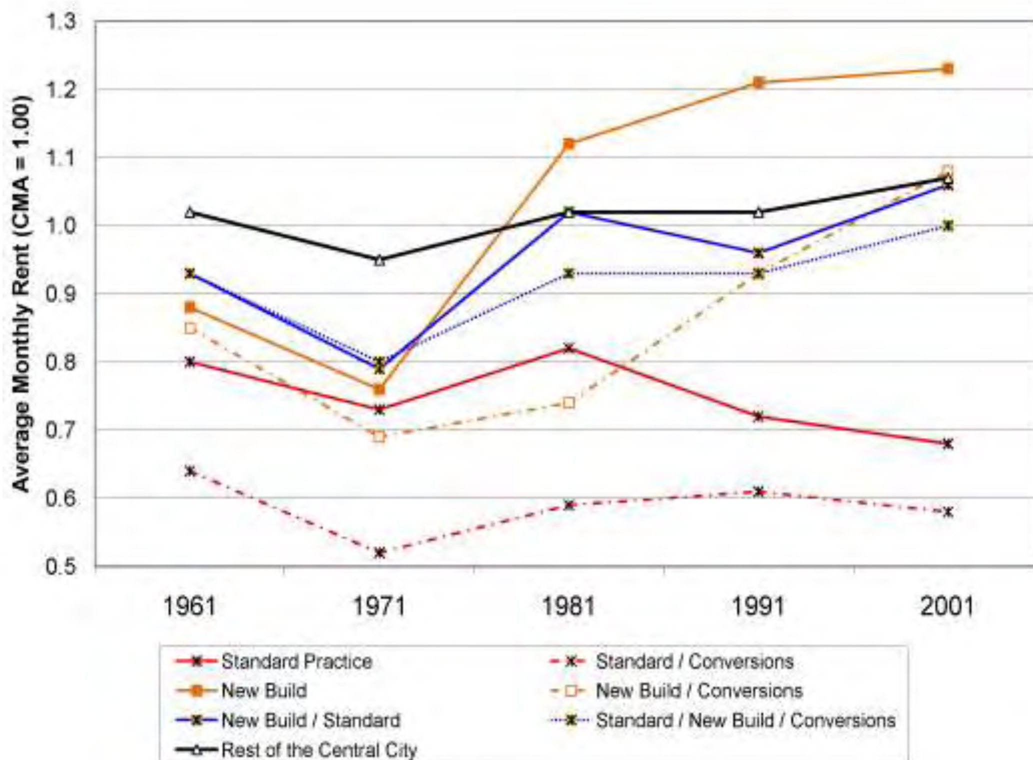
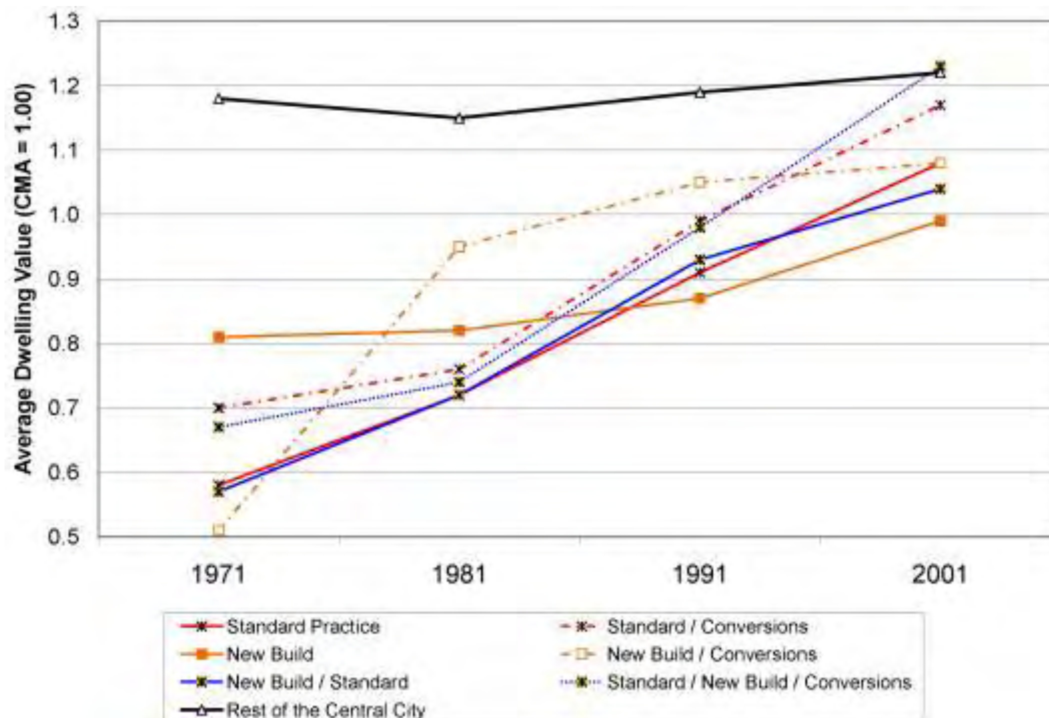


Figure 44: Average Dwelling Value (Ratio to CMA Mean), by Form of Gentrification, by City, 1971 − 2001

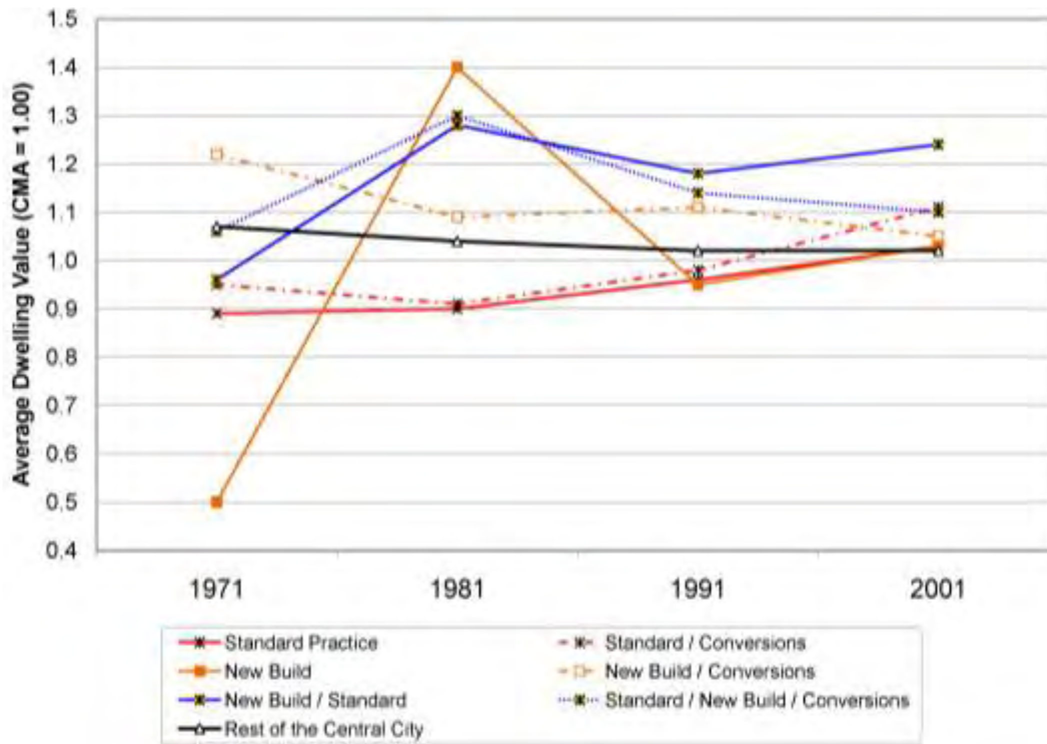
44 a) Montreal Urban Community



Source: Calculated by the authors from Census of Canada, various years

Note: The average dwelling value ratio is calculated for each census tract in relation to the CMA. This chart traces the mean ratios for each gentrification group. Dwelling values are not adequately comparable from the 1961 census onwards.

44 b) City of Toronto



44 c) City of Vancouver

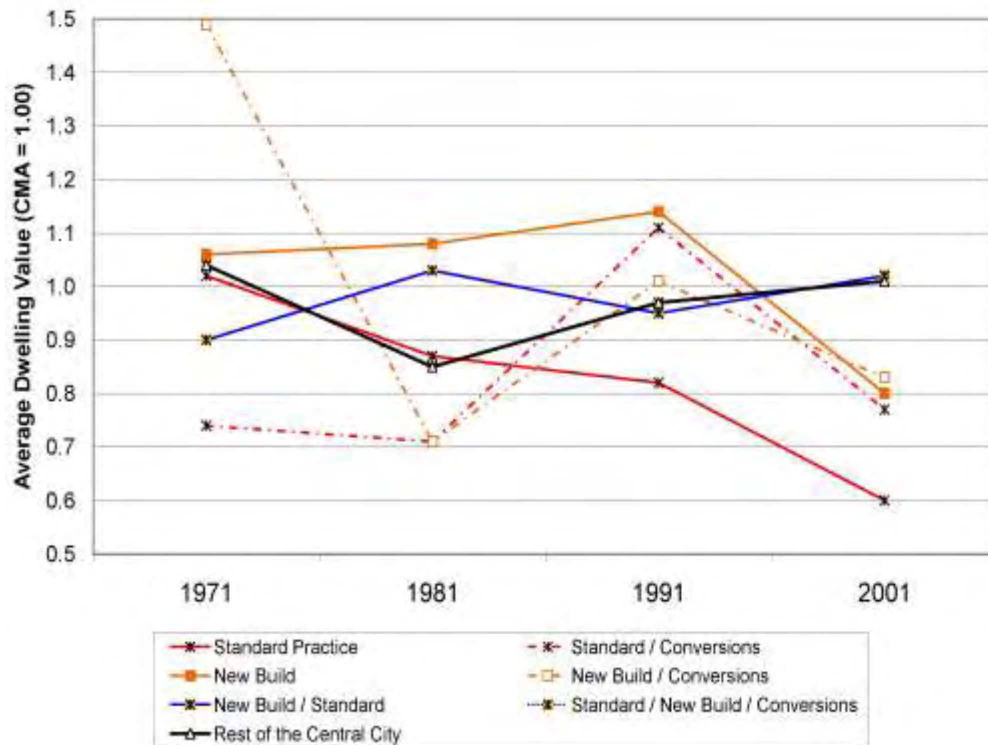


Table 9: Larger Principal Component Analysis (PCA), Including all 6 Sets of Variables, Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Vari-ance	Cum. %	Total	% of Vari-ance	Cum. %	Total	% of Vari-ance	Cum. %
1	2.63	10.96	10.96	2.63	10.96	10.96	2.50	10.41	10.41
2	2.46	10.23	21.19	2.46	10.23	21.19	2.16	8.99	19.40
3	2.15	8.94	30.13	2.15	8.94	30.13	2.15	8.95	28.35
4	1.59	6.63	36.76	1.59	6.63	36.76	1.70	7.10	35.45
5	1.51	6.29	43.05	1.51	6.29	43.05	1.41	5.88	41.33
6	1.27	5.28	48.33	1.27	5.28	48.33	1.41	5.86	47.19
7	1.19	4.97	53.30	1.19	4.97	53.30	1.34	5.57	52.76
8	1.15	4.81	58.11	1.15	4.81	58.11	1.28	5.35	58.11
9	1.03	4.28	62.39						
10	0.98	4.08	66.48						
11	0.94	3.92	70.39						
12	0.90	3.75	74.14						
13	0.84	3.49	77.64						
14	0.80	3.33	80.97						
15	0.71	2.95	83.92						
16	0.65	2.71	86.63						

Source: Calculated by the authors from Census of Canada, various years

Note: Census tracts are the units of analysis. The principal components analysis involved a pooled analysis of 1,130 census tracts from across the three central cities of Montreal, Toronto and Vancouver.

Table 10a. Expanded Rotated 8-Component Matrix, Pooled PCA for Montreal, Toronto, and Vancouver, with All 6 Sets of Variables Included

Variables	Component							
Change in	1	2	3	4	5	6	7	8
Artist Proportion 71 to 81	0.172	-0.037	**0.325**	**0.346**	**0.301**	**0.448**	-0.077	-0.162
Aritst Proportion 81 to 91	**0.263**	0.078	0.059	0.204	0.142	-0.245	0.017	**0.376**
Artist Proportion 91 to 96	0.125	0.104	0.103	0.144	0.207	0.129	0.033	**-0.747**
Artist Proportion 96 to 01	0.044	0.003	0.057	0.127	0.1	0.135	-0.025	**0.725**
Social Status 71 to 81	0.087	0	**0.806**	0.094	0.031	0.036	0.079	-0.005
Social Status 81 to 91	**0.79**	0.027	0.025	0.11	-0.103	0.049	0.132	-0.012
Social Status 91 to 96	0.021	**0.519**	-0.026	-0.014	0.166	-0.001	**-0.572**	0.093
Social Status 96 to 01	0.067	-0.085	-0.142	**0.539**	0.058	-0.11	**0.55**	0.053
Income Ratio 71 to 81	0.07	-0.045	-0.197	**0.357**	-0.212	**0.579**	0.066	0.026
Income Ratio 81 to 91	0.148	0.003	-0.03	0.089	-0.077	**-0.637**	0.165	-0.006
Income Ratio 91 to 96	-0.049	**0.61**	0.015	-0.199	-0.017	0.003	0.226	-0.025
Income Ratio 96 to 01	-0.032	-0.127	-0.063	0.088	-0.22	0.071	**-0.49**	0.028
Rental Share 71 to 81	-0.025	0.044	**0.821**	-0.123	-0.019	0.076	0.094	-0.014
Rental Share 81 to 91	**0.828**	0.005	0.038	-0.177	0.148	0.019	-0.001	-0.045
Rental Share 91 to 96	0.074	**0.758**	0.082	-0.05	0.175	0.006	-0.242	-0.012
Rental Share 96 to 01	0.024	-0.002	0.012	0.047	**0.752**	0.087	0.251	-0.02
Average Monthly Rent 71 to 81	-0.124	-0.023	**0.663**	0.118	0.012	-0.145	-0.31	0.016
Average Monthly Rent 81 to 91	**0.64**	-0.076	-0.134	**-0.533**	0.079	0.152	0.175	0.06
Average Monthly Rent 91 to 96	-0.051	**0.557**	-0.1	**0.359**	-0.067	-0.183	-0.07	-0.098
Average Monthly Rent 96 to 01	-0.056	-0.102	0.054	**0.433**	0.087	0.11	-0.033	0.031
Average Dwelling Value 71 to 81	-0.019	0.121	**0.392**	-0.183	0.119	**0.411**	0.221	0.039
Average Dwelling Value 81 to 91	**0.767**	-0.078	-0.042	0.101	-0.007	-0.265	-0.162	0.026
Average Dwelling Value 91 to 96	-0.052	**0.737**	0.043	-0.072	-0.218	0.088	0.101	-0.005
Average Dwelling Value 96 to 01	0.014	-0.061	0.021	0.063	**0.836**	-0.013	-0.06	0.008

Source: Calculated by the authors from Census of Canada, various years

Notes: The results shown are after Varimax rotation with Kaiser Normalization. The component loadings are the correlation coefficients between the variables (rows) and components (columns). The units of analysis are 1,130 census tracts from the central cities of Montreal, Toronto and Vancouver. Component scores above 3.00 are bolded.

Table 10b: Component Interpretation of the Expanded Principal Components Analysis

Component	
1	1980s upgrading, accompanied by increasing rental tenure
2	Early 1990s upgrading
3	1970s upgrading, but with increasing rental proportions (and no income increases)
4	Incipient but limited or stalled upgrading in the 1970s, followed by 1990s upgrading
5	Areas seeing rapid dwelling value inflation, as well as rental stock, in the 1990s
6	1970s upgrading in income and dwelling values (but not social status)
7	Areas negatively impacted by the early 1990s recession
8	Incipient artist concentration stalled in the 1980s, but resuming in the late 1990s