Fading Inner Suburbs? A Historio-Spatial Analysis of Prosperity Indicators in the Urban Zones of the 15 Largest Census Metropolitan Areas.

by

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A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Arts
in
Planning

Waterloo, Ontario, Canada, 2011

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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ABSTRACT

The possibility of urban decline in metropolitan post-war inner suburbs is currently being examined in the planning literature, particularly in the United States. Inner suburbs are built between 1946 and 1971 and are therefore older and structurally different from the later suburbs. At the same time, they lack the amenities of the core and the inner cities.

This thesis aims to examine whether inner suburban decline is occurring in Canada. 15 largest Census Metropolitan Areas (CMAs) are selected for the purpose of this study. All CMAs are then separated into five urban zones: the core, the inner suburbs, the outer suburbs, and the fringe/exurbs. All zones are then assessed for decline based on relative changes in median household income, average dwelling values, and average gross rent in the period between 1986 and 2006. Subsequently, nine of the largest CMAs are also assessed for declines in the prosperity factor and the exclusivity factor. These variables are extracted via a factor analysis which includes variables measuring demographic, socio-economic, and housing characteristics.

Results indicate that inner suburbs declined in median household income, the average value of dwelling, and the prosperity factor measures. In contrast, average gross rent and the exclusivity factor showed less clear results. Overall, the results obtained in this study suggest that Canada's inner suburbs are experiencing decline.

The possible causes of inner suburban decline remain poorly understood. A number of possible explanations are offered, ranging from the lack of urban appeal of the inner suburbs, the decline of the industrial employment sector, to aging housing stock, the movement of displaced low-income immigrants, and the aging of seniors with limited income. More research is necessary in order to establish plausible mechanisms beyond preliminary speculation.

A number of policy approaches to inner suburban decline are outlined. Emphasis is placed on the revitalization of housing, greater cooperation between metropolitan regions and implementation of smart growth strategies. Further research avenues include the confirmation of the phenomenon in Canada, as well as policy case studies examining the success of planning approaches in arresting inner suburban decline.

ACKNOWLEDGEMENTS

I thank my adviser, Joe Qian, and my committee member, Pierre Filion, for guiding me through the thesis process. This thesis would not have been possible without your guidance or your comments and suggestions. Thanks also go to my external reader, Jonathan Li, whose suggested final revisions helped sharpen my final draft.

Special thanks go to Edie Cardwell, the Graduate Studies Administrator for the School of Planning. Edie is the best administrator that any student could possibly ask for.

Thanks also go to my friends, both the 'old' and the new friends I met during my studies.

Finally, I would like to thank my family: my parents, Zdravko and Ana Pavlic, my brother, Slobodan Pavlic, and my partner, Jacqui Okum. Your unwavering support during the writing of this thesis was deeply appreciated. Thank you for being the loving family that you are.

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1. INTRODUCTION

1.1. CONTEXT

Increasing socio-economic disparity in the inner cities of the United States during the second half of the 20th century has been recorded by numerous scholars (Campbell & Sacks, 1967; Smith, 1973; Logan & Schneider, 1982; Frey, 1993; Halpern, 1995). In Canada, the phenomenon has been studied to a more limited extent, often focusing on the distinctiveness of Canadian inner cities (Mercer, 1979, 1991; Filion, 1987; Ley 1981, 1986). Yet, a number of studies have pointed out that Canadian inner cities also witnessed decay, although to a lesser extent (Bourne, 1989, 1993a; Ram, Norris, & Skoff, 1989; Broadway, 1995). More recently, many academics have begun to address the apparent renewal of the inner cities through a continuing process of gentrification in both the United States and Canada (Wyly & Hammel, 1999; Hackworth, 2005; Meligrana & Skaburksis, 2005; Walks & Maaranen, 2008).

At the same time, some researchers have pointed out that the early post-war North American suburbs are now declining, often at the expense of the more contemporary suburbs and possibly the revitalizing inner cities. Often classified as inner suburbs or inner-ring suburbs, they were built in roughly the first two decades of the post-war period (Lucy & Philips, 2000). While there are methodological disagreements concerning the extent, standardization, and the underlying causes of the inner suburban decay, a number of empirical studies have implied socio-economic decline in this urban zone. Jackson (1985) warned about the process in the mid-1980s, although most studies have been more recent (Lucy & Philips, 2000; Ley & Smith, 2000; Smith, Caris, & Wyly, 2001; Walks, 2001; Bunting, Walks, & Filion, 2004; Hackworth, 2005; Lee & Leigh, 2007).

Yet, the concept of inner suburban decline has not been extensively studied in Canada. The few studied that exist have addressed the phenomenon briefly, and largely with a focus on only a few large Canadian cities.

1.2. RESEARCH QUESTION AND OBJECTIVES

This thesis attempts to examine broad spatial patterns in Census Metropolitan Areas (CMAs), although its primary intent is to analyze the changes in economic prosperity of the inner suburbs in comparison to other urban zones. As such, the exploratory research question is as follows:

> *Is there empirical evidence of declining inner suburban prosperity in Canadian urban regions relative to other urban zones?*

In order to achieve an answer, three objectives are outlined in guiding the thesis:

a) To examine current academic literature and debate on inner suburban decline, particularly in the United States and Canada.
b) To better understand the spatial structure of CMAs and the interplay between different urban zones of a CMA, particularly in relation to the inner suburbs.
c) To investigate whether current planning policies at a municipal, provincial, and federal level can address the spatial realities of inner suburbs.

1.3. SUMMARY OF METHODS

Studying spatial patterns in urban regions is, by necessity, an exercise in quantitative research. As such, this thesis utilizes quantitative methods in attempting to answer the research question.

This thesis is largely exploratory in nature, as little current research on this topic exists in Canada. As such, this thesis analyzes spatial patterns in 15 largest CMAs in order to determine

whether inner suburbs are experiencing decay. The CMAs chosen include: Toronto, Montreal, Vancouver, Ottawa-Gatineau, Calgary, Edmonton, Quebec City, Winnipeg, Hamilton, London, Kitchener, St. Catharines-Niagara, Halifax, Oshawa, and Victoria. These CMAs, although they do not represent every province, represent every Canadian region and together constitute of over 50% of Canadian population.

The current research standardizes inner suburbs and other urban zones present in a metropolitan area by grouping census tracts—which are relatively small and stable geographic areas—into separate urban zones based on the age of housing stock contained within the tracts, as well as tract density levels. This approach allows for spatial comparison of urban zones within a metropolitan area irrespective of its often arbitrary municipal boundaries (Walks, 2001; Bunting et al., 2004; Lee & Leigh, 2007). The CMAs studied in this research are separated into five zones: the core, the inner city, the inner suburbs, the outer suburbs, and the fringe/exurbs.

All urban zones are then analyzed in two separate research stages. In the first stage, change in three variables—median household income, average value of dwelling and average gross rent—is calculated for all urban zones between 1986 and 2006 for all 15 CMAs. The selected variables are used as three separate markers of economic prosperity. In the second stage, nine variables that are separated into demographic, socio-economic, and housing categories are reduced via a factor analysis. Only factors which explain a significant amount of variance are extracted. Furthermore, only factors which broadly measure economic prosperity are retained. Change in the retained factors is then calculated for all urban zones between 1986 and 2006 for the nine largest CMAs.

This thesis then presents a conceptual model of inner suburban decline. Two trends are identified in this model: the decentralizing trend and the back to the city trend. All thesis findings are compared against three predictions that are generated from this simple model:

1. Prosperity will decline in the inner suburbs of most CMAs.
2. Prosperity will increase in the outer suburbs and the fringe/exurbs of most CMAs.
3. Prosperity will increase in the core and/or the inner city of some CMAs. This effect will happen mostly in larger CMAs; prosperity may in fact decrease in these urban zones in the smaller CMAs studied.

1.4. SIGNIFICANCE OF RESEARCH

Quantitative research that attempts to spatially assess the possibility of inner suburban decline in Canadian CMAs is almost completely absent in the planning literature. While American empirical research on this topic exists, and while the spatial patterns of the two countries are often analogous, they are not entirely congruent (Filion, Bunting, McSpurren, & Tse, 2004). As such, American conclusions and findings should be applied to Canadian urban regions with caution. Therefore, the proposed research seeks to address the current gaps in planning literature by investigating whether there has been a significant spatial shift in the inner suburbs of Canadian CMAs. A steep decline in the inner suburbs would necessitate changes in planning policy.

1.5. THESIS ORGANIZATION

Chapter Two presents the available literature on inner suburban decline. It focuses on possible reasons for decline and whether it is a systemic phenomenon. It also explores methodological disagreements among researchers in conceptualizing and measuring decline. Although most

research on this concept is American, relevant Canadian research is also discussed in this chapter.

Chapter Three presents the research methodology of the thesis. This includes the description of data collection methods, site selection, as well as a discussion of measuring zonal decline. An overview in the way the urban zones are standardized is presented, the study time period, the conceptual model, and variable selections are discussed. Furthermore, methodological limitations and delimitations are addressed.

Chapter Four presents the findings of the thesis. It presents findings for all the variables used in this research.

Chapter Five provides a brief discussion of the findings; in particular, it provides possible mechanisms which may explain the findings.

Chapter Six discusses possible policy implications of inner suburban decline. A number of potential solutions to the decline are presented.

Chapter Seven offers a brief conclusion of this thesis. Future directions for research are also outlined in this final chapter.

2. LITERATURE REVIEW

2.1. INTRODUCTION

The geographic order of post-World War II North America consisted of a series of sprawl-inducing events. The most significant of these were the growth of the automobile industry, coupled with government financing of the highway system, government-backed mortgages, and the increased affluence of the middle-class (Checkoway, 1986; Harvey, 1989; Fishman, 2000; Walks, 2001). As a result, the inner city areas underwent a long and protracted period of disinvestment. The decentralizing geographic shift spurred social and income homogenization in newly-created suburban subdivisions, while withdrawing at least some and — especially in the United States — often significant capital from inner cities (Bourne, 1989; Broadway, 1995; McCann, 1999; Lucy & Philips, 2000; Hackworth, 2005).

In contrast, the suburbs expanded outward, appearing largely immune to similar decay. Indeed, the spatial configuration of North American metropolitan regions was conceptually understood as consisting of two dichotomous parts: the city and the suburb (Harris & Lewis, 1998). Consequently, they were seen as a separate sphere, in which the laws of supply and demand of the housing market protected its economic, socio-cultural, and political well-being (Smith et al., 2001). Therefore, any neighbourhood decline was perceived as a plight reserved for the inner city, a problem that could only be alien to the suburban realm.

2.2. PREVALENCE OF, AND POSSIBLE REASONS FOR, THE DECLINE

Inner suburban decline — that is, the decline of the suburbs built in roughly the first two decades of the post-war period — has nevertheless become apparent in a variety of different locations (see Jackson, 1985; Harvey, 1996; Lucy & Philips, 2000; Smith et al., 2001; Hackworth, 2005; Lee & Leigh, 2007, among others). If such a decline is systemic among North American

metropolitan regions, urban theorists argue that the planning challenge of inner suburban revitalization will be far more serious than inner city rejuvenation as suburbs lack the city's distinctive amenities (Lucy & Philips, 2000; Smith et al., 2001; Fitzgerald & Leigh, 2002). In particular, suburbs suffer from a shortage of nonmarket organizations, such as government centres, universities, churches, and other socio-cultural institutions. These organizations may invest in declining neighbourhoods which adjoin them, even if such actions are not in tune to prevailing market forces. Furthermore, inner suburbs lack urban vistas, multi-modal transportation infrastructure, attractive architecture, walkable neighbourhoods, and diverse entertainment options (Orfield, 1997; Fitzgerald & Leigh, 2002). The decaying inner suburban landscape, then, may prove a serious challenge to the economic vitality of metropolitan regions.

Those who view inner suburban decline as a deep-seated occurrence (see Harvey, 1996; Lucy & Philips, 2000; Hackworth, 2005; Lee & Leigh, 2007) assume it to be a product of a number of related events spanning several decades. Principally, these include the gentrification of the inner city, a shift in real estate preferences, and a noticeable deterioration of inner suburban housing stock. While gentrification was at first deemphasized as consisting of little more than scattered and diffuse inner city renewal within a far larger environment of inner city decay (Berry, 1985; Bourne, 1993b), it gathered significant momentum in numerous cities following the recession of the 1990s (Wyly & Hammel, 1999; Hackworth, 2005). Hackworth's (2005) study of the ten largest metropolitan regions in the United States is particularly illustrative, as most of the regions studied experienced increasing inner city affluence, combined with inner suburban decline. Similarly, research done in the metropolitan areas of Atlanta, Cleveland, Philadelphia, and Portland has recognized increasing impoverishment in inner suburban areas of those regions, coupled with a renaissance of their inner cities (Lee & Leigh, 2007).

Paradoxically, the rejuvenation of the inner city did not halt the physical expansion of the outer suburbs, which continued to grow during the same time period (Lewis, 1983; Garreau, 1991; Soja, 1992). These new suburbs feature housing stock more in line with market preferences; in contrast, the housing of post-war suburbs is often in a state of disrepair, and lacking in modern amenities and space (Harvey, 1996; Lucy & Philips, 2000). This problem is further exacerbated by the fact that early suburban housing is built to modest standards within the same time frame; thus, the housing stock declines in unison (Kling, Olin, & Poster, 1991).

As inner suburban fortunes are directly related to the vibrancy of the local housing market, it becomes possible for more affluent residents to escape from their declining neighbourhoods by moving farther out to more recent and stable subdivisions, or even to certain inner city neighbourhoods experiencing a buoyant housing market (Lucy & Philips, 2000). As a result, the older inner suburban ring is caught in the middle: the inner suburban areas experience disinvestment and the movement of affluent elites often into either the inner city areas or the more preferred outer suburbs, while at the same time welcoming the underclass displaced by gentrifying forces. However, the movement of people may not be direct in every circumstance. Berry (1999) argues that gentrification is confined only to certain, generally larger, cities with strong central business districts. Therefore, in metropolitan regions devoid of a strong urban center the movement of people may be more unidirectional as the affluent members move into the outer suburbs and the fringe/exurbs, while lower income households populate both the inner city and the inner suburbs (Bier, 2001).

Smith et al. (2001), however, note that changing market preferences do not sufficiently explain the causative factors of inner suburban decline and argue that the catalyst for the process is instead found in the declining supply of available capital. Hence, it is not necessarily the

movement of people that commences the process of decline, but rather capital disinvestment in the form of decreasing mortgage commitments from banks and failure to invest in current housing stock. The process of disinvestment is especially evident in the earliest post-war suburbs which largely housed an industrial class of workers. In such cases, the linkages between the decline of the industrial sector and the residential decline of these working-class neighbourhoods are direct (Smith et al, 2001; Walks, 2001). Hence, any movement of people into, and out of, the inner suburbs is a consequence of, not the reason for, the decline.

Neither explanation, of course, may be mutually exclusive. Hudnut (2003) has argued that population decline, followed by the loss of an established tax base, infrastructure disrepair, and increased levels of suburban poverty, sets the stage for capital disinvestment. Bier (2001) has similarly noted that the process of decline is especially acute when construction of newer and larger housing in a metropolitan area outstrips the actual growth of the number of households. In such situations, households may indeed move to the outer suburbs based on market preferences. However, many of them may not be replaced, thus eroding the tax base, and causing a sharp drop in housing values and capital investment (Mieszkowski & Mills, 1993; Lucy & Philips, 2000).

It is therefore apparent that fickle housing markets and changing market preferences — and the resulting dynamic shifts in interurban populations — cannot be ignored. The suburbs of metropolitan regions are, in fact, surprisingly vulnerable as the median stay of home-owners is only eight years (Lucy & Philips, 2000). Therefore, as the housing goals and financial capacities of households increase, they more often choose to enhance their housing quality by investing in a new and improved dwelling, rather than reinvesting in their current housing stock (Varady & Raffel, 1995; Lucy & Philips, 2000; Bier, 2001). This is largely because secure housing

investments are the predominant considerations in home buyers' real estate preferences (Varady & Raffel, 1995).

The high rates of mobility also raise the question of whether the suburban home owners place any attachment to their suburban communities, aside from their vested interest in their real estate investments. Troublingly, the mobility present in the suburban home ownership sector is mirrored in the commercial sector, as businesses have few ties to suburban communities they are located in (Bier, 2001). Thus, they can easily sever their connections and move further outward in pursuit of cheaper and more plentiful land. Furthermore, businesses located in the suburbs are not dependant, nor do they rely, on local suburban jurisdictions (Lucy & Philips, 2000). Instead, they depend on a large catchment area spanning a large commuting distance that crosses into numerous separate communities.

2.3. THE POSTMODERN CHALLANGE

Not all theorists, however, view inner suburban decline as a systemic process. In particular, postmodern urbanists reject the idea that urban growth, expansion, decay, and rejuvenation can be understood according to such notions (Soja, 1989; Knox, 1991; Dear & Flusty, 1998; Dear, 2003). These scholars instead argue that metropolitan regions no longer function as a singular monolithic entity which originates from the center and expands outwards, but rather as a combination of different entities that do not necessarily interconnect. Indeed, the geographic configuration and the prevalence of capital or disinvestment is, at least seemingly, random (Dear & Flusty, 1998). Accordingly, the expansion of the outer suburbs, the decline of the inner suburbs, and the gentrification of the inner city are not treated as a deep-rooted occurrence that

functions similarly in different metropolitan regions, but rather as localized phenomena that cannot be easily universalized.

The postmodernist reply, however, ignores the singular nature of suburbs and its continued dependence on the central city. Suburbs generally consist of a relatively small number of decentralized subdivisions and are therefore politically and spatially fragmented (Lucy & Philips, 2000). In cases where suburbs have been annexed into the larger central city, they may be further weakened as they compete for resources with other subdivisions and the inner city (Orfield, 1997). Consequently, due to their low densities and disjointed nature, they cannot attract the same allegiance of business and political elites, hospitals, universities, and other high-profile institutions which often support and finance inner city rejuvenation projects (Orfield, 1997; Lucy & Philips, 2000; Orfield, 2002). Clearly, any nuanced analysis of the suburbs must include an acknowledgment of the centralizing forces which exist in metropolitan regions.

The post-modern challenge to more traditional understandings of spatial order is salient insofar as it challenges generalization of emergent patterns from a few individualized case studies. As an example, a research concentrating on the inner suburbs of the deindustrialized north and east of the United States (Beauregard, 1993; Hill et al., 1995; Adams, Fleeter, Kim, Freeman, & Cho, 1996) cannot necessarily demonstrate endemic decline. Furthermore, it is important to note that less geographically specific research does not demonstrate that a downtrend in inner suburban fortunes is ubiquitous. Indeed, some have experienced an increasing affluence during the time period of supposed deterioration (Lucy & Philips, 2000). Therefore, any explanatory models are likely to be incomplete and offer only crude predictions. In addition, any generalizations are further complicated by a lack of methodological agreement in conceptualizing inner suburban decline.

2.4. METHODOLOGICAL DISAGREEMENTS AND LIMITATIONS

There is no standardized definition of both temporal and spatial characteristics of inner suburbs. Most scholars define them as the suburbs built in the first two decades of the post-war period, but some have included earlier pre-war suburbs in the definition (Beauregard, 1993). However, any inclusion of the early twentieth century streetcar suburbs into a larger inner suburban classification may considerably alter the study results as the former consist of very different density patterns, transportation options, and housing stock composition (Lee & Leigh, 2007). Hudnut (2003) has proposed that inner suburbs can best be defined by relabeling them as 'first-tier' suburbs, which would account for both their timing of the development, as well as their spatial location.

Even more troubling is the absence of a standardized method which could be used to accurately identify the spatial boundaries of inner suburbs. Most of the conducted studies rely on political boundaries separating the central city from its closest suburban counterparts (Beauregard, 1993; Hill et al., 1995; Smith et al., 2001). However, if the suburbs and the central city are not dichotomous, the political boundaries between different municipalities are, to a large extent, arbitrary and may not represent accurate divisions between the inner city, the inner suburbs, and the outer suburbs. The value of the political boundaries as a proxy for spatial divisions is further diminished by the fact that many cities have extended their territories through annexation and amalgamation of former separate municipalities (Baldassare, 1986), thus further blurring the lines between the inner city and the inner suburbs. Consequently, several authors have suggested 'fixing' the location of inner suburbs based on the predominant age of housing of individualized census tracts (Bunting et at., 2001; Bunting et al., 2004; Lee & Leigh, 2007). Essentially, the inner suburban ring in such models is reserved for census tracts in which the age of predominant

housing stock usually dates between the immediate post-war period and the political and economic restructuring of the early 1970s.

A further limitation in the literature is a failure in standardizing measurement indicators which could be used to represent the deterioration of inner suburbs. Consequently, differing indicators may be used as illustrations of inner suburban decline. For example, studies may rely on one or few variables, such as per capita income or housing affordability. As a result, Lee & Leigh (2007) argue that scholars may arrive at contradictory conclusions due to widely diverging methods. They instead rely on a factor analysis based on demographic, socioeconomic, and housing characteristics: the demographic variables track the proportion of young, elderly, and visible minorities; the socioeconomic variables track poverty levels, welfare recipients, unemployment rates, education levels, and relative per capita income; finally, the housing characteristics track the proportion of home owners, renters, and overcrowded housing units. Nonetheless, certain singular market indicators, such as the value of housing stock, as well as per capita and household income, help to assess the economic health of selected metropolitan regions even if such illustrations are incomplete (Lucy & Philips, 2000; Bunting et al., 2004; Hackworth, 2005).

2.5. THE CANADIAN EXPERIENCE

Perhaps surprisingly, there is a lack of Canadian research which directly addresses the corrosion of the inner suburbs. This is especially unexpected given that the spatial realities of Canadian Metropolitan Areas of the post-war era are often at least somewhat analogous to those of the United States (Walks, 2001; Bunting et al., 2004). Nonetheless, most studies treat inner suburban decline as a secondary concept within the wider theoretical framework of spatial

patterning of urban poverty in Canadian metropolitan regions (Bunting et al., 2004), global city polarization in the post-Fordist era (Walks, 2001), or of deprivation and dependency of seniors, immigrants and other disadvantaged groups (Ley & Smith, 2000).

What little research exists appears to confirm that inner suburbs in Canada are not immune to decay that has historically affected many of the Canadian inner cities (Ley & Smith, 2000; Walks, 2001; Bunting et al., 2004). In particular, Ley and Smith's (2000) analysis of Toronto, Montreal, and Vancouver demonstrates some evidence of suburbanization of poverty, particularly in certain inner suburban pockets largely populated by immigrants. Similarly, Walks' (2001) study of the Toronto CMA further reveals increased polarization in the inner suburbs of Toronto between the census years of 1971 and 1991. However, neither study is sufficiently extensive as to offer a broad Canadian perspective on the subject. The most inclusive research is presented in Bunting et al.'s (2004) paper which analyzes spatial patterns of rental housing affordability stress of eleven large CMAs. Their research suggests that most cities in Canada exhibit a 'dual-city' form, in which either the inner city or the inner suburbs shelter the largest proportion of urban poor. However, this study cannot be used as evidence of inner suburban deterioration since it lacks an essential temporal component, which is necessary to illustrate any declivity between two different points in time.

Furthermore, inner suburbs may exhibit considerable decline without a dramatic change in income polarization, concentration of poverty, or housing affordability stress. In particular, a significant dip in median household incomes may signal some, or considerable, disinvestment even if other indicators do not change drastically (Lucy & Philips, 2000). For example, a decrease in land values relative to the CMA as a whole, or an income decrease of current home owners, may not substantially change the number of households below the low income cut-offs,

or the number of household facing housing affordability stress, but it still represents a loss of tax base and increased capital disinvestment representing tangible, though not easily visible, decline. This is not to say that the indicators and indices used in the Canadian studies so far are of little value, especially because they can be used to analyze possible deterioration of high-rise and low-rise rental apartments and social housing that was built in the inner suburbs of many Canadian CMAs during the suburban apartment boom of the 1960s and 1970s (Murdie, 1994).

2.6. RESEARCH DIRECTION

This thesis attempts to build on the current research addressing inner suburban decline in North America. In particular, it accepts the general consensus in the literature, which concludes that inner suburbs exist as a separate spatial category, distinct from the earlier inner city and the more distant suburbs and exurbs. It accepts this view based on the current research available which shows that the current paradigm remains useful in generating valuable data that may aid planners in policy analysis. As such, this thesis will aim to provide additional evidence to a researched phenomenon, rather than opening a new field of inquiry.

The new evidence that this thesis will attempt to offer is important in two separate ways. Firstly, this thesis will attempt to study a large urban system. This system includes fifteen separate large and mid-size CMAs. Most studies on the phenomenon of inner suburban decline have used fewer urban regions in attempting to provide evidence of decline in inner suburban prosperity. Larger studies, such as the Lucy and Philips (2000) study of over 500 suburban municipalities, exist; however, such studies have classified inner suburban boundaries based on municipal boundaries. In contrast, the current thesis will attempt to spatially standardize boundaries of inner suburbs, as well as other urban zones, in order to offer a consistent and repeatable approach in measuring

inner suburban decline across differing urban regions. This approach will largely parallel the work of Bunting, Walks, and Filion (2004) and Lee and Leigh (2007). As a result, this thesis will be able to compare the performance of inner suburbs in comparison to other urban zones, including the centralized inner cities, and the more distant outer suburbs and fringes. Such an approach will enable this thesis to more thoroughly gauge the extent of economic decline (if any) in the inner suburbs.

Secondly, this thesis will attempt to examine evidence for the phenomenon using the Canadian spatial landscape. The evidence coming from the United States can currently be interpreted in regards to Canadian experience with caution, in light of the fact that the history of decay in the inner cities of United States and Canada has not proceeded in exactly parallel directions (Mercer, 1979, 1991; Filion, 1987; Ley 1981, 1986). The current research will address the Canadian research gap by moving beyond addressing inner suburban decay in light of the global city hypothesis by selecting a metropolitan area in every heavily populated Canadian region, and by adding a relevant temporal component in assessing inner suburban decline.

This paper is interested in establishing the prevalence of inner suburban decline within this large urban system. However, there are varying definitions of decline used within the available literature. Since there is considerable definitional latitude in assigning what constitutes decline of an urban zone, this thesis has chosen to approach the term decline in its basic form, dealing primarily with relative economic prosperity of an area. However, economic indicators used in the literature also vary, although attention is often paid to per capita or household indicators. This approach is consistent with a number of researchers (Lucy and Philips 2000, Hackworth, 2005, Hulchanski, 2007). Lee and Leigh (2007) have, however, argued for an expended set of variables reduced via a factor analysis. The current research opts for both approaches.

Therefore, the first stage evaluates only a few separate variables, as per Hackworth's (2005) study. The second stage evaluates a broader range of variables which are reduced by utilizing a factor analysis, paralleling Lee and Leigh's (2007) study.

2.7. CHAPTER CONCLUSION

The current review of literature suggests that the process of decline is well under way in the inner suburbs of American cities. Principally, numerous researchers suggest that the movement of people due to changing market preferences, combined with aging housing stock, has caused the current crisis. Others, however, place primacy on decreased presence of capital and lack of reinvestment in the inner suburbs. Nevertheless, while theoretical disagreements over the structural forces which shape the contours of this deteriorating landscape exist, there is wide agreement among most scholars that inner suburbs are poorly prepared to meet the challenges of decline. The postmodern scholars are perhaps the only significant objectors; they reject the idea of systemic inner suburban decline, and instead suggest that contemporary understandings of metropolitan regions as monolithic entities need a rethinking. However, the empirical evidence from a number of different metropolitan regions implies that current misfortunes of inner suburbs are structurally deep-rooted and pervasive. Still, a number of research challenges exist, not least of which stem from a lack of clear methodological agreement in defining inner suburbs, or measuring decline. The challenge is further deepened by the fact that the Canadian national perspective on the topic is limited in scope. It is therefore clear that more research on this subject is necessary in order to demonstrate whether decline of the inner suburban realm is endemic in Canada.

3. RESEARCH METHODOLOGY

3.1. INTRODUCTION

Research from the United States strongly suggests that inner suburban decline is not geographically constrained. At the same time, most Canadian research focuses almost exclusively on Canada's large metropolitan regions. However, case studies of only a few urban regions cannot provide evidence for a wider, structural decline. Therefore, this chapter describes the research methodology, which attempts to answer the question: *Is there empirical evidence of declining inner suburban prosperity in Canadian urban regions relative to other urban zones?*

The chapter explains the quantitative methodology used in the study, including the way in which data are collected, which metropolitan regions are selected, how urban zones are standardized, and which variables are selected as prosperity indicators. This chapter then discusses the conceptual model used in the study, as well as research expectations generated from this model. Finally, both the limitations and delimitations of the described study are discussed.

3.2. DATA COLLECTION

Data used in this research has been collected by Statistics Canada for the 1971, 1986, 1991, 1996, 2001, and 2006 Census of Canada. The Census of Canada is conducted every 5 years and includes a broad range of socio-economic variables. Census data was collected online from the Canadian Census Analyser hosted by the Faculty of Arts and Science at the University of Toronto. Access to the database is restricted; however, access is available to students and staff of subscribing Canadian universities.

3.3. SITE SELECTION

Standardization of urban regions was accomplished by conflating them with Statistics Canada's CMAs. Statistics Canada defines CMAs as an "[a]rea consisting of one or more adjacent municipalities situated around a major urban core… [with] a population of at least 100,000" (Statistics Canada, 2006). This removes smaller urban centers from the study, many of which are unlikely to have clearly defined concentric urban zones. However, including the remaining 33 defined CMAs in one study would be impractical for the purposes of this thesis. Therefore, 15 of the largest CMAs in the country were included in the study. These include: Toronto, Montreal, Vancouver, Ottawa-Gatineau, Calgary, Edmonton, Quebec City, Winnipeg, Hamilton, London, Kitchener, St. Catharines-Niagara, Halifax, Oshawa, and Victoria.

The largest urban region in the group, the Toronto CMA, had a population of over 5,100,000 according to the 2006 census, while the smallest urban region, the Victoria CMA, had a population of slightly over 330,000 in the same census year. Thus, the selected regions provide a considerable cross section between the largest and most of the medium-sized urban regions in the country. Combined, the urban regions studied consisted of over 18,500,000 people, or about 56% of the total (2006) Canadian population. Finally, the selected CMAs represent every Canadian region—although not every province.

3.4. MEASURING ZONAL DECLINE

Measuring inner suburban decline requires standardization of different urban zones. As the current research includes 15 CMAs of differing sizes, considerable care must be taken in standardizing the urban zones and thus ensuring a level of comparability between them. Furthermore, any study which tracks changes in prosperity in different urban zones requires a

temporal component: namely, the current state of an urban zone must be compared to its earlier condition in order to determine whether any significant changes can be observed. Finally, any comparison of different urban zones and different CMAs requires variables that serve as useful proxies of prosperity, and will therefore allow this thesis to gage whether inner suburbs are systematically declining.

3.4.1. Standardization of Urban Zones

Urban zones refer to the separation of an urban region that is based both on location and timing of the development. The number of urban zones identified can vary, but will likely include at least a separation between the core city and the suburbs.

In order to spatially organize urban regions in different urban zones, the empirical methodology adopted in this research is almost identical to the spatial model outlined in Filion, Bunting, Pavlic, and Langlois (2010), and very similar to work previously done by Bunting et. al. (2004) in Canada, as well as Lee and Leigh (2007) in the United States. This methodology separates census tracts of every urban region into several urban zones. Census tracts are "small, relatively stable geographic areas that usually have a population of 2,500 to 8,000" (Statistics Canada, 2006). The delineation of zones is based mainly on the age of housing stock and density parameters of census tracts.

The temporal fixing of spatial separation is preferable to spatial separation based on municipal boundaries for two reasons. Firstly, the methodology allows duplication of this research for other urban regions in Canada. Secondly, the methodology more accurately represents the spatial location of urban zones. Boundaries between two different municipalities do not

necessarily signal a change in the timing of development. In addition, municipal boundaries may change due to historic city amalgamations and annexations.

Every CMA in this research is separated into five separate urban zones. Census tracts located within a two kilometre diameter of the highest real estate values within the CMA are classified as the 'core' area of the city. However, as a result of suburbanization, the highest real estate values may not correspond to the city core. In such situations, the core zone consists of census tracts that envelop historical pre-war main streets, and therefore may include fewer census tracts. Census tracts that contain dwellings 1.5 times the CMA average of dwelling built before 1946 in the 1971 Census of Canada are classified as the 'inner city' area. The 1971 Census of Canada is preferred to the 1986 or the 2006 census largely because of the possible destruction of older housing stock in the following census years. As a result, areas that would have been defined as an inner city zone in 1971 could possibly be defined as a different urban zone in the 1986 or the 2006 census. Census tracts for both the core and the inner city are therefore fixed and do not vary between census years.

Census tracts that contain 1.5 times the CMA average of dwellings built between 1946 and 1971 in the 1971 Census of Canada and have population densities equal or greater than 1,000 person per square kilometre (p/km^2) are classified as 'inner suburbs.' The density metric prevents small, mostly unurbanized tracts from qualifying as inner suburban zones. The selection of 1,000 p/km^2 is based in part on a generally significant density drop-off below this threshold. Census tracts that are not significantly below the threshold densities but which are contiguous with the built-up area of an urban region are also included.

Census tracts that do not qualify as the core, the inner city, and the inner suburbs in the 1971 Census of Canada, but which have population densities equal or greater than 1,000 p/km^2 in any subsequent census year are classified as 'outer suburbs.' Similar to the inner suburbs, census tracts that approach threshold densities and are contiguous with the built-up area of an urban region are also included. Unlike the other urban zones discussed so far, the outer suburban zones are not spatially fixed, and may grow in their boundaries over the study period.

Finally, the census tracts that are not a part of the core, the inner city, and the inner suburbs and therefore have a population density of less than 1,000 persons per square kilometre in any census year are classified as fringe/exurbs. Census tracts which are not contiguous with the built up metropolitan area are also classified as 'fringe/exurbs.' The dual classification suggests that this zone includes both towns not yet fully absorbed by the urban region, as well residential communities that are too sparsely populated as to be included in the outer suburbs. Like the outer suburbs, the boundaries of the fringe/exurbs may change over time.

In addition, census tracts within each zone must be connected with each other. For example, there may not be an unconnected inner city tract surrounded by fringe/exurban tracts. In such cases, the unconnected tract would become a part of the fringe/exurbs. This requirement is practical: many CMAs will have census tracts that qualify as a part of the inner city, but that are unconnected with any other inner city tracts. For example, in the Toronto CMA, the old towns of Unionville or Cooksville are well outside the boundaries of the City of Toronto and do not come close to connecting to any other inner city tract. Yet, based purely on the housing stock and density characteristics, such census tracts would be considered a part of the inner city of Toronto. However, such areas have evolved separately from the inner city tracts and were

eventually absorbed into the urban region by encroaching urban sprawl. Such areas will therefore become outer suburbs as outer suburban census tracts envelop them.

There are a few exceptions to the connectivity requirement: CMAs with multiple similarly-sized cities do not have a connectivity requirement. As an example, the Kitchener CMA includes the cities of Waterloo and Cambridge in addition to the city of Kitchener. Cambridge inner city areas will not necessarily connect to those of Waterloo. And yet, Cambridge is not merely a village or a small town close to Kitchener or Waterloo, but rather one of the three regional anchors. Therefore, the requirement for census tract contiguity does not exist between the three cities of the Kitchener CMA.

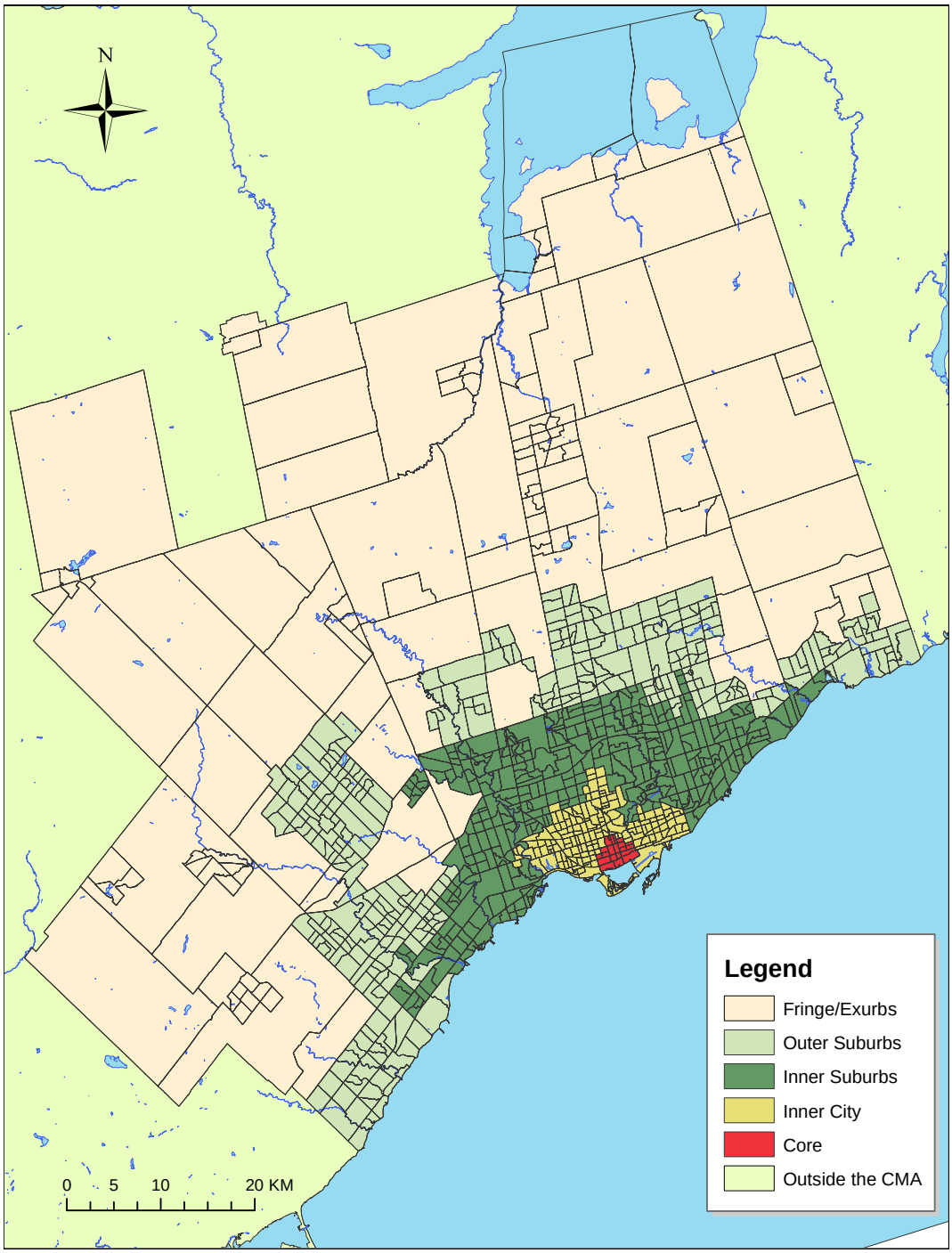
Figure 3-1 illustrates the separation of urban zones of the Toronto CMA in 2006. Appendix A illustrates the separation for urban zones of all CMAs in 1986 while Appendix B illustrates the separation for urban zones of all CMAs in 2006.

3.4.2. Temporal Comparison

Since this research attempts to analyse changes in relative prosperity of the inner suburbs, all of the CMAs must be compared against a baseline year. For the purposes of this thesis, the 1986 data represents the baseline year, against which the 1991, 1996, 2001, and 2006 census years are compared.

The 1971 census was also considered as the baseline year. However, Statistics Canada did not calculate all of the chosen variables for that census year. The 1986 census also represents a relatively reliable data set, with a decreased number of suppressed census tracts in large urban regions in comparison to both the 1971 and 1981 census. Finally, the 1986 census allows for a

Figure 3-1: Urban zones of the Toronto CMA, 2006



continuous temporal comparison of the outer suburbs and their relative performance in comparison to the inner suburbs.

3.4.3. Selecting Indicators of Urban Zone Decline and/or Increased Affluence

This thesis attempts to examine change in temporal prosperity of urban zones, and inner suburbs in particular, with considerable carefulness. However, there is a significant variation in size between the largest and the smallest CMAs studied. Smaller CMAs have relatively few census tracts, precluding advanced data analysis. As such this research is divided into two separate stages. The first stage of research examines only three variables which can serve as indicators of prosperity. However, it examines these variables for all 15 CMAs studied. The second stage of research utilizes a factor analysis of ten variables grouped in demographic, socio-economic, and housing categories. This stage examines the urban zones of only the nine largest CMAs.

3.4.3.1. Stage One

The first stage of this research uses variables largely parallel to those of Hackworth's study (2005). Hackworth's analysis of 10 American conurbations focused on four separate variables gathered by the U.S. Census: population density, per capita income, house value, and contract rent. The current research maps three broadly similar variables found in the Census of Canada. These include three static measures: median household income, average value of dwelling, and average gross rent. Population density is not mapped because Hackworth's study uses this variable to express landscape complexity against which other selected variables can be compared. In contrast, this research groups the tracts into five separate urban zones and compares the values of variables against each urban zone for all 15 CMAs studied. This comparison allows for a more standardized comparison of the variables between CMAs that vary

significantly in total land area and population. The three variables in aggregate collectively represent the economic well being of a given landscape (Hackworth, 2005).

Median incomes are often used as a gage of the overall prosperity and stability of a given geographic landscape. Unlike the mean income variables, median incomes are relatively unaffected by the skewing of extremely high or low values. Both mean and median incomes are extensively used in academic literature in order to assess the overall economic well being of a landscape (*see* Walks, 2001; Lucy & Philips, 2000; Hackworth, 2005). In the case of the current research, household incomes are used instead of per capita or family incomes. This preference is pragmatic. Households are basic economic units; as such, data for the other two variables (average value of dwelling and the gross rent) are collected for individual households only.

Housing values can be used as a metric for investment and disinvestment in an area. Hence, the desirability of an area and household residential preferences are tied to dwelling values. This variable has been used by Hackworth (2005), as well as Waddell, Berry, and Hoch (1993) as an indicator of area desirability and economic prosperity.

Finally, gross or cash rent can be used as a proxy for measuring investment and disinvestment in a landscape (Hackworth, 2005; also see, Hoch & Wadell, 1993; Hackworth, 2002). In this research, it is used as one of the basic measures of prosperity in each urban zone.

All three variables are obtained for every non-suppressed census tract in 1986, 1991, 1996, 2001 and 2006 census years, and are then aggregated for each CMA, urban zone, and time period. The 20 year study period precludes direct comparison of the three variables, largely as a result of inflation and potential rise or decline of real incomes across Canada. Therefore, all temporal comparisons between different urban zones are relative and are also weighted. The obtained

results for all three variables are therefore expressed as weighted value relative to the weighted CMA values for that variable. The Relative Value (*RV*) formula is expressed in Equation 3-1 and Equation 3-2.

In order to compare changes in urban zones between the time periods, the Relative Value of a given variable in 2006, 2001, 1996 and 1991 census years is divided by the Relative Value of the same variable in one of the preceding census years. This yields an Index of Change for a given variable. The Index of Change (*IC*) formula is expressed in Equation 3-3.

All 15 CMAs also have each available census tract mapped for relative temporal changes for the baseline census year (1986), as well as the endpoint year (2006) through the use of Geographic Information System (GIS) software. These results are available in Appendix C.

Equation 3-1: Relative Value formula for a static prosperity variable.

$$RV_x = c\frac{\sum_{i=1}^{N} h_i x_i}{\sum_{i=1}^{T} h_i x_i}$$

where:

RV_x: expected Relative Value of x.

N: number of census tracts (i) in an urban zone (core, inner city, inner suburbs, outer suburbs, and fringe/exurbs).

T: total number of census tracts (i) in a CMA.

x: static prosperity variable (median household income, average value of dwelling, gross rent).

h: weighting variable (number of households for median household income, number of owner-occupied households for average value of dwelling, and number of tenant-occupied households for average gross rent).

c: the normalizing constant, given in equation 3-2.

Equation 3-2: Normalizing constant for Equation 3-1.

$$c = \frac{\sum_{i=1}^{T} h_i}{\sum_{i=1}^{N} h_i}$$

where:

N: number of census tracts (i) in an urban zone (core, inner city, inner suburbs, outer suburbs, and fringe/exurbs).

T: total number of census tracts (i) in a CMA.

h: weight (household for median household income, owner-occupied households for average value of dwelling, and tenant-occupied households for average gross rent).

Equation 3-3: Index of Change for static prosperity variables.

$$IC_R = \frac{R_n}{R_i}$$

where:

IC_R: Index of Change of R.

R_n: Relative Value of a static prosperity variable (median household income, average value of dwelling, gross rent) in year n (2006, 2001, 1996, 1991).

R_i: Relative Value of a static prosperity variable (median household income, average value of dwelling, average gross rent) in year i (2001, 1996, 1991, 1986).

In addition, a GINI coefficient is calculated for each urban zone for the median household income variable. The GINI coefficient is a measure of inequality in a given distribution, with the coefficient of 0 representing total equality and the coefficient of 1 representing maximum inequity (Burt, Barber & Rigby, 2009). The results of the calculation are available in Appendix D.

3.4.3.2. Stage Two

The second stage of this research expands the selection of variables and groups them according to demographic, socio-economic, and housing characteristics. Ten variables which help gauge the overall prosperity and wellbeing of an urban zone are analyzed in this stage. They include: proportion of young population, proportion of elderly population, proportion of immigrants, proportion of unemployed, proportion of low income families, proportion of university graduates, median household incomes, average dwelling values, gross rent, and proportion of dwellings owned. Detailed description of the variables is available in Table 3-1. The variables roughly correspond to—and are meant to replicate in principle—Lee and Leigh's (2007) study which examined inner suburban decline. However, some modification and the reduction of variables was necessitated by the differences between the United States and Canadian census.

Due to the complexity of evaluating the effects of a large number of variables, they are reduced via a factor analysis, as in Lee and Leigh's study. Analysis of Variance (ANOVA) mean comparison tests are, however, conducted for every variable separately and the results of this analysis are available in Appendix F.

Kaiser-Meyer-Olkin and Bartlett's Test is utilized in order to assess the appropriateness of factor analysis on the data set. If the tests are positive, factors with eigenvalues close to 1 are retained for further analysis (de Vaus, 2002; Hinton, Brownlow, McMurray & Cozens 2004). Furthermore, the initial solution is then rotated utilizing Varimax rotation. This is the most commonly used rotation in social research (Pett, Lackey & Sullivan, 2003) and is also used by Lee and Leigh's (2007) study. All census tracts are then scored for deviation against the initial

Table 3-1: Variables Used in the Factor Analysis of Nine Largest CMAs.

	Factor Variables		
Category	Name	Calculation*	Time
Demographic	YOUNGPOP	Proportion of young population (0-14) in comparison to population total	'86, '91,' 96, '01, '06
	ELDPOP	Proportion of elderly population (65+) in comparison to population total	'86, '91, '96, '01, '06
	IMMIG	Proportion of immigrant population in comparison to population total	’86, ’91, ‘96’ ’01, ‘06
Socio-economic	UNEMP	Percentage of unemployed	'86, '91, '96, '01, '06
	LOWINCFAM	Percentage of low income families	'86, '91, '96, '01, '06
	UNIVPOP	Proportion of university graduates compared to total population 15+	'86, '91, '96, '01, '06
	MHHINC	Median household income	'86, '91, '96, '01, '06
Housing	HSVAL	Average value of dwelling	'86, '91, '96, '01, '06
	RENTVAL	Average gross rent	'86, '91, '96, '01, '06
	OWNPROP	Proportion of owned dwellings in comparison to total dwellings	'86, '91, '96, '01, '06

* All urban zone calculations are relative to the CMA average.

factor solution by using the Anderson-Rubin scoring method (Field, 2009). These scores are then re-aggregated for each CMA, urban zone, and time period for comparison purposes. Further details of the factor analysis is available in Appendix G.

In addition to a simple mean comparison of the results, a regression model is used to examine spatial changes in more detail. Due to the longitudinal nature of the study, random-effect generalized least squares (GLS) regression and fixed-effect GLS regression models are the two most useful regression candidates (Rabe-Hesketh & Skrondal, 2008). The fixed-effect model, however, omits coefficients of covariates that vary between clusters (Rabe-Hesketh & Skrondal, 2008). As a result, a random-effect model is selected and is expressed in Equation 3-4.

As random-effect regressions ideally require balanced panel data, the census tracts which split during the study period must be aggregated back together for regression purposes by using Statistics Canada census tract concordance files. In addition, since outer suburbs and

Equation 3-4: Random-effect model with spatial-temporal variables for each CMA.

$$y = \beta_0 + \beta x1 + \beta x2 + \beta x3 + u + e$$

where:

y:	the extracted factor.
β:	the parameter vector.
0:	the constant.
x1:	spatial dummies (downtown, inner city, inner suburbs, outer suburbs, fringe/exurbs).
x2:	time dummies (1986, 1991, 1996, 2001, 2006).
x3:	interaction dummies of space and time.
u:	unobserved effects.
e:	the error term.

fringe/exurbs are not spatially fixed, some of the split census tracts may end up in different urban zones. As an example, the fringe/exurban census tract 1 in 1986 may be split into census tract 1.01 and 1.02 in 1991. However, census tract 1.01 may be classified as an outer suburb tract in 1991 while tract 1.02 is still classified as a fringe/exurb tract. In practice, however, the effect of this was negligible, affecting less than 1% of all tracts. Nonetheless, urban zone boundaries for the purposes of regression may be slightly different than the urban zone boundaries generated for the other parts of this thesis. However, the differences are very minor.

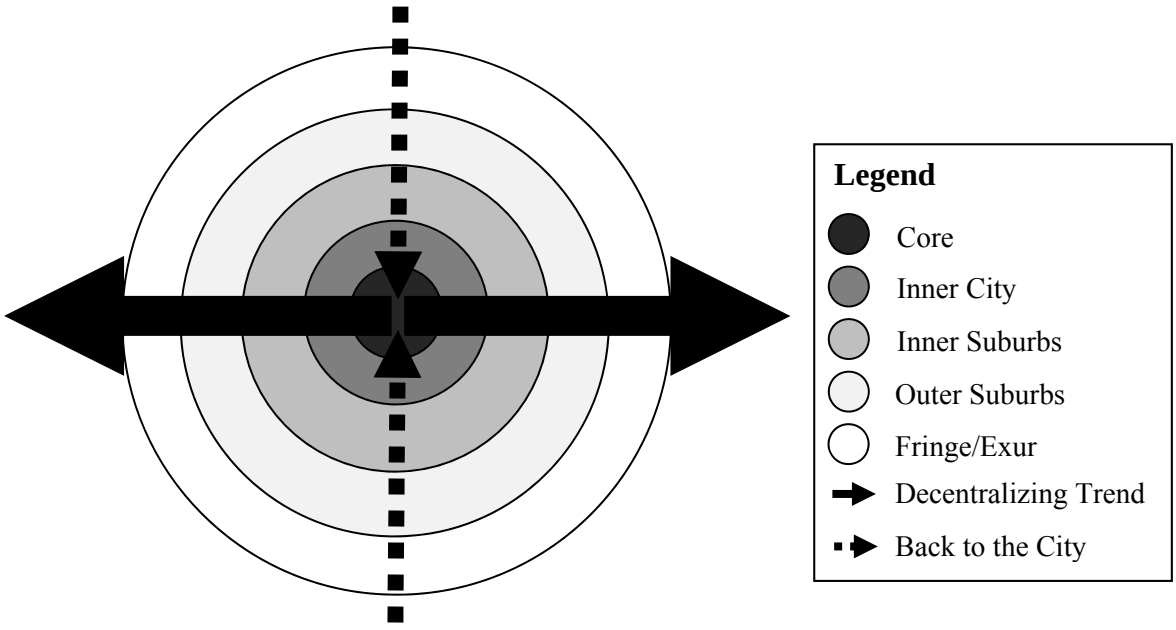
In addition, the low amount of census tracts in the smaller CMAs studied in the first stage of the research precludes a statistically significant regression analysis; thus, only nine of the largest CMAs are included in the second stage of research.

3.5. A CONCEPTUAL MODEL OF DECLINE AND RESEARCH EXPECTATIONS

This thesis proceeds based on the premises of a conceptual model of inner suburbs derived from the literature review conducted in Chapter 2. Figure 3-2 shows this conceptual model of decline, which bears a strong resemblance to Lee and Leigh's (2007) model. Two trends are captured in the model:

1. The decentralizing trend, which extends away from the core into the fringes.
2. The back to the city trend, which extends from suburban zones back into the inner city and the core.

Figure 3-2: A Conceptual Model of Inner Suburban Decline.



Although this model is admittedly highly simplified, it nevertheless captures the key ideas found in the literature examining inner suburban decline. The decentralizing trend captures market preferences for contemporary suburban housing. This trend is one of the traditional reasons for the decline of the core and the inner city. However, as metropolitan areas continue to expand outwards, and as the older suburbs age, the decentralizing trend starts to affect the inner suburbs as well. In contrast, the amenities offered by the central city start a counter back to the city movement. However, the inner suburbs do not contain the same amenities as the core and the inner city, and are thus not a part of this movement.

It is important to note that the second trend is unlikely to affect every CMA. Indeed, many CMAs may only exhibit a decentralizing trend; thus, they may decay along with the inner suburbs at the expense of the outer suburbs and the fringes. The back to the city trend will most likely, though not invariably, occur only in larger CMAs. Large CMAs have an expanded set of amenities, as well as a greater economic and political pull that assists in inner city revitalization (Lucy & Philips, 2000). These factors indirectly propel the back to the city movement.

A number of broad predictions can be made on the basis of this conceptual model. Three predictions which concern this thesis are given below:

1. Prosperity will decline in the inner suburbs of most CMAs.
2. Prosperity will increase in the outer suburbs and the fringe/exurbs of most CMAs.
3. Prosperity will increase in the core and/or the inner city of some CMAs. This effect will happen mostly in larger CMAs; prosperity may in fact decrease in these urban zones in the smaller CMAs studied.

3.6. METHODOLOGICAL LIMITATIONS AND DELIMITATIONS

The design of the study allows for standardization of a diverse set of CMAs. However, possible objections to the research may include the lack of detailed causative analysis, reliance on data obtained from Statistics Canada, the lack of micro-level focusing, the variables used to measure prosperity, as well as the simplicity of the conceptual model.

The design of the study provides consistency and standardization, but cannot directly account for the causation of spatial changes. This study also relies on information obtained from Census Canada. Therefore, the results of the study are only as accurate as the census.

The need for consistency also precludes analysing CMAs on the basis of Dissemination Areas (DAs). DAs, like census tracts, are geographic units of comparison. However, DAs are considerably smaller in size, and therefore could define urban zones more accurately and offer a finer grained analysis of data. However, because DAs did not exist prior to 2001, it is difficult to use them as the unit of analysis in this study. Furthermore, it is beyond the scope of this research to describe changes in spatial affluence in complete detail for all 15 CMAs.

Selection of variables which act as proxies of economic prosperity will invariably include subjective judgement. This research assumes that the selected variables all broadly measure the concept of prosperity. Furthermore, in the first stage of research, only three separate variables are used as measures of prosperity. Moreover, no index is computed in an effort to weigh the relative importance of each variable (or lack thereof). Lee & Leigh (2007) in particular have argued against using a small set of variables and advocate a factor analysis based on a number of variables grouped into demographic, socioeconomic, and housing characteristics. The second stage of this research partly addresses this criticism by adapting their suggestions to the nine

largest CMAs in the study. Still, the variables used in this study are likely measuring different aspects of prosperity. As a result, the conceptual model utilized in this study is admittedly crude. Only two trends are captured. Moreover, specific municipal policies—which may explain some of the variance in results between different CMAs—are not analyzed and are beyond the scope of this study.

3.7. CHAPTER CONCLUSION

The dearth of studies addressing inner suburban decline in Canadian urban regions points to a need for a study wide enough in scope in order to test whether decline in inner suburban prosperity is prevalent in Canada. This scope necessitates a quantitative methodology, thus allowing the researcher to standardise different urban zones.

Once standardized, the three selected variables are computed for every urban zone and time period between 1986 and 2006: median household incomes, average dwelling values, and gross rent. The variables are then compared through time in order to measure any changes in prosperity in all urban zones. Subsequently, a factor analysis of nine variables grouped into demographic, socio-economic, and housing variables is performed for the nine largest CMAs. Once the retained factors are extracted, factor scores of each urban zone are calculated for every urban zone and time period between 1986 and 2006. The results are then compared by using a random-effect GLS regression model. All the research findings are applied against three predictions, which stem from a conceptual model of inner suburban decline.

4. FINDINGS

4.1. INTRODUCTION

This chapter presents the thesis findings. The Relative Values and the Indices of Change for median household income, average value of dwelling, and average gross rent variables is calculated for all 15 CMAs. All findings are compared against the predictions derived from the conceptual model. Subsequently, two factors are extracted from a grouping of demographic, socio-economic, and housing variables. The two factors—the prosperity factor and the exclusivity factor—are re-aggregated for every urban zone of the 9 largest CMAs. Both factor findings are evaluated by a random-effect GLS regression model and are then compared against the predictions of the conceptual model.

4.2. CHANGES IN STATIC VARIABLES ACROSS THE 15 CMAS

The findings for all 15 CMAs are presented in tabular form. They indicate relative changes in household median incomes, average dwelling values, and average gross rent across all urban zones during the study period.

4.2.1. Changes in Median Household Incomes

The household median income Index of Change between 1986 and 2006 for the 15 CMAs is given for each urban zone in Table 4-1. Figure 4-1 illustrates changes in median household income Relative Values through each temporal data point in each urban zone of the 15 largest CMAs. More detailed tables are available in Appendix F.

Table 4-1: Index of Change for the median household income variable, 1986-2006.

	Core	Inner City	Inner Suburbs	Outer Suburbs	Fringe/Exurbs
Toronto	1.11	1.06	**0.87**	0.93	1.07
Montréal	0.98	1.14	**0.88**	1.01	0.99
Vancouver	1.18	1.08	**0.90**	0.96	1.06
Ottawa – Gatineau	0.97	1.07	**0.84**	0.94	1.05
Calgary	1.05	1.14	**0.85**	0.92	1.01
Edmonton	0.96	0.99	**0.87**	0.95	1.04
Québec	1.09	0.91	**0.87**	1.01	1.04
Winnipeg	0.97	0.96	**0.86**	0.93	1.11
Hamilton	0.88	0.94	**0.85**	1.06	1.01
London	0.95	0.99	**0.91**	0.97	1.06
Kitchener	0.88	1.00	**0.88**	0.99	1.09
St. Catharines – Niagara	1.02	1.05	**0.92**	0.95	1.05
Halifax	0.77	0.96	**0.88**	0.99	1.06
Oshawa	0.84	0.80	**0.85**	1.01	1.03
Victoria	1.10	1.00	**0.94**	0.91	1.00
Mean	0.98	1.01	**0.88**	0.97	1.04
Median	0.97	1.00	**0.87**	0.96	1.05
Standard Deviation	0.11	0.09	**0.03**	0.04	0.03

The findings indicate that relative median household incomes declined most markedly in the inner suburbs. All of the CMAs had a household median income Index of Change below one in the inner suburbs. The low standard deviation further points to the uniformity of decline in this zone.

In contrast, the highest increase in relative median household incomes occurred in the fringe/exurbs. Only the Montreal CMA had an Index of Change below one in this zone. Here too, the standard deviation was low, indicating little variation in CMA results.

Slight contractions occurred in relative median household incomes in the outer suburbs. While the majority of the inner suburbs declined for this variable, the declines tended to be more moderate. The low standard deviation once again suggests relatively little variation between CMAs.

Figure 4-1: Change in household median income Relative Values, 1986-2006.

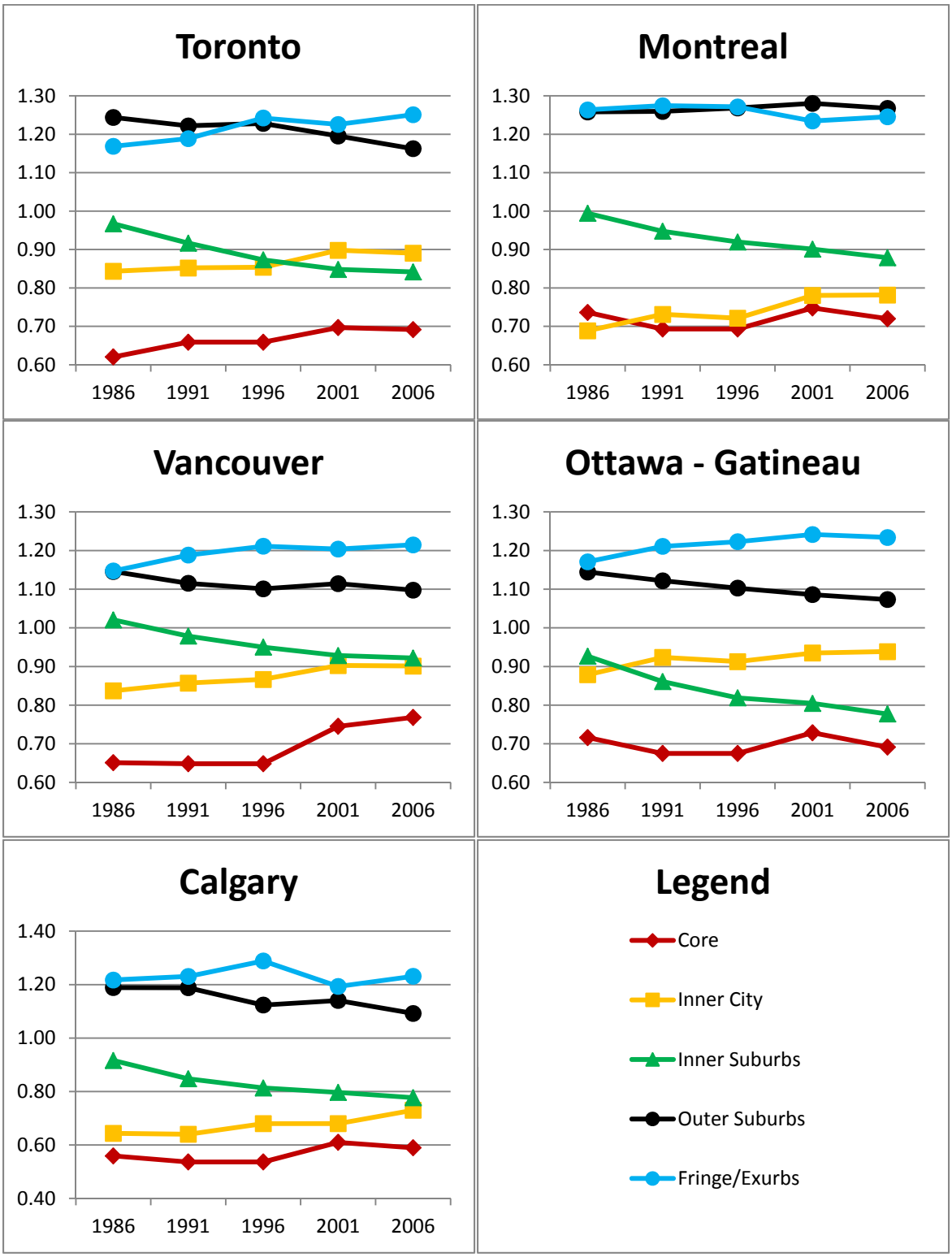


Figure 4-1: Change in household median income Relative Values, 1986-2006. (continued)

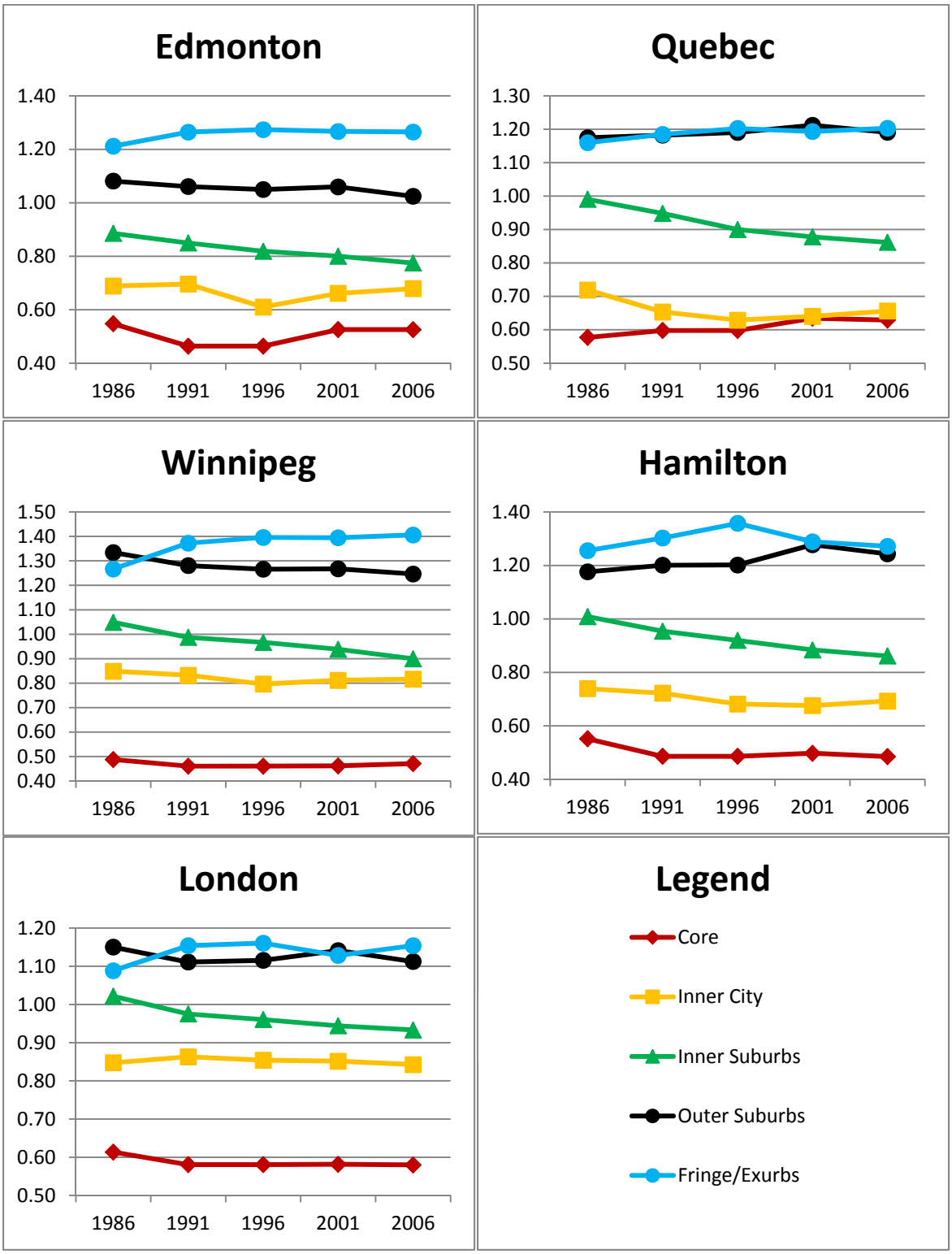
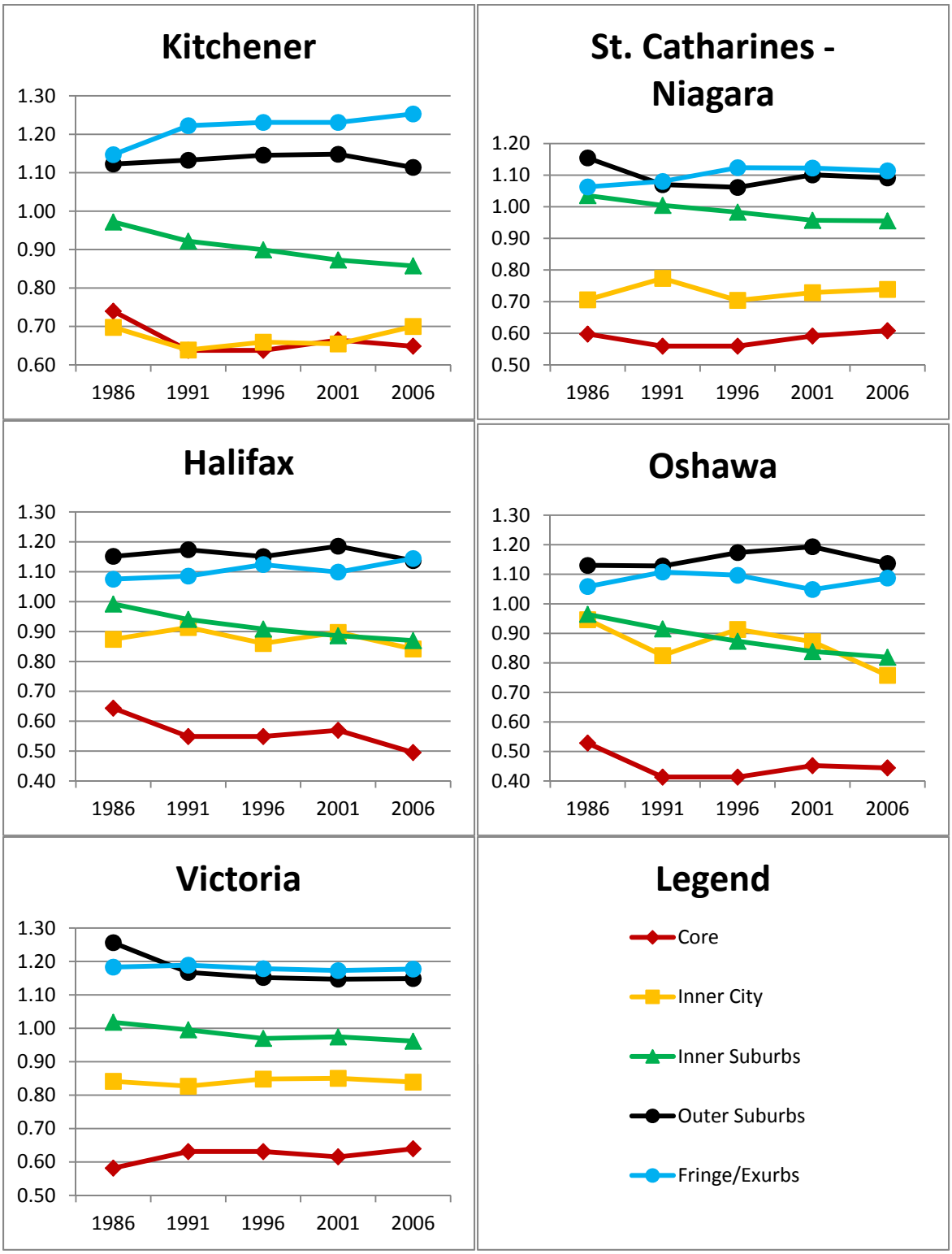


Figure 4-1: Change in household median income Relative Values, 1986-2006. (continued)



The Index of Change in the core showed far more variability. The mean Index of Change was just below one. However, the standard deviation was the highest in this zone. Furthermore, eight CMAs had an Index of Change below one in the core. In comparison, eight CMAs had an Index of Change above one in the inner city. These results, coupled with high standard deviations suggest that CMAs are experiencing widely diverging income trends in both the core and the inner city.

4.2.1.1. Comparing Findings Against Conceptual Model Predictions

The obtained empirical findings are contrasted against the three predictions derived from the conceptual model introduced in Chapter 3:

1. *Prosperity will decline in the inner suburbs of most CMAs.*

Prosperity, as measured by the median household income variable, declined in all 15 CMAs. Although a decline was expected in most CMAs, the uniform consistency of the decline meets the expectations of the first prediction.

2. *Prosperity will increase in the outer suburbs and the fringe/exurbs of most CMAs.*

This prediction was fully confirmed in only 4 CMAs: Quebec, Hamilton, Halifax and Oshawa. Surprisingly, relative median household incomes decreased in the outer suburbs of 11 CMAs. While decreases were relatively minor, the results obtained suggest that the decentralizing trend has started to affect the outer suburbs at the expense of the fringe/exurbs. Indeed, relative median household incomes increased at least slightly in the fringe/exurbs of 13 CMAs. Furthermore, the fringe/exurbs were more prosperous than the outer suburbs in 13 CMAs. The two exceptions were the Montreal and Hamilton CMAs. Both had a higher increase in the Index of Change in the outer suburbs than in the fringe/exurbs. In fact, the fringe/exurbs of Montreal

declined—although insignificantly so. Finally, the CMA of Victoria showed no decentralizing trend whatsoever: the outer suburbs declined while the fringe/exurbs remained stable. The empirical findings therefore only partially confirm the second prediction. Furthermore, the findings suggest that the decentralizing trend has started to affect many, though not all, outer suburbs.

3. *Prosperity will increase in the core and/or the inner city of some (mostly larger) CMAs.* Relative median household incomes increased in both the core and the inner city of four CMAs—Toronto, Vancouver, Calgary, and St. Catharines-Niagara. In addition, incomes also increased in the inner city zone of Ottawa-Gatineau and Montreal CMAs. Furthermore, the core zones of Quebec and Victoria CMAs also increased in prosperity. Victoria is also the only CMA to not register any kind of a decentralizing trend. Therefore, the results obtained suggest that only the back to the city trend operates in this CMA. Overall, the findings confirm the prediction and hint at the back to the city movement, occurring mostly—though not exclusively—in the larger CMAs.

4.2.2. Changes in Average Dwelling Values

The average value of dwelling Index of Change for the selected 15 CMAs in the study period 1986 and 2006 is given for each urban zone in Table 4-2. Figure 4-2 illustrates changes in average value of dwelling Relative Values through each temporal data point in each urban zone of the 15 largest CMAs. More detailed tables are available in Appendix F.

The findings indicate that relative average dwelling values declined most noticeably in the inner suburbs. Calgary and Victoria were the only two CMAs that had a neutral or positive Index of

Table 4-2: Index of Change for the average value of dwelling variable, 1986-2006.

	Core	Inner City	Inner Suburbs	Outer Suburbs	Fringe/Exurbs
Toronto	0.66	1.17	**0.99**	0.95	1.03
Montréal	1.07	1.35	**0.98**	1.01	1.03
Vancouver	0.95	1.05	**0.99**	1.00	1.09
Ottawa – Gatineau	0.93	1.17	**0.96**	0.93	1.08
Calgary	0.85	1.35	**1.03**	0.96	0.96
Edmonton	0.97	0.90	**0.93**	0.95	1.09
Québec	1.20	1.06	**0.94**	0.95	1.04
Winnipeg	0.99	0.97	**0.87**	0.86	1.17
Hamilton	1.00	0.89	**0.93**	1.04	0.98
London	1.01	1.01	**0.95**	0.89	1.07
Kitchener	0.97	1.09	**0.92**	0.99	1.03
St. Catharines – Niagara	0.93	0.98	**0.93**	0.96	1.07
Halifax	1.03	1.14	**0.93**	1.10	1.06
Oshawa	0.80	0.90	**0.85**	0.98	1.01
Victoria	0.93	0.99	**1.00**	1.13	0.98
Mean	0.95	1.07	**0.95**	0.98	1.05
Median	0.97	1.05	**0.94**	0.96	1.04
Standard Deviation	0.12	0.15	**0.05**	0.07	0.05

change for this variable. The standard deviation was moderate, indicating some unevenness in CMA results.

Slight contractions also occurred in relative average dwelling values of the outer suburbs. The Index of Change was positive or neutral in five CMAs: Montreal, Vancouver, Hamilton, Halifax, and Victoria. The standard deviation was relatively high in this zone, indicating that some disparity was present between the CMAs.

In contrast, the relative average dwelling values increased in the fringe/exurbs. Calgary, Hamilton, and Victoria were the only CMAs with an Index of Change below 1 in this zone. The standard deviation was moderate, indicating some variation in CMA results.

The results obtained in the core and the inner city once again showed most unevenness. The mean Index of Change was below one in this zone. However, five CMAs: Montreal, Quebec,

Figure 4-2: Change in average value of dwelling Relative Values, 1986-2006.

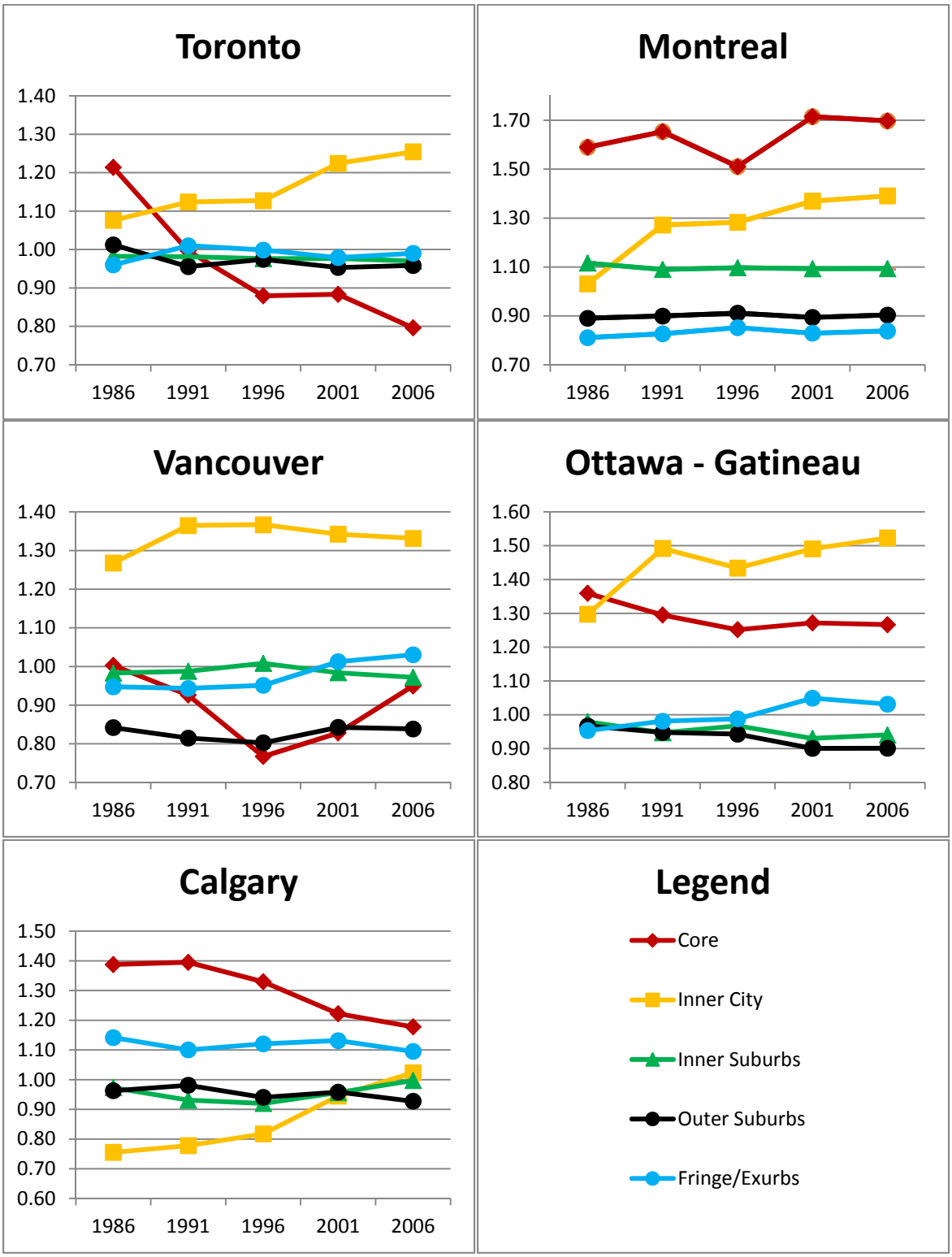


Figure 4-2: Change in average value of dwelling Relative Values, 1986-2006. (continued)

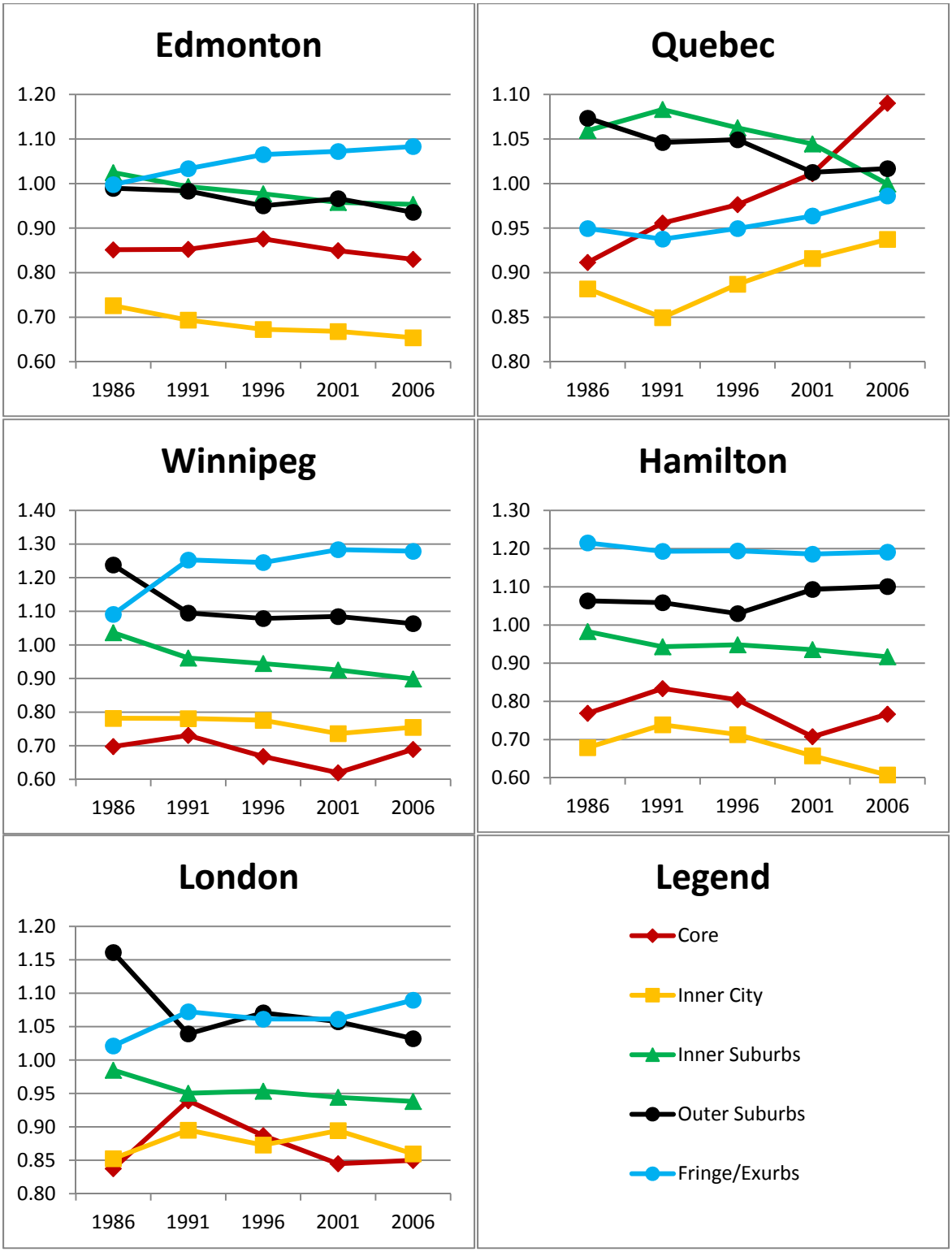
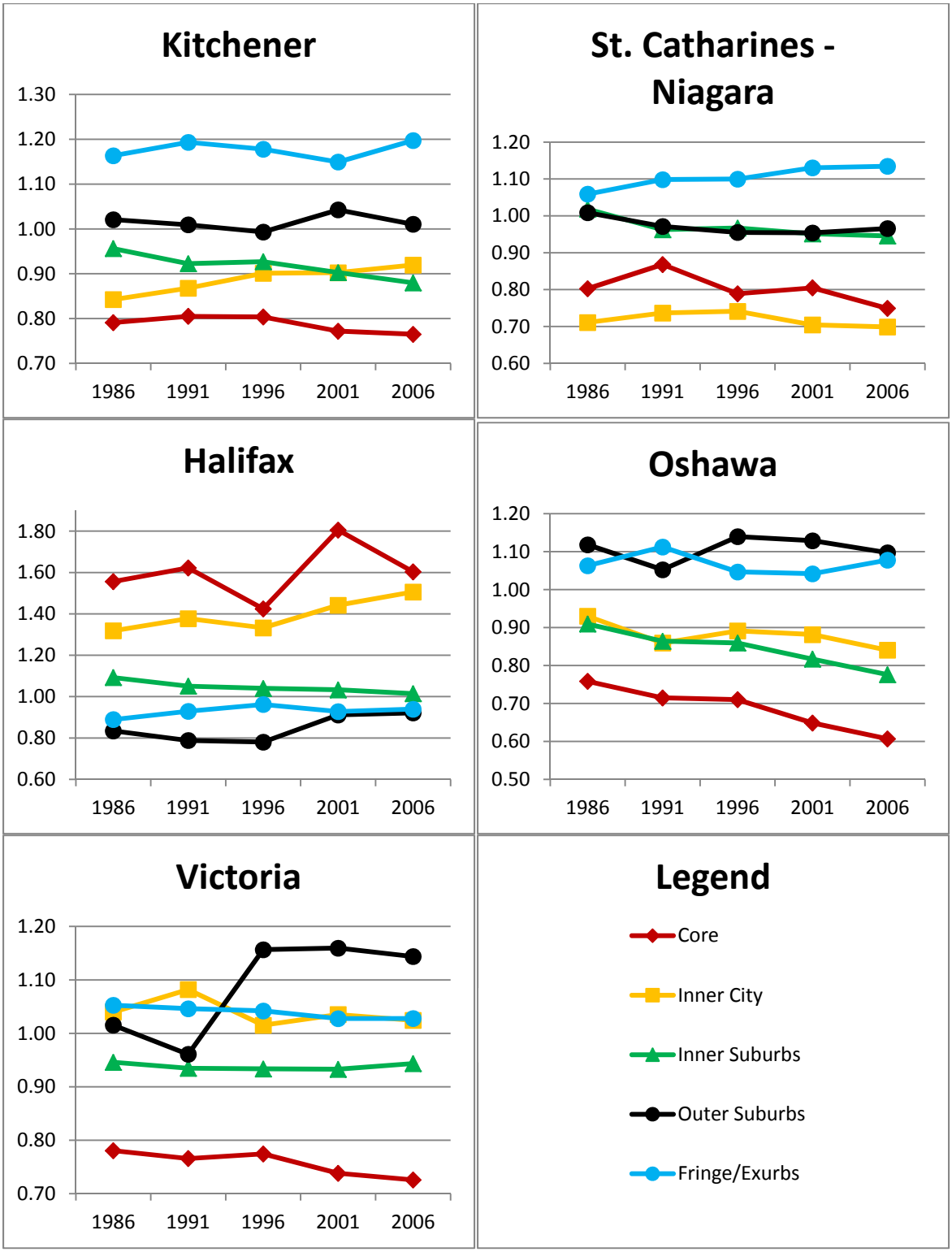


Figure 4-2: Change in average value of dwelling Relative Values, 1986-2006. (continued)



Hamilton, London, and Halifax recorded a positive Index of Change. The standard deviation was second highest among all urban zones for this variable. In comparison, the average dwelling values increased in the majority of the inner cities. However, while the mean Index of Change in this zone was over one, relative dwelling costs decreased in 6 CMAs: Edmonton, Winnipeg, Hamilton, St. Catharines – Niagara, Oshawa, and Victoria. This zone also had the highest standard deviation, indicating considerable disparity between CMAs. These results, coupled with high standard deviations, suggest that CMAs are experiencing diverging housing trends in both zones.

4.2.2.1. Comparing Findings Against Conceptual Model Predictions

The obtained empirical findings are contrasted against the three predictions derived from the conceptual model introduced in Chapter 3:

1. *Prosperity will decline in the inner suburbs of most CMAs.*

Relative average dwelling values decreased in the inner suburbs of 13 CMAs. The only exceptions were the Calgary and Victoria CMAs. Calgary's increase in the inner suburbs may in part be attributed to its small inner city urban zone. Furthermore, Toronto, Montreal, and Vancouver noted insignificant decreases in relative dwelling values. The inner suburbs of all these CMAs may therefore have retained most of their value due to the proximity to the inner city. Therefore, it is possible that the back to the city movement may positively affect the inner suburbs in urban regions with high core and inner city real estate prices. Nonetheless, the dwelling value Index of Change decreased in the majority of the CMAs. Therefore, the findings confirm the first prediction.

2. Prosperity will increase in the outer suburbs and the fringe/exurbs of most CMAs.

The findings fully confirm the second prediction in only two CMAs: Montreal and Halifax. Relative dwelling values decreased in the outer suburbs of 10 CMAs. Once again, this suggests that a decentralizing trend has started to affect the outer suburbs at the expense of the fringe/exurbs. This, however, was not the case everywhere. Hamilton, Halifax, and Victoria all had a higher Index of Change for this variable in the outer suburbs than in the fringe/exurbs. In addition, dwelling values in the fringe/exurbs of Calgary, Hamilton, and Victoria actually slipped. Calgary is also the only CMA which completely failed to meet the prediction, with both the outer suburbs and fringe/exurbs declining in dwelling values. This suggests that Calgary displays only the back to the city trend for this specific variable. Overall, the findings partially confirm the prediction and further suggest that the decentralizing trend has started to affect some outer suburbs.

3. *Prosperity will increase in the core and/or the inner city of some (mostly larger) CMAs.*

Relative dwelling value increases occurred in both the core and the inner city of four CMAs—Montreal, Quebec, London, and Halifax. Furthermore, relative dwelling values increased in the inner city of 5 additional CMAs: Toronto, Vancouver, Ottawa-Gatineau, Calgary, and Kitchener. Toronto, however, was also notable for having a drastic decline in housing prices of its core area. It is possible that such a large decline can be explained by the growth of the condominium market in Toronto, which generally attracts smaller households. Overall, it appears that there is a high demand for inner city real estate in many CMAs. This suggests that the back to the city movement is perhaps stronger than assumed by this research. Therefore, the findings in this case met the expectations of the second prediction.

4.2.3. Changes in Average Gross Rent

The average gross rent Index of Change for the selected 15 CMAs in the study period 1986 and 2006 is given for each urban zone in Table 4-3. Figure 4-3 illustrates changes in average gross rent Relative Values through each temporal data point in each urban zone of the 15 largest CMAs. More detailed tables are available in Appendix F.

Table 4-3: Index of Change for the average gross rent variable, 1986-2006.

	Core	Inner City	Inner Suburbs	Outer Suburbs	Fringe/Exurbs
Toronto	1.01	0.96	**1.03**	0.89	0.98
Montréal	1.08	1.09	**0.97**	1.00	0.99
Vancouver	1.11	1.05	**0.95**	0.89	1.04
Ottawa – Gatineau	1.04	1.00	**0.98**	0.97	1.03
Calgary	0.90	0.96	**0.98**	1.03	1.15
Edmonton	0.90	0.97	**0.98**	1.03	1.06
Québec	1.06	0.99	**0.99**	0.99	0.99
Winnipeg	0.95	1.00	**1.00**	1.04	1.04
Hamilton	0.98	0.92	**1.03**	0.99	1.01
London	0.96	0.93	**1.00**	1.01	1.01
Kitchener	0.91	1.06	**0.97**	1.02	1.14
St. Catharines – Niagara	0.99	0.95	**1.00**	1.02	1.02
Halifax	1.17	1.01	**1.01**	0.75	0.92
Oshawa	0.87	1.09	**0.98**	0.96	1.10
Victoria	0.94	1.02	**1.00**	1.03	0.97
Mean	0.99	1.00	**0.99**	0.97	1.03
Median	0.98	1.00	**0.99**	1.00	1.02
Standard Deviation	0.09	0.05	**0.02**	0.08	0.06

The findings indicate that relative rents stayed stable in the inner suburbs. The mean and the median inner suburban Index of Change for this variable was almost entirely neutral. The standard deviation was very low, as all CMA results were clustered closely together.

The average gross rent Index of Change was similarly stagnant in the outer suburbs. The mean Index of Change for this variable was similarly neutral. However, the standard deviation was significantly higher, indicating considerable unevenness in CMA results.

Figure 4-3: Change in average gross rent Relative Values, 1986-2006.

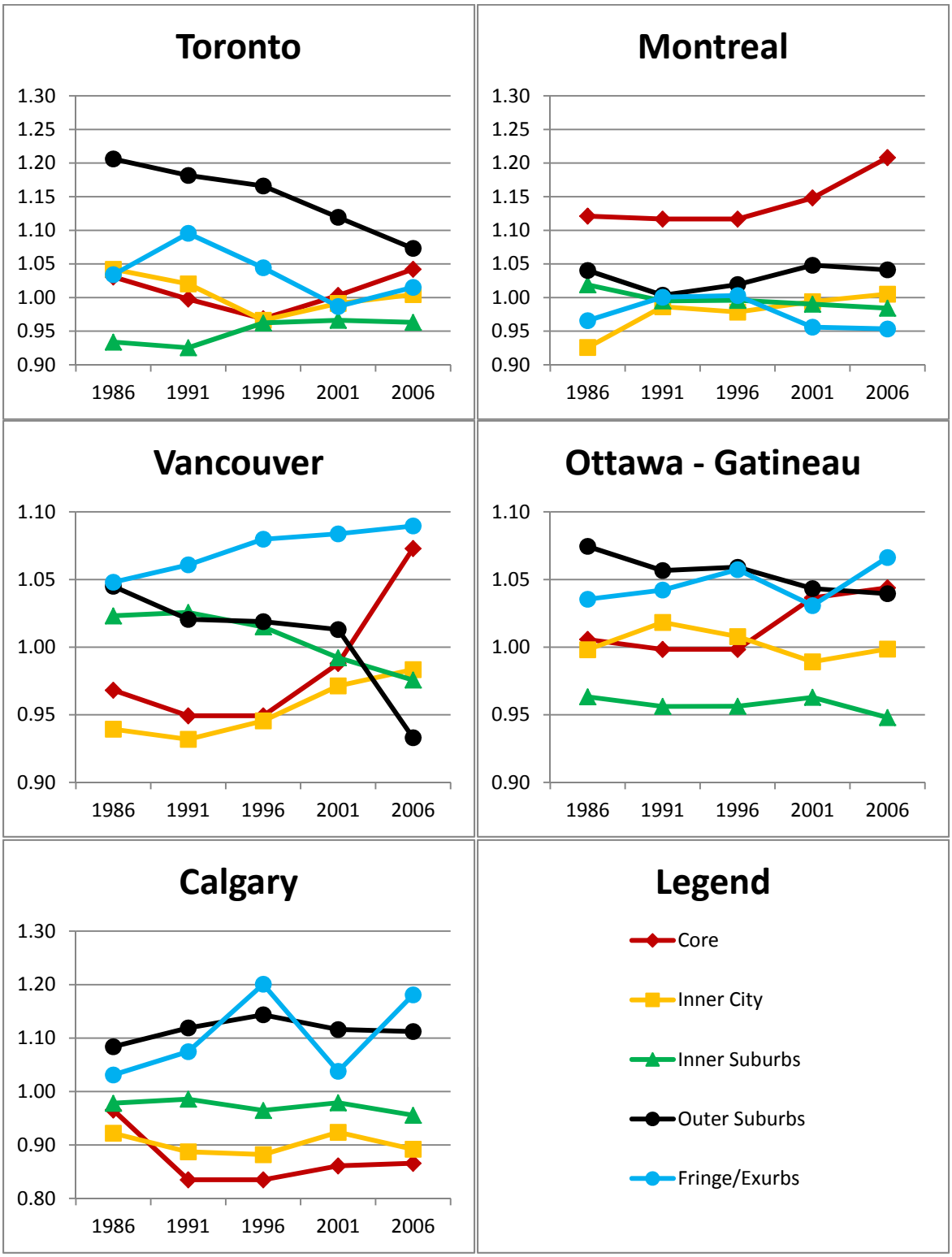


Figure 4-3: Change in average gross rent Relative Values, 1986-2006. (continued)

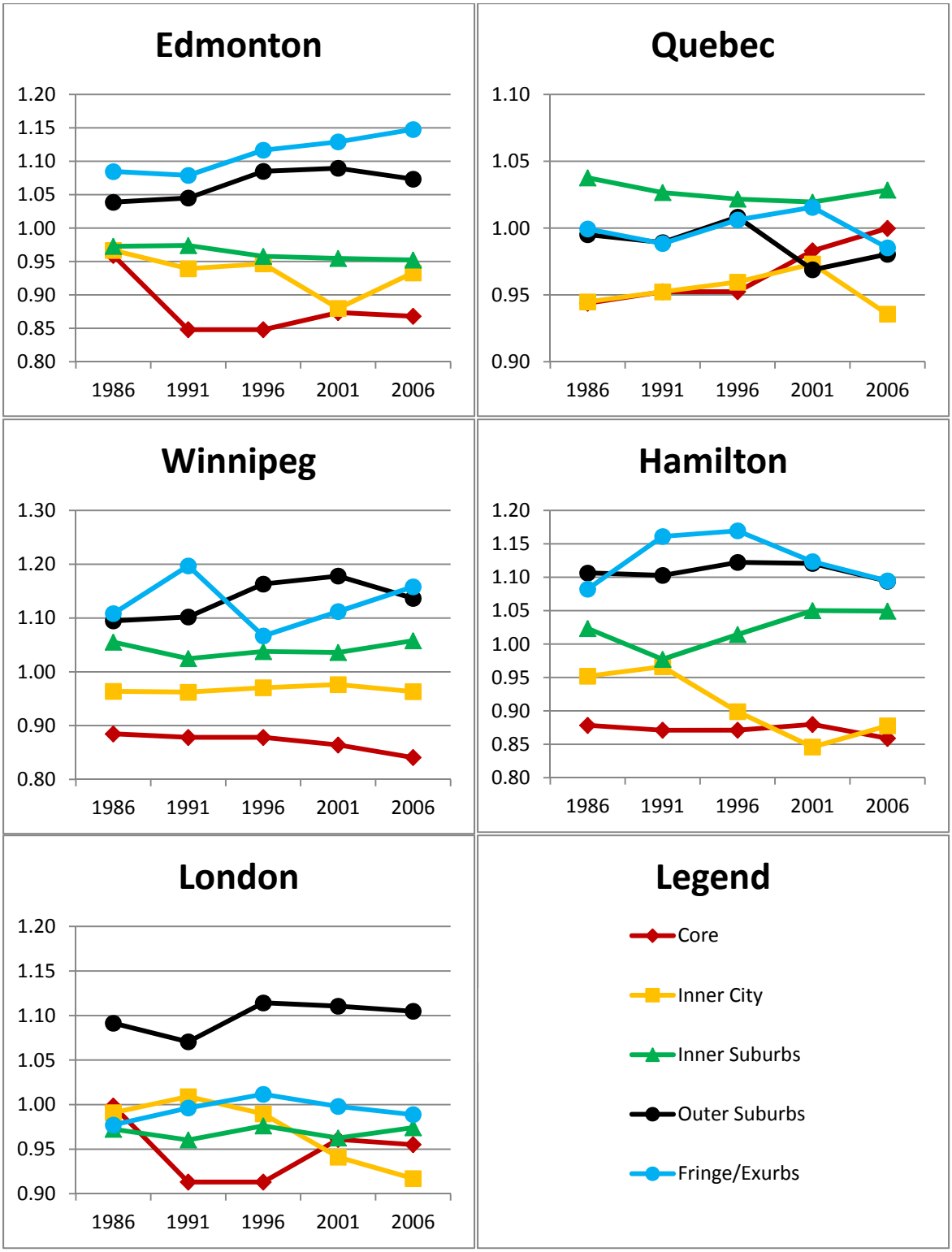
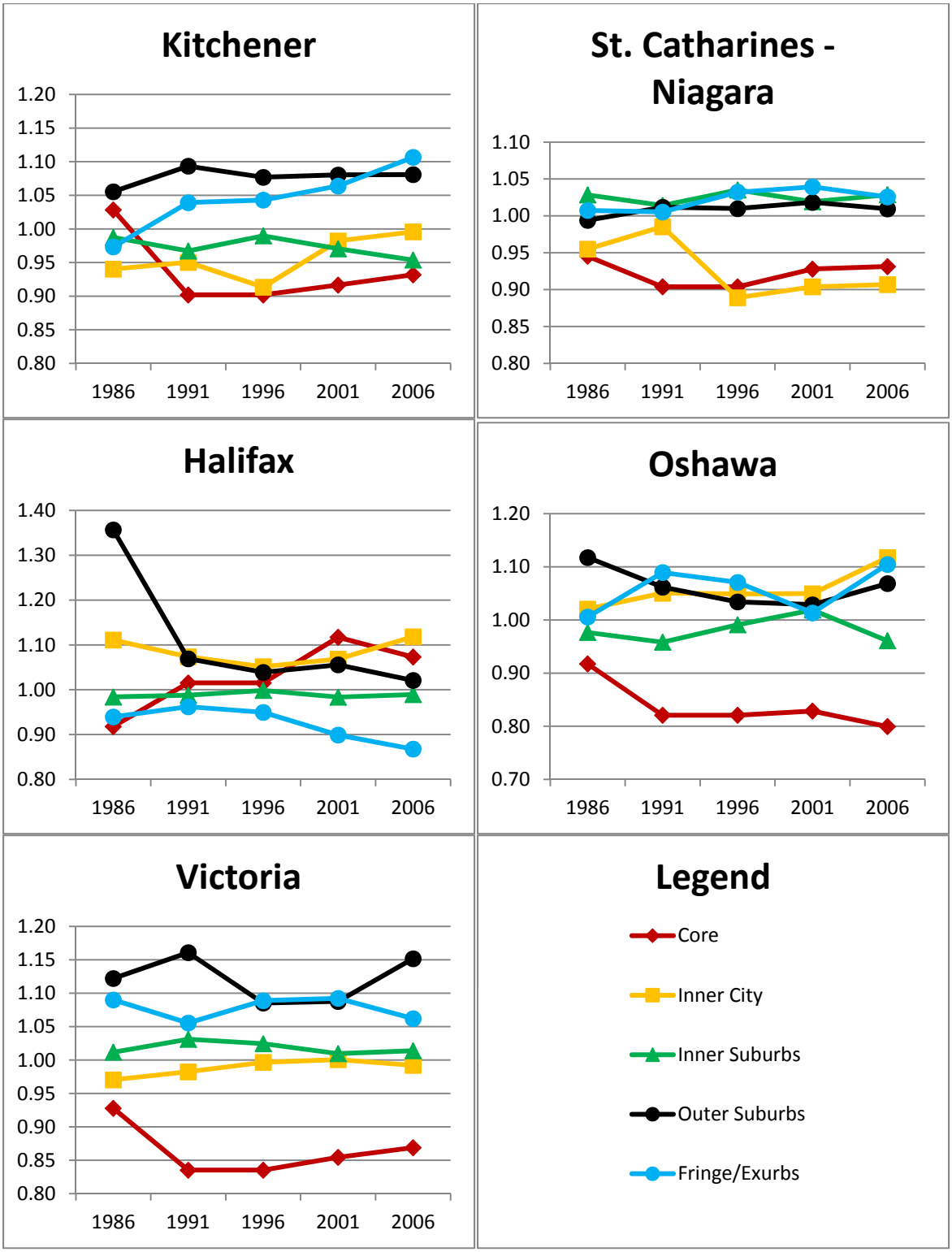


Figure 4-3: Change in average gross rent Relative Values, 1986-2006. (continued)



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In contrast, the Index of Change for gross rent was mostly positive in the fringe/exurbs. Only five CMAs—Toronto, Montreal, Edmonton, Quebec, Halifax, and Victoria—had an Index of Change of less than one for this value. The standard deviation was moderate in this zone, indicating some variation in CMA results.

The results obtained in the core suggest a flat Index of Change. The mean Index of Change was static. However, the standard deviation in this zone was highest among all urban zones, illustrating a diverging average gross rent trend in CMA.

The Index of Change also remained relatively stable in most CMAs of the inner city. This zone also had slight unevenness in results between the CMAs, with a moderate standard deviation.

4.2.3.1. Comparing Findings Against Conceptual Model Predictions

The obtained empirical findings are contrasted against the three predictions derived from the conceptual model introduced in Chapter 3:

1. *Prosperity will decline in the inner suburbs of most CMAs.*

Relative average gross rent decreased in only 8 CMAs studied. Furthermore, the decreases in the 8 CMAs were small. Little overall change in rent occurred in the inner suburbs. Therefore, the findings do not confirm the first prediction.

2. *Prosperity will increase in the outer suburbs and the fringe/exurbs of most CMAs.*

Relative average gross rent increased in both the outer suburbs and the fringe/exurbs of 5 CMAs studied: Calgary, Edmonton, Winnipeg, Kitchener, and St, Catharines-Niagara. Gross rent also increased in the fringe/exurbs of 10 CMAs and in the outer suburbs of 8 CMAs. Gross rent was higher in the outer suburbs than in the fringe/exurbs of 5 CMAs—Toronto, Montreal, Quebec, Halifax, and Victoria. The findings therefore weakly confirm the second prediction.

3. *Prosperity will increase in the core and/or the inner city of some (mostly larger) CMAs.* Average gross rent increased in the core and the inner cities of 3 CMAs: Montreal, Vancouver, and Halifax. Furthermore, rent increased in the core of Toronto, Ottawa-Gatineau, and Quebec CMAs. It also increased in the inner cities of Kitchener, Oshawa, and Victoria CMAs. Therefore, the results weakly confirm the prediction.

4.3. FACTOR ANALYSIS

A factor analysis was performed using the nine variables shown in Table 4-4 for the 9 largest CMAs. The tenth variable—which measured the proportion of the immigrant population—was dropped due to insignificant loadings on any extracted factor. KMO and Bartlett's Test confirmed that the dataset was a good fit for factor analysis. Consequently, three factors were extracted. Details of the analysis can be found in Appendix G.

Table 4-4: Variables used in the factor analysis of nine largest CMAs.

	Factor Variables		
Category	Name	Calculation*	Time
Demographic	YOUNGPOP	Proportion of young population (0-14) in comparison to population total	'86, '91,' 96, '01, '06
	ELDPOP	Proportion of elderly population (65+) in comparison to population total	'86, '91, '96, '01, '06
Socio-economic	UNEMP	Percentage of unemployed	'86, '91, '96, '01, '06
	LOWINCFAM	Percentage of low income families	'86, '91, '96, '01, '06
	UNIVPOP	Proportion of university graduates compared to total population 15+	'86, '91, '96, '01, '06
	MHHINC	Median household income	'86, '91, '96, '01, '06
Housing	HSVAL	Average value of dwelling	'86, '91, '96, '01, '06
	RENTVAL	Average gross rent	'86, '91, '96, '01, '06
	OWNPROP	Proportion of owned dwellings in comparison to total dwellings	'86, '91, '96, '01, '06

* All urban zone calculations are relative to the CMA average.

Table 4-5 shows rotated factor loadings for the three extracted factors. The first extracted factor groups together high property ownership, high median household incomes, with low incidence of low income families and low unemployment rates. This integrated variable, titled in this research as the prosperity factor, explains 30% of overall variance in data. The second factor combines high proportion of university graduates with high housing values, high rents, and high median household incomes. This second integrated variable, titled in this research as the exclusivity factor, explains 25% of the overall variance in data. Finally, the third factor groups high proportion of youths and relatively high household ownership with low proportions of the elderly. The third integrated variable explained 20% of the overall variance in data.

Table 4-5: Varimax rotated factor loadings with eigenvalues over 1 for 9 CMAs analyzed. Values over .4 are bolded.

	Component		
	1	2	3
YOUNGPOP	.233	-.167	**.861**
ELDPOP	.002	.004	**-.871**
UNEMP	**-.852**	-.184	.019
LOWINCFAM	**-.904**	-.242	.009
UNIVPOP	.059	**.861**	-.210
MHHINC	**.557**	**.474**	.299
HSVVAL	.129	**.854**	-.110
RENTVAL	.377	**.664**	.128
OWNPROP	**.810**	.003	**.417**

This thesis is concerned with the first two extracted factors, as the third factor does not meaningfully measure an easily discernable aspect of prosperity: no socio-economic variables were loaded on this factor. Furthermore, the third factor included less than four extracted variables.

4.3.1. Prosperity Factor Scores

Figure 4-4 shows the prosperity factor scores for the 9 studied CMAs, re-aggregated by urban zone and time. The inner suburbs suffered the clearest and most significant declines in prosperity over time. In fact prosperity factor scores decreased in every inner suburb of the 9 CMAs studied. Although the inner cities of most CMAs also mostly declined, their fall was less consistent. In contrast, urban zones in most CMAs experienced increased prosperity in the core, the outer suburbs, and most significantly, the fringe/exurbs.

In order to further confirm whether the prosperity factor scores capture statistically significant differences, the results are validated via a random-effect GLS regression model. Table 4-6 shows the regression results of the prosperity factor. The decreasing values in time dummies in the regression analysis confirm that the inner suburbs have experienced a decline over time in all of the CMAs studied. The decreases are often statistically insignificant in later years, partly due to relatively few observations in each time period and partly as a result of gradual change between individual time periods.

The spatial dummies also reveal that the inner suburbs are still more prosperous than the central city. The negative coefficients in the core and the inner city urban zones suggest that relative prosperity of those zones is still lower than that of the inner suburbs. However, the inner city and the inner suburbs of the Toronto and Calgary CMA appear to be converging over time. While other CMAs do not register a similar convergence, all CMAs register a clear divergence between the inner suburbs and the outer suburbs. The divergence is statistically significant for most CMAs, with the exception of Calgary, Edmonton, Winnipeg and Hamilton. The lack of

Figure 4-4: Anderoson-Rubin prosperity factor scores, 1986-2006.

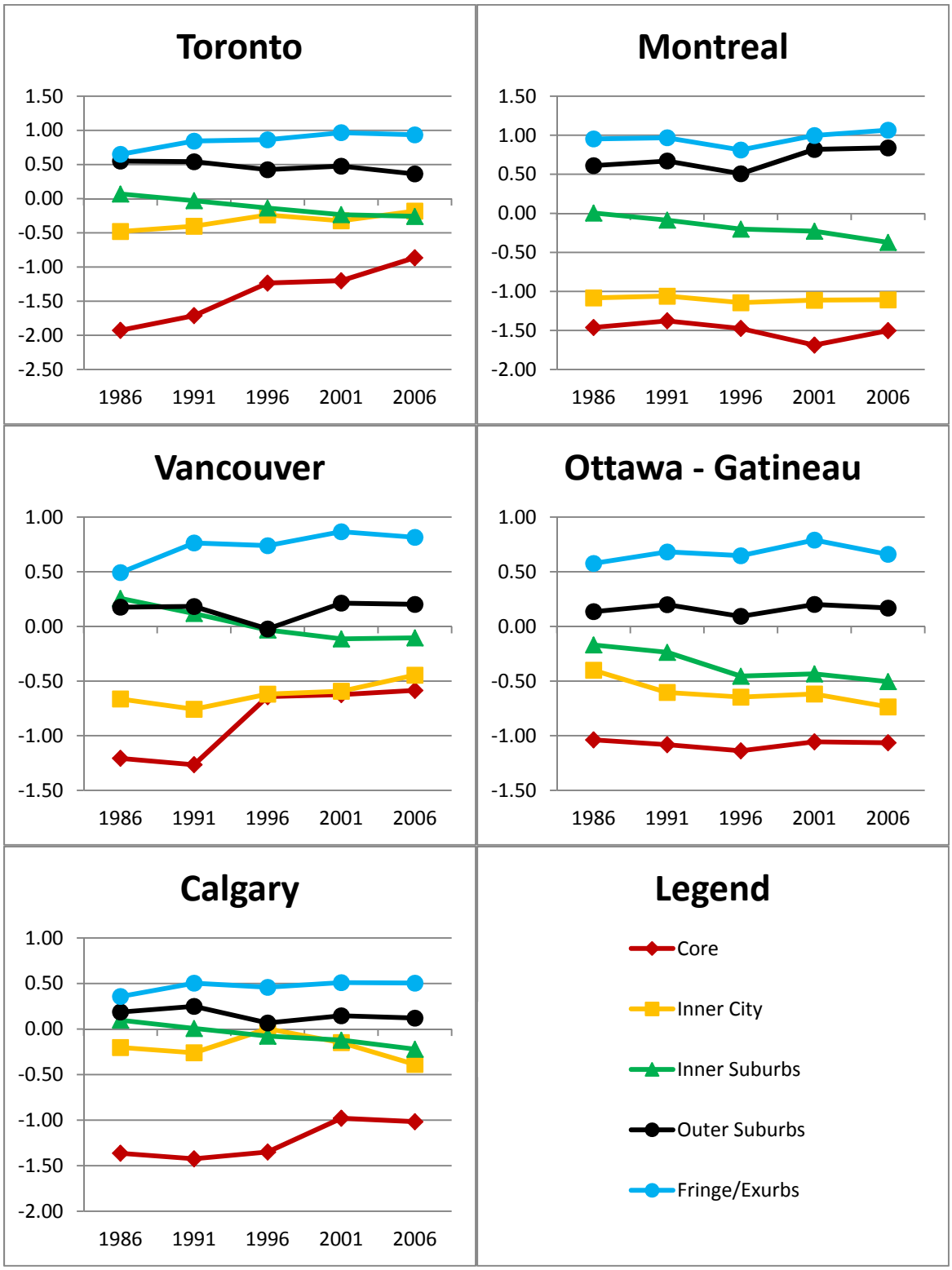

Figure 4-4: Anderson-Rubin prosperity factor scores, 1986-2006. (continued)

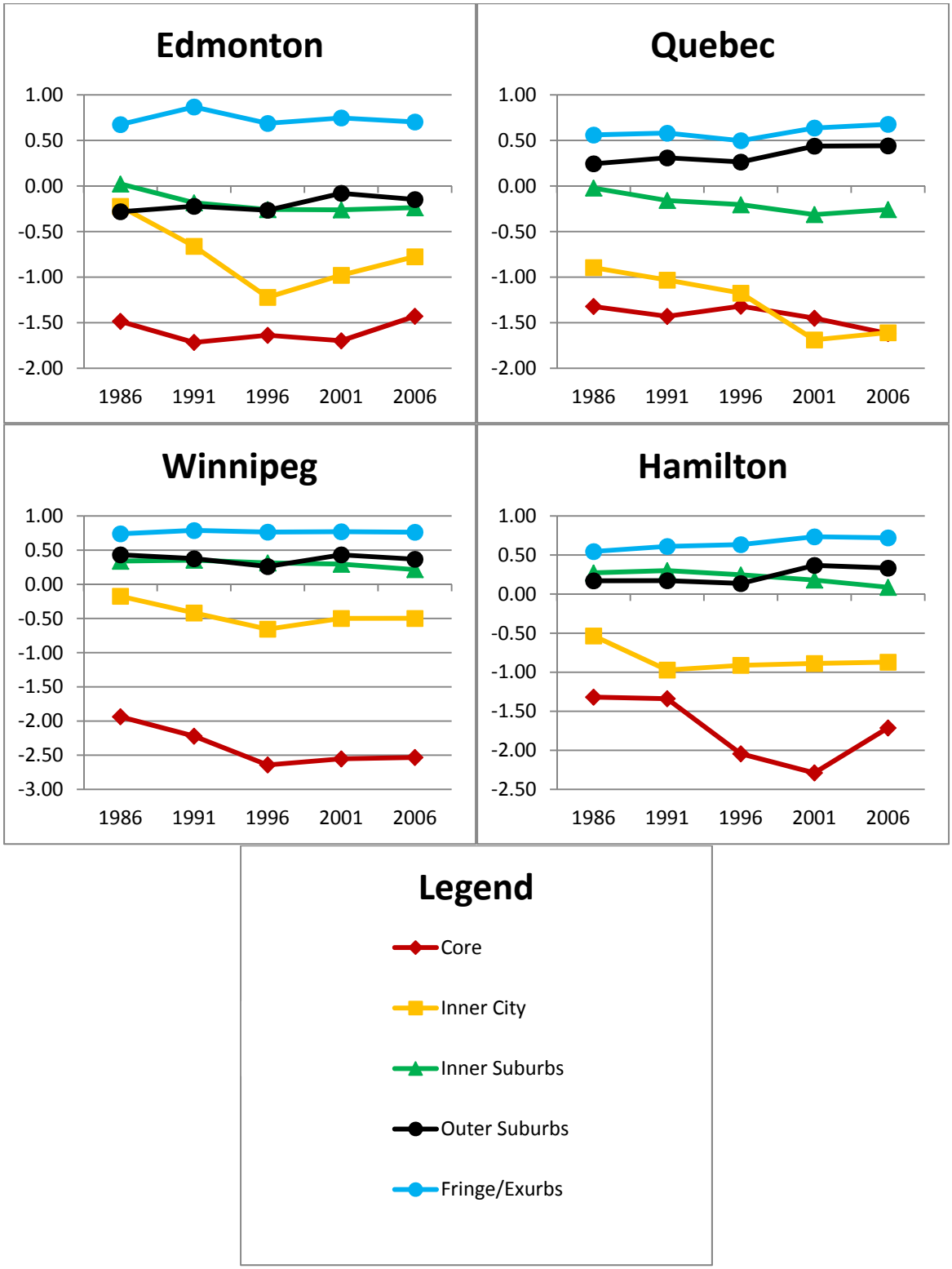

Table 4-6: Random-Effect GLS regression results of the prosperity factor score for the nine largest CMAs.

	TORONTO			MONTREAL			VANCOUVER		
	Coefficient		z	Coefficient		z	Coefficient		z
Core	-0.8978	**	-4.26	-1.2066	**	-7.05	-0.4562	*	-2.32
Icity	-0.0626		-0.79	-0.8314	**	-10.15	-0.4628	**	-3.87
Osub	0.7340	**	9.85	0.7899	**	3.75	0.5099	**	4.48
Exurb	1.0121	**	13.15	1.2117	**	14.29	0.7194	**	7.42
1986	0.2781	**	10.60	0.2641	**	10.36	0.2959	**	7.23
1991	0.1618	**	6.17	0.1746	**	6.85	0.1648	**	4.03
1996	0.0801	**	3.05	0.0857	**	3.36	0.0397		0.97
2006	-0.0103		-0.39	-0.1336	**	-5.24	0.0096		0.24
1986*Core	-0.8229	**	-6.65	-0.1961	*	-2.07	-1.1146	**	-8.42
1991*Core	-0.4984	**	-4.03	0.0837		0.88	-0.9175	**	-6.93
1996*Core	-0.0538		-0.44	0.0783		0.83	-0.2014		-1.52
2006*Core	0.2352		1.90	0.0006		0.01	-0.0466		-0.35
1986*Icity	-0.5383	**	-11.50	-0.3452	**	-7.61	-0.5288	**	-6.58
1991*Icity	-0.3215	**	-6.87	-0.1499	**	-3.31	-0.4300	**	-5.35
1996*Icity	-0.0847		-1.81	-0.1284	**	-2.83	-0.1052		-1.31
2006*Icity	0.0909		1.94	0.1355	**	2.99	0.0443		0.55
1986*Osub	0.0324		0.59	-0.1541		-1.08	-0.1628		-1.56
1991*Osub	-0.0764		-1.53	-0.1907		-1.33	-0.1599		-1.59
1996*Osub	-0.0848		-1.70	-0.1858		-1.30	-0.1489		-1.50
2006*Osub	-0.1343	**	-2.73	0.0415		0.30	0.0060		0.06
1986*Exurb	-0.3445	**	-6.73	-0.2100	**	-4.44	-0.4631	**	-6.71
1991*Exurb	-0.2516	**	-4.84	-0.2412	**	-5.09	-0.1936	**	-2.79
1996*Exurb	-0.1317	*	-2.53	-0.1940	**	-4.10	-0.0901		-1.30
2006*Exurb	-0.0790		-1.51	0.1525	**	3.22	-0.0734		-1.05
Constant	-0.1513	**	-3.39	-0.22565	**	-4.90	-0.00137		-0.02
sigma_u	0.722861			0.788404			0.591039		
sigma_e	0.32999			0.335445			0.319929		
rho	0.827543			0.84672			0.773393		
Num. of observations	3561			3430			1360		
Num. of groups	713			686			272		
R-sq. Within	0.13			0.11			0.16		
Between	0.27			0.45			0.36		
Overall	0.25			0.42			0.33		
Wald chi2 (24)	698.92			906.7			357.46		
Prob>chi2	0.000			0.000			0.000		

**p < .01; *p < .05. The constant is the inner suburbs in 2001.

Table 4-6: Random-Effect GLS regression results of the prosperity factor score for the nine largest CMAs. (continued)

	OTTAWA - GATINEAU			CALGARY			EDMONTON		
	Coefficient		z	Coefficient		z	Coefficient		z
Core	-0.7597	**	6.38	-0.8675	**	-2.86	-1.4216	**	-3.29
Icity	-0.3689		5.14	-0.0565		-0.20	-0.6867		-1.83
Osub	0.4528	*	3.36	0.1053		0.88	0.1183		0.87
Exurb	0.7258	**	0.35	0.5106	**	3.22	0.9872	**	7.09
1986	0.2143	**	1.31	0.1677	**	3.42	0.2511	**	3.81
1991	0.1955	**	-0.86	0.1066	*	2.17	0.1365	*	2.07
1996	0.0131		1.03	0.0531		1.08	0.0689		1.05
2006	-0.0696		0.15	-0.0985	*	-2.01	-0.0182		-0.28
1986*Core	-0.1687		-3.19	-0.5117	**	-2.85	-0.1592		-0.48
1991*Core	-0.2375		-2.57	-0.3688	*	-2.05	-0.1248		-0.38
1996*Core	-0.0615		-2.77	-0.2584		-1.44	0.0135		0.04
2006*Core	0.0473		-2.53	0.0958		0.53	0.2877		0.87
1986*Icity	0.0009		-3.13	-0.0821		-0.50	0.4709		1.64
1991*Icity	-0.1464		-0.67	-0.2187		-1.32	0.2231		0.78
1996*Icity	-0.0979		-0.87	0.1002		0.61	-0.2613		-0.91
2006*Icity	-0.0659		1.36	-0.1590		-0.96	0.2348		0.82
1986*Osub	-0.0708		1.03	0.1234		1.68	-0.3631	**	-3.49
1991*Osub	-0.1877		0.55	0.1031		1.42	-0.4135	**	-3.97
1996*Osub	-0.0754		0.24	0.0475		0.65	-0.1664		-1.60
2006*Osub	-0.0069		-0.34	0.0902		1.24	-0.1517		-1.46
1986*Exurb	-0.2533	**	-1.51	-0.2029		-1.95	-0.2363	*	-2.22
1991*Exurb	-0.2186	*	0.96	-0.0987		-0.93	-0.0102		-0.10
1996*Exurb	-0.0821		-0.19	-0.0233		-0.22	-0.0831		-0.78
2006*Exurb	-0.0067		0.78	0.0964		0.91	-0.0254		-0.24
Constant	-0.2460	*	-3.59	-0.06242		-0.75	-0.22113	*	-2.56
sigma_u	0.866552			0.593867			0.616437		
sigma_e	0.362791			0.27315			0.395299		
rho	0.850864			0.825386			0.708607		
Num. of observations	925			710			860		
Num. of groups	185			142			172		
R-sq. Within	0.05			0.15			0.07		
Between	0.26			0.18			0.37		
Overall	0.24			0.18			0.32		
Wald chi2 (24)	101.14			127.35			151.33		
Prob>chi2	0.000			0.000			0.000		

**p < .01; *p < .05. The constant is the inner suburbs in 2001.

Table 4-6: Random-Effect GLS regression results of the prosperity factor score for the nine largest CMAs. (continued)

	QUEBEC			WINNIPEG			HAMILTON		
	Coefficient		z	Coefficient		z	Coefficient		z
Core	-1.0840	**	-5.26	-2.8361	**	-11.92	-2.4118	**	-9.06
Icity	-1.2870	**	-5.68	-0.7639	**	-4.40	-1.0941	**	-6.55
Osub	0.7298	**	4.43	0.1978		1.01	0.1508		0.98
Exurb	0.8781	**	6.23	0.3249		1.70	0.3393	*	2.34
1986	0.3340	**	5.30	0.0345		0.62	0.0197		0.34
1991	0.1906	**	3.02	0.0485		0.87	0.0762		1.31
1996	0.1148		1.82	0.0410		0.73	0.0529		0.91
2006	0.0195		0.31	-0.0137		-0.25	-0.1020		-1.75
1986*Core	-0.2992	*	-2.53	0.1912		1.55	0.8040	**	4.94
1991*Core	-0.1379		-1.16	0.2391		1.94	0.9266	**	5.69
1996*Core	0.0272		0.23	-0.1211		-0.98	0.1095		0.67
2006*Core	-0.1896		-1.60	0.0021		0.02	0.5766	**	3.54
1986*Icity	0.2909	*	2.24	0.2126	*	2.37	0.1869		1.82
1991*Icity	0.4677	**	3.60	0.0250		0.28	-0.1370		-1.33
1996*Icity	0.3858	**	2.97	-0.1430		-1.59	-0.0696		-0.68
2006*Icity	0.0246		0.19	0.0818		0.91	0.1207		1.17
1986*Osub	-0.3857	**	-3.15	0.0438		0.37	-0.0546		-0.44
1991*Osub	-0.2039		-1.72	-0.0420		-0.36	-0.1447		-1.22
1996*Osub	-0.1220		-1.03	-0.0840		-0.73	-0.0691		-0.59
2006*Osub	-0.0346		-0.30	-0.0358		-0.31	0.0809		0.73
1986*Exurb	-0.3057	**	-3.29	-0.0084		-0.08	-0.0911		-0.86
1991*Exurb	-0.2587	**	-2.77	-0.0669		-0.62	-0.1888		-1.77
1996*Exurb	-0.2107	*	-2.26	-0.0126		-0.12	-0.1447		-1.35
2006*Exurb	-0.0065		-0.07	-0.0335		-0.31	0.0145		0.13
Constant	-0.3186	**	-3.00	0.350899	**	3.25	0.289962	**	3.12
sigma_u	0.68791			0.738964			0.676167		
sigma_e	0.30097			0.290265			0.323008		
rho	0.839336			0.866332			0.814198		
Num. of observations	675			690			735		
Num. of groups	135			138			147		
R-sq. Within	0.19			0.08			0.13		
Between	0.53			0.59			0.47		
Overall	0.50			0.56			0.44		
Wald chi2 (24)	262.71			238.16			212.44		
Prob>chi2	0.000			0.000			0.000		

**p < .01; *p < .05. The constant is the inner suburbs in 2001.

statistical significance in these CMAs can partly be explained by lesser divergence, and partly by a relatively low number of observed tracts in these CMAs.

The interaction dummies show that changes in the core and the inner city were highly variable between CMAs. In most CMAs, the changes in these urban zones mostly failed to meet statistical significance, especially in the core. However, the appreciation of the prosperity factor score in the core and the inner city was highly statistically significant in Toronto; conversely, the decline in the prosperity factor in the inner city of the Quebec CMA was also statistically significant.

Most significant increases in the prosperity factor scores generally occurred in the fringe/exurbs. The results were highly statistically significant in Toronto, Montreal, Vancouver, Quebec, and Hamilton CMAs. In contrast, the results were statistically insignificant in the Winnipeg CMA. Prosperity factor scores also increased in the outer suburbs, although statistical significance was not met. Once again, it is likely that the relatively small amount of observations prevents a more detailed confirmation of results in smaller CMAs.

4.3.1.1. Comparing Findings Against Conceptual Model Predictions

The obtained empirical findings are contrasted against the three predictions derived from the conceptual model introduced in Chapter 3:

1. *Prosperity will decline in the inner suburbs of most CMAs.*

The prosperity factor declined in the inner suburbs of all the CMAs studied, without an exception, and often with high statistical significance in the early years. The uniformity of the empirical findings therefore meets the expectations of the first prediction.

2. Prosperity will increase in the outer suburbs and the fringe/exurbs of most CMAs.

Only partial confirmation was obtained for Toronto and Winnipeg CMAs. In both CMAs, the prosperity factor increased in the fringe/exurbs, but not the outer suburbs. Conversely, the prosperity factor increased in both the outer suburbs and the fringe/exurbs of the other seven CMAs studied. However, the prosperity factor score increased very slightly in the outer suburbs of the Ottawa-Gatineau CMA, and weakly in the fringe/exurbs of the Edmonton CMA. Furthermore, increases in the outer suburbs often failed to meet statistical significance. Nonetheless, the findings generally point to consistent increases in the prosperity factor of both zones and therefore confirm the second prediction.

3. *Prosperity will increase in the core and/or the inner city of some (mostly larger) CMAs.*

The prosperity factor increased in both the core and the inner city of Toronto and Vancouver CMAs. In addition, it increased in the core of Calgary and Edmonton CMAs. However, the results were statistically weak for the latter two CMA. The results were negative in the other 5 CMAs, suggesting an existent, but weak back to the city trend. Therefore, the findings only weakly confirm the third prediction.

4.3.2. Exclusivity Factor Scores

Figure 4-5 shows exclusivity factor scores for the 9 studied CMAs, re-aggregated by urban zone and time. Exclusivity factor scores showed considerable variability among the CMAs studied.

The largest increases in the exclusivity factor occurred in the inner city and the fringe/exurban zones. In contrast, the outer suburban exclusivity factor scores decreased in the majority of the CMAs. The results for the inner suburbs and the core were mixed, lacking a distinct trend.

As was done with prosperity factor scores, a random-effect GLS regression is further used to confirm the statistical significance of the results. Table 4-7 shows the regression results. The time dummies show increased exclusivity factor scores in the inner suburbs in Toronto, Montreal, Vancouver, and Calgary CMAs while other CMAs exhibited a slight decrease in exclusivity scores. However, the results rarely reached statistical significance. The relatively limited number of observations and the gradual change in coefficients likely explains this result. The spatial dummies in this case affirmed the greater exclusivity factor score in both the core and the inner city of Toronto, Montreal, Vancouver, and Ottawa-Gatineau CMAs at statistically significant levels. The core was also the most exclusive zone in Calgary, Edmonton, Quebec, and Hamilton CMAs; however, the results did not reach statistical significance. Surprisingly, both the outer suburbs and the fringe/exurbs had lower exclusivity factor scores than the inner suburbs in three CMAs: Montreal, Vancouver, and Hamilton. However, statistical significance was once again lacking.

Although cores of the CMAs generally have high exclusivity factor scores, the interaction dummies show that their exclusivity declined over time. The exceptions are Montreal and Quebec, as exclusivity scores increases significantly in both CMAs. Exclusivity factor scores similarly increased significantly in Montreal's inner city. The interaction dummies rarely reached statistical significance for any urban zone, precluding an additional confirmation of results. In addition, the coefficients of determination were notably lower for this factor across the nine CMA. Variance for this score therefore appeared to be more scattered than for the prosperity score. Calgary and Edmonton CMAs showed an especially poor fit.

Figure 4-5: Anderson-Rubin exclusivity factor scores, 1986-2006.

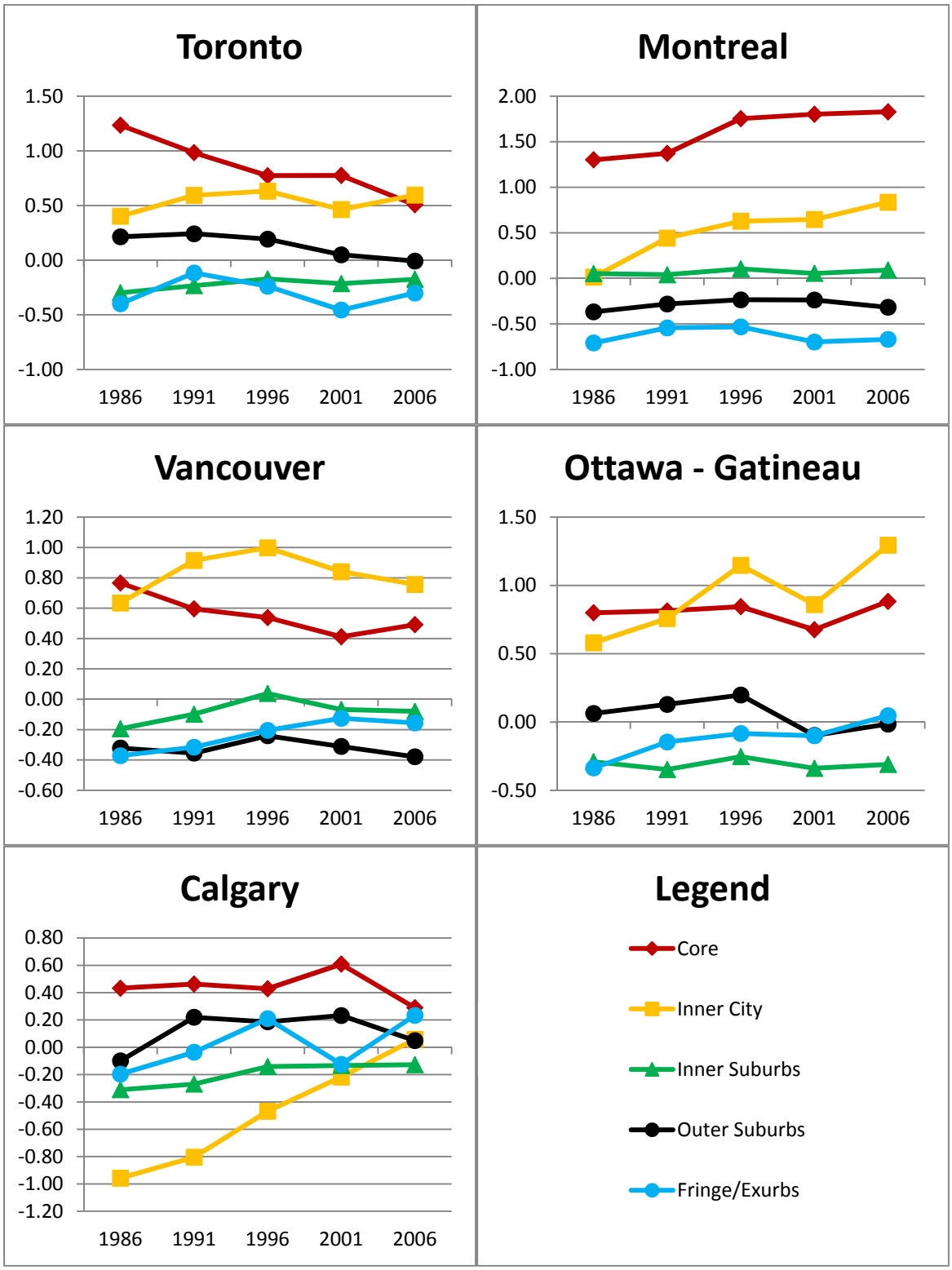

Figure 4-5: Anderson-Rubin exclusivity factor scores, 1986-2006. (continued)

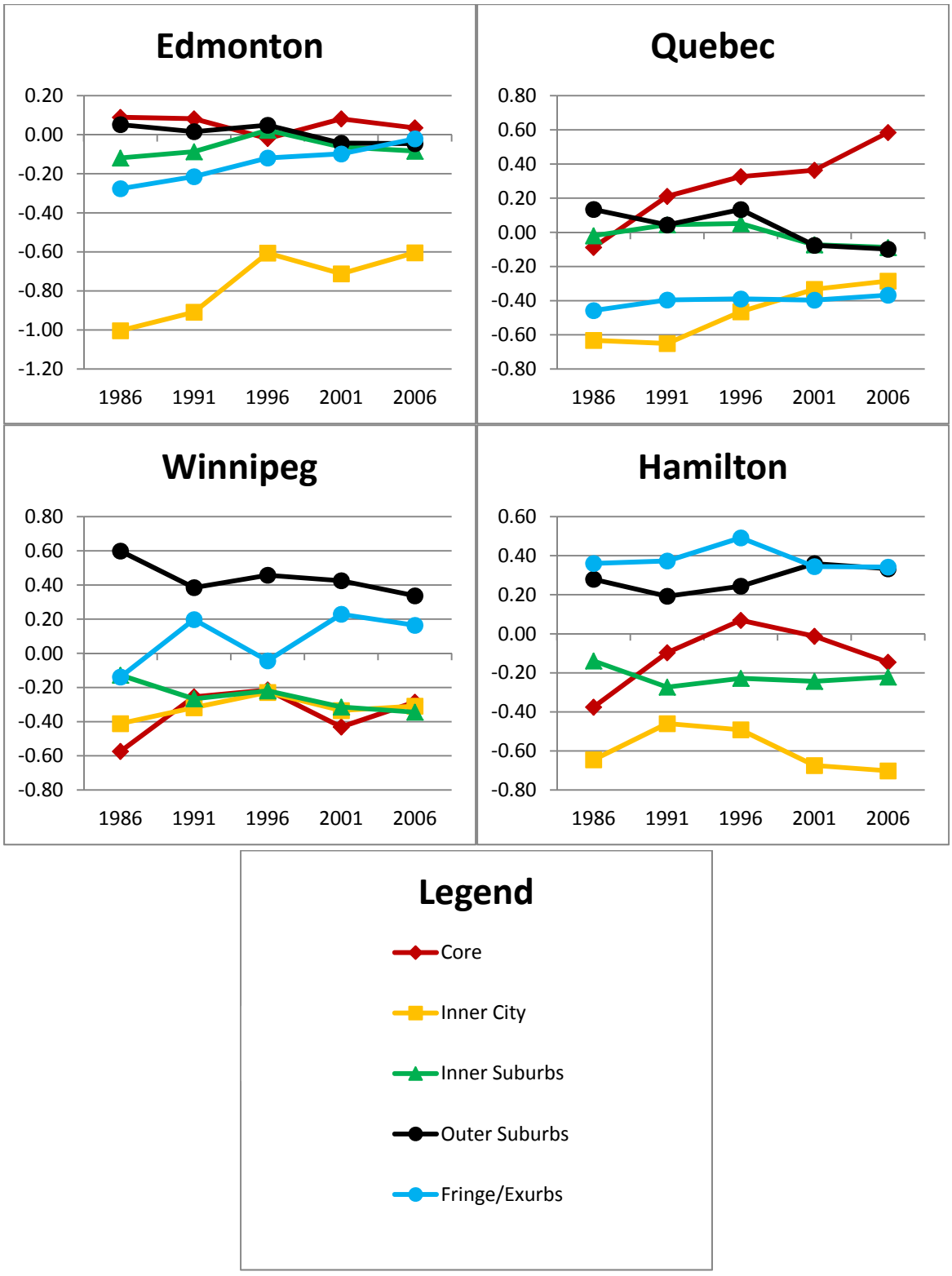

Table 4-7: Random-Effect GLS regression results of the exclusivity factor score for the nine largest CMAs.

	TORONTO			MONTREAL			VANCOUVER		
	Coefficient		z	Coefficient		z	Coefficient		z
Core	0.9280	**	3.52	1.6639	**	8.09	0.4230		1.49
Icity	0.7692	**	7.71	0.6377	**	6.48	0.8567	**	4.97
Osub	-0.0489		-0.53	-0.0318		-0.15	-0.1368		-0.96
Exurb	0.0279		0.30	-0.4574	**	-4.52	-0.1110		-0.82
1986	0.0220		0.78	0.0293		1.46	-0.1399	**	-4.74
1991	-0.0444		-1.57	-0.0220		-1.10	-0.0754	*	-2.56
1996	-0.0249		-0.88	-0.0029		-0.15	0.0158		0.53
2006	0.0020		0.07	0.0294		1.47	-0.0063		-0.21
1986*Core	0.8015	**	6.02	-0.2945	**	-3.95	0.4763	**	4.99
1991*Core	0.2789	*	2.10	-0.2374	**	-3.18	0.2163	*	2.27
1996*Core	-0.0007		-0.01	-0.2112	**	-2.83	-0.0037		-0.04
2006*Core	-0.2567		-1.93	0.0064		0.09	0.1001		1.05
1986*Icity	0.0080		0.16	-0.5960	**	-16.71	0.0338		0.58
1991*Icity	0.0244		0.49	-0.2938	**	-8.24	0.1002		1.73
1996*Icity	-0.0557		-1.11	-0.1965	**	-5.51	-0.0187		-0.32
2006*Icity	-0.0253		-0.50	0.1126	**	3.16	-0.0965		-1.66
1986*Osub	0.4495	**	7.59	0.1583		1.40	0.1371		1.82
1991*Osub	0.2063	**	3.84	0.1407		1.25	0.0328		0.45
1996*Osub	0.1162	*	2.16	0.0912		0.81	0.0342		0.48
2006*Osub	-0.1023		-1.94	-0.0220		-0.20	-0.0786		-1.15
1986*Exurb	0.0153		0.28	-0.1695	**	-4.55	0.0245		0.49
1991*Exurb	0.2863	**	5.12	-0.0535		-1.44	-0.0848		-1.69
1996*Exurb	0.1358	*	2.43	-0.0273		-0.73	-0.0981		-1.96
2006*Exurb	0.0648		1.15	-0.0412		-1.11	-0.0202		-0.40
Constant	-0.1889	**	-3.38	0.035381		0.64	-0.02011		-0.23
sigma_u	0.928716			0.966605			0.945623		
sigma_e	0.35442			0.269739			0.231699		
rho	0.872877			0.927753			0.943364		
Num. of observations	3561			3430			1360		
Num. of groups	713			686			272		
R-sq. Within	0.09			0.22			0.08		
Between	0.10			0.16			0.12		
Overall	0.10			0.17			0.12		
Wald chi2 (24)	345.72			905.46			132.93		
Prob>chi2	0.000			0.000			0.000		

**p < .01; *p < .05. The constant is the inner suburbs in 2001.

Table 4-7: Random-Effect GLS regression results of the exclusivity factor score for the nine largest CMAs. (continued)

	OTTAWA - GATINEAU			CALGARY			EDMONTON		
	Coefficient		z	Coefficient		z	Coefficient		z
Core	1.3890	**	1.66	0.6915		1.94	0.1248		0.27
Icity	1.1206	**	-1.39	0.6606	*	2.01	-0.6230		-1.55
Osub	0.5013	**	-0.68	0.0141		0.10	-0.0676		-0.46
Exurb	0.0379		-1.63	0.3605	*	2.06	-0.0305		-0.21
1986	0.0582		2.30	-0.1637	**	-3.63	-0.0429		-1.09
1991	-0.0383		1.85	-0.1319	**	-2.93	-0.0354		-0.90
1996	0.0459		1.17	-0.0663		-1.47	0.0071		0.18
2006	0.0067		-1.04	-0.0055		-0.12	-0.0376		-0.95
1986*Core	-0.3313	**	-6.24	0.2537		1.54	0.0860		0.44
1991*Core	-0.2667	*	-2.88	0.1601		0.97	0.0319		0.16
1996*Core	-0.2874	**	-2.13	0.0973		0.59	-0.1703		-0.86
2006*Core	-0.2628	*	3.16	0.0683		0.41	-0.0055		-0.03
1986*Icity	-0.3243	**	-3.91	-0.5614	**	-3.70	-0.2367		-1.38
1991*Icity	-0.0691		-4.44	-0.5975	**	-3.94	-0.1748		-1.02
1996*Icity	-0.0902		-2.43	-0.3514	*	-2.32	0.0563		0.33
2006*Icity	0.1410		0.99	0.1352		0.89	0.1472		0.86
1986*Osub	0.0814		0.42	0.3765	**	5.58	0.2952	**	4.74
1991*Osub	0.0439		0.34	0.2884	**	4.32	0.2069	**	3.32
1996*Osub	0.0194		0.66	0.1522	*	2.28	0.0940		1.51
2006*Osub	-0.0268		0.09	-0.1187		-1.78	-0.0557		-0.89
1986*Exurb	-0.0992		-4.70	-0.0294		-0.31	-0.0377		-0.59
1991*Exurb	0.0631		-2.36	-0.1000		-1.03	-0.1483	*	-2.33
1996*Exurb	-0.0123		-2.63	0.1463		1.51	-0.0881		-1.39
2006*Exurb	0.0513		0.60	0.1644		1.69	0.0341		0.54
Constant	-0.3101	**	-0.26	-0.14568		-1.50	-0.07336		-0.80
sigma_u	0.730664			0.718662			0.744351		
sigma_e	0.257028			0.248892			0.236498		
rho	0.889882			0.892903			0.908308		
Num. of observations	925			710			860		
Num. of groups	185			142			172		
R-sq. Within	0.07			0.25			0.12		
Between	0.25			0.03			0.02		
Overall	0.24			0.05			0.03		
Wald chi2 (24)	115.11			180.76			98.47		
Prob>chi2	0.000			0.000			0.000		

**p < .01; *p < .05. The constant is the inner suburbs in 2001.

Table 4-7: Random-Effect GLS regression results of the exclusivity factor score for the nine largest CMAs. (continued)

	QUEBEC			WINNIPEG			HAMILTON		
	Coefficient		z	Coefficient		z	Coefficient		z
Core	0.3510		1.83	-0.1053		-0.45	0.1167		0.44
Icity	-0.3235		-1.35	0.0346		0.20	-0.5084	**	-3.04
Osub	-0.0968		-1.78	0.6160	**	3.31	0.3095	*	2.20
Exurb	-0.2032		-1.27	0.5418	**	2.97	0.4089	**	3.12
1986	0.0976	*	2.07	0.1585	**	3.44	0.1027	*	2.36
1991	0.0786		1.78	0.0050		0.11	-0.0336		-0.77
1996	0.0496		2.39	0.0252		0.55	-0.0330		-0.76
2006	-0.0443		-1.31	-0.0166		-0.36	0.0032		0.07
1986*Core	-0.4973	**	-6.32	-0.1750		-1.72	-0.4455	**	-3.66
1991*Core	-0.2292	**	-2.82	0.0695		0.68	-0.0684		-0.56
1996*Core	-0.1697	*	-1.71	0.0771		0.76	0.0676		0.55
2006*Core	0.2518	**	3.42	0.0654		0.64	-0.1425		-1.17
1986*Icity	-0.3420	**	-4.36	-0.2539	**	-3.42	-0.0928		-1.21
1991*Icity	-0.3879	**	-4.42	-0.0304		-0.41	0.2298	**	2.99
1996*Icity	-0.2120	*	-2.62	0.0096		0.13	0.1693	*	2.20
2006*Icity	0.0868		1.16	0.0089		0.12	-0.0278		-0.36
1986*Osub	0.0350		0.91	0.0645		0.66	0.0769		0.82
1991*Osub	0.0269		0.04	0.0761		0.79	0.1663		1.87
1996*Osub	0.0529		0.97	0.0449		0.47	0.0628		0.72
2006*Osub	0.0071		0.51	-0.0829		-0.88	-0.0929		-1.11
1986*Exurb	-0.2942	**	-4.99	-0.3102	**	-3.47	-0.2719	**	-3.42
1991*Exurb	-0.1483	*	-2.79	0.0046		0.05	-0.0939		-1.17
1996*Exurb	-0.1650	**	-3.10	-0.2723	**	-3.03	-0.0057		-0.07
2006*Exurb	0.0376		0.66	-0.0658		-0.73	-0.0669		-0.83
Constant	-0.0272		-0.19	-0.32798	**	-3.12	-0.14109		-1.55
sigma_u	0.753329			0.73353			0.707629		
sigma_e	0.201996			0.239571			0.239094		
rho	0.932925			0.903614			0.897535		
Num. of observations	675			690			735		
Num. of groups	135			138			147		
R-sq. Within	0.26			0.10			0.10		
Between	0.08			0.10			0.16		
Overall	0.09			0.10			0.16		
Wald chi2 (24)	189.28			73.69			91.49		
Prob>chi2	0.000			0.000			0.000		

**p < .01; *p < .05. The constant is the inner suburbs in 2001.

4.3.2.1. Comparing Findings Against Conceptual Model Predictions

The obtained empirical findings are contrasted against the three predictions derived from the conceptual model introduced in Chapter 3:

1. *Prosperity will decline in the inner suburbs of most CMAs.*

While the prosperity factor decreased in every CMA, the exclusivity factor showed markedly different results, with five CMAs showing a positive change. Furthermore, the decrease in the exclusivity factor score of the Ottawa – Gatineau CMA was statistically insignificant. Therefore, the results fail to confirm the first prediction.

2. *Prosperity will increase in the outer suburbs and fringe/exurbs of most CMAs.*

The exclusivity factor score increased in both the outer suburbs and the fringe/exurbs of Montreal and Calgary CMAs. The increases also occurred in the fringe/exurbs of every other CMA, with the exception of Hamilton. In addition, the exclusivity factor score declined in more than half of the CMAs. Only the Montreal, Calgary, and Hamilton CMAs had increased scores in this zone, which were all statistically insignificant. Therefore, the findings can only partly confirm the second prediction.

3. *Prosperity will increase in the core and/or the inner city of some (mostly larger) CMAs.*

Although the results were only weakly significant outside the four largest CMAs, every single CMA increased its exclusivity factor scores in the core, the inner city, or both. Scores increased in both zones of Montreal, Ottawa – Gatineau, Quebec, and Winnipeg CMAs. Exclusivity factor scores also increased in the inner cities of Toronto, Vancouver, Calgary, and Edmonton CMAs. Finally, the scores also increased in core of the Hamilton CMA. Indeed, this factor indicates the clearest evidence of the back to the city movement. It is also possible to speculate that the

relatively healthy inner suburban values for this variable may stem from a positive core and inner city spill-over effect. Overall, the findings meet the expectations of the third prediction.

4.4. CHAPTER CONCLUSION

Past studies indicate that inner suburban decline is endemic to many urban regions of the United States, as well as large Canadian CMAs. A conceptual model used in this study attributes this to two separate trends: 1) the decentralizing trend which pulls prosperity to the city edges; 2) the back to the city trend which attracts prosperity back into the core and the inner city. This conceptual model allows the thesis to generate three research predictions: 1) that prosperity will decline in the inner suburbs; 2) that the outer suburbs and the fringe/exurbs will increase in prosperity; 3) that prosperity will increase in the core and the inner city of at least some, mostly larger, CMAs.

The first stage of research, which analyzed three static variables across time for all 15 CMAs, shows strong relative decline in the inner suburbs in two of the three prosperity measures. Relative median household incomes declined in the inner suburbs of all of the CMAs studied, without exception. Although not shrinking as dramatically, relative average dwelling values decreased in the inner suburbs of all but two CMAs, confirming the first research prediction. The findings only partially confirmed the second research prediction, as outer suburbs slightly declined and the fringe/exurbs increased in prosperity as measured by these variables. Therefore, the decentralizing trend may in fact negatively affect the outer suburbs at the expense of fringe/exurbs; however, more research is necessary to confirm this speculative suggestion. Finally, the core and the inner city zones of some, mostly larger, CMAs increased in prosperity, validating the back to the city trend for both variables.

In comparison, average gross rent showed little uniform change for any urban zone among the 15 CMA. In fact, rents remained surprisingly stable during the study period. Some temporal and spatial variation in the individual CMAs was apparent in most of the urban zones. The findings failed to confirm the first research prediction, as less than half of the inner suburbs declined. However, the results weakly confirmed the second prediction, as gross rent increased slightly in the outer suburbs and the fringe/exurbs in the majority of the CMAs. The third prediction was also weakly confirmed, as rent increased in the core or the inner city in a moderate number of CMAs. The fluctuating changes, however, suggest that the rental markets are highly localized. They may be too affected by municipal policy—such as rent control—in order to be of use on their own as a measure of investment or disinvestment, at least in the Canadian context.

The second stage of this research provides further evidence for inner suburban decline among nine of the largest CMAs studied. The first factor—titled as the prosperity factor—explained more variation in data analyzed than any other factor. Here too, the effect was surprising: the prosperity factor scores declined in the inner suburbs of all nine CMAs. No other urban zone had the same uniform levels of decline. Random-effect GLS regressions further validated these results; however, the relatively small statistical effect between the five year time periods suggests that the decline was relatively gradual over time. Therefore, the first research prediction was confirmed. Furthermore, the prosperity factor scores increased in the majority of outer suburbs and fringe/exurbs, satisfying the second research prediction. Finally, the prosperity factor scores increased in both the core and/or the inner cities of four large CMAs, thus weakly confirming the third prediction.

In comparison, the second factor—titled as the exclusivity factor—showed mixed results, with four of the nine CMAs registering a slight increase in exclusivity factor scores in the inner

suburbs. As with the prosperity factor, random-effect GLS regressions validated the overall findings. Therefore, the results failed to confirm the first research prediction, as prosperity as measured by this variable did not decline in most inner suburbs. It is possible that the perceived exclusivity of the central city is having a positive spill-over effect on the inner suburbs for this factor. A more detailed conceptual model is needed to evaluate this possibility, however. The second research prediction was only partially confirmed as the exclusivity factor scores increased in the fringe/exurbs, but not the inner suburbs. Finally, the exclusivity factor scores increased in a relatively large number of core and/or inner city zones, thus validating the third prediction. It is, however, important to note that results for this factor rarely met statistical significant and that the coefficients of determination were often very low among the nine CMAs. Therefore, relative changes in exclusivity scores do not appear to be strongly tied to any particular urban zone.

The findings presented in this chapter give a clearer picture of the prosperity trends among all of the urban zones in general, and the inner suburbs in particular among the studied CMAs. Although the results obtained for each variable in this study did not correspond identically to each other, relatively close correspondence was obtained for three of the five variables utilized. However, the two variables which failed to uncover evidence of decline—average gross rent and the exclusivity factor—point to a need in formulating the concept of decline more clearly on one hand, and expanding the conceptual model on the other.

Accordingly, the relative decreases in median household income, average value of dwelling, and the prosperity factor variables strongly suggest that the inner suburbs are declining. No other urban zone displayed such consistent results among the studied CMAs. Therefore, the research question posed in this thesis has been answered in the affirmative: there is now evidence which

suggests that there is a decline in prosperity in the inner suburbs of Canadian urban regions relative to other urban zones.

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5. DISCUSSION

5.1. INTRODUCTION

The decline of the inner city at least partly paved the way for the expansion of the inner suburbs, as well as their early success. The residential, solidly middle-class inner suburbs were thought to be protected from the plight of the inner cities by the economic laws of supply and demand (Smith et al., 2001). The evidence accumulated in this thesis, however, suggests that the inner suburbs are experiencing a real decline.

The findings presented in Chapter 4 show that the inner suburbs appear to lag in prosperity relative to other urban zones, often even to cores and the inner cities—the historical locations of blight. It is important to once again note that this decline is relative. In other words, the cores and the downtowns of CMAs tend to still be less prosperous than the inner suburbs. However, where the prosperity trends are mixed, the picture in the inner suburbs is more uniform. Over the long term, an eventual convergence in prosperity is probable, particularly in CMAs where the core and the inner city are currently on an upturn. Indeed, in the Toronto CMA, the prosperity factor scores of the inner suburbs have converged with the core and the inner city scores. If the trends remain consistent, it is possible to speculate that the cores and the inner cities of some CMAs will become more prosperous than the inner suburbs.

This is especially remarkable given the fact that most large and mid-sized CMAs retain a considerable amount of 'frozen' poverty in their cores and inner cities: subsided housing, as well as other forms of social services, is concentrated in these zones as a result of historical inner city renewal programs (Orfield, 1997; Lucy & Philips, 2000). In other CMAs, convergence between the prosperity of the inner suburbs and the core and the inner city may be slower, and it is unlikely that the core and the inner city in such CMAs will become more desirable in the

foreseeable future. In such a situation, further decay or stagnancy is a more realistic scenario for all three zones.

However, it remains unclear why the inner suburbs are gradually declining. A number of factors may play a role. The following chapter offers possible reasons for this decline in light of the thesis' findings and prior findings in the field. The chapter focuses on lacking architectural and urban characteristics, the negative impact of disinvestment following deindustrialization, urban access, the diminishing housing values due to aging of the housing stock, the influx of low-income immigrants, and the effects of the aging population on the inner suburbs. It is important to note that the possible mechanisms offered here are by no means exhaustive and are often highly speculative.

5.2. THE BARRENNESS OF INNER SUBURBS

The simplest explanation is that the revitalization of the core and the inner city has occurred at the expense of the inner suburbs. In particular, the inner suburban neighbourhoods are visually undistinguished and lack identifiable architecture. They do not contain a mix of uses and therefore lack nearby entertainment options and other urban amenities. They are also not walkable and lack transportation options (Orfield, 1997; Lucy & Philips, 2000; Fitzgerald & Leigh, 2002). In other words, inner suburbs lack easy access to vital and minor amenities. However, these features do not uniquely distinguish the inner suburbs from its more distant outer and exurban cousins. Yet, the outer suburbs are declining only slightly—or not at all—while the fringes and the exurbs are becoming more prosperous over time. Indeed, the lack of urban amenities may prove to be unattractive to a certain segment of the population, but not to the population as a whole.

5.3. DISINVESTMENT AND COMPETITION FROM OTHER URBAN ZONES

The geography of employment areas has also substantially changed between the early days of the inner suburbs and the present. The jobs which were located in the inner suburbs tended to largely involve the manufacturing sector. These jobs were relatively well paid and relatively plentiful in the early days of the inner suburbs (Smith et al, 2001; Walks, 2001). Therefore, the early residents of the inner suburbs had a possibility of closer access to work at adequate wages, making much of the early suburban expansion possible in the first place (Smith et al, 2001). In addition, government investments into road infrastructure and highways in the previous decade (Harvey, 1989; Fishman, 2000) made access to vital amenities simple, as long as the residents possessed a vehicle.

However, the early realities of inner suburbs are no longer applicable. Canada, together with most developed nations, has undergone a period of deindustrialization, making many of the well-paid manufacturing jobs disappear (Smith et al., 2001; Walks, 2001). Many such jobs were replaced with lower paid unskilled and semi-skilled service sectors jobs (Walks, 2001). In addition to lower pay, the new jobs were not necessarily located in the inner suburbs, making access to them more difficult. This lack of access is further compounded by the near-ubiqitous decentralization of the city through the creation and expansion of the outer suburbs and exurbs; indeed, a 100 mile diameter metropolitan area is already a reality in the United States (Orfield, 1997). As a result, even the jobs in the manufacturing sector often shifted away from the inner suburbs (Short, Hanlon & Vicino 2007). The new well-paid jobs were largely concentrated in the non-traditional (light) industrial sector or in the service sector. These jobs often required higher skills and were largely created either in the office parks of the wealthy outer suburbs, or alternatively in the downtown or inner city corporate offices (Lucy & Philips, 2000; Short et al.,

2007).

As such, the inner suburbs are 'squeezed' from both ends: the core and the inner city retain the attractive high-profile employers and institutions, while the outer suburbs and the fringes welcome businesses looking for more favourable property taxes and land value costs (Orfield, 2002). In other words, the inner suburbs cannot offer a similar competitive niche.

Validating this hypothesis may prove to be difficult and this thesis could not do so with its chosen study model, which only examined the validity of decentralization and back to the city trends, but not the underlying causes of the trends. A rigorous examination of the effects of deindustrialization on the inner suburbs would require an accurate inventory of changes in employment lands for every CMA studied. Obtaining such information not only goes beyond the scope of this thesis, but also may not be possible to collect for every CMA. Nonetheless, possible proxies may be utilized in examining this hypothesis; in particular, changes in occupational sector structure in different urban zones may prove instructive. If the concentration of manufacturing occupations is heavier in the inner suburbs than elsewhere in early census years and if the inner suburbs lag in professional occupation sectors in more recent years, this would suggest that the inner suburbs were disproportionately negatively impacted by deindustrialization. Further research is necessary in order to examine these effects.

5.4. URBAN ACCESS

At the same time, access to employment and amenities is further diminished in the inner suburbs due to the expansion of the metropolitan regions. As metropolitan regions become more congested, the employment deficit of the inner suburbs becomes increasingly burdensome. In other words, it may make far more sense for a person to live in the core or the inner city if his or

her work is located there, than to live in the inner suburbs. These two zones are far more likely to offer multimodal transportation options than the inner suburbs.

Similarly, while the outer suburbs depend on the car to perhaps an even larger extent than the inner suburbs, they offer proximity to diverse employment nodes for many skilled workers (Short et al., 2007). Of course, many people living in the outer suburbs may still commute to the core or the inner city of the metropolitan region. Indeed, in some CMAs, few may work in the outer suburbs. In other, larger CMAs, they may be an important employment destination.

Still, congestion issues are tied only to large urban regions. Congestion is unlikely to exist in many mid-sized and smaller CMAs, such as Kitchener or St. Catharines-Niagara. And yet, the prosperity indicators for the inner suburbs in these CMAs do not differ greatly from Toronto or Vancouver CMAs. In fact, CMAs with highest land values in the inner suburbs tended precisely to be in the largest CMAs. The three largest CMAs all observed relatively static home values and Calgary's relative housing costs actually increased. Indeed, most significant relative decreases in the inner suburban housing values tended to occur in many of the mid-sized and smaller CMAs. Therefore, it is not altogether clear that inner suburbs are lacking in access options, especially compared to the outer suburbs and the fringe/exurbs. In fact, closer access to the core and the inner city may in fact explain the relative resilience of housing prices in the inner suburbs of larger CMAs in comparison to the smaller ones. Access to the central city amenities is still easier for the residents of the inner suburbs than those in the outer suburbs and the fringes. Even though the inner suburbs do not contain such amenities directly, they are relatively proximate to them. In larger cities, the added distance may be a positive factor for the real estate values of the inner suburbs; however, in the more mid-sized and smaller CMAs, the

increased distance to the center is only marginal and thus does not appear to influence real estate values.

5.5. HOUSING STOCK

Though access is an important part of real estate values, it is not the only one and it cannot be taken in isolation of other factors. Issues of endogeneity are bound to crop up in any discussion of real estate values; however, it likely that the built form of the inner suburbs helps explain its relative undesirability and diminishing prosperity.

In particular, the housing stock of the inner suburbs may be considered unattractive and not in line with current market preferences. Inner suburbs generally consist of post-war bungalow housing (Lucy & Philips, 2000; Hudnut, 2003). In that, they are very different from the outer suburbs and the fringes. Where inner suburbs offer a relatively small housing footprint on a relatively large lot size, the housing footprint of the outer suburbs takes over the majority of the lot size (Lucy & Philips, 2000). In the fringe/exurbs, it can be expected that the lot sizes are larger still (sometimes much larger) and housing footprints immense. The structure of the outer suburbs and the fringes is built according to modern market tastes; as a result, these zones have a large advantage in attracting middle-class and upper-middle class residents to the exclusion of others. Conversely, the housing in the core or the inner city cannot compete in terms of size, but offers urban amenities which no other zone can offer.

Additionally, the bungalows of the inner suburbs may not only be eschewed by the current market due to their footprint: they were originally built to modest standards and therefore require increased maintenance as they age (Harvey, 1996; Lucy & Philips, 2000). The youngest inner suburbs at this point were built forty years ago, with the oldest having been constructed almost

sixty-five years ago. Maintenance of the inner suburban housing stock may be too expensive for many households. As a result, much of the inner suburban housing may be structurally decaying (Lucy & Philips, 2000). More problematically, the construction of the inner suburbs did not follow the piecemeal construction process of the old core and the inner city. Although prior construction was rarely altogether ad hoc, the inner suburbs were often constructed in a series of temporally closely spaced series of large-scale subdivisions (Lucy & Philips, 2000; Bier, 2001; Orfield, 2002). Therefore, many inner suburban neighbourhoods were built closely together in time. Therefore, because such neighbourhoods do not have a mix of different ages in their housing stock, they all require maintenance and increased upkeep at the same time. As this happens, the structural decline may result in declining housing prices. Of course, many private homeowners may choose to renovate their personal housing stock, but this may not reverse a downward pressure on housing prices in neighbourhoods where most private homeowners do not have the required incomes to properly repair their houses, particularly in inner suburbs which formerly depended on well-paid manufacturing jobs.

In comparison, the core and the inner city would be relatively immune from this problem as long as they contain a diverse housing mix. However, the outer suburbs, as well as the exurbs, may not be. They are generally built up subdivision by subdivision, and therefore the housing stock in these zones would also age in concert. In fact, this may already be happening. Contrary to the conceptual model used in this thesis, the outer suburbs in many CMAs also declined in prosperity by several measures, including average dwelling values. The decreases were slight, and property values in this zone were still well above average in most CMAs. However, the outer suburbs are also newer than the inner suburbs. It is possible that the slight dip in relative housing prices in the outer suburbs is a result of outer suburban tracts which have the oldest

housing stock in this zone (i.e. housing stock from the 1970s and 1980s). Indeed, research by Brueckner and Rosenthal (2009) suggests that high income households prefer to locate in parts of the metropolitan area where the age of the housing stock is relatively young. Therefore, as the outer suburbs and even exurbs age further, they may experience much the same problems that plague the inner city. More research in direct associations between the age of the housing stock and household incomes and dwelling values is necessary to confirm this hypothesis, however.

5.6. IMMIGRANT SETTLEMENT

As inner suburbs decrease in relative values, they may prove to be attractive to immigrants. Immigrants, compared to the Canadian population as a whole, are likely to have lower disposable incomes (Hou & Picot, 2003); as a result, they may be priced out of other, more affluent urban zones whether they are urban or suburban. Immigrants may have limited incomes and often work low-skilled and badly paid jobs. As a result, the increased movement of immigrants into the inner suburbs may correlate with lower relative median incomes. Furthermore, because of their limited incomes, the overall tax and investment base in the inner suburbs further declines, thus further lowering the overall prosperity of the inner suburbs. Correspondingly, housing prices either stay stagnant or decrease.

Once again, it would be difficult to disentangle causation in any expanded model which tracks inner suburban decline. Simple correlations between increasing numbers of immigrants and diminishing prosperity of the inner suburbs may be explained by a number of other variables, including those already discussed in this thesis. Indeed, the lower capital that the immigrants possess could only ever be a contributing factor, as immigrants of lower means likely relocate to the inner suburbs due to already existing cost differentials between the inner suburbs and other

urban zones. An addition of an immigrant variable would therefore undoubtedly introduce strong multicollinearity effects in any more advanced model of decline.

Even basic correlations do not necessarily show an effect. Indeed, the original factor analysis in this research also utilized immigrant population as one of its variables. However, this variable was dropped because it proved to be an insignificant loading on all three derived factors. Notably, this was the only originally selected variable which could not load uniquely on any given factor and the only one to be dropped. It therefore appears impossible to use the monolithic immigrant population variable as any predictor of economic prosperity. Any discussion of an immigrant effect requires a considerably more nuanced analysis.

One possibility which may generate more meaningful results would be to split immigrant groups into long-term immigrants and recent immigrants. There is strong evidence which suggests that more recent immigrants face a prosperity gap in comparison to both the native-born Canadian population and long-term immigrants (Hou & Picot, 2003). It is therefore possible that recent immigrants largely choose to settle in the inner suburbs, while long-term immigrants choose to live in more prosperous urban zones. Furthermore, current generations of recent immigrants exhibit an even greater economic gap than previous immigrant cohorts, as well as lesser long-term socio-economic ability and diminished job prospects (Hou & Picot, 2003). Any addition of the recent immigrant variable would also ideally control for this effect.

It is, however, impossible to consistently track the population of recent immigrants using the Canadian census. The Canadian census measures the population of immigrants who arrived to Canada three years prior in the earlier census years; subsequently, this variable was removed and replaced with the population of immigrants who arrived to Canada five years prior. As a result,

direct comparison is impossible, at least for the comparison period between the 1986 and 2006 census years. A study which includes this variable would therefore have to be restricted to more recent census years.

5.7. AGING IN PLACE

It is, of course, possible that the inner suburbs are not declining in the traditional sense. More and more seniors are choosing to age in place rather than downscale to smaller units as they become older (Rowles, Oswald, & Hunter, 2004). The inner suburbs represent the first mass suburban expansion in North America, fuelled by the automobile era, high post-war prosperity, and cheap mortgages. If seniors are indeed aging in place, then it is to be expected that they mostly live in the original suburbs and some of the earlier outer suburban neighbourhoods. In comparison, the baby boomer and younger cohorts would tend to cluster in the outer suburbs or the exurbs.

As seniors tend to live on fixed (pension) incomes, the relative decreases in median household incomes and the prosperity factor scores may be an artefact of an increasing number of pensioners in the inner suburbs relative to other urban zones. Much of the declining land values may be illusory in that case as the average dwelling value variable in the census is a result of a survey question in the long form census. As such, seniors may be more withdrawn from the real estate market and may undervalue what their property is worth. This type of decline would not be harmless, but would call for entirely different policy responses.

However, there is strong reason to doubt that aging in place can explain the overall decline of inner suburbs. The factor analysis utilized in this thesis failed to link elderly status with either increasing or decreasing dwelling values; similarly, the elderly population was not linked with

either increased or decreased incomes. Indeed, the factor analysis showed that the concentration of young population was associated with slightly higher ownership rates, and inversely associated with the concentration of the elderly population. As such, it is doubtful that aging in place by itself can explain the observed results. However, it is possible that the elderly population living in the inner suburbs is different from the elderly population living elsewhere, something which the utilized factor analysis cannot discover. Therefore, it is still possible that the characteristics of the elderly population which located in the inner suburbs may shed some light on inner suburban decline.

5.8. CHAPTER CONCLUSION

By a number of different measurements, inner suburban decline appears to be a real phenomenon in Canada. Yet, the reasons for the decline are not well understood in the literature. As such, the possible mechanisms for inner suburban decline offered in this thesis remain highly speculative.

It is true that inner suburbs lack many of the urban amenities that are prized by the urban planners. Yet, the lack of such amenities has not stemmed the creeping sprawl; while the outer suburbs have also slightly declined, the fringe/exurbs remain the most prosperous zones in the vast majority of CMAs. It is, however, possible that other challenges uniquely attached to the inner suburbs explain at least some of the decline. For example, the effects of deindustrialization may have disproportionately affected this urban zone. Moreover, the inner suburbs contain housing stock which is no longer preferred by suburban dwellers. At the same time, it is not urban enough to compete with the core or the inner city. In addition, this housing stock is aging, thus negatively affecting both housing values and the overall prosperity of the inner suburbs. At the same time, the more affordable nature of the inner suburbs may encourage low-income

immigrants to settle in this zone as they become priced out of other urban zones. However, any treatment of immigrants will have to be specific: aggregating all immigrants together provided no significant loading on any factor in this thesis. The overall economic well-being of the inner suburbs may be further hampered by seniors aging in place who only possess a fixed and limited income. However, this thesis has failed to substantiate this hypothesis. Clearly, more research is necessary in order to untangle the causes of inner suburban decline.

6. POLICY IMPLICATIONS

6.1. INTRODUCTION

Policy responses to inner suburban decline remain mostly theoretical, as the phenomenon is still relatively unacknowledged. Nonetheless, possible approaches to combating decay within the inner suburbs have been proposed by a multitude of authors and some have been politically implemented. Specifically, these multi-faceted approaches require support of local, regional, and often provincial and federal governments. The policies discussed in this chapter attempt to stem inner suburban decline by directing growth to the inner suburbs.

Many scholars link the misfortunes of the inner suburbs with the expanding outward growth. Therefore, policies which halt much of the greenfield development also by extension help halt the decline of the inner suburbs. However, since central cities rarely control suburban zones, any smart growth initiatives must be regionally based. Problematically, regional governments are prone to disagreements on issues of smart growth since its principles directly counter the interests of the outer suburbs. Therefore, any regional cooperation will likely have to occur under a coalition of the inner cities, the inner suburbs, as well as the older outer suburbs which are starting to decay. Conversely, higher level governments may institute smart growth strategies even in the absence of regional consensus, thus bypassing potential regional discord. Nonetheless, current governmental incentives rarely address the well-being of inner suburbs specifically. Therefore, local, regional, and higher level governments must be more explicit in targeting these urban zones with specific policies that may refurbish inner suburban neighbourhoods.

Smart growth policies, however, are unlikely to rehabilitate the inner suburbs on their own. As housing continues to age in the inner suburbs, targeted maintenance incentives may prove to be essential in preserving the zone's attractiveness. This investment will have to concentrate on both private housing through use of tax credits, but also potentially through spatial reconfiguration of subsidized housing. The latter strategies may, however, be difficult to implement due to their high costs.

6.2. SMART GROWTH STRATEGIES

Curbing sprawl and placing greater reliance on mixed-use development and infill can potentially help to reverse the decline of the inner suburbs. Inner suburbs are closer to the central city and multi-modal transportation than the outer suburbs; yet, they benefit from their connections to the outer suburbs. Moreover, unlike the greenfield areas of outer suburbs, the inner suburbs have usable infrastructure already in place for development projects. These potential advantages can be combined with regional policies which further promote the concentration of development in built-up zones. However, political competition and disagreements often make such policies objectionable to outer suburban municipalities which strongly benefit from greenfield development, and they may not necessarily be supported by higher level governments.

6.2.1. Smart Growth and the Inner Suburbs

Any successful implementation of smart growth must address the current over-reliance on greenfield development, and must balance it with redevelopment in currently under-utilized properties, vacant lands, and brownfield sites. Recently, American research has focused on the potential role that the inner suburbs may have in meeting these objectives. In particular, Hudnut (2003) has argued that the inner suburbs form a buffer between the inner city and the outer

suburbs, and are therefore a crucial component in the realization of smart growth objectives. This is especially true since the inner suburbs are considerably more open to redevelopment. They are often denser and, at least theoretically, more amenable to pedestrian use and public transit than their outer suburban counterparts. Furthermore, they often contain significant opportunities for infill development (Goldstein, Jensen, & Reiskin, 2001; Moudon, 2001; Hudnut, 2003).

Furthermore, infill is not necessarily more expensive than greenfield development: it is geographically closer to the urban cores and can be connected to existing infrastructure (Wiewel & Persky, 1994; Porter, 1997). Indeed, in the United States, the marginal infrastructure cost of new housing development in under-utilized inner city and inner suburban areas is one-sixth that of the marginal infrastructure cost in undeveloped greenfield areas (Lee, 2005). Thus, municipal, as well as provincial governments would benefit from policies encouraging infill development within the underutilized inner suburban areas as a matter of long-term savings in infrastructure maintenance.

6.2.2. Regional Politics, Conflict, and Cooperation

Most smart growth policies require a strong, functional regional government that is committed to reducing sprawl. However, many inner suburban municipalities suffer from a lack of financial resources when compared to their outer suburban counterparts (Powell, 2000). Correspondingly, many of the wealthy outer suburbs have little desire to cooperate with the inner cities and the inner suburbs, as low-density greenfield developments often directly align with their financial interests. Therefore, regional infighting is common.

A classic example which illustrates inter-municipal conflict is that of the Minneapolist-St. Paul metropolitan region. The regional government of Minneapolis-St. Paul enacted a penalty for outward development in the 1970s by increasing sewer connection fees based on distance from the central city (Porter, 1997; Orfield, 1997; Lucy & Philips, 2000). Moreover, it also instituted a tax sharing program among all of the local municipalities some years later. Ultimately, neither strategy was successful in reversing sprawl in the region: wealthier suburbs successfully fought against these measures, and the inner city and the older inner suburbs continued to decline (Orfield, 2002).

Politically, then, there appears to be little reason for municipalities within an urban region to cooperate. Indeed, economic competition between municipalities is common, especially in large metropolitan regions. Even individual neighbourhoods and districts within a single municipality may compete internally for economic development, particularly in cities which have annexed most of their surrounding municipalities (Lee, 2005). However, the American experience suggests that the population of inner cities, inner suburbs, and low-tax capacity outer suburbs makes up the majority (60-75%) of the total population of most metropolitan areas (Richmond, 2000).

The emerging relative decline of outer suburbs in at least some Canadian CMAs presented in this thesis suggests that the situation in Canada is comparable to the United States, particularly as the older outer suburbs themselves are eschewed by the housing market in favour of newer outer suburbs and fringe/exurbs. As a result, the current unchecked expansion has built-in structural decay as the housing ages and as the metropolitan region continues to expand. Such a process is detrimental not only to the core, inner city, and the inner suburbs, but also for the outer suburbs as they continue to sprawl. Therefore, the cooperation between different municipalities, or

between different city wards, must focus on achieving a more spatially balanced region, with roughly comparable opportunities and basic social and economic amenities.

Johnson (2001) argues that the creation of a regional urban growth boundary is a simple, yet effective smart growth strategy that can also help spatially balance a metropolitan area. In theory, a fixed boundary helps encourage redevelopment of the inner suburbs and the inner city, at the expense of the exurban and rural areas (Nelson & Dawkins, 2004). For example, Portland was at least partly successful in curbing outer suburban growth by investing in city infrastructure, and by instituting firm minimum allowable densities across the urban growth boundary (Porter, 1997). However, growth boundaries still may concentrate development in the inner city and the outer suburbs at the expense of the inner suburbs (Lee, 2005). In other words, an urban growth boundary may not necessarily equalize socio-economic disparities between urban zones. Nevertheless, Orfield notes that the disparities in fiscal capacity are lower in Portland than any other metropolitan region he has studied.

6.2.3. Provincial Smart Growth Policies

Strong urban growth boundaries and more general restrictions on development require at least some cooperation between municipalities within an urban region. However, not all Canadian metropolitan areas have all-embracing regional governments which would enable implementation of smart growth policies. Alternatively, even strong regional governments, or metropolitan areas dominated by a single municipality, may tilt against proactive land development policies. In such situations, provincial governments may expand their own planning mandates and initiate smart growth policies themselves. For example, the province of Ontario has chosen a proactive role in ensuring that at least some of the smart growth objectives

are implemented in the Greater Golden Horseshoe, the most populated and economically significant part of the province.

In 2005, the province unveiled the largest greenbelt in the world, a space protected from development amounting to just under 730,000 hectares. The Ontario Greenbelt covers a swath of south-western Ontario, including much of the urbanized Golden Horseshoe region (Province of Ontario, 2005). Furthermore, in 2006, Ontario followed up with the Places to Grow Act in 2006 with The Growth Plan for the Greater Golden Horseshoe (GPGGH), which set clear planning goals for the geographic region which includes the Niagara-St. Catherines, Kitchener-Waterloo, Guelph, Hamilton, Toronto, and Oshawa CMAs. The key planning objectives include directing at least 40% of all growth within existing urban areas by 2015, as well as intensifying the core city areas by instituting minimal residential and employment densities (Province of Ontario, 2006).

The Growth Plan for the Greater Golden Horseshoe is noteworthy in that it sets specific objectives for a large and politically fractured and dispersed super region. The Greater Golden Horseshoe is composed of a multitude of local municipal and regional governments; furthermore, the central city of this super region, Toronto, does not belong to any regional government. Therefore, the province has directly imposed requirements on each municipality, thus guiding the growth of the region that lacks an overarching municipal body.

6.2.4. Extending Smart Growth: Targeting Specific Urban Zones

Ontario's Growth Plan for the Greater Golden Horseshoe may prove to be a viable and successful model in an implementation of a smart growth strategy. Similarly, other more localized smart growth initiatives (such as urban growth boundaries) may be similarly useful in

arresting inner suburban decline. However, while smart growth policy strategies set explicit growth objectives, they do not specifically address development challenges faced by different urban zones. Indeed, smart growth strategies are usually implemented as a policy toolkit designed to curb endless regional sprawl. Therefore, though planning for smart growth is likely advantageous to the inner suburbs (Orfield, 1997), the benefits are largely indirect. Alternatives, such as the Urbanizing Tier System (UTS), overlay zoning, and targeted municipal or provincial grants seek to remedy this problem by implementing separate policy objectives to spatially different areas of a metropolitan region.

The Urbanizing Tier System (UTS) solution was first proposed by Freilich (1999), but is also espoused by Lee (2005). Freilich argues that universal planning mechanisms are not equally applicable to every urban zone; for example, the policy instruments required for downtown or inner city redevelopment may be very different than those required in the inner suburbs. The UTS therefore separates metropolitan regions in several different tiers, according to their geographic, spatial, and functional characteristics (Freilich, 1999). As a result, different policies can be developed for the needs of each tier. The Growth Plan for the Greater Golden Horseshoe, in effect, utilizes a basic tier system by creating separate land use requirements for defined urban growth centers and intensification corridors. However, the legislation's policy targets do not extend beyond the simple city/suburb dichotomy. In contrast, UTS principles are more specific: they provide incentives for growth and infill development in the inner city and the inner suburbs, and penalties — usually in the form of increased development and infrastructure charges — in the rural and exurban areas of the city in order to curb sprawl.

Other alternative policies include targeted zoning incentives. These may have distinct advantages in that they can be passed by local municipalities and may not necessarily need

approvals of higher-level governments. For example, Atlanta utilizes an overlay district zoning which assigns additional zoning requirements that are placed on a defined geographic area, but which do not change the underlying zoning (Lee, 2005). In particular, overlay zoning may be applied to encourage certain types of development, as well as target desired uses, or to control an appearance of the area. According to Fitzgerald and Leigh (2002), overlay district zoning has been successful in the inner suburbs of Atlanta in revitalizing dilapidated commercial strips as well as main streets.

Further options available to both municipalities, as well as provincial governments, include awarding grants to inner suburban neighbourhoods that can effectively use the funds for revitalization purposes. Such programs grant funds to local municipalities for revitalization of neighbourhoods that aim to provide mixed-income residential neighbourhoods, access to employment, multi-modal transportation, as well other commercial, retail and recreational space (Lee, 2005).

6.3. HOUSING REVITALIZATION

According to Lucy and Philips (2000), one of the primary contributors to inner suburban decline is the decay of private housing stock that has aged in unison. In addition, this housing stock is not built according to the current market preferences. Indeed, this thesis strongly suggests that inner suburban housing is becoming less desirable over time in many Canadian urban regions. Moreover, the situation in Canada is further complicated in many inner suburbs by the presence of numerous mid- and high-rise apartment buildings which are rapidly decaying. Reinvestments in both types of housing, as well as reinvestments in subsidized housing may prove crucial in revitalizing inner suburbs.

6.3.1. Revitalization of Private Housing

According to certain authors, home renovations can add considerable value to aging inner suburban housing stock (Kelly, 1993; Carmon, 2002). Kelly (1993) has argued that old inner suburban housing is viable and even desirable as long as it is updated for current market tastes. Consequently, Kelly has noted that the continued success of the inner suburb of Levittown, New York, can largely be attributed to homeowner redesign of their households. Remarkably, "by the end of its first decades, the visual landscape of Levittown—both interior and exterior—had been almost totally redesigned, not by the builder, but by the homeowners" (Kelly, 1993, p. 6). Carmon (2002) has similarly argued that updating existing inner suburban housing stock, which may include changes in both the total floor space, as well as style, may make current inner suburban households as feasible alternatives to new outer suburban homes without demolishing existing housing stock.

The cost of the revitalization of the housing stock may partly be mitigated by (relatively) low-cost tax credit programs. For example, the Canadian Government introduced a limited-time Home Renovation Tax Credit (HRTC) which allowed tax deductions on eligible home renovation expenditures (Leonard, 2009). However, the Canadian tax credit applied to renovation work on any house. It was therefore a relatively expensive budgetary item and also not an incentive specifically targeting homes in the inner suburbs. Such programs do, however, exist elsewhere. Perhaps the most famous example is the "This Old House" program in Minnesota. Established in 1993 and available until 2003, the program allowed incentives to homeowners of Minneapolis and Hennepin County — one of the original inner suburban counties of Minneapolis — to revitalize existing housing stock that was at least 45 years of age (Lee, 2005; Lee & Leigh, 2007; Minnesota Statutes, 2008).

It is important to note that, while tax credit programs may be successful, they must work in tandem with other policies which aim to improve the inner suburbs. Specifically, inner suburbs must often revitalize their current infrastructure in the inner suburbs—including sewage, water, schools, and roads—in order to compliment the reinvestments in private housing stock (Lee, 2005).

6.3.2. Revitalization of Private Apartment Buildings

The presence of the urban mid- and high-rises in most Canadian inner suburban areas has been a notable difference in the composition of the inner suburbs of the United States and Canada. Many of these private market-rent buildings were built in Canada in the 1960s and 1970s during the suburban apartment boom. Murdie (1994) in particular has argued that many of the inner suburban apartment buildings are slowly declining. While the current research found little overall change in average gross rent in the inner suburbs as compared to the other urban zones during the study period, it did not specifically discriminate between different types of rental units.

Most problematically, although many such apartment complexes contain considerably higher densities per hectare than inner suburban single detached and semi-detached homes or rowhouses, they are still suburban; specifically, they are often far removed from public transit, as well as retail and commercial space (City of Toronto, 2008).

In 2008, Toronto unveiled the Mayor's Tower Renewal program, whose goal is to revitalize many of the inner suburban towers within the city area. In particular, the plan outlines a renewal strategy which includes the addition of urban amenities, public transit improvements, retrofitting of the current buildings, as well as inclusion of new infill housing, among other objectives (City

of Toronto, 2008). If successful, the refurbishment and infill of inner suburban apartment buildings would prove as one of the possible options in improving the liveability and desirability of the inner suburbs. It is not entirely clear whether the ambitious objectives of the program are feasible in the current environment of fiscal restraint, particularly as the plan will require long-term support of municipal, provincial, and federal politicians. Nonetheless, even a downscaled plan focusing on infill and addition of commercial and retail space near high-density apartment buildings in the inner suburbs, may assist in the revitalization of the Canadian inner suburbs.

6.3.3. Rebalancing Social or Subsidized Housing

It is important to note that only inner suburbs with a large proportion of lower and moderate incomes can be reconditioned with planning approaches discussed above. Certain impacted areas with many households under severe distress cannot be repaired with these planning tools. In such cases, increases in social or subsidized housing budgets are the only policy instruments that can be used for neighbourhood revitalization (Carmon, 2000).

Here, special attention must be given to a regional housing strategy. Orfield (2002) argues that an implementable housing plan is pivotal in avoiding expanding suburban decay. Most importantly, a regional or provincial plan should take the pressure off the inner city and the inner suburbs by assigning some of the responsibility for affordable housing within other urban zones, thus spatially balancing low-income households in much the same way as smart growth seeks to balance development. For example, regional or provincial governments can require minimal allowable numbers of affordable housing units within outer suburbs and fringe/exurbs, thus at least partly mitigating spatial unevenness in wealth. Such programs are rare, as they are politically unpopular and costly to implement (Rusk, 1999). One example of an implemented

and functioning program is found in the Montgomery County of Maryland, which requires all developments of over fifty dwellings to set aside 12-15% of the total dwellings for low and moderate income households in exchange for density bonuses (Orfield, 1997; Rusk, 1999). As a result, the income disparities between different parts of this county were less pronounced than in most other counties of the state. Such programs may be especially fruitful when combined with increased housing grants from higher-level governments (Orfield, 1997). However, consensus is unlikely to be reached, as— similar to smart growth initiatives — it would lower the tax base of the outer suburbs and the fringe/exurbs. Any such strategy would therefore be politically difficult to implement.

6.4. CHAPTER CONCLUSION

What becomes clear, then, is that policy approaches to inner suburban decline are underdeveloped, particularly in Canada. Nevertheless, the increased focus on smart growth may prove to be a positive contributor in the revitalization of the inner suburbs. Still, past experience suggests that considerable obstacles must be overcome in the implementation of smart growth policies. Many municipal governments may not be willing to cooperate, even if doing so is within their best interests. Furthermore, at least some provincial governments may prove hostile, or at least ambivalent in spatially balancing the metropolitan regions which fall within their purview. In addition, local, regional, and provincial governments must be more attentive to particular needs of the inner suburbs in their implementations of smart growth policies.

Potential housing and apartment revitalization programs may also offer considerable assistance in battling inner suburban decline. Targeted tax credit programs could prove to be a low-cost option in refurbishing private households. Potentially larger investments would be needed in

revitalizing low-cost inner suburban rental buildings. Finally, expanded subsidized housing programs which attempt to balance the concentration of subsidized housing across the urban region may also stem the decline of the inner suburbs; however, ramping up political will for such programs may prove difficult.

It is important to note that this list of recommendations is not wholly inclusive: indeed, it is the starting point of a discussion that is based on limited real-world policy experience. The discussion, however, does stress the need for metropolitan regions to balance their development and growth, increasing stability and preventing current and future structural decline in the inner suburbs and potentially other urban zones.

7. CONCLUSION

7.1. INTRODUCTION

The concluding chapter briefly summarizes the spatial realities of Canadian Census Metropolitan Areas by briefly summarizing the literature review, the methods used, and the findings of this thesis. Subsequently, this chapter briefly discusses possible causes of decline and the policy approaches which may potentially arrest inner suburban decline. Finally, this chapter outlines further avenues for research into this topic.

7.2. SPATIAL REALITIES OF CANADIAN CENSUS METROPOLITAN AREAS

This thesis has aimed to analyze the evidence of inner suburban decline in the 15 largest CMAs. This task was undertaken on the basis of scholarly literature which suggests that the core and the inner city are no longer the only decaying urban zones; in fact, this literature suggests that at least some cores and inner cities are recovering. The inner suburbs are, in effect, caught in the middle: they do not have the modern housing amenities, they are relatively small, and are also aging; hence, they are not in line with current housing market preferences. At the same time, they do not possess the neighbourhood amenities of the core and the inner city, nor do they have the same business and institutional allegiances.

This thesis was primarily concerned with overall economic prosperity of the inner suburbs. In order to measure prosperity, urban zones were classified on the basis of age of housing stock, density, and connectivity among the individual census tracts. Once they were classified, urban zones were compared for relative increases or decreases in values of three separate static variables: median household income, average value of dwelling and average gross rent. In addition, two additional variables were compared for the nine largest CMAs: the prosperity factor and the exclusivity factor. The two factors were extracted via a factor analysis from a

larger set of demographic, socio-economic, and housing variables. All five variables were used as indicators of prosperity.

This thesis then presented a simple conceptual model which aimed to capture some of the most important themes found in the literature. This conceptual model describes two trends: the decentralizing trend and the back to the city trend. The former trend siphons off prosperity from the inner suburbs into the more distant fringes, while the latter trend drains prosperity from the suburbs into the core and the inner city. Based on this model, three predictions are generated: firstly, that most CMAs will experience a decline in prosperity in the inner suburbs; secondly, that the outer suburbs and the fringe/exurbs will experience an increase in prosperity; thirdly, that at least some—mostly larger—CMAs will experience an increase in prosperity in the core and the inner city.

The inner suburbs of the fifteen largest CMAs have notably declined in the inner suburbs for two out of the three static variables between 1986 and 2006. The decline in median household incomes and average dwelling values in this zone was remarkably consistent among all 15 CMAs. Relative Values for both variables also mostly decreased in the outer suburbs. In contrast, Relative Values increased in most fringe/exurbs and some, mostly larger, core and inner CMAs. Therefore, the first and the third prediction was confirmed for these two variables, while the third prediction was partially confirmed. In comparison, rents in this zone did not change substantially during the study period; furthermore, changes in rent were generally — though not always — minor for every urban zone. Although the first prediction was not confirmed for this variable, it was partially confirmed for the second prediction and partially confirmed for the third.

The second stage of this research further examined changes in the prosperity factor and the exclusivity factor scores. The prosperity factor score declined in all nine CMAs studied. This factor was also closest to fully confirming the predictions generated by the conceptual model: the first and the second prediction were confirmed, and the third was weakly confirmed. In contrast, the exclusivity factor scores did not decline in the majority of the inner suburbs. As a result, the first research prediction was not confirmed for this variable. In comparison, the latter two predictions were both confirmed.

The findings support the current literature which suggests that inner suburban decline is endemic to many metropolitan regions. Indeed, three out of five variables detected a clear decline in inner suburbs. In addition, median household income Relative Values and the prosperity factor scores decreased systematically. No other urban zone had such clear and consistent positive or negative results. It therefore appears that the inner suburbs of Canada are witnessing a similar trend of decline that has been described in the American planning literature. Moreover, the phenomenon does not appear to be limited only to large metropolises, as this study also includes a number of mid-sized urban regions.

7.3. REASONS FOR DECLINE

While decline appears to be endemic to inner suburbs, the root causes of decline are difficult to establish. Indeed, it is difficult to pinpoint the underlying causes due to methodological complexity. However, despite these problems, certain possible causes are examined in this thesis.

The built form of the inner suburbs is largely unattractive, lacking in distinct urban amenities. Nonetheless, such objections can be raised against both the outer suburbs and the fringe/exurbs. Therefore, while the attractiveness of the built form may play a role, it is certainly minor.

Another possibility is that disinvestment resulting from deindustrialization has hit the inner suburbs harder than urban zones. The inner suburbs represent the first mass suburban expansion in North America. As such, they were largely economically powered by attainable and well-paying industrial jobs. It is possible that the shift to the service-sector has benefitted other urban zones to a greater extent than the inner suburbs, where the shift has resulted in an increased number of unskilled and semi-skilled service and industrial jobs. This thesis has been unable to uncover evidence for this particular hypothesis; as such, it represents a potentially strong research avenue.

It is also possible that access to employment negatively affects the attractiveness of the inner suburbs. Many professional jobs are located in the inner city or, alternatively, in the newer suburbs. It's unlikely this factor plays a large role given that the evidence points to increased relative housing prices in the inner suburbs of large CMAs relative to mid- and small-sized CMAs. Indeed, it appears that relatively easy access to the city in large CMAs — when compared to even more distant urban zones — may help arrest declines in relative housing values.

Inner suburbs also have a problem with the form of its housing stock. Most authors agree that modest bungalow housing that defined the inner suburban era is unattractive to new buyers, who prefer either the footprints of the more distant suburbs or the amenities the inner city can offer

them. Worst of all, the stock is aging at approximately the same time. Indeed, this is a hypothesis that needs to be tested in detail.

The role of immigration remains unclear. It is possible that more low-income immigrants are choosing to live in the inner suburbs due to their relative affordability. However, little evidence can be produced to support this hypothesis, at least among the immigrant group as a whole. It is possible that recent immigrants are finding the inner suburbs more attractive, and in the process depressing them further, but the inconsistencies in the census files make such research impossible to conduct.

Finally, it is possible that the income effects, as well as the housing value effects in the inner suburbs are a result of an increased number of seniors aging in place. However, there is little current evidence of this; indeed, this thesis has failed to find any such association with its chosen methodology. In summary, a whole host of causative elements may be responsible for the decline, and they are unlikely to be mutually exclusive. Indeed, more research is necessary in order to examine these possible hypotheses.

7.4. POLICY RESPONSES TO INNER SUBURBAN DECLINE

Policy responses to inner suburban decline remain speculative to a degree. However, a number of proposed, as well as implemented, policies may stem the decline of inner suburbs. Notably, these may include revitalization of housing and spatial balancing of affordable housing.

Inner suburbs may also be direct beneficiaries of smart growth policies which rein in the constant growth of the exurbs, and which concentrate more even growth and development across the urban region. However, such policies may require the increased cooperation of different—and often competing—municipalities that make up an urban region, as well as provincial and federal

governments. Provincial plans, such as the recently instituted Ontario's Growth Plan for the Greater Golden Horseshoe may indirectly benefit the inner suburbs. However, other, more direct policies are potentially in the toolkit of provinces or regional governments, including separating urban zones and developing specific policy objectives for each zone. Other possible strategies include changes in approaches to zoning, infill development, as well as spatial balancing of social housing.

7.5. DIRECTIONS FOR FUTURE RESEARCH

The current study is largely an introduction to a potentially complex phenomenon. As such, the current research opens up a number of future research avenues.

This thesis does not standardize the selection of variables in measuring prosperity. Indeed, the variables used as proxies of prosperity in this research do not uniformly correspond to each other. A factor analysis, however, is helpful in collapsing a disparate, yet relevant set of variables. It is possible that a factor analysis with a greater set of variables would improve the level of investigation. However, there is no scholarly consensus in selecting and interpreting variables for factor analysis. This is an issue which requires further theoretical discussion, as well as additional empirical research. At the same time, a factor analysis cannot fully capture the complexity in the spatial landscape. As such, other measurements are also necessary in examining this phenomenon in more detail. As an example, measuring occupational sector change over time in different urban zones would add considerable complexity in interpreting results; yet, it may add an important dimension in evaluating inner suburban decline.

Nonetheless, it is clear that the findings obtained in this research offer a prospect of further replication of results in smaller CMAs as well as urban areas (UA), as well as more detailed

replication of the results for the 15 largest CMAs. However, the small amount of census tracts available in smaller CMAs and UAs likely preclude implementation of an identical methodology. It may be possible to mitigate this problem by utilizing a smaller unit of analysis, such as the dissemination area (DA). Similarly, utilizing DAs in the 15 largest CMAs studied here may uncover hidden spatial patterns. However, DAs were introduced by Statistics Canada in 2001; while DA are similar to enumeration areas (EAs) which they replaced, the two units of analysis do not correspond perfectly. Any future research would have to bridge this gap in order to study Canadian spatial landscapes in more detail.

Just as importantly, it is difficult to perform a fine-grained analysis without taking account of municipal, regional, and provincial policy. While the current thesis attempts to examine structural change, it cannot explain all variability in the results. Some variability is likely to be a result of municipal policy. Analyzing municipal policy is beyond the scope of this research, particularly as many large CMAs contain many separate municipalities. However, separate case studies may be organized for individual CMAs, which can merge quantitative research results with a qualitative policy analysis. Similarly, policies which may aid in reversing inner suburban decline must be examined in greater detail. A comprehensive study of regional smart growth initiatives and regional cooperation programs can help determine whether such efforts have a tangible impact on inner suburban prosperity.

This thesis, furthermore, offers an admittedly simplified concept of suburban decline. While this rudimentary model is useful in generating predictions, it cannot easily disentangle the complex causes of inner suburban decline. As such, expanding the model may improve predictive accuracy and allow for a better understanding of inner suburban decline. For example, the findings of this research hint at the possibility of both positive and negative spill-over effects

between urban zones in at least some CMAs. Furthermore, investment and disinvestment trends may be analyzed: these trends may be based on current bank commitments or real estate market activity of a given neighbourhood. Many other variables may be positive or negative predictors for decline but cannot be accounted for in a very simple conceptual model and a factor analysis. Such an analysis would benefit from additional—and difficult to obtain—data sources beyond the Census of Canada.

Moreover, the factor analysis used in this research 'entangles' socio-economic variables with other indicators. An alternative approach would construct an index for measuring economic prosperity that would then be easily replicable with the census or other data sets. Once an index was constructed, a logistic regression could be used to test various variables and the marginal effects they have on decline. The logistic regression derived from the index could be binary, with a declining or not declining value. Alternatively, greater nuance could be obtained by using a multinomial logistic regression with a greater number of values: for instance, the regression could include prosperous, neutral, and declining values or even very prosperous, prosperous, neutral, declining, and severely declining values. However, adding more categories would come at a price of decreasing the statistical significance of marginal effects that may nonetheless be important. Some experimentation would be required to find the best fit. Moreover, there would be a temptation to add as many explanatory variables as possible in such a model; this could produce highly insignificant and spurious results. Therefore, only variables with a strong theoretical underpinning should be used in such circumstances.

Moreover, the current study only tangentially addresses the issue of metropolitan polarization. Although the GINI coefficients calculated in Appendix E show little evidence of either increased metropolitan polarization in the inner suburbs or other urban zones, additional study is needed to

confirm these results. GINI calculations may be especially sensitive to sample size; as such, dissemination area calculations may possibly uncover some evidence of intra-tract polarization. Furthermore, polarization can be measured by using other metrics: for example, Walks (2001) has suggested utilizing an index of dissimilarity and a neighbourhood dissimilarity index of average and/or median household incomes in uncovering evidence of polarization within the urban zones. Furthermore, household median income deciles and income gradients may also identify neighbourhood polarization trends.

Finally, this thesis indirectly opens up possible research avenues in the future health of other urban zones. What is clear, for example, is that core and inner city rejuvenation is not ubiquitous in Canadian Metropolitan Areas and appears to be generally — though not exclusively — concentrated in the larger metropolitan regions. As such, research chronicling the decline, rather than the rejuvenation of the core and the inner city is still relevant, as is analysis of current policy approaches to the declining inner cities. In addition, the outer suburbs may have diminished in desirability, as both median incomes and dwelling values appear to have decreased or stagnated in this zone. To this end, a study breaking down the outer suburbs into several sub-zones according to the period of housing construction may answer the question as to whether the outer suburbs may be following a similar trajectory as their inner suburban counterparts.

An additional concern unique to Canadian research is the unavailability of reliable detailed census data for the 2011 census year, and possibly all further census years. The detailed long-form questionnaire of the 2011 census from which most of this type of research obtains most of its variables will be voluntary for the first time. In addition to biases of voluntary surveys, the change to a voluntary survey precludes direct comparisons with earlier census years as the data is likely to vary considerably between the two. Therefore, any further longitudinal study of the

phenomenon which uses the census will be limited to the year 2006 as the upper bound. Nonetheless, at least one alternative to the census exists which may offer an alternative study instrument: the Longitudinal Administrative Databank (LAD) database. The LAD is a longitudinal sample of tax filers for years 1982 and 2007 and includes postal codes as a basis for spatial research. The postal codes are available in the file and can then be fixed to census tracts. Unlike the census, the LAD is a longitudinal yearly database and is continually updated; as such, the 2007 is the current upper bound for information, but the file periodically adds new years.

The statistics used in the LAD largely come from the annual tax file of individual persons collected by the Canada Revenue Agency, although other statistics are attached to the database (for example, the immigration file of any person can be linked to the LAD). In any given year, the LAD includes a longitudinal sample of 20% of the tax filing population (Dryburgh, 2004). While missing much of the richness available in the long-form questionnaire, the LAD also offers many advantages. Since income information from the LAD is taken directly from an individual's tax file, it is more likely to be accurate.

Furthermore, as LAD is an individual data set, an individual can be tracked over the long-term. This provides many advantages: for example, the LAD enables the researchers to directly examine if individuals in high income brackets are moving out of the inner suburbs at a higher rate than the individuals in high income brackets in other urban zones. Conversely, the LAD enables researches to examine whether individuals in low income brackets and families on social assistance are moving to the inner suburbs at a higher rate than individuals in other urban zones. This direct tracking of individuals also allows for a direct examination of the effects of aging in place, as well as the location to which more recent immigrants settle. Similarly, the LAD enables family tracking: as such, children can be tracked as well: do they choose to settle in same

urban zones as their parents, or does the location depend on their own incomes? Indeed, such complicated analysis is possible with the LAD and impossible with any census data set.

Housing values and rental values, however, cannot be directly derived via the LAD, but an estimated value may be derived by tax deduction indicators. Similarly, educational and occupational factors may be estimated via a similar mechanism, although any such estimation is likely to have an arbitrary component to it. Nevertheless, the LAD suggests that a further study of these phenomena is not necessarily limited to 2006 as the upper bound, as long as the study methods are modified to take advantage of an alternative dataset.

7.6. CHAPTER CONCLUSION

What remains clear, then, is that the current study represents only a modest contribution to the topic of inner suburban decline. While this thesis found broad evidence to support a specific form of decline, more work needs to be done in assessing the overall extent of the decline. Furthermore, little is still known about the possible causes of inner suburban decline. The causes are, in any case, complex and interlocked, and therefore difficult to methodologically untangle. More work needs to be done, as understanding the causal process in greater depth would be instrumental in bringing about less speculative and more evidence-based policy responses to combat inner suburban decline.

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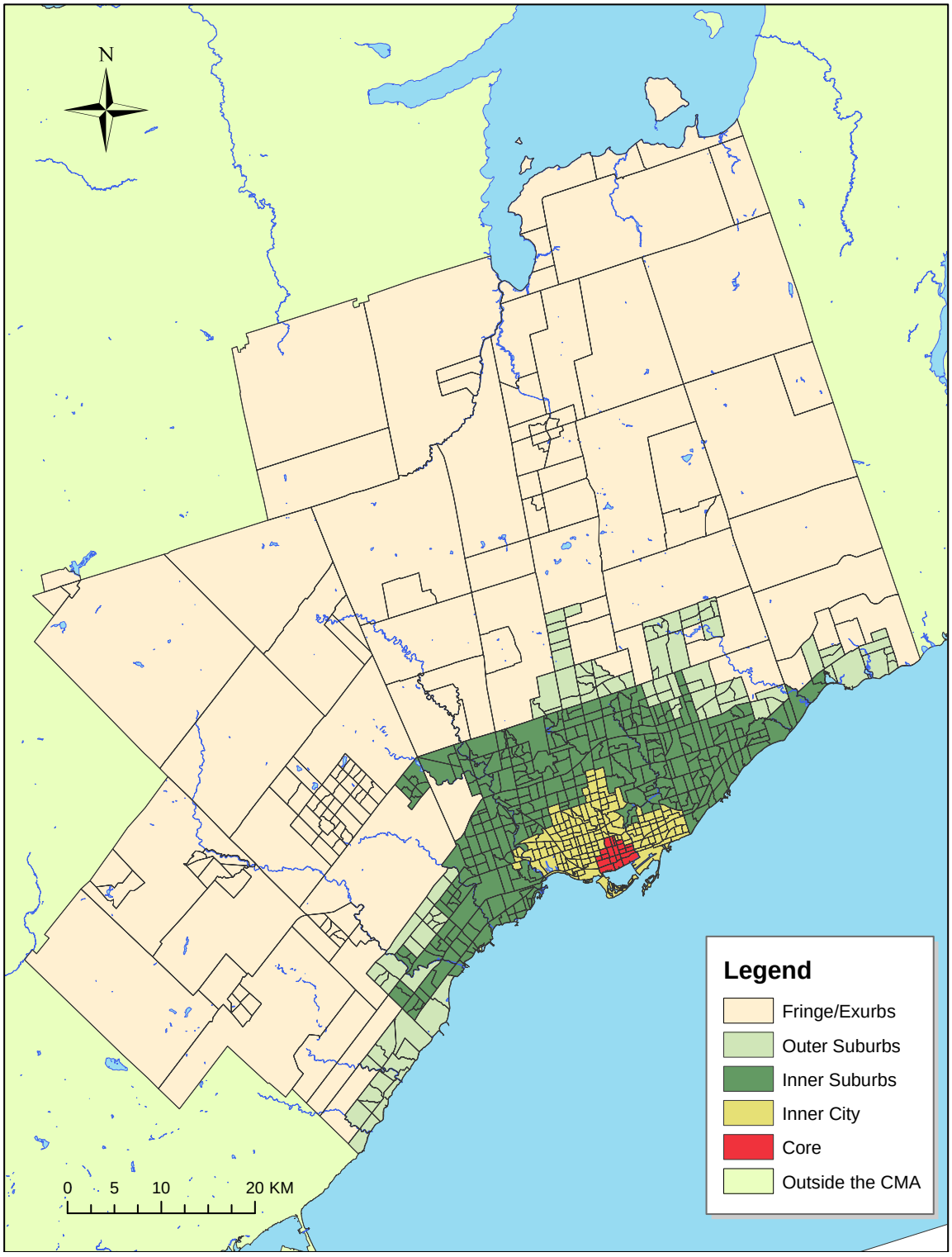
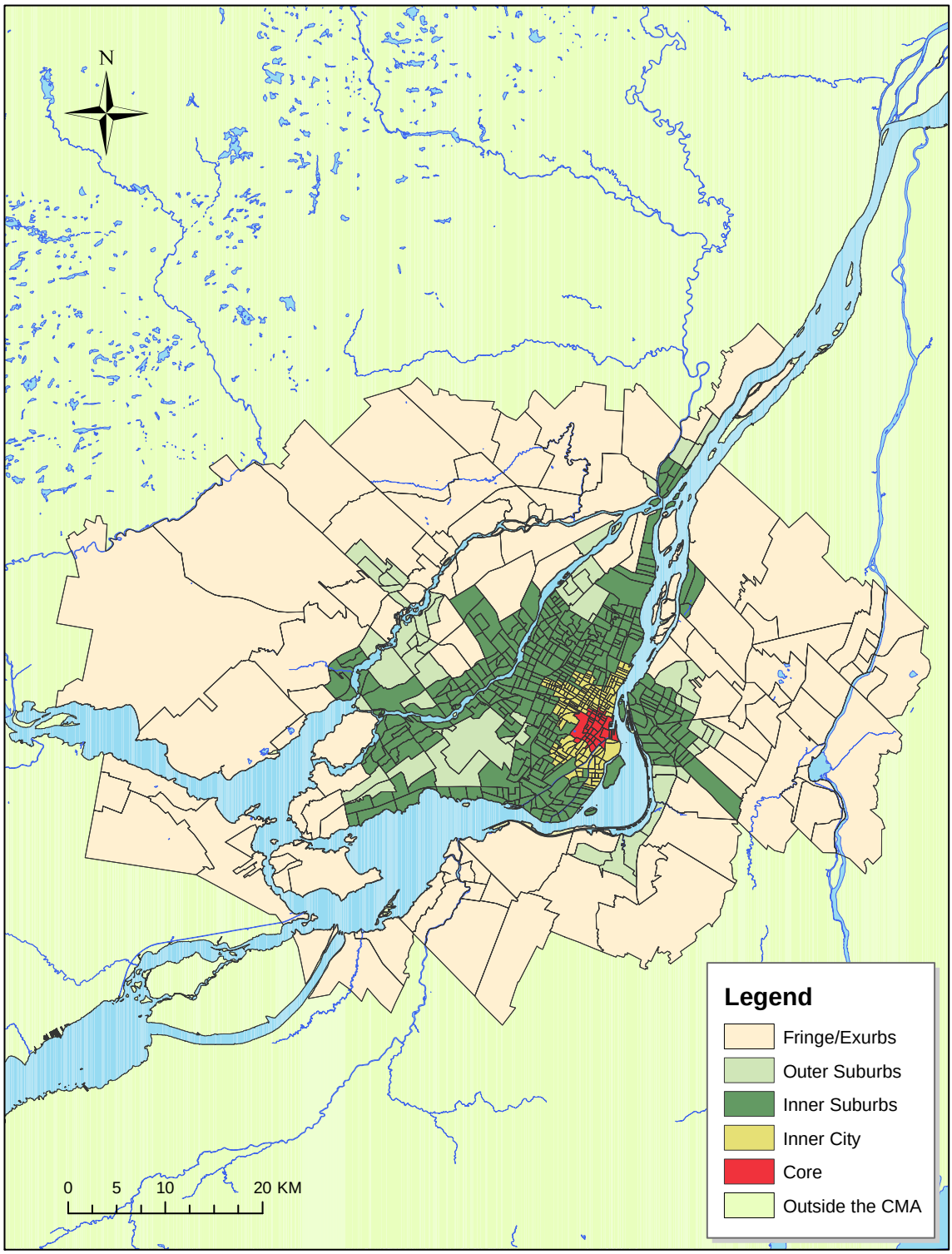
APPENDIX A

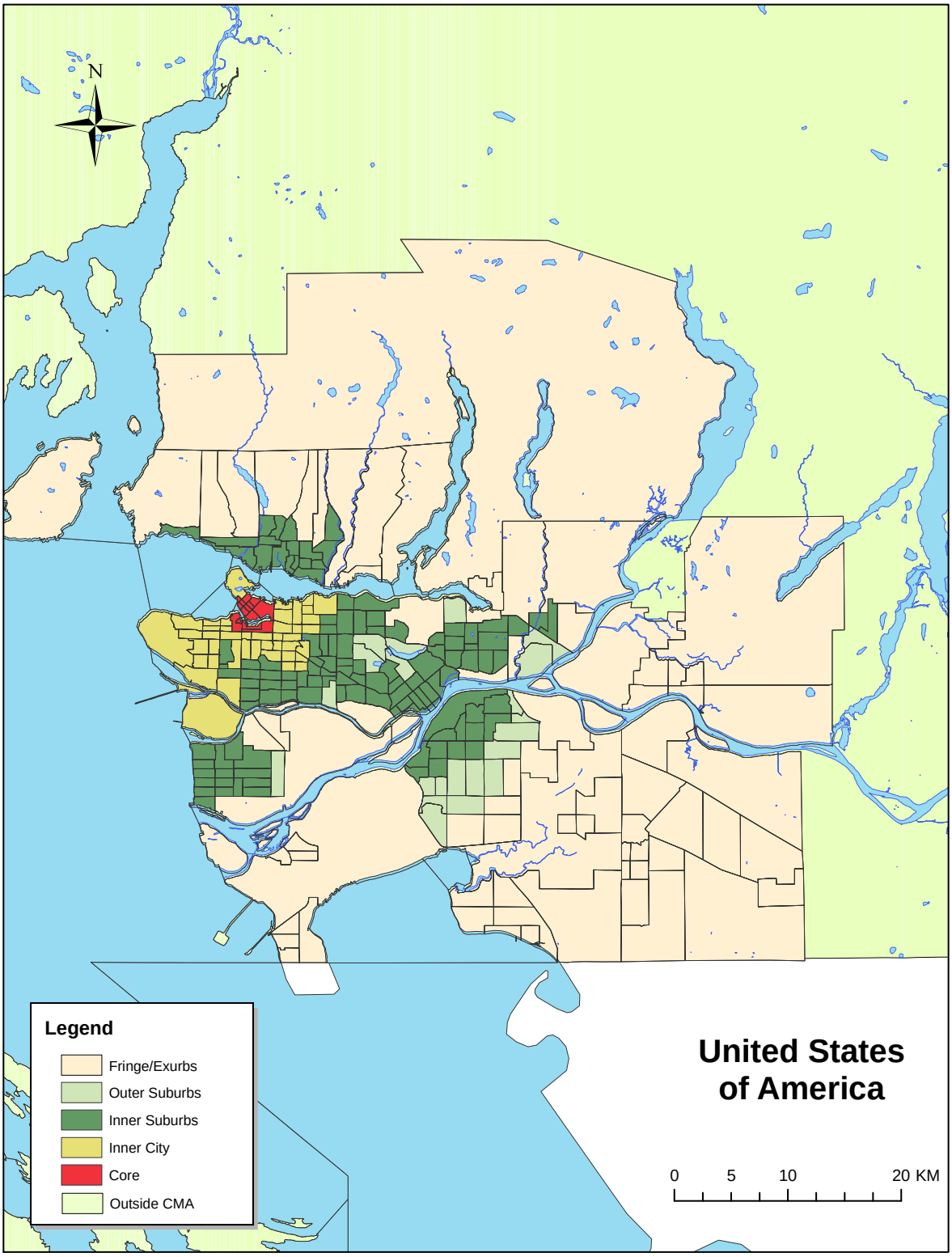
Map A-1: Urban zones of the Toronto CMA, 1986.



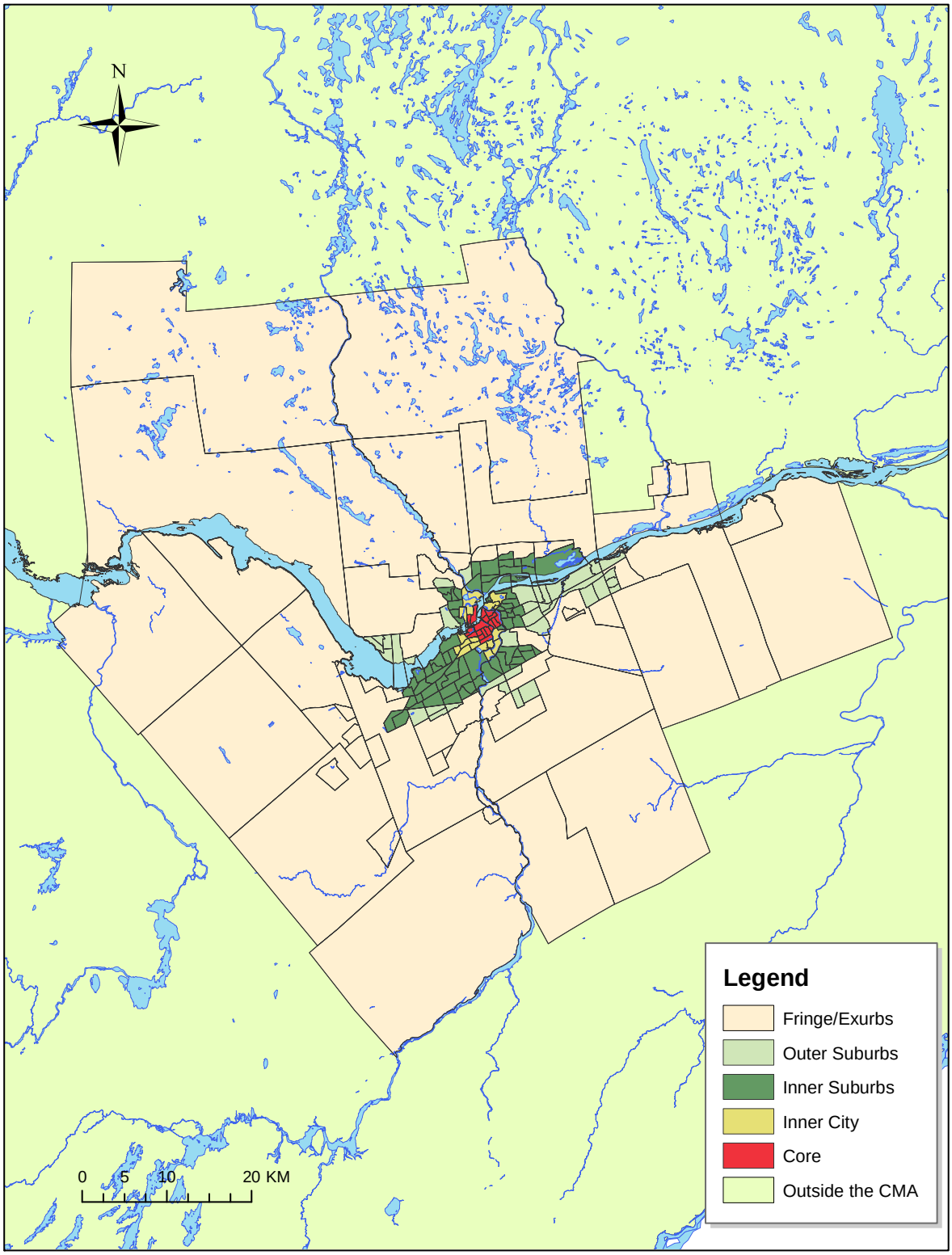
Map A-2: Urban zones of the Montreal CMA, 1986.



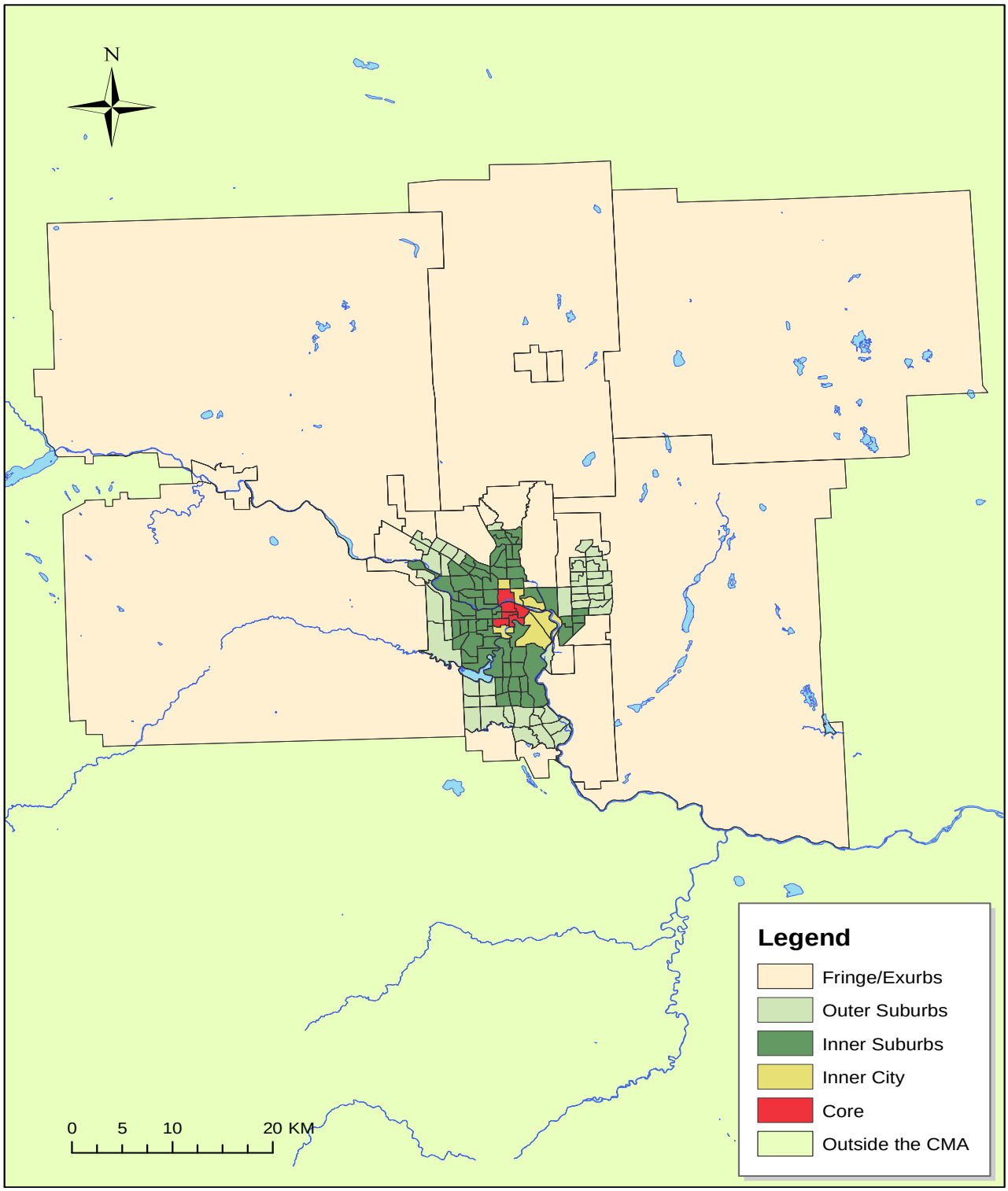
Map A-3: Urban zones of the Vancouver CMA, 1986.



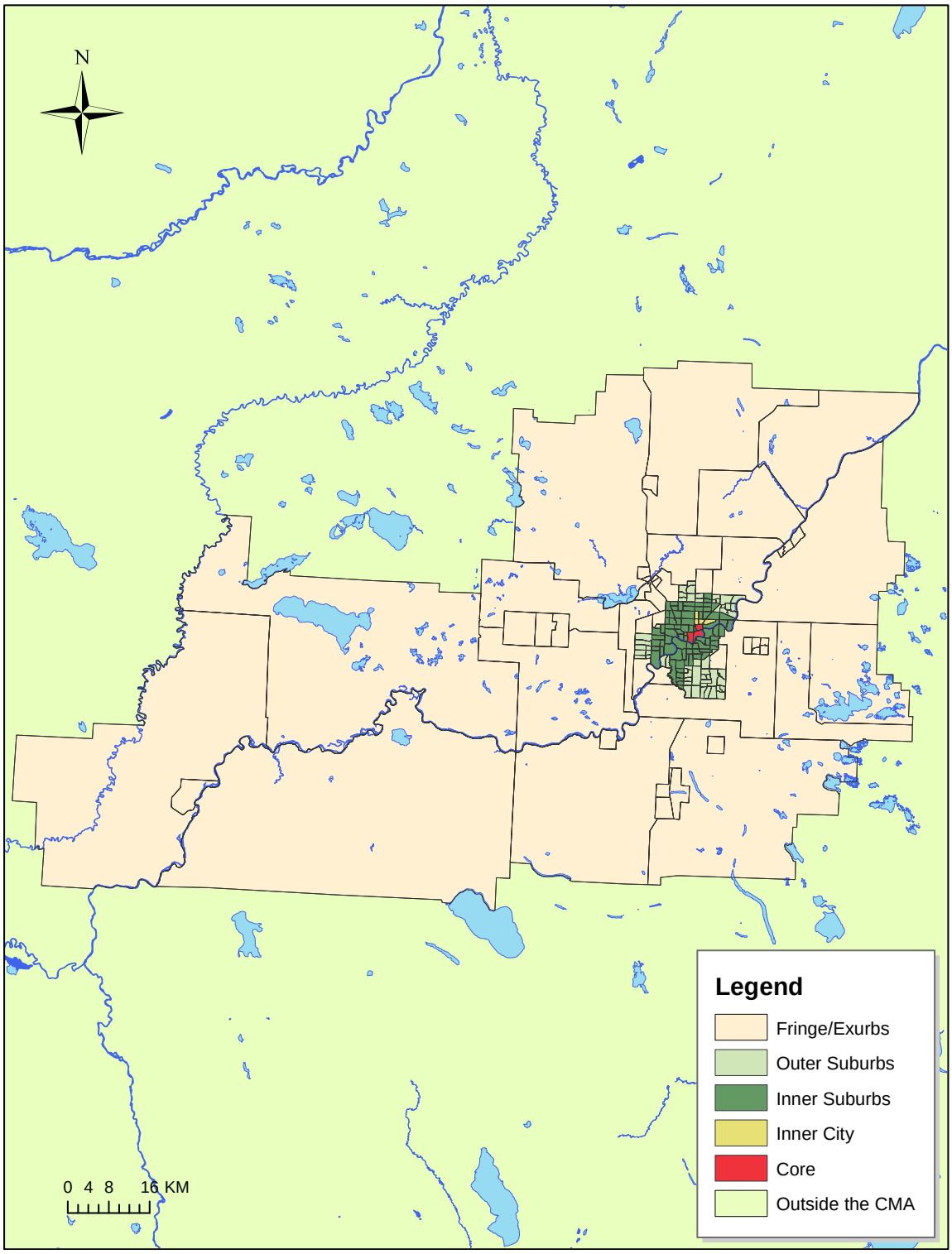
Map A-4: Urban zones of the Ottawa CMA, 1986.



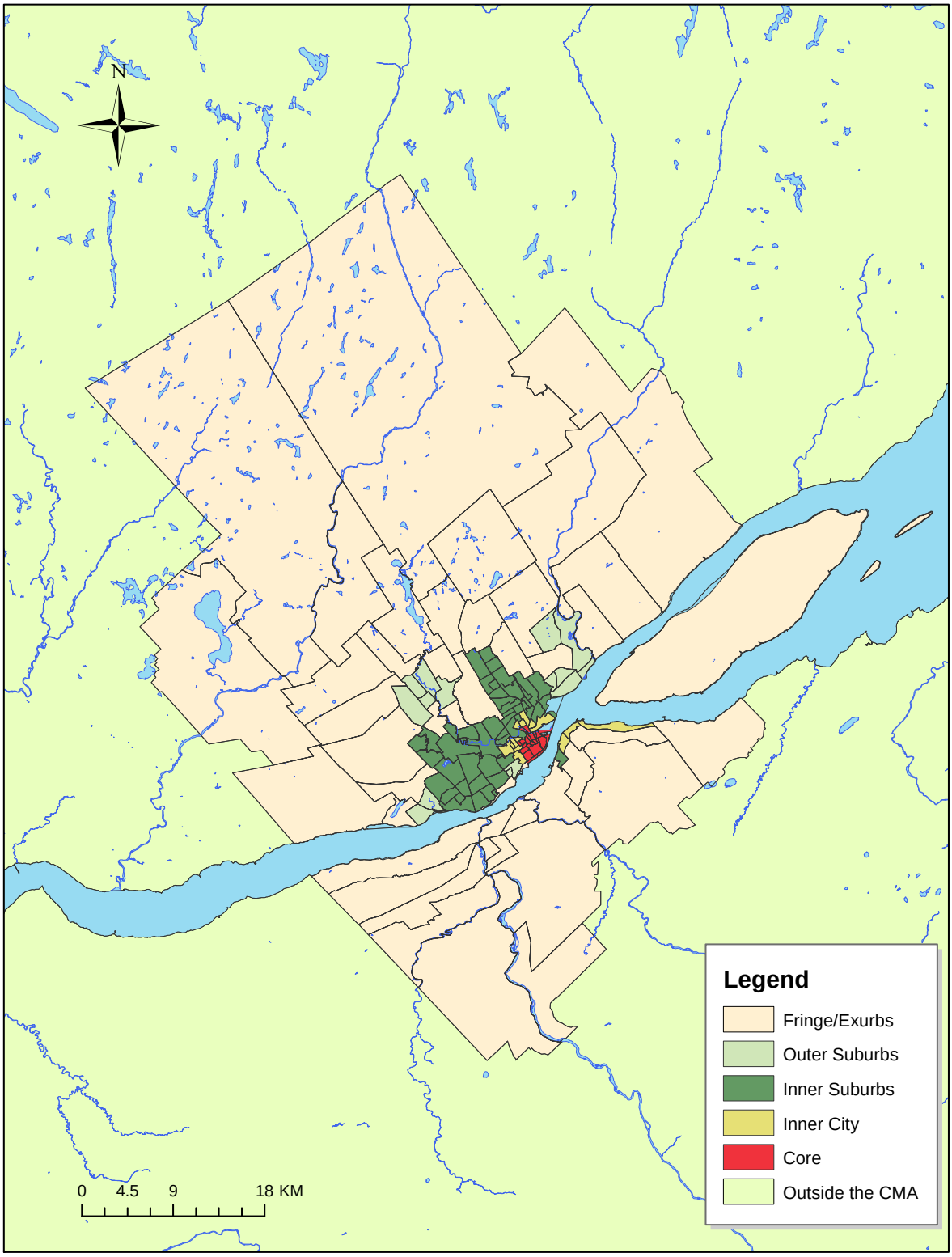
Map A-5: Urban zones of the Calgary CMA, 1986.



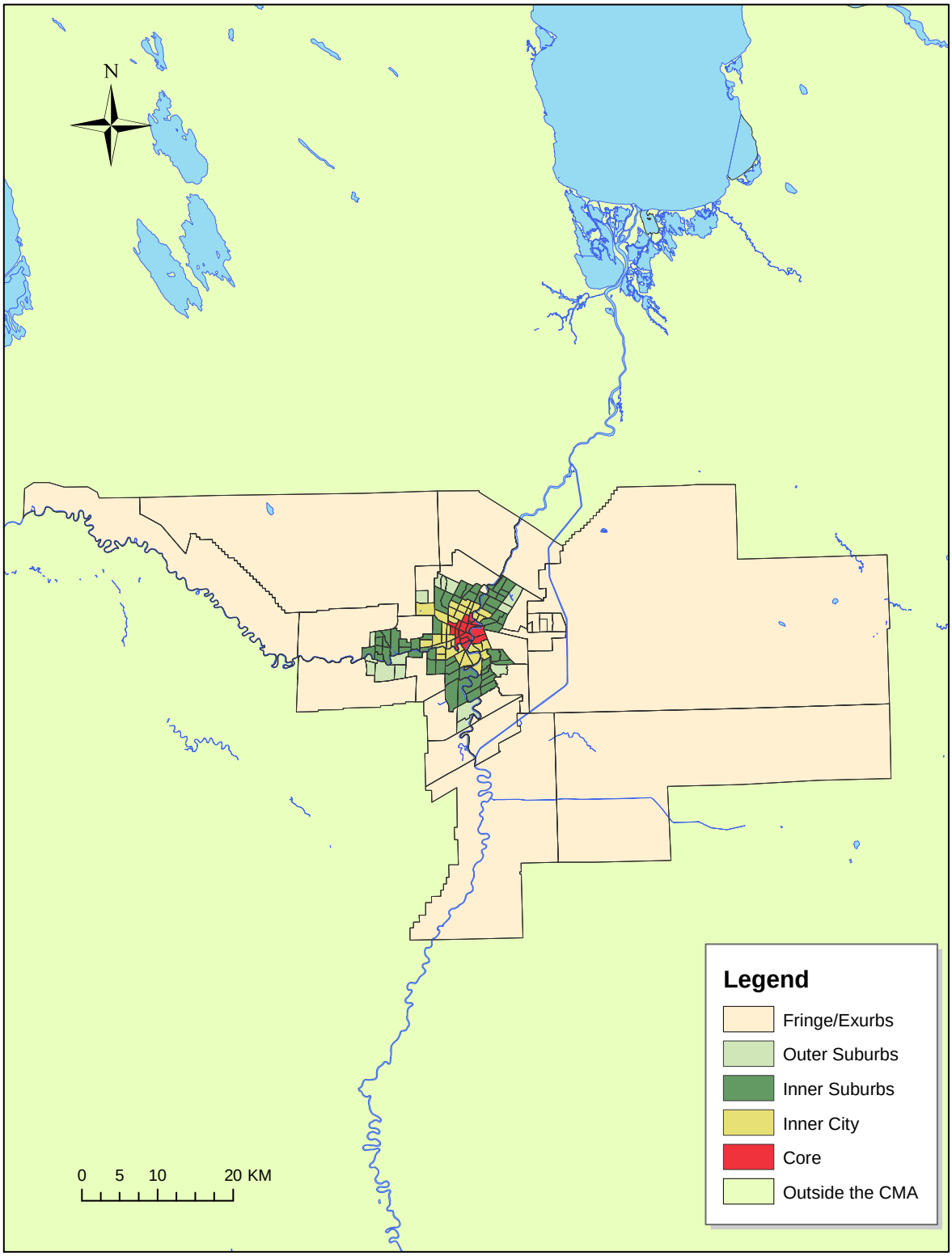
Map A-6: Urban zones of the Edmonton CMA, 1986.



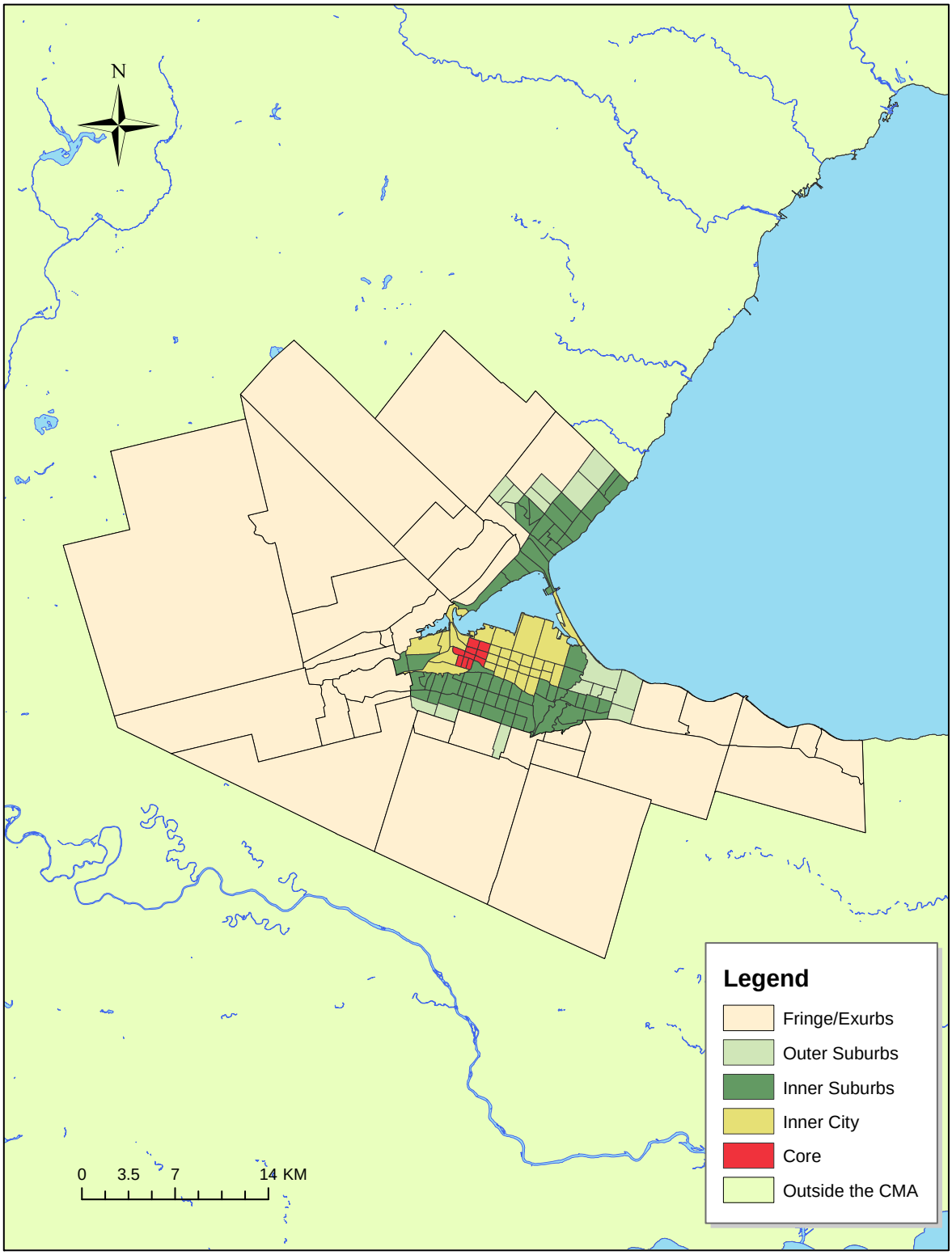
Map A-7: Urban zones of the Quebec CMA, 1986.



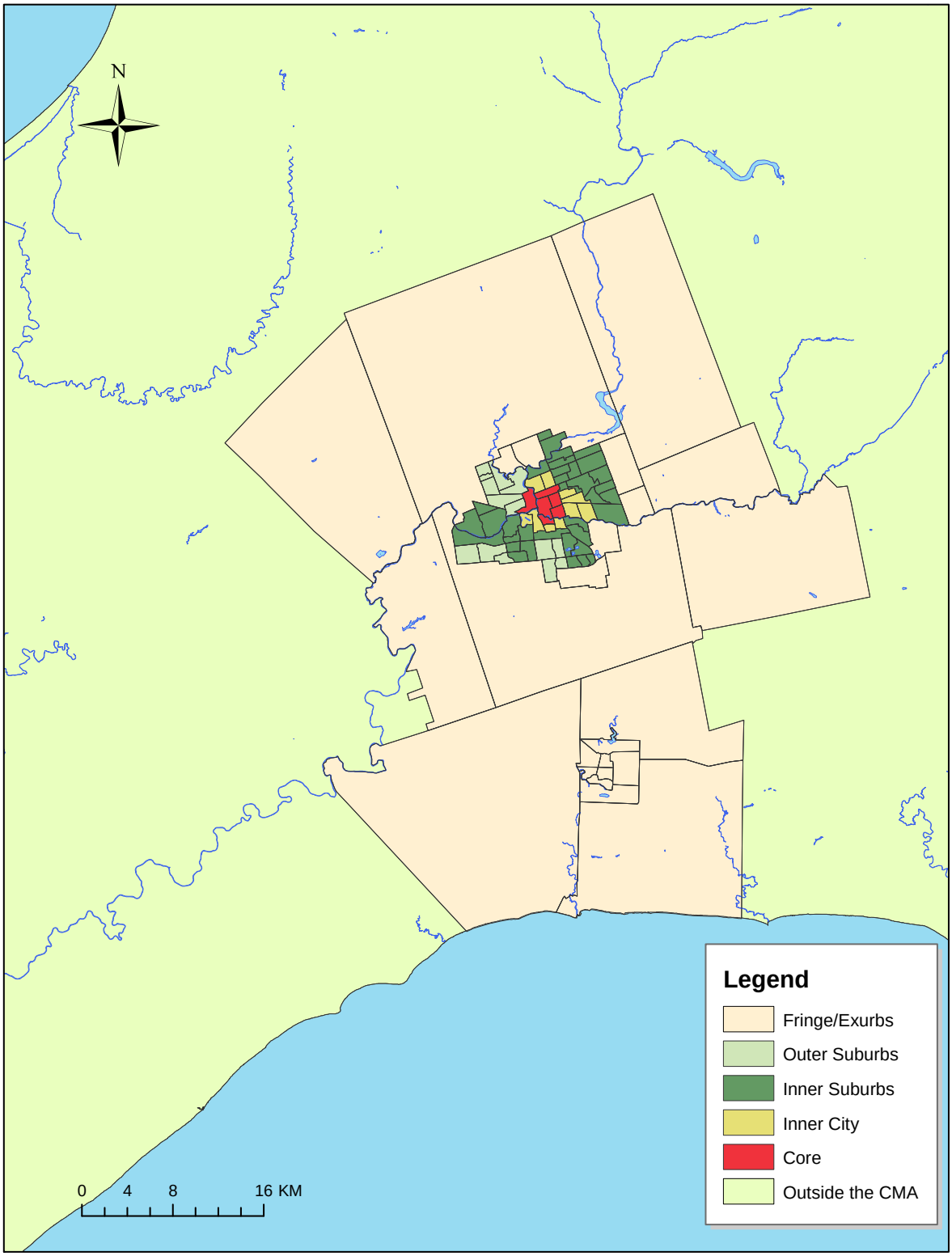
Map A-8: Urban zones of the Winnipeg CMA, 1986.



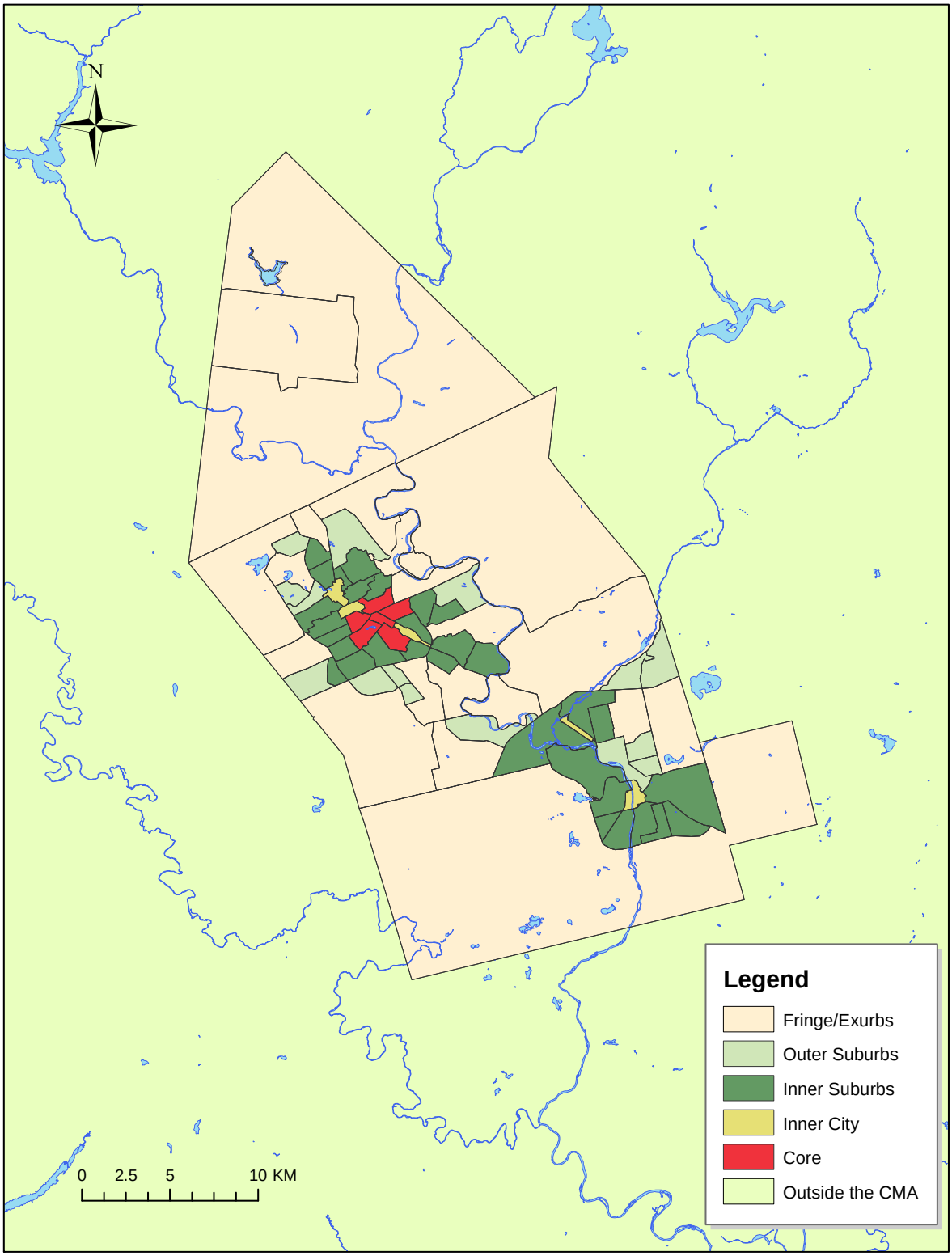
Map A-9: Urban zones of the Hamilton CMA, 1986.



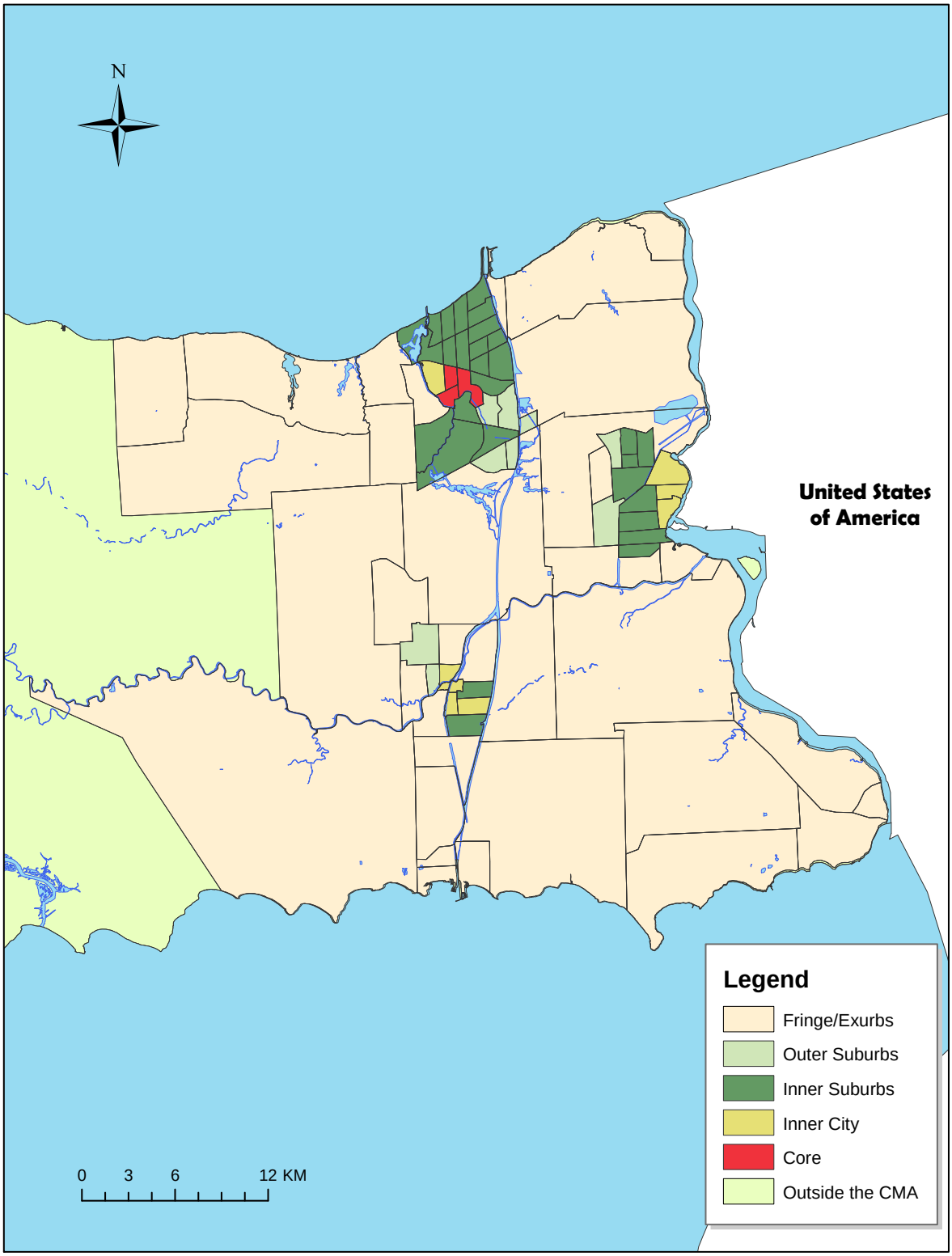
Map A-10: Urban zones of the London CMA, 1986.



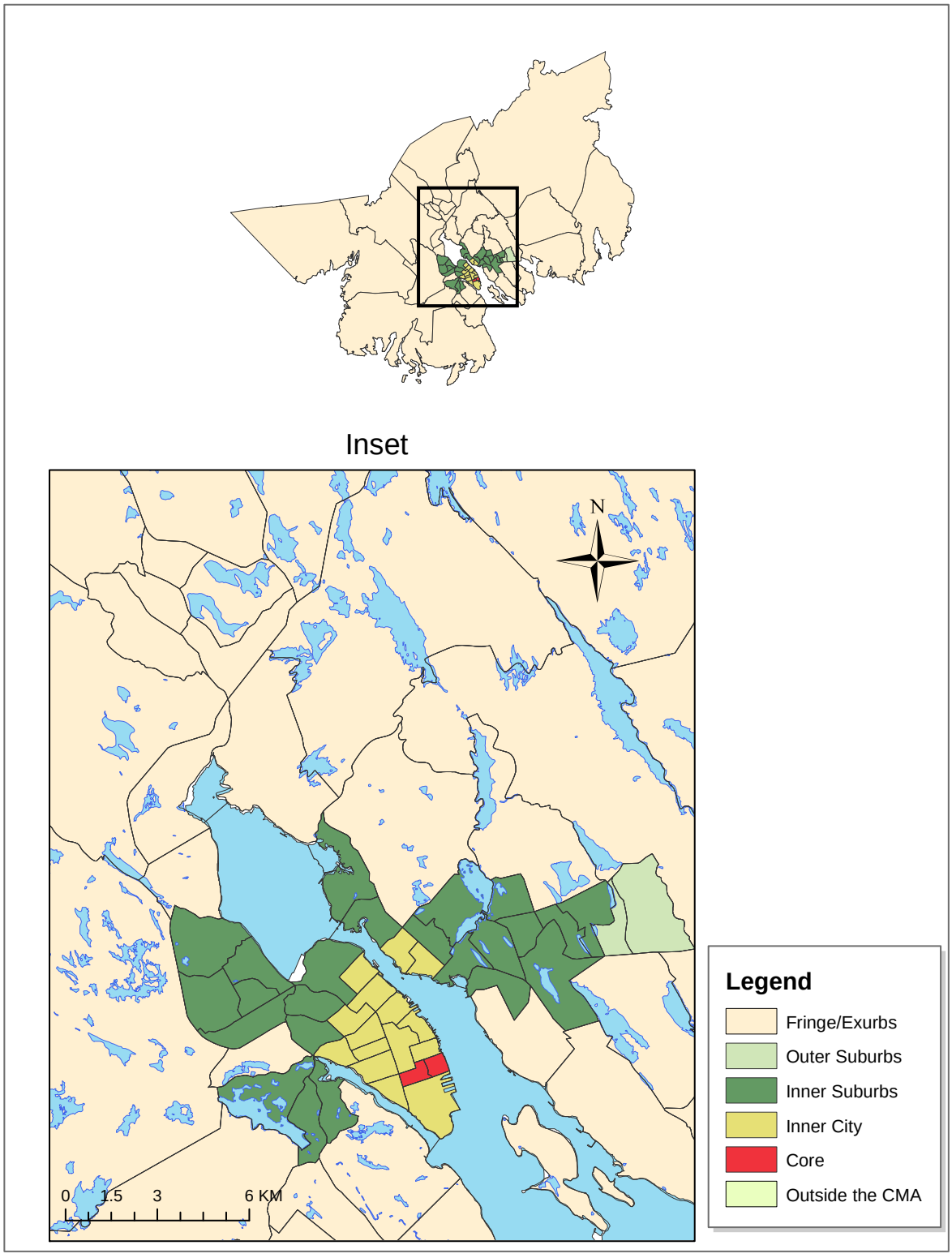
Map A-11: Urban zones of the Kitchener CMA, 1986.



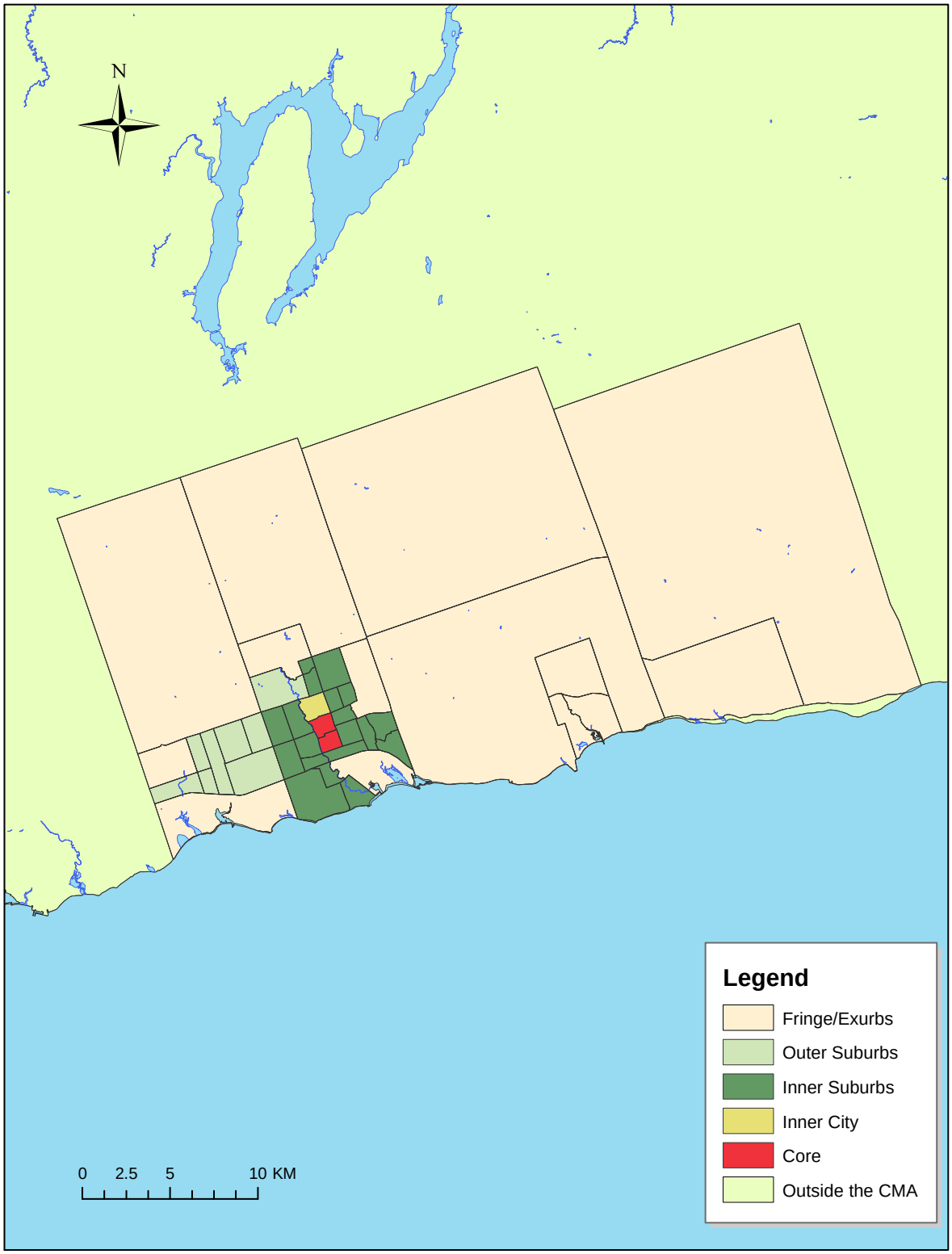
Map A-12: Urban zones of the St. Catharines – Niagara CMA, 1986.



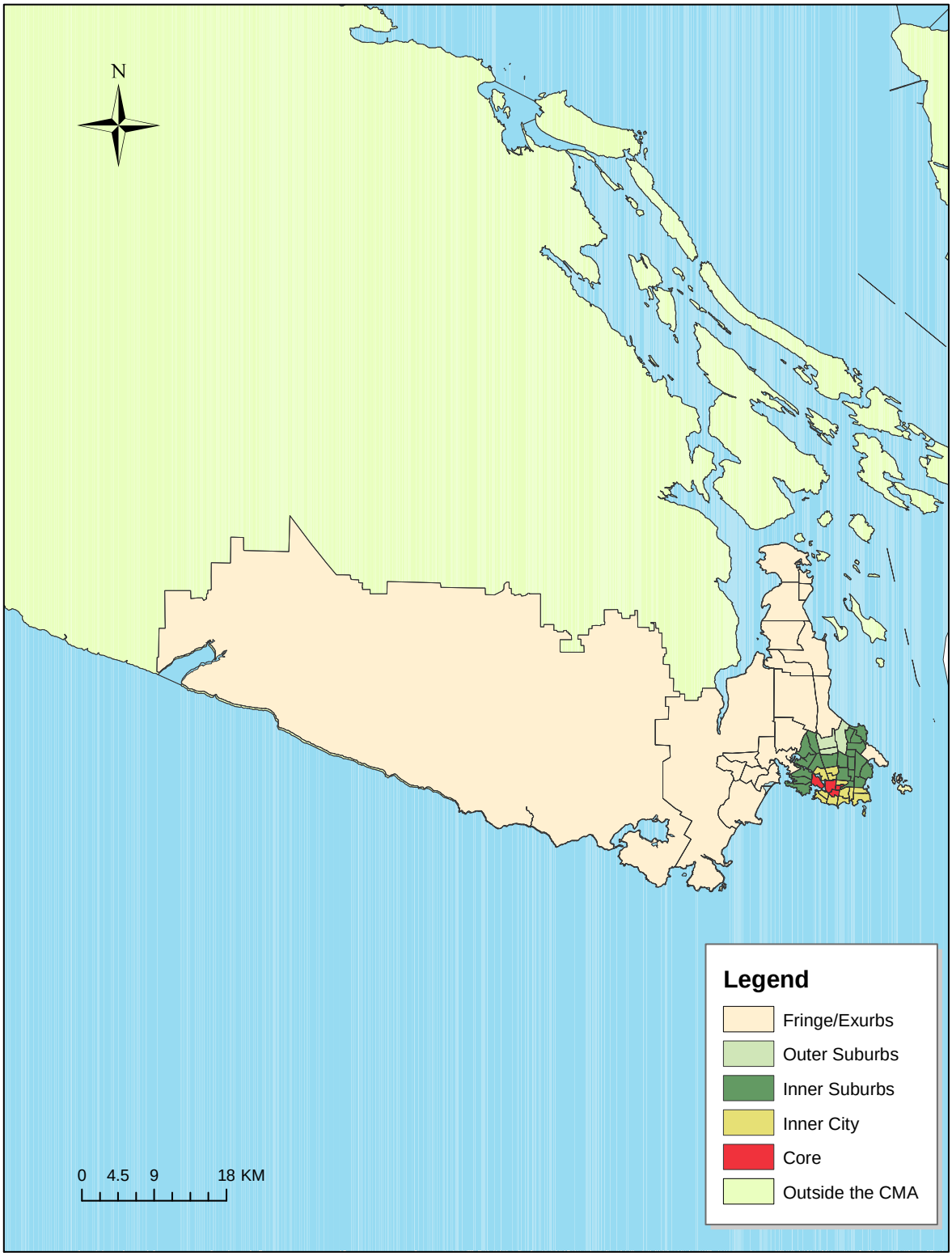
Map A-13: Urban zones of the Halifax CMA, 1986.



Map A-14: Urban zones of the Oshawa CMA, 1986.

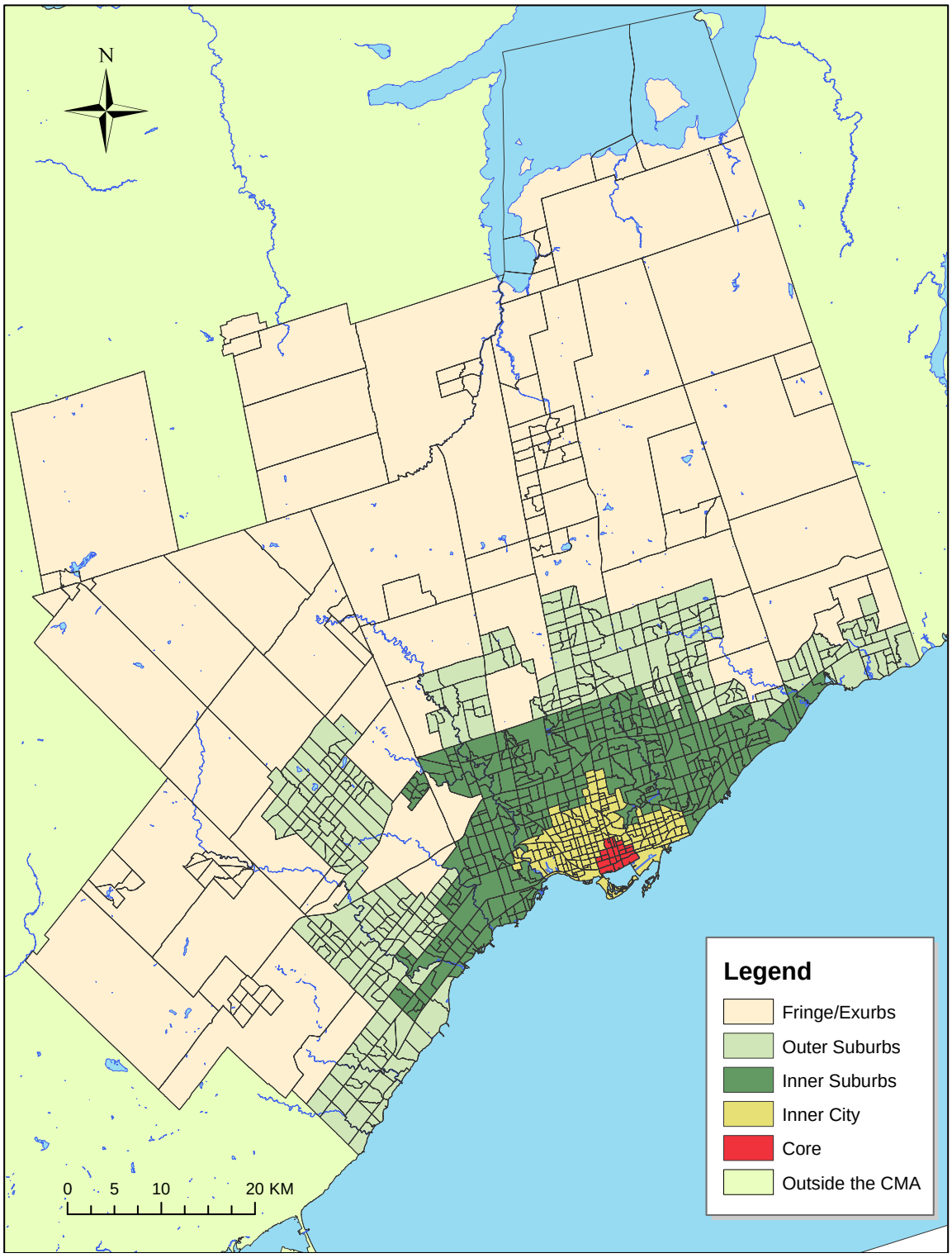


Map A-15: Urban zones of the Victoria CMA, 1986.

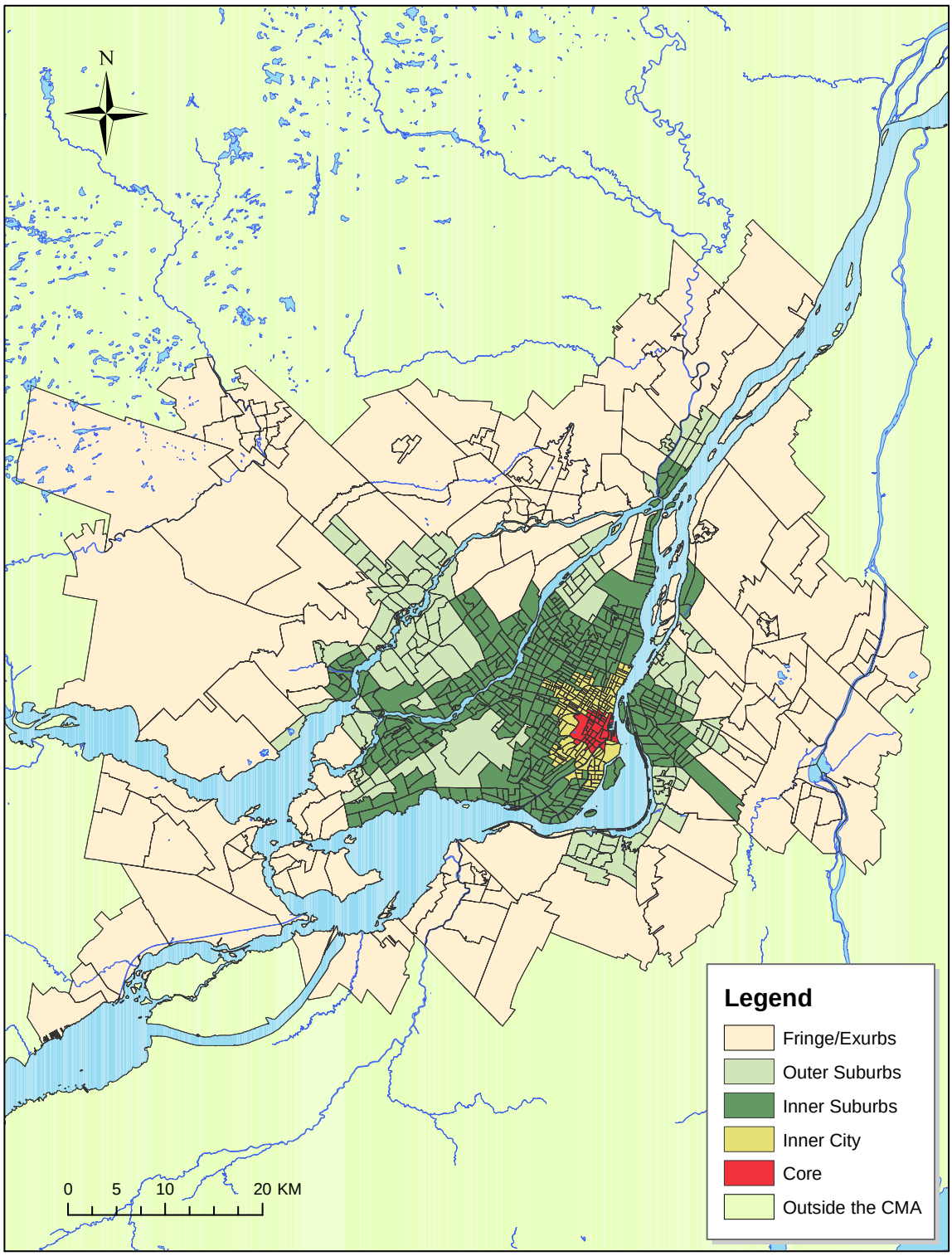


APPENDIX B

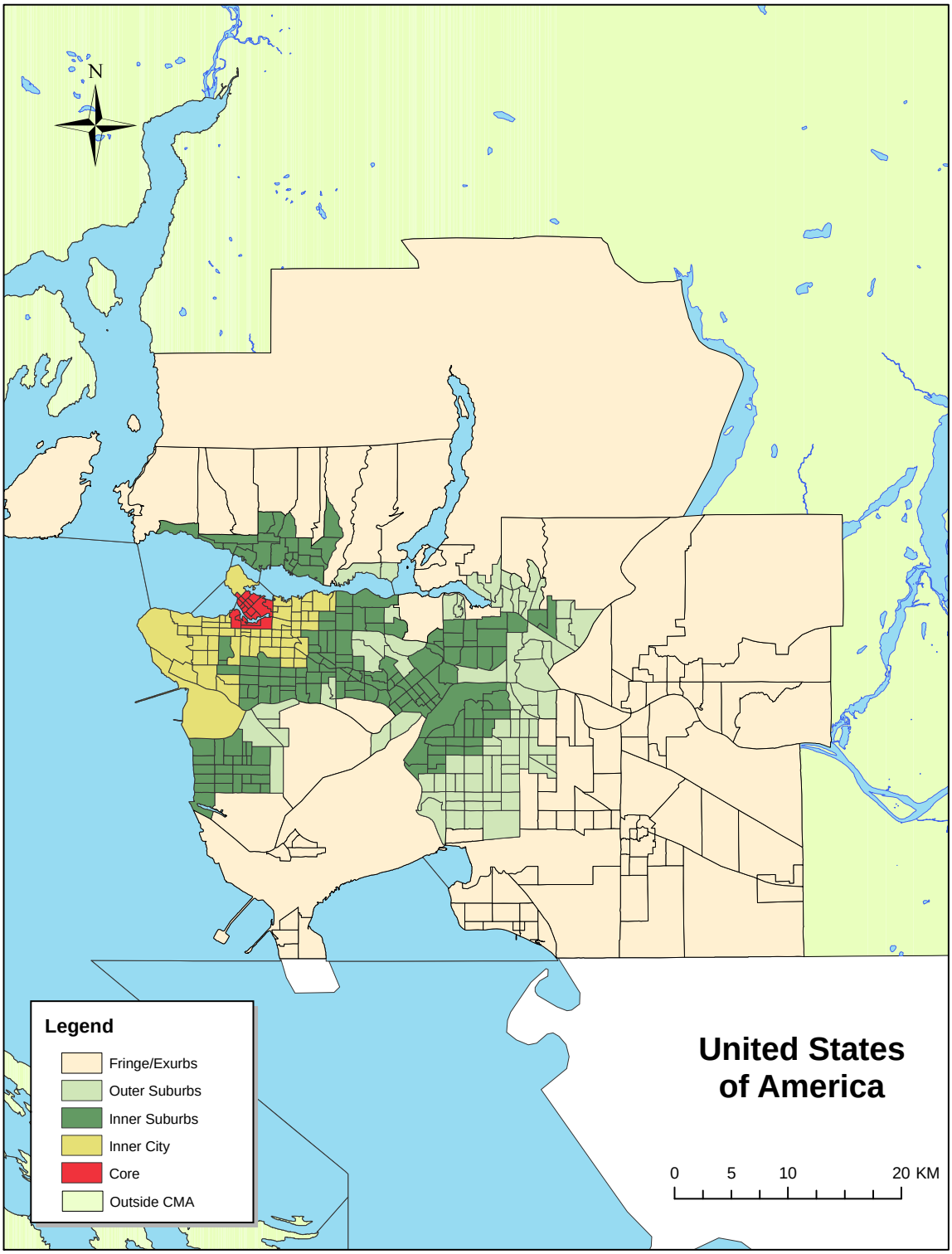
Map B-1: Urban zones of the Toronto CMA, 2006.



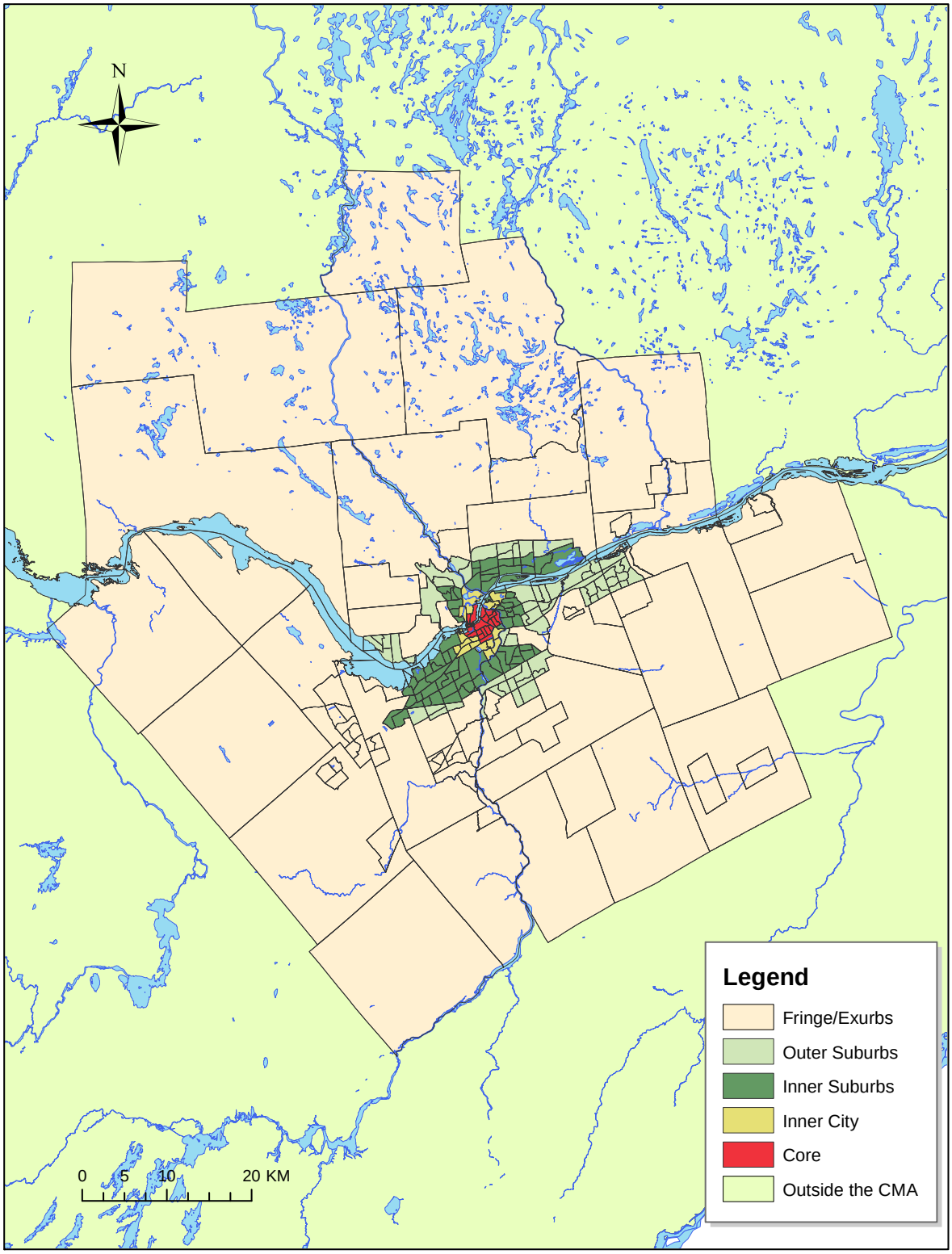
Map B-2: Urban zones of the Montreal CMA, 2006.



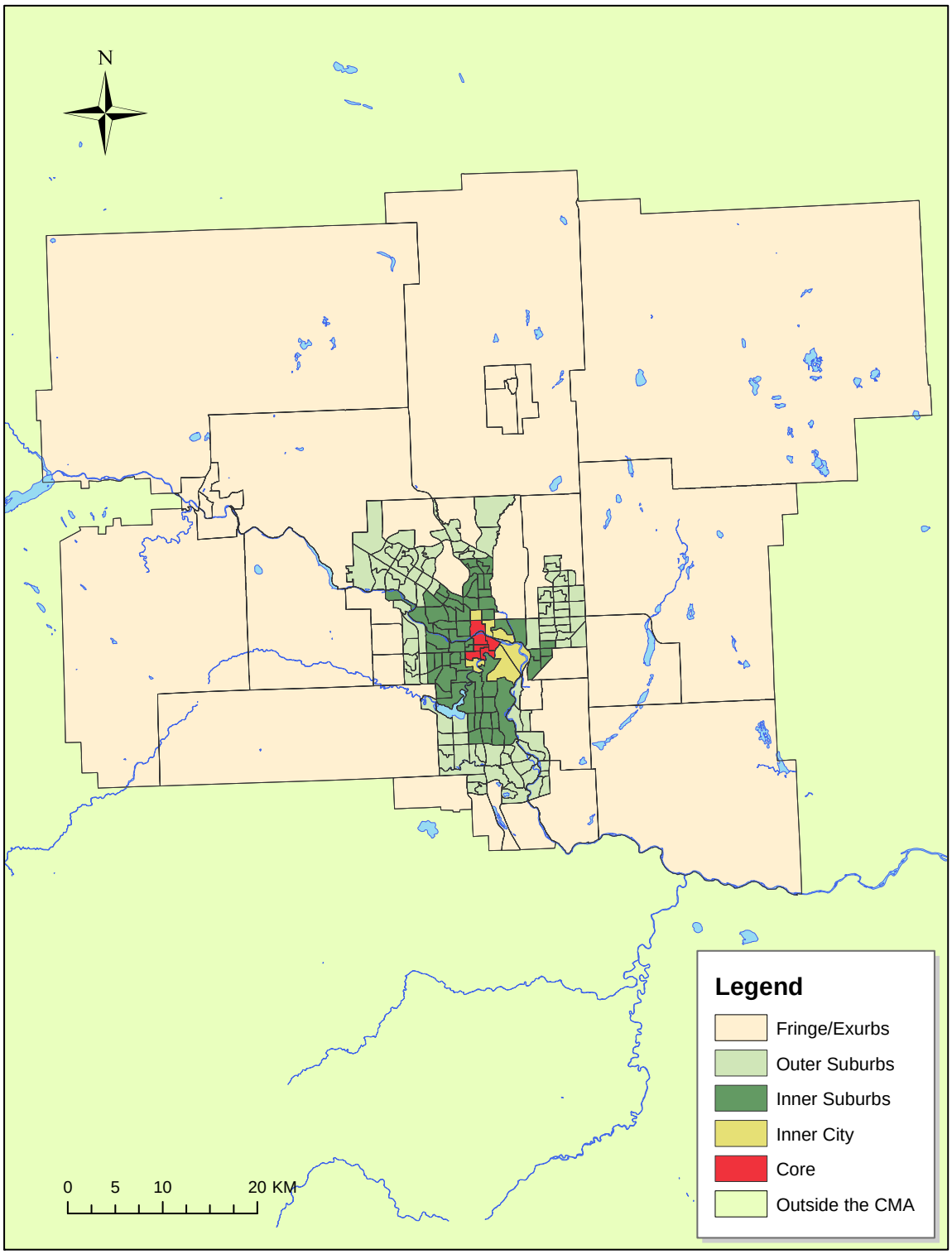
Map B-3: Urban zones of the Vancouver CMA, 2006.



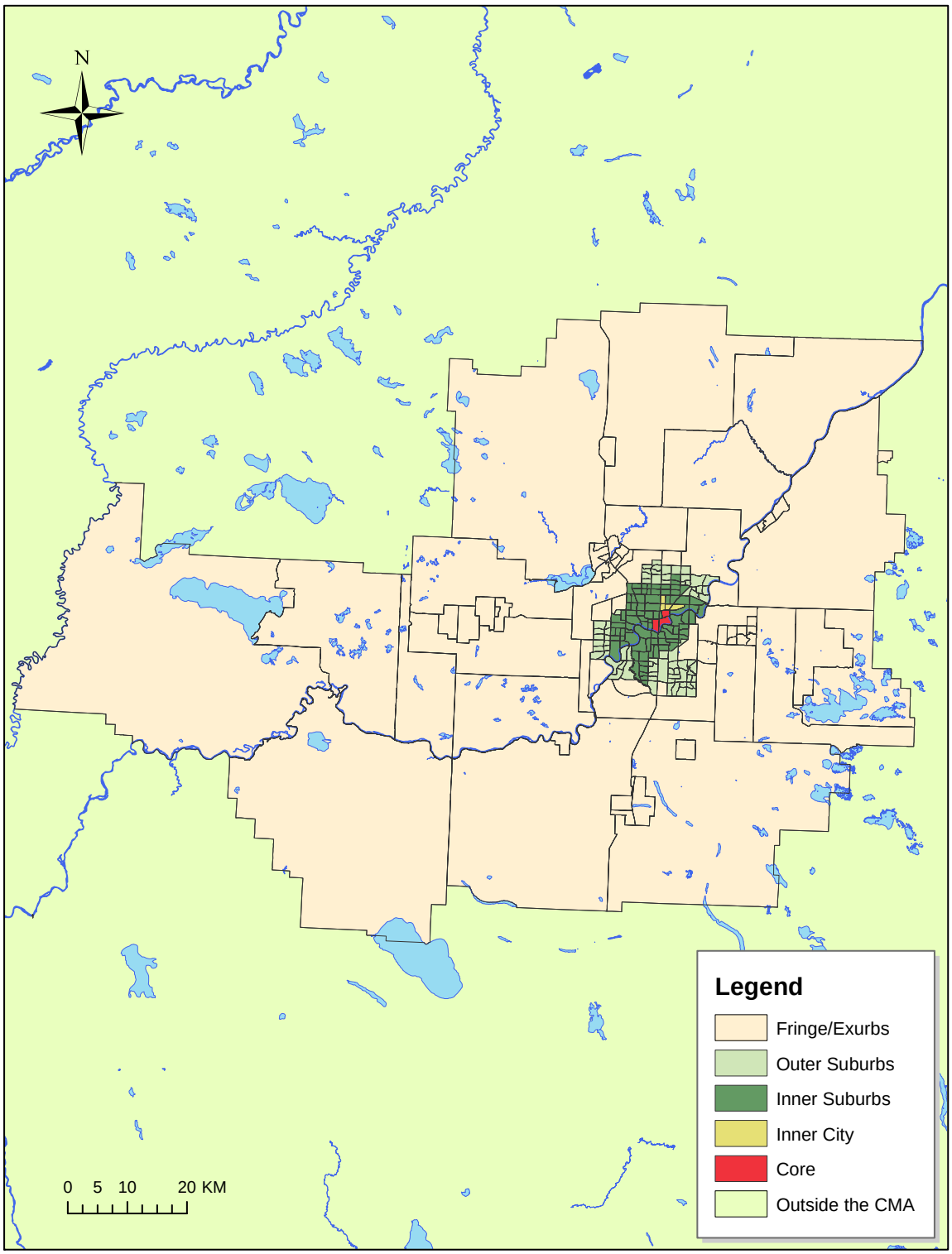
Map B-4: Urban Zones of the Ottawa – Gatineau CMA, 2006.



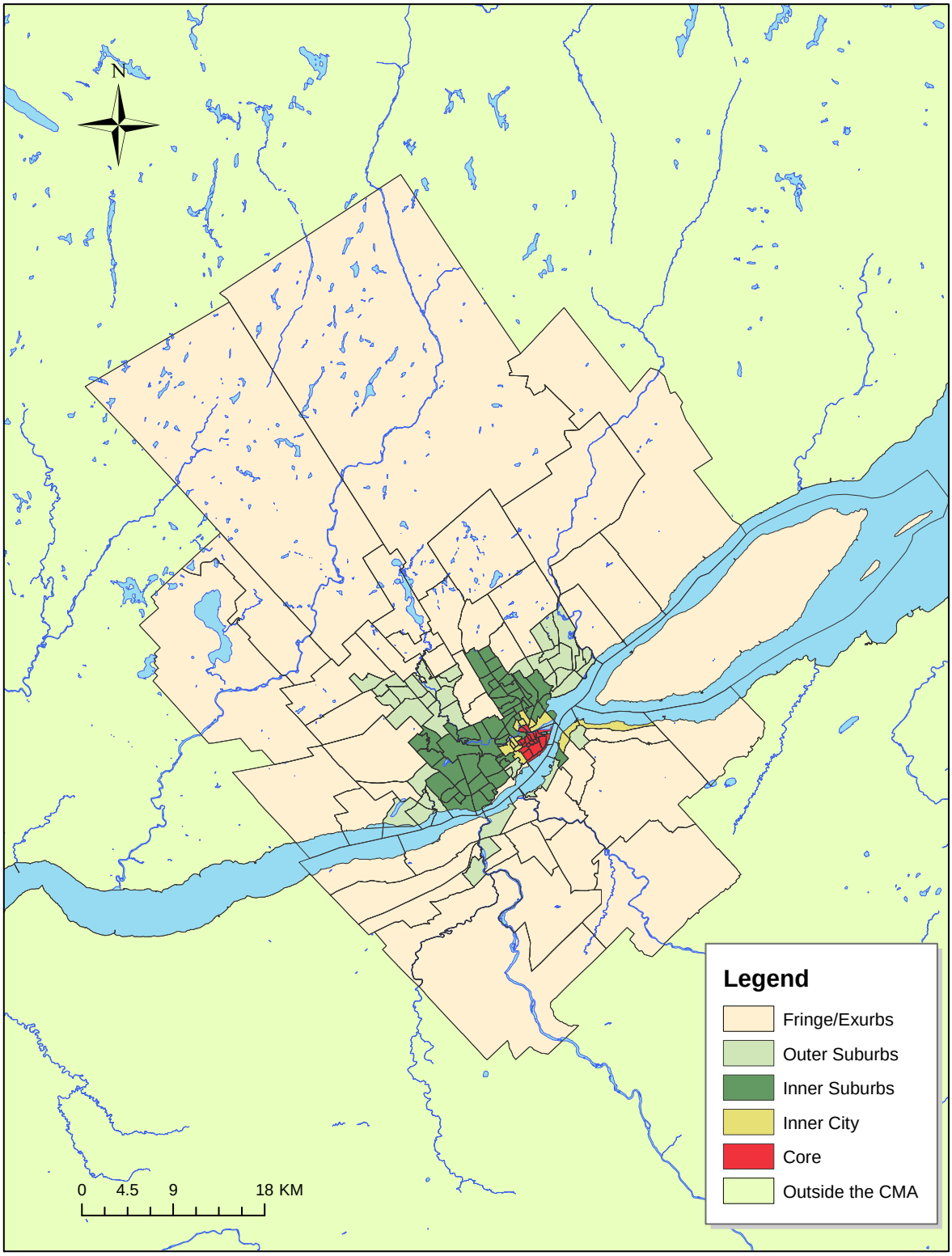
Map B-5: Urban zones of the Calgary CMA, 2006.



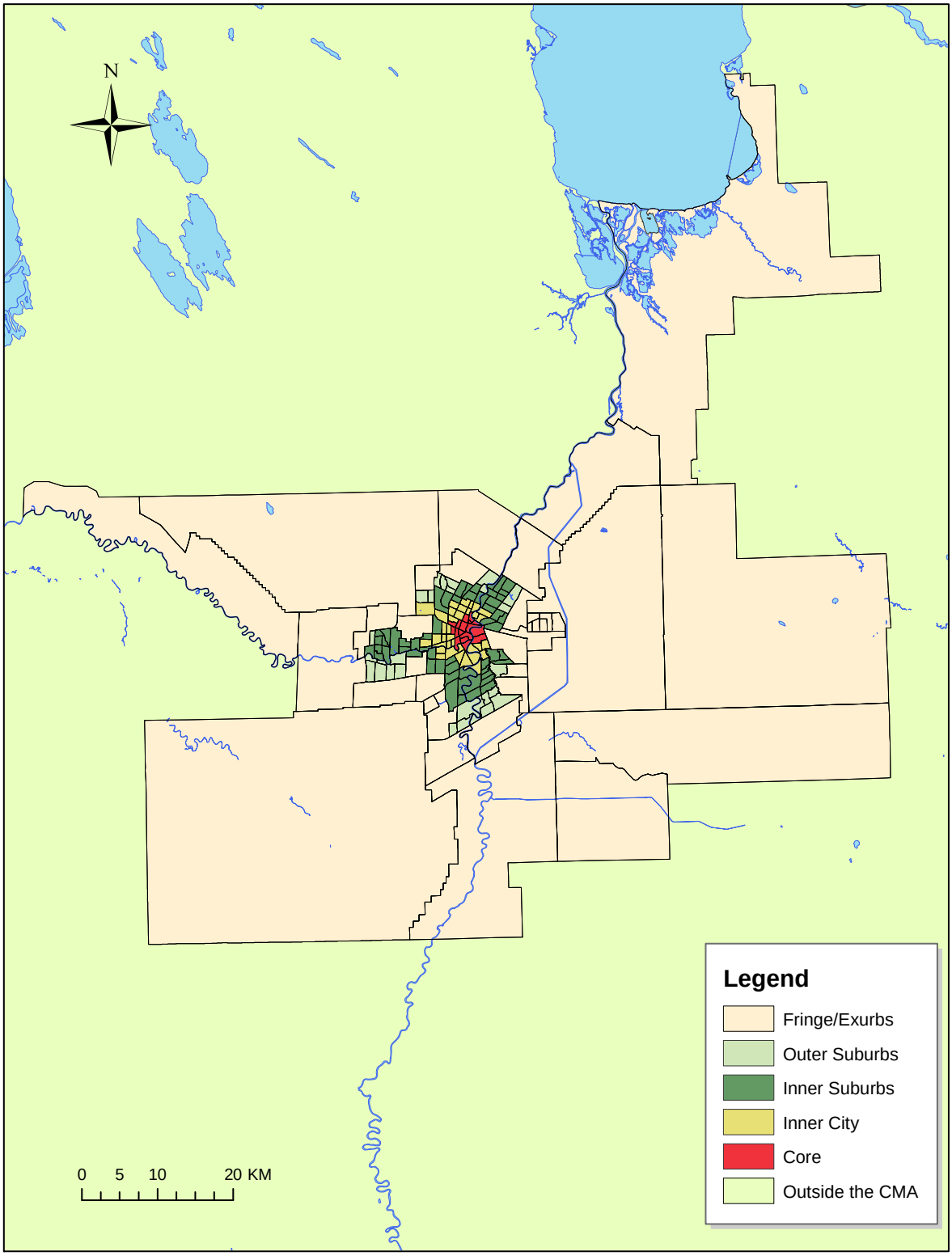
Map B-6: Urban zones of the Edmonton CMA, 2006.



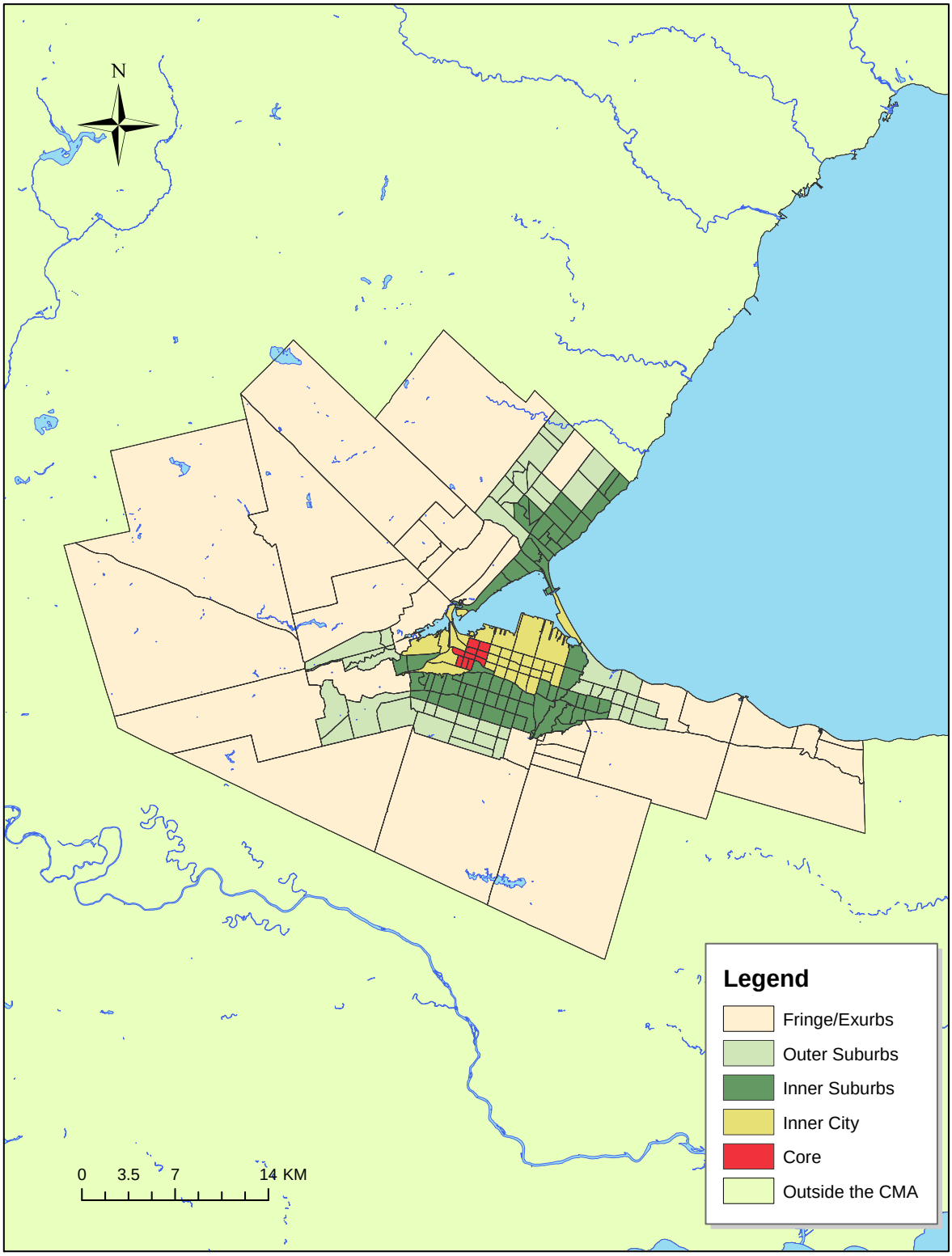
Map B-7: Urban zones of the Quebec CMA, 2006.



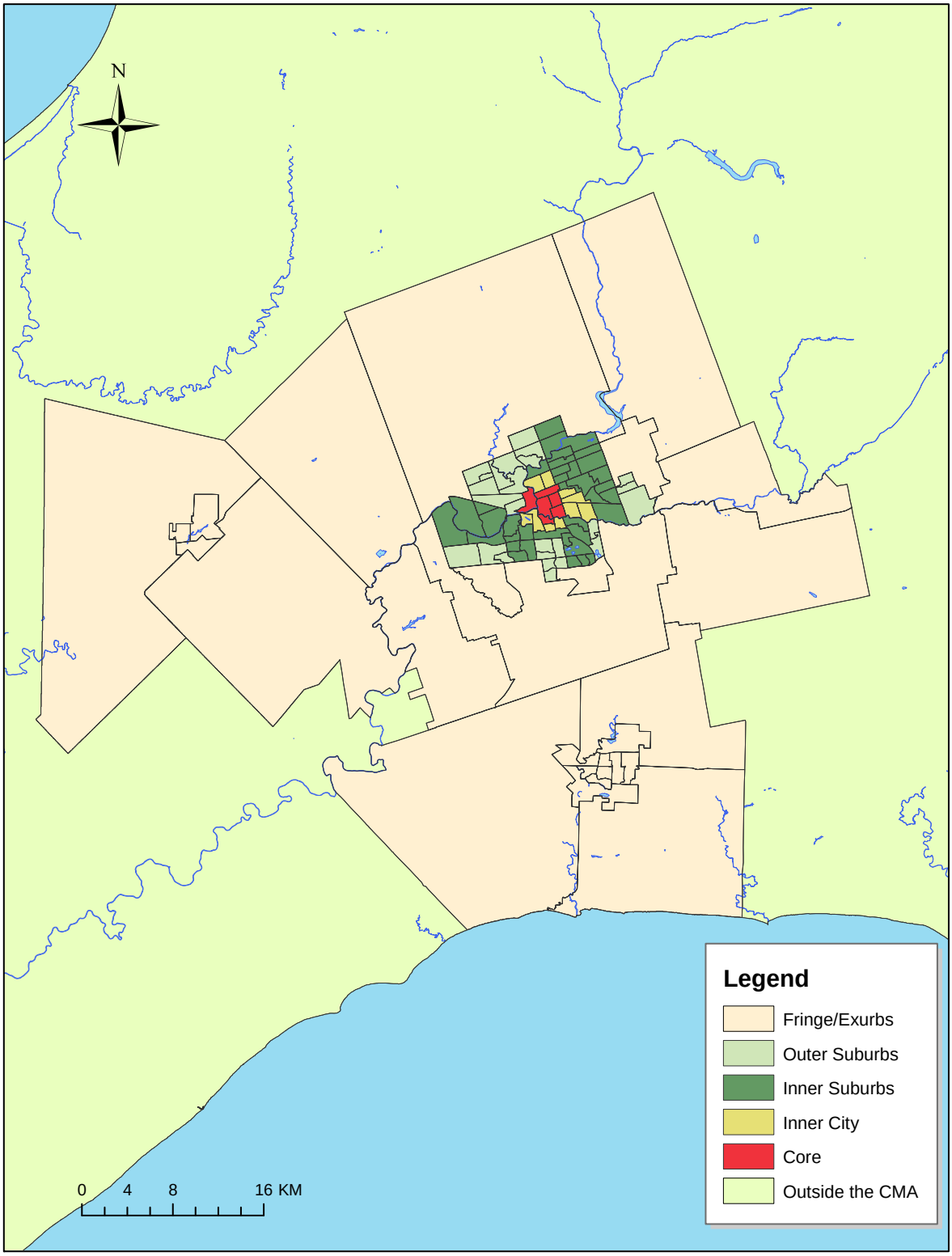
Map B-8: Urban zones of the Winnipeg CMA, 2006.



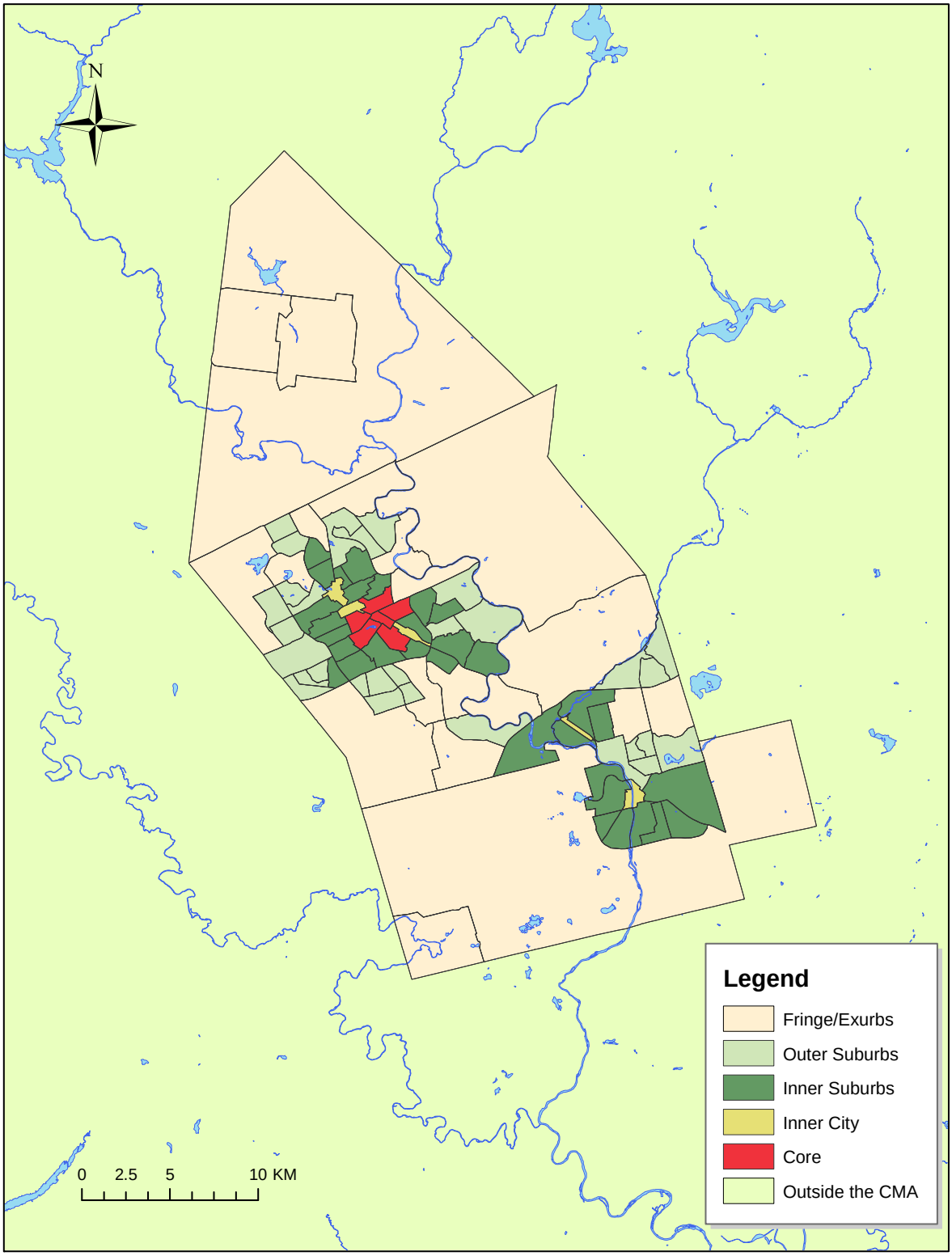
Map B-9: Urban zones of the Hamilton CMA, 2006.



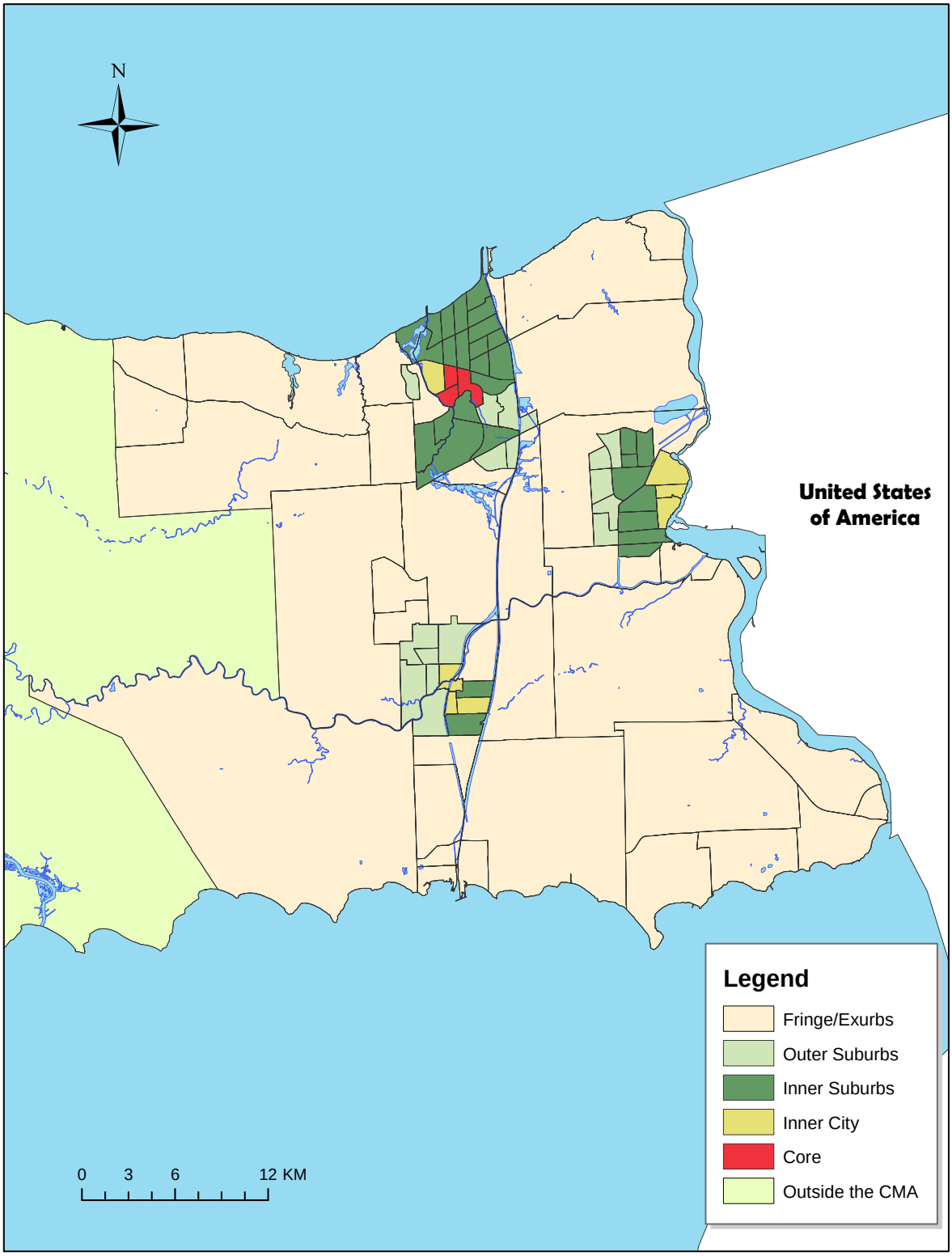
Map B-10: Urban zones of the London CMA, 2006.



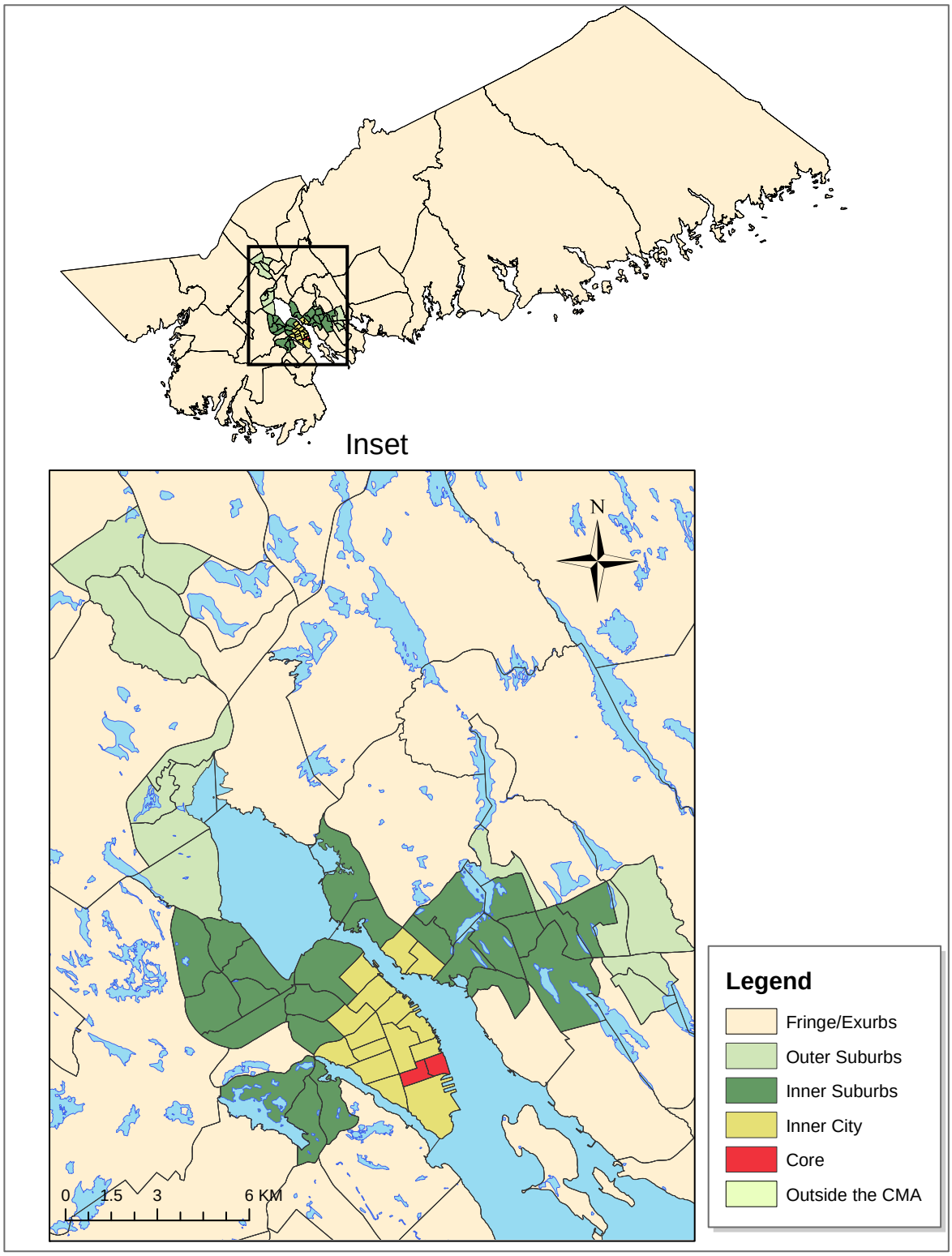
Map B-11: Urban zones of the Kitchener CMA, 2006.



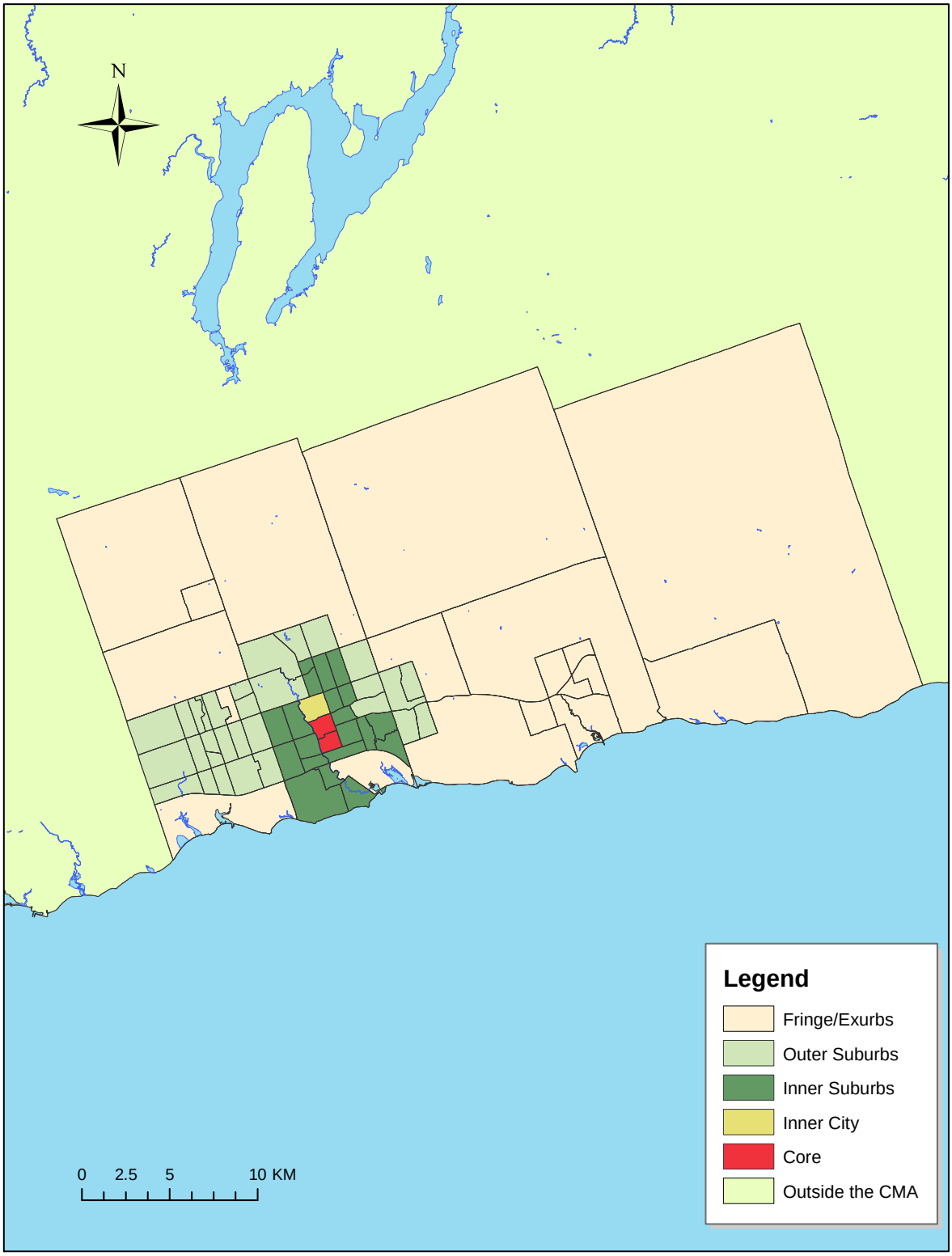
Map B-12: Urban zones of the St. Catharines – Niagara CMA, 2006.



Map B-13: Urban zones of the Halifax CMA, 2006.



Map B-14: Urban zones of the Oshawa CMA, 2006.



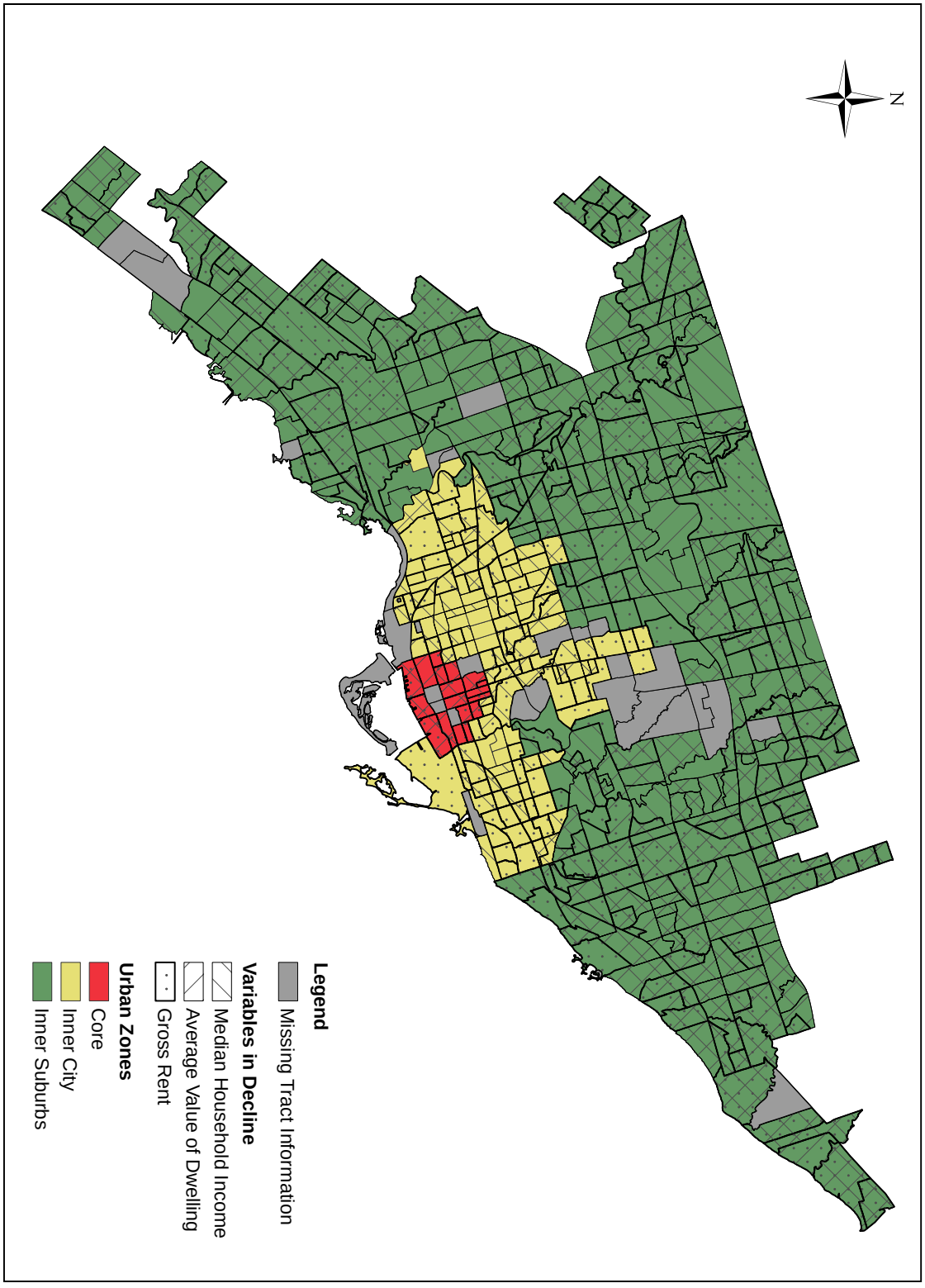
Map B-15: Urban zones of the Victoria CMA, 2006.

APPENDIX C

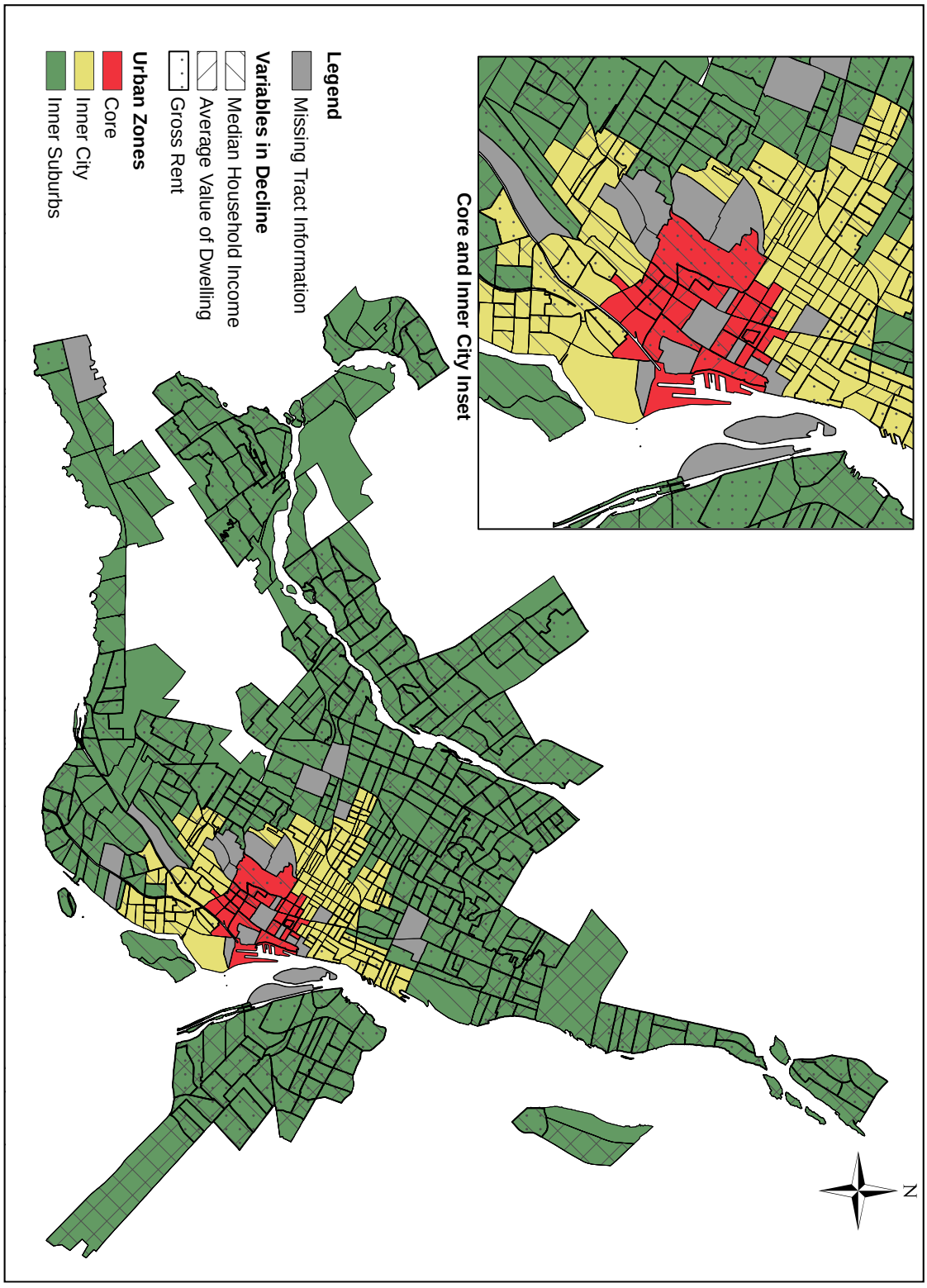
All 15 CMAs also have each available census tract mapped for relative temporal changes for the baseline census year (1986), as well as the endpoint year (2006) through the use of a Geographic Information System (GIS) application. However, the census tracts in the 1986 and 2006 census do not match each other due to census tract splitting. As a result, the 1986 census tracts are split to match the 2006 census tracts for the purposes of mapping. Any new tracts split in such a way are assumed to have the same values as the census tract they were split from. Since the location of outer suburbs and fringe/exurbs is not fixed, it is impossible to spatially compare them at the census tract level between the two time periods.

Visually mapping changes in any variable between the study period of 1986 and 2006 also presents problems as mapping requires standardization of census tracts. A census tract in 1986 was often split into multiple census tracts by 2006. As a result, a 1986 census tract often must be split into several 2006 census categorisations for the purposes of comparison. The variable values for all the splits are assumed to be the same, which is unlikely. Howenstine (1993) has noted that such mapping assumptions are likely to introduce at least moderate error, particularly in larger and highly dynamic census tracts. However, as the Appendix only maps decline in fixed urban zones, some of this error is likely to be minimized. Nontheless, all of the spatial changes shown in Maps C-1 to C-15 are suggestive, rather than definitive.

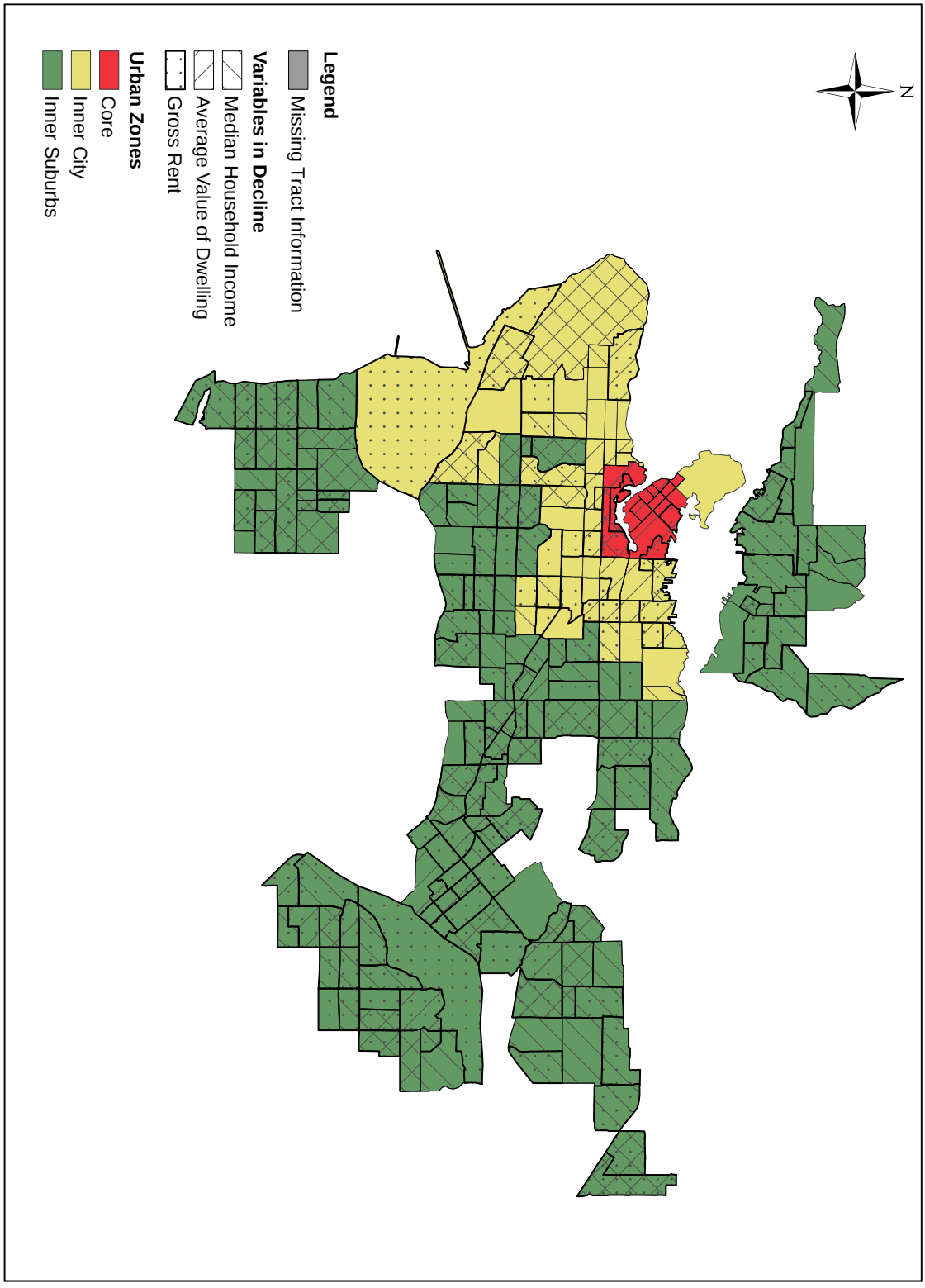
Map C-1: Variables in decline for selected urban zones of the Toronto CMA, 1986-2006.



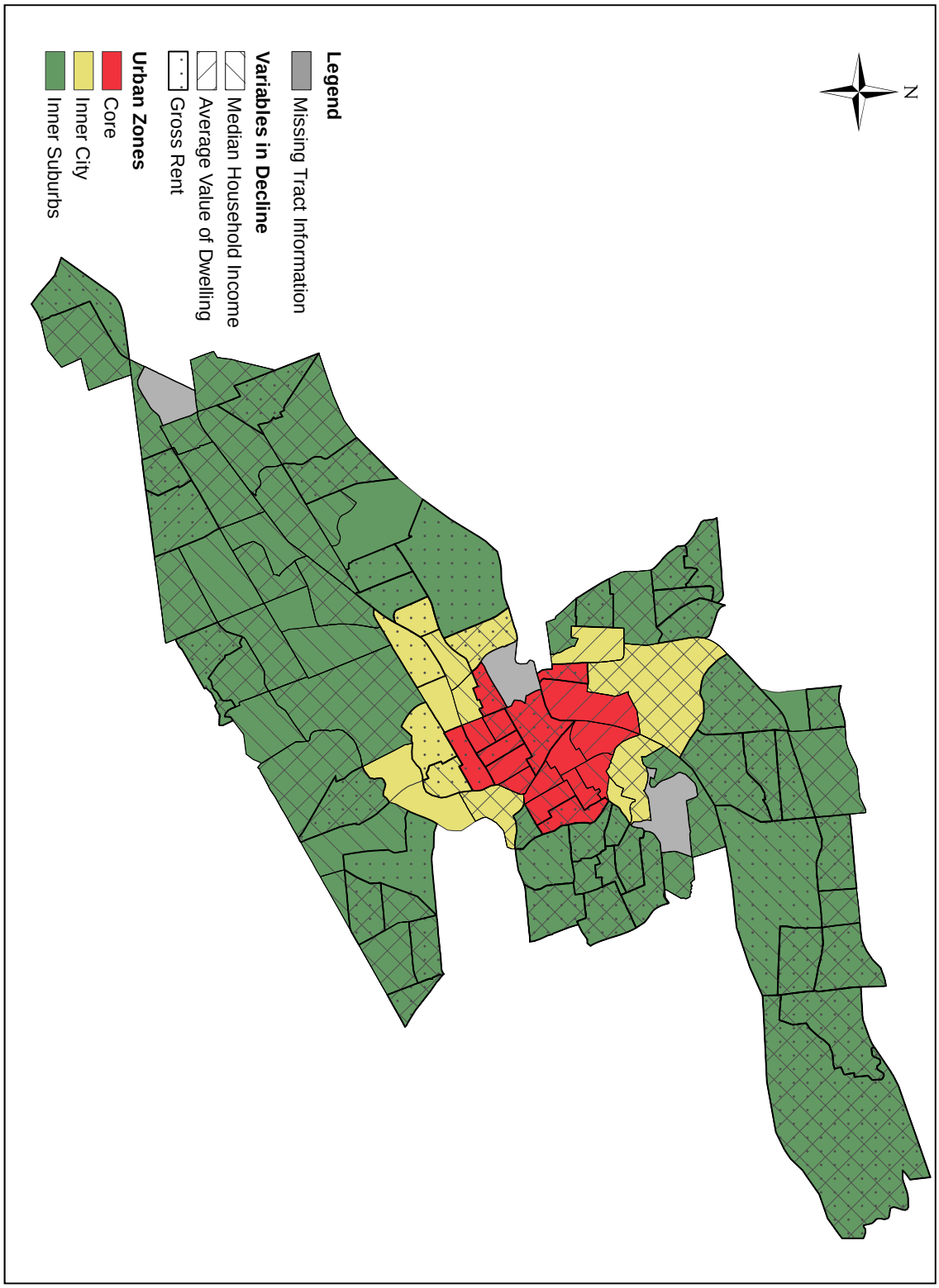
Map C-2: Variables in decline for selected urban zones of the Montreal CMA, 1986-2006.



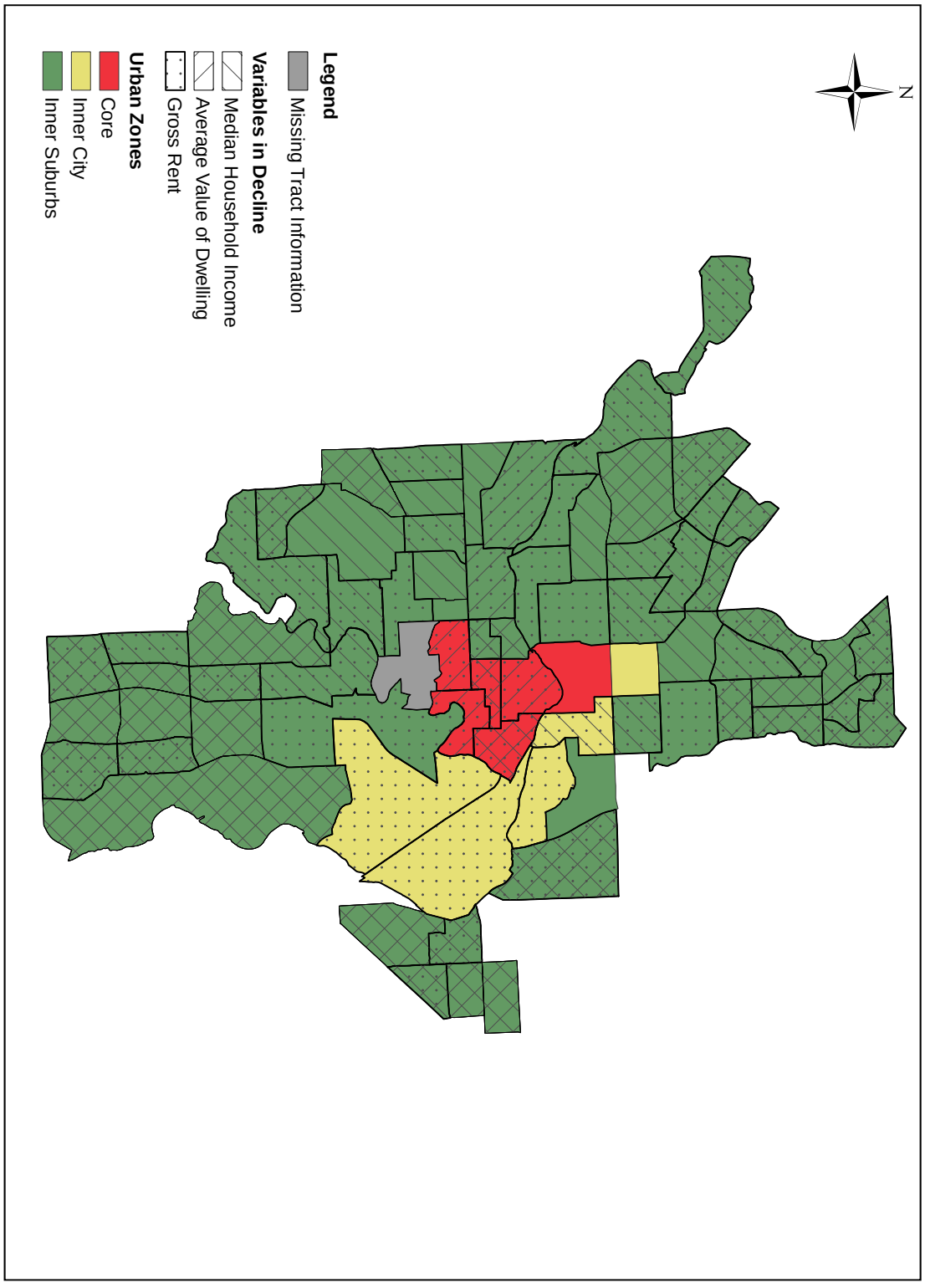
Map C-3: Variables in decline for selected urban zones of the Vancouver CMA, 1986-2006.



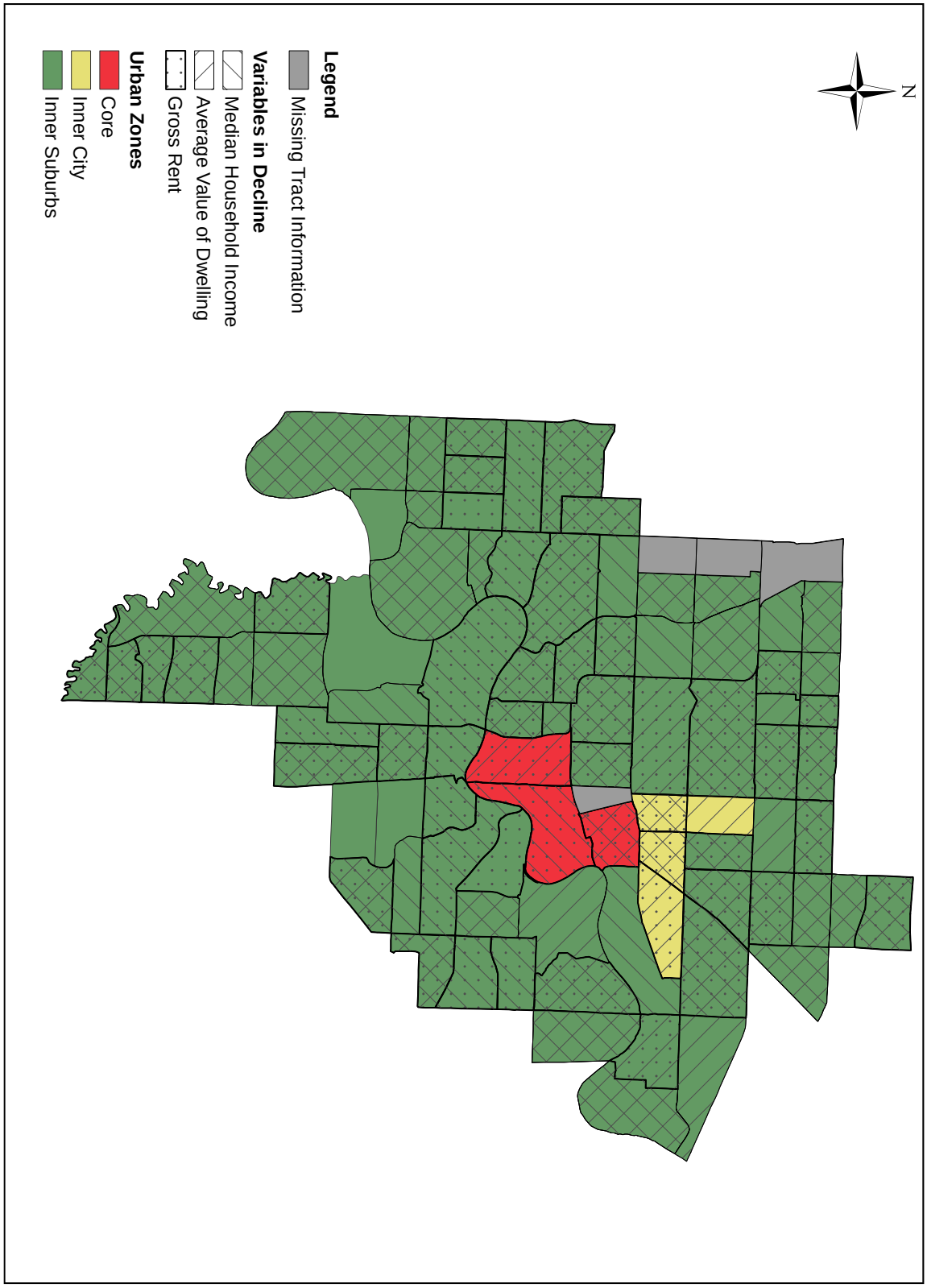
Map C-4: Variables in decline for selected urban zones of the Ottawa-Gatineau CMA, 1986-2006.



Map C-5: Variables in decline for selected urban zones of the Calgary CMA, 1986-2006.

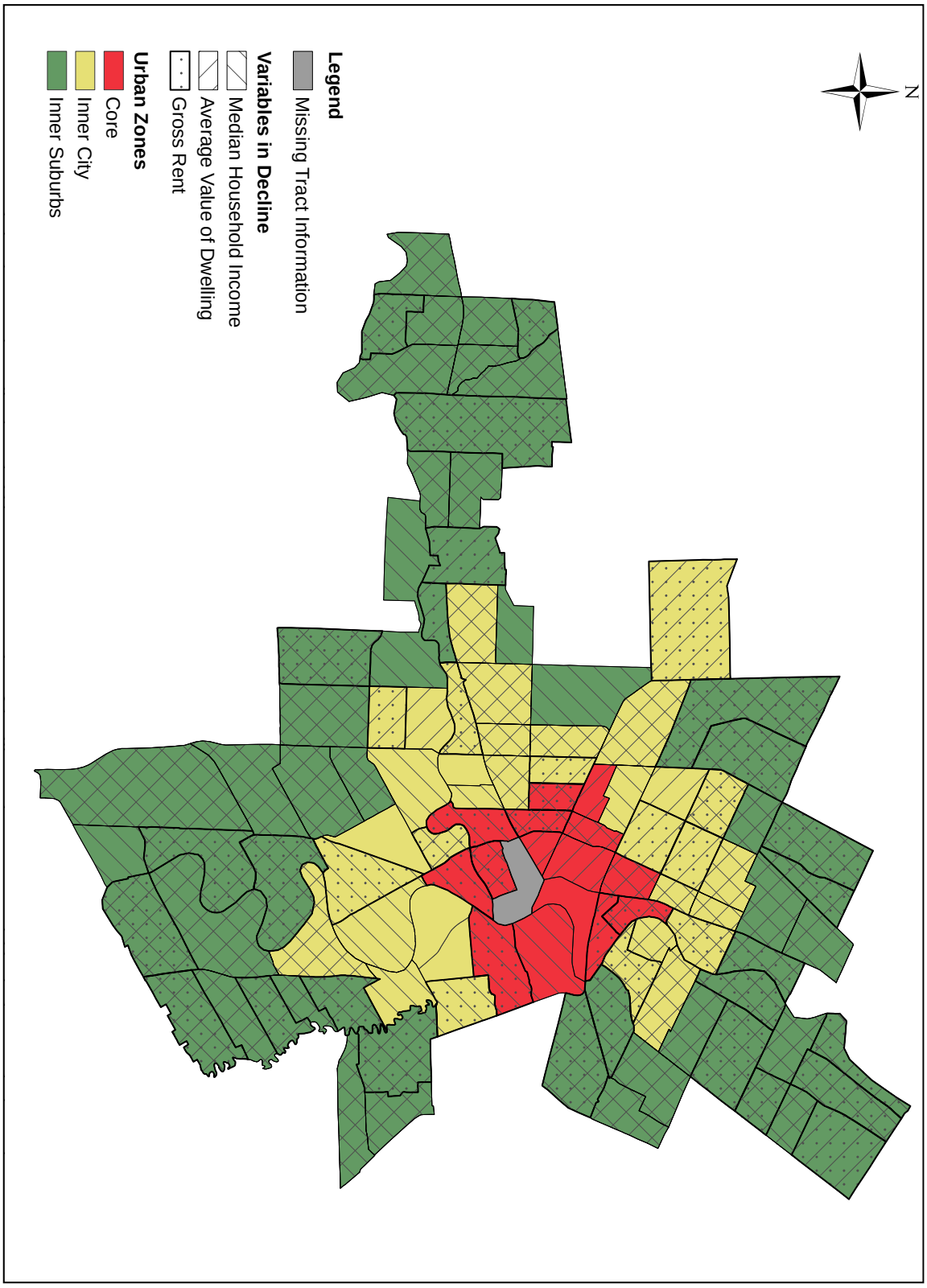


Map C-6: Variables in decline for selected urban zones of the Edmonton CMA, 1986-2006.

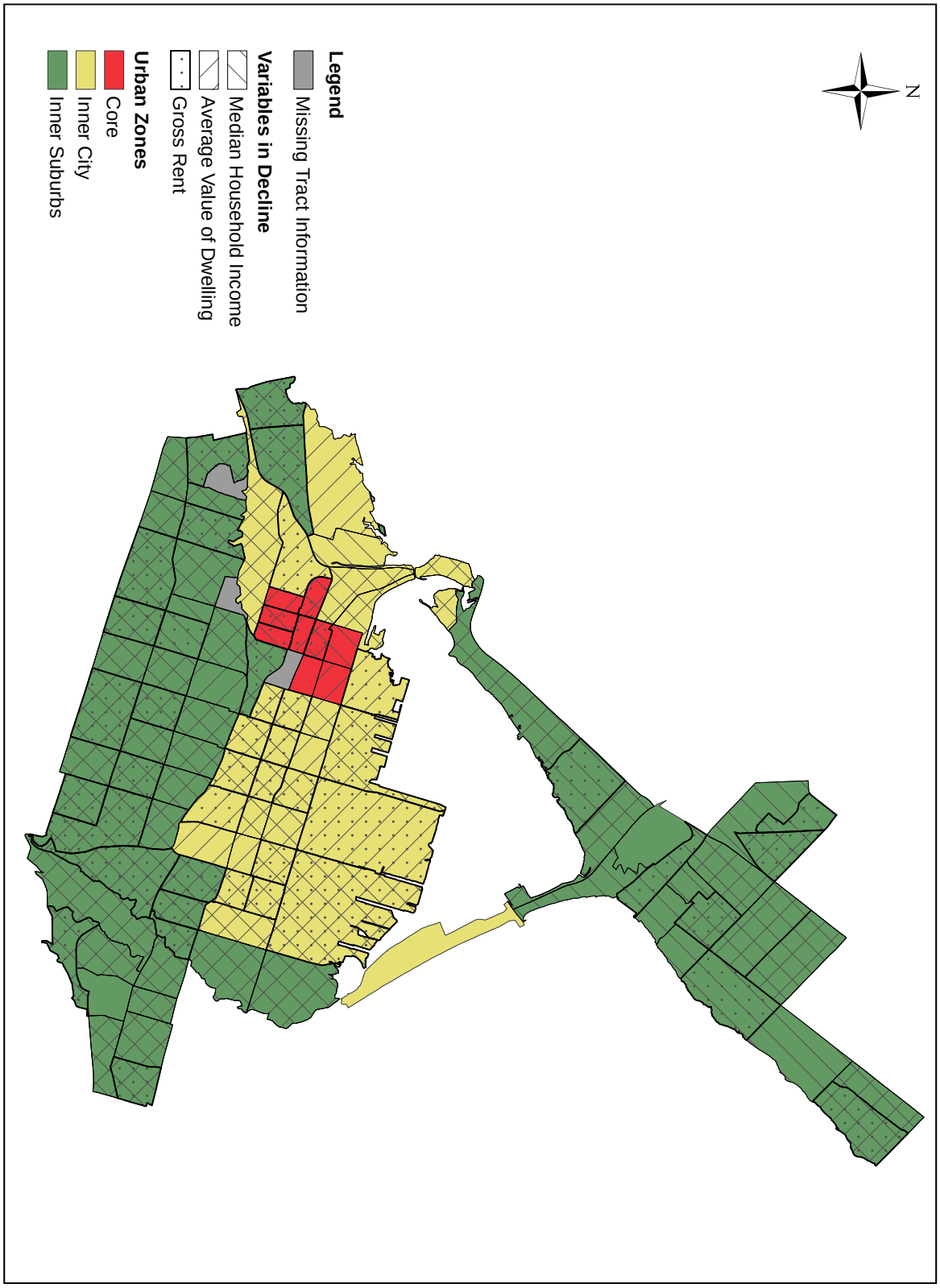


Map C-7: Variables in decline for selected urban zones of the Quebec CMA, 1986-2006.

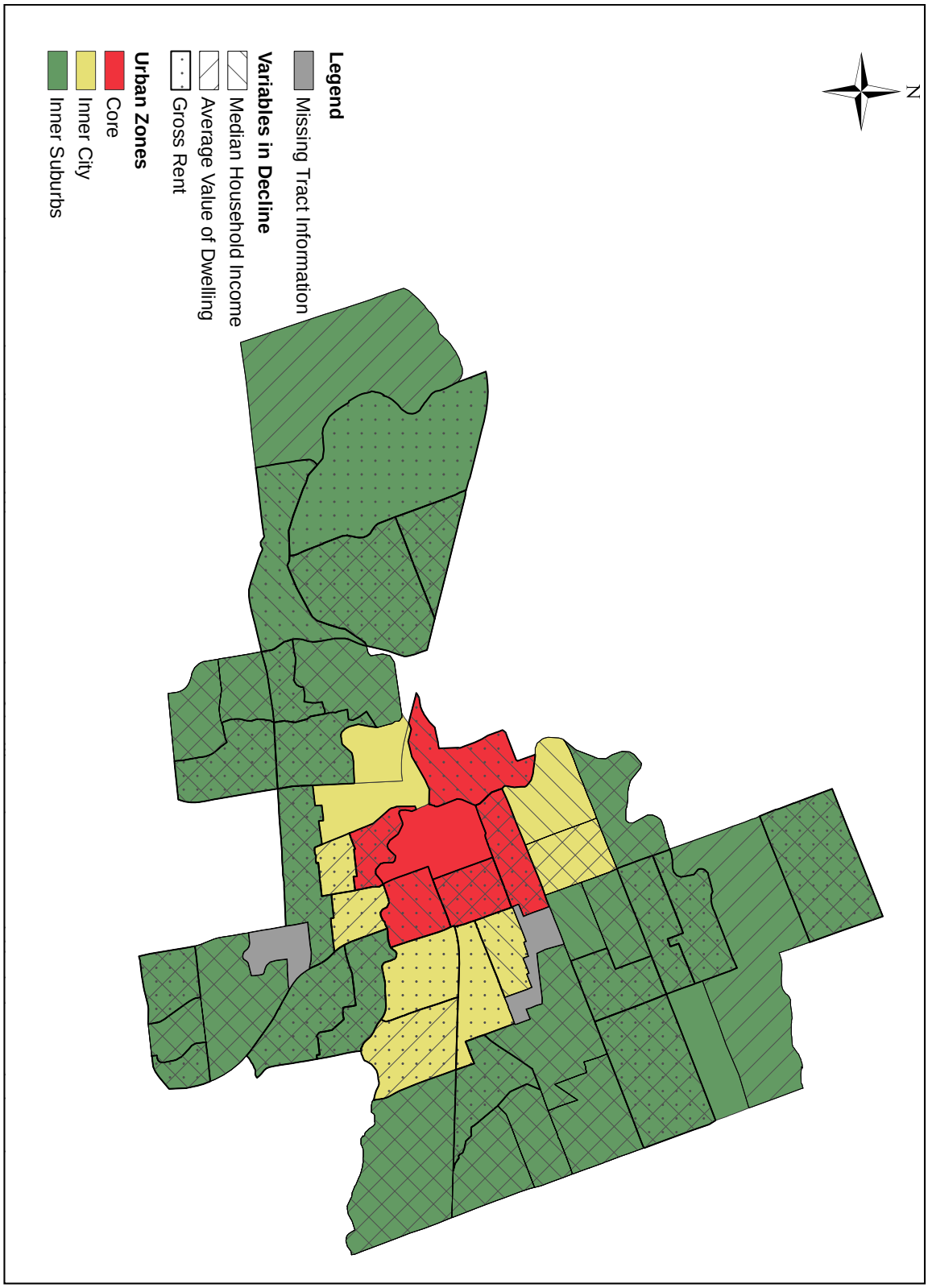
Map C-8: Variables in decline for selected urban zones of the Winnipeg CMA, 1986-2006.



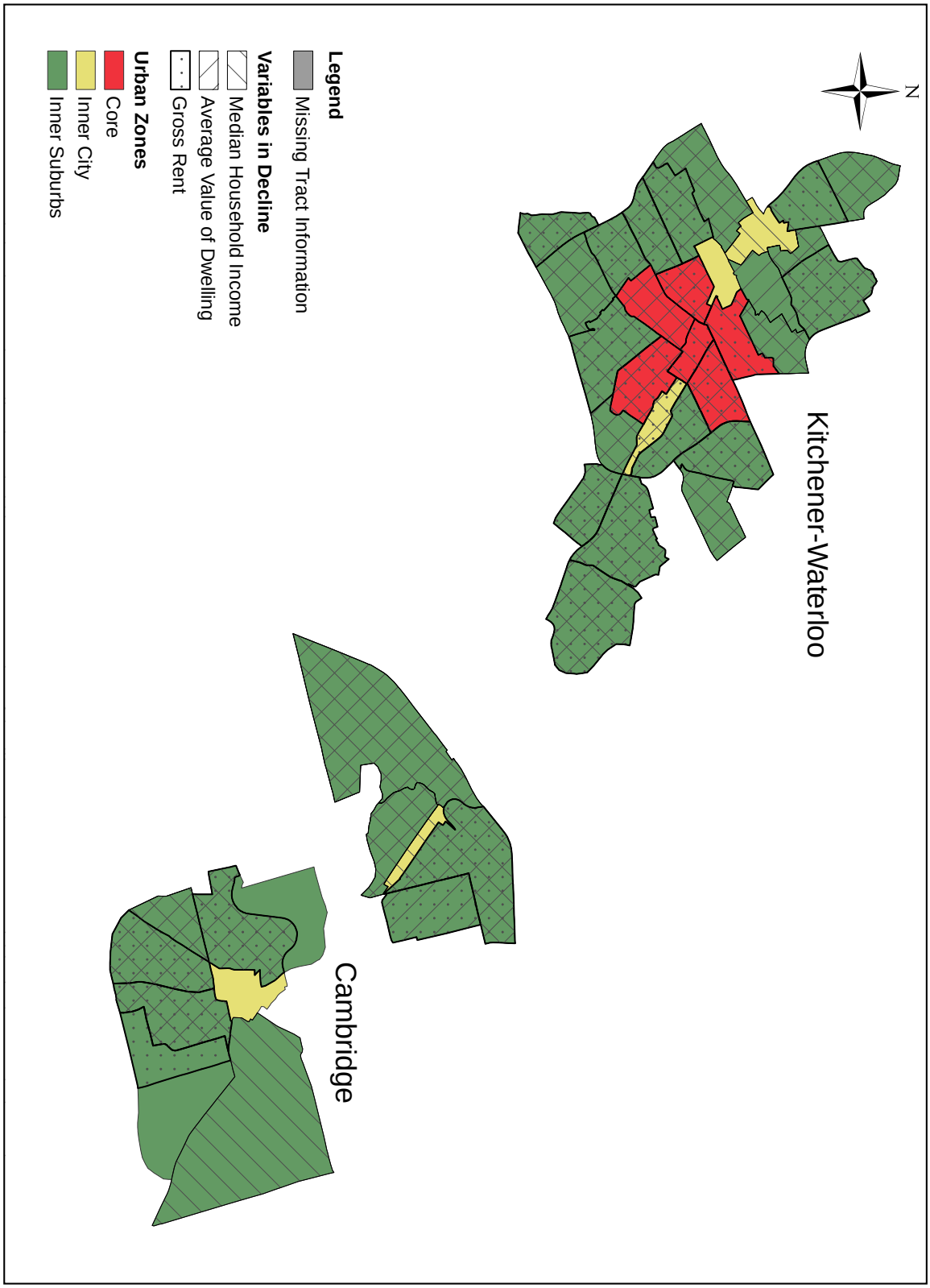
Map C-9: Variables in decline for selected urban zones of the Hamilton CMA, 1986-2006.



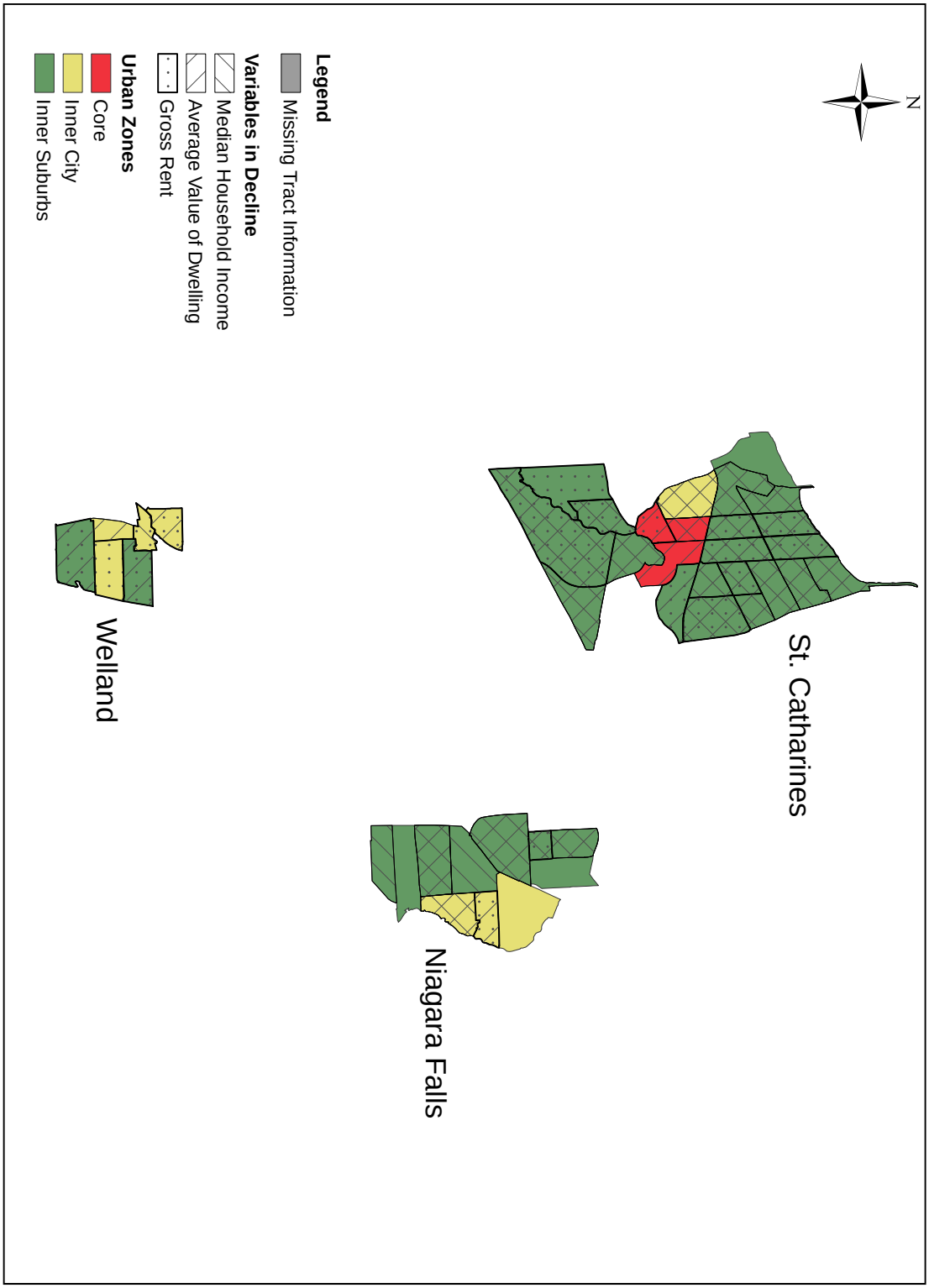
Map C-10: Variables in decline for selected urban zones of the London CMA, 1986-2006.



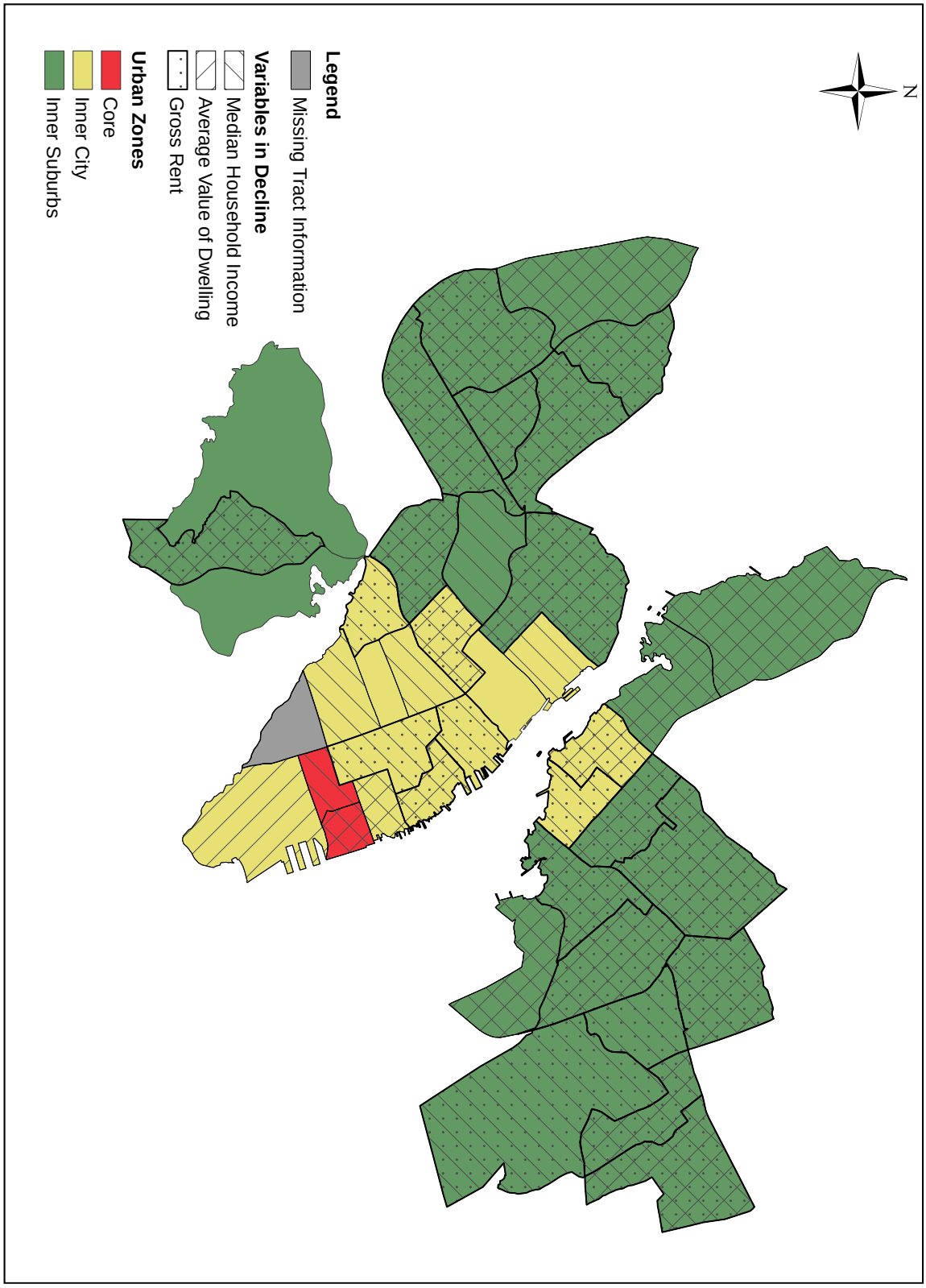
Map C-11: Variables in decline for selected urban zones of the Kitchener CMA, 1986-2006.



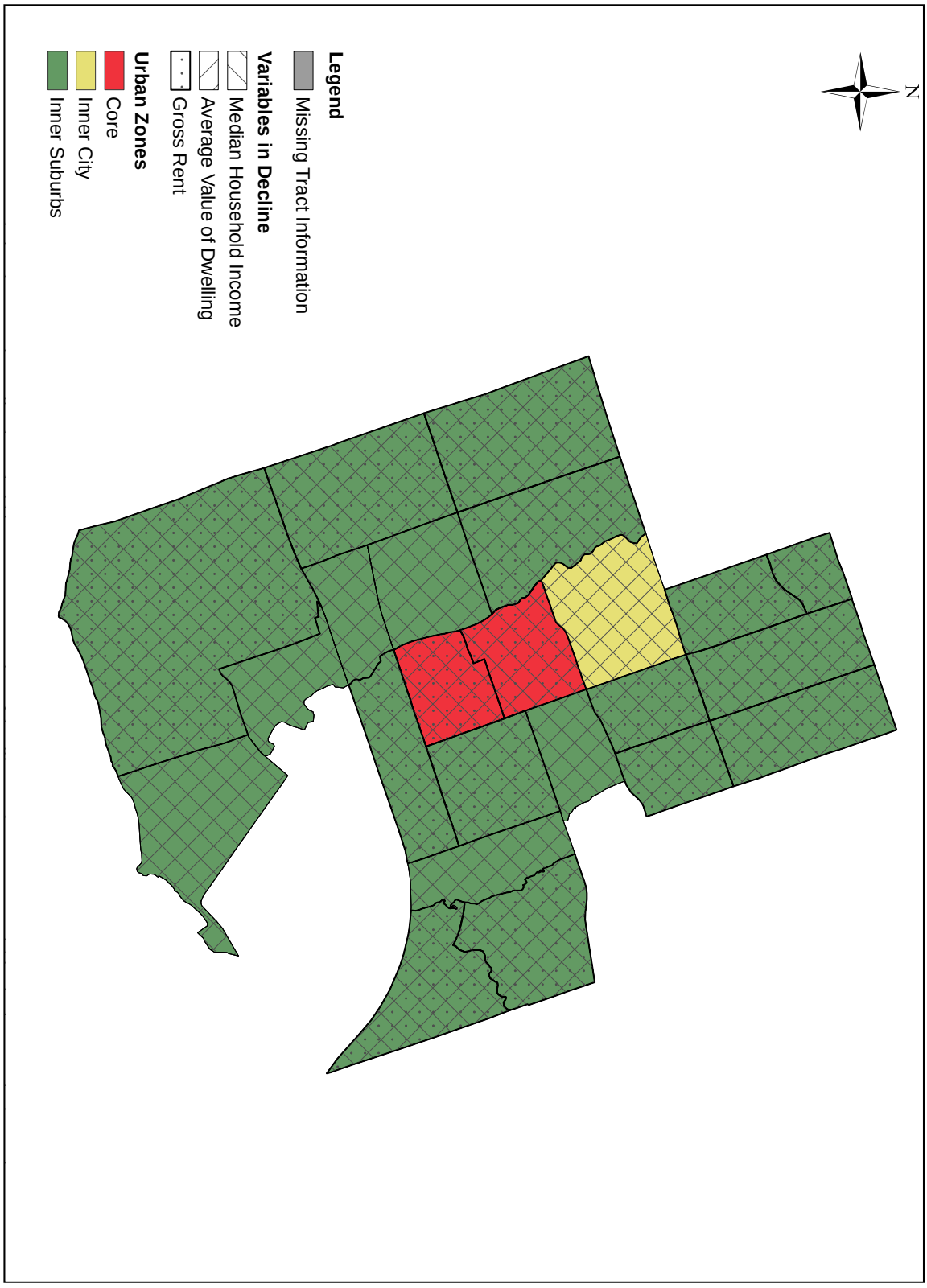
Map C-12: Variables in decline for selected urban zones of the St. Catharines-Niagara CMA, 1986-2006.



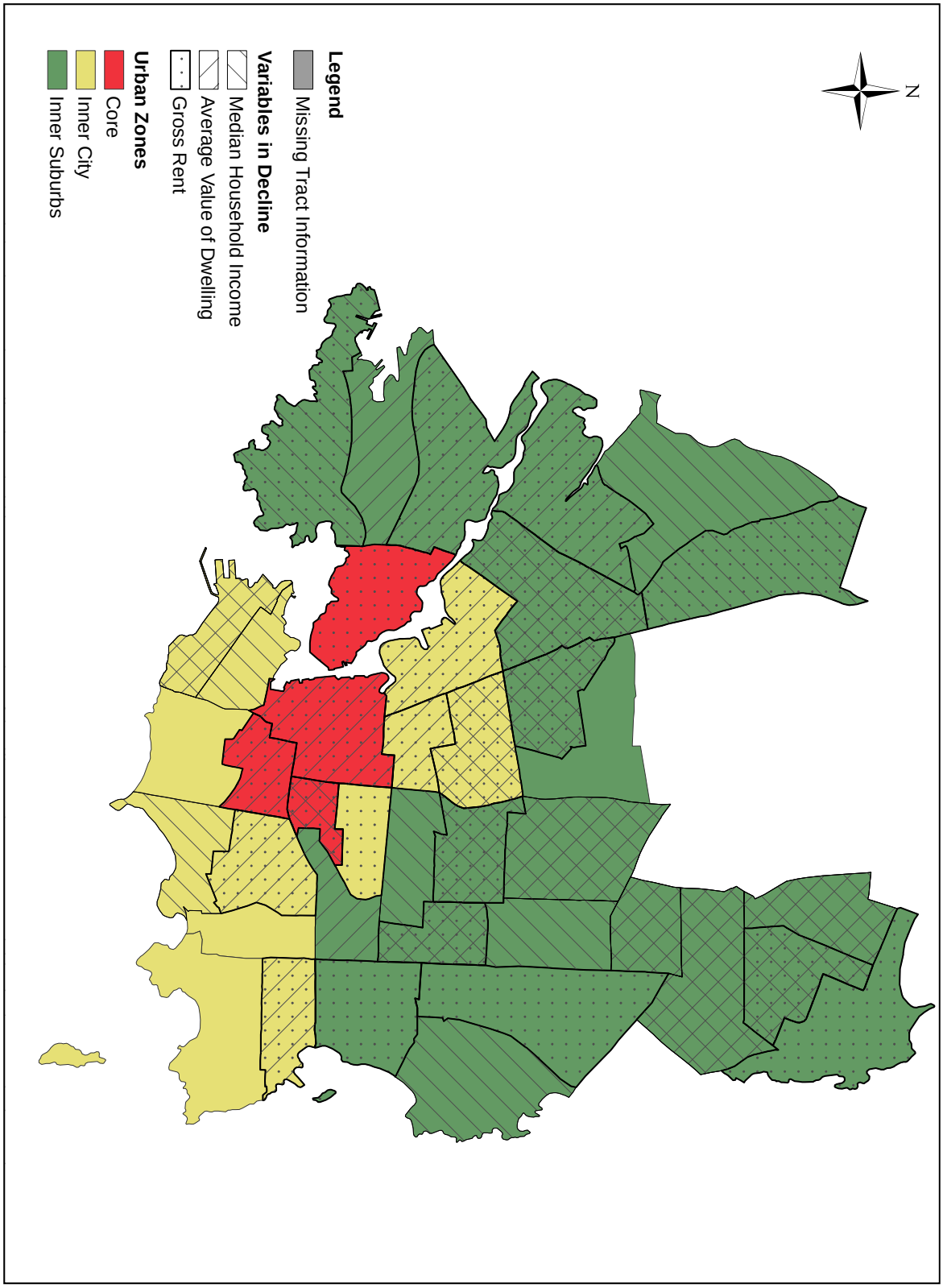
Map C-13: Variables in decline for selected urban zones of the Halifax CMA, 1986-2006.



Map C-14: Variables in decline for selected urban zones of the Oshawa CMA, 1986-2006.



Map C-15: Variables in decline for selected urban zones of the Victoria CMA, 1986-2006.



APPENDIX D

Table D-1: Median household income Relative Values and Indices of Change, 1986-2006.

		Median Household Income Relative Value					*Index of Change*				
	Zone	*1986*	*1991*	*1996*	*2001*	*2006*	*'86-'91*	*'91-'96*	*'96-'01*	*'01-'06*	*'86-'06*
Toronto	Core	0.62	0.66	0.66	0.70	0.69	1.06	1.01	1.06	0.99	1.11
	Inner City	0.84	0.85	0.85	0.90	0.89	1.01	1.00	1.05	0.99	1.06
	Inner Suburb	0.97	0.92	0.87	0.85	0.84	0.95	0.95	0.97	0.99	0.87
	Outer Suburb	1.24	1.22	1.23	1.20	1.16	0.98	1.01	0.97	0.97	0.93
	Fringe/Exurbs	1.17	1.19	1.24	1.23	1.25	1.02	1.05	0.99	1.02	1.07
Montreal	Core	0.74	0.73	0.69	0.75	0.72	0.99	0.95	1.08	0.96	0.98
	Inner City	0.69	0.73	0.72	0.78	0.78	1.06	0.99	1.08	1.00	1.14
	Inner Suburb	0.99	0.95	0.92	0.90	0.88	0.95	0.97	0.98	0.98	0.88
	Outer Suburb	1.26	1.26	1.27	1.28	1.27	1.00	1.01	1.01	0.99	1.01
	Fringe/Exurbs	1.26	1.27	1.27	1.23	1.25	1.01	1.00	0.97	1.01	0.99
Vancouver	Core	0.65	0.63	0.65	0.75	0.77	0.97	1.03	1.15	1.03	1.18
	Inner City	0.84	0.86	0.87	0.90	0.90	1.02	1.01	1.04	1.00	1.08
	Inner Suburb	1.02	0.98	0.95	0.93	0.92	0.96	0.97	0.98	0.99	0.90
	Outer Suburb	1.15	1.12	1.10	1.11	1.10	0.97	0.99	1.01	0.98	0.96
	Fringe/Exurbs	1.15	1.19	1.21	1.20	1.21	1.04	1.02	0.99	1.01	1.06
Ottawa - Gatineau	Core	0.72	0.68	0.67	0.73	0.69	0.95	0.99	1.08	0.95	0.97
	Inner City	0.88	0.92	0.91	0.93	0.94	1.05	0.99	1.02	1.00	1.07
	Inner Suburb	0.93	0.86	0.82	0.80	0.78	0.93	0.95	0.98	0.97	0.84
	Outer Suburb	1.14	1.12	1.10	1.09	1.07	0.98	0.98	0.98	0.99	0.94
	Fringe/Exurbs	1.17	1.21	1.22	1.24	1.23	1.03	1.01	1.02	0.99	1.05
Calgary	Core	0.56	0.52	0.54	0.61	0.59	0.94	1.02	1.14	0.97	1.05
	Inner City	0.64	0.64	0.68	0.68	0.73	1.00	1.05	0.99	1.08	1.14
	Inner Suburb	0.92	0.85	0.81	0.80	0.78	0.93	0.96	0.98	0.98	0.85
	Outer Suburb	1.19	1.19	1.12	1.14	1.09	1.00	0.95	1.02	0.96	0.92
	Fringe/Exurbs	1.22	1.23	1.29	1.19	1.23	1.01	1.05	0.93	1.03	1.01
Edmonton	Core	0.55	0.52	0.46	0.53	0.53	0.95	0.90	1.13	1.00	0.96
	Inner City	0.69	0.70	0.61	0.66	0.68	1.01	0.88	1.08	1.03	0.99
	Inner Suburb	0.89	0.85	0.82	0.80	0.77	0.96	0.96	0.98	0.97	0.87
	Outer Suburb	1.08	1.06	1.05	1.06	1.02	0.98	0.99	1.01	0.97	0.95
	Fringe/Exurbs	1.21	1.26	1.27	1.27	1.26	1.04	1.01	0.99	1.00	1.04
Quebec	Core	0.58	0.58	0.60	0.63	0.63	1.00	1.04	1.06	0.99	1.09
	Inner City	0.72	0.65	0.63	0.64	0.66	0.91	0.96	1.02	1.02	0.91
	Inner Suburb	0.99	0.95	0.90	0.88	0.86	0.96	0.95	0.98	0.98	0.87
	Outer Suburb	1.17	1.18	1.19	1.21	1.19	1.01	1.01	1.02	0.98	1.01
	Fringe/Exurbs	1.16	1.18	1.20	1.19	1.20	1.02	1.02	0.99	1.01	1.04
Winnipeg	Core	0.49	0.46	0.46	0.46	0.47	0.94	1.00	1.00	1.02	0.97
	Inner City	0.85	0.83	0.80	0.81	0.82	0.98	0.96	1.02	1.01	0.96
	Inner Suburb	1.05	0.99	0.97	0.94	0.90	0.94	0.98	0.97	0.96	0.86
	Outer Suburb	1.33	1.28	1.27	1.27	1.25	0.96	0.99	1.00	0.98	0.93
	Fringe/Exurbs	1.27	1.37	1.40	1.39	1.41	1.08	1.02	1.00	1.01	1.11

Table D-1: Median household income Relative Values and Indices of Change, 1986-2006. (continued)

		Median Household Income Relative Value					*Index of Change*				
	Zone	*1986*	*1991*	*1996*	*2001*	*2006*	*'86-'91*	*'91-'96*	*'96-'01*	*'01-'06*	*'86-'06*
Hamilton	Core	0.55	0.53	0.49	0.50	0.48	0.97	0.91	1.02	0.98	0.88
	Inner City	0.74	0.72	0.68	0.68	0.69	0.98	0.94	0.99	1.03	0.94
	Inner Suburb	1.01	0.95	0.92	0.88	0.86	0.95	0.96	0.96	0.97	0.85
	Outer Suburb	1.18	1.20	1.20	1.28	1.24	1.02	1.00	1.06	0.97	1.06
	Fringe/Exurbs	1.26	1.30	1.36	1.29	1.27	1.04	1.04	0.95	0.99	1.01
London	Core	0.61	0.58	0.58	0.58	0.58	0.95	1.00	1.00	1.00	0.95
	Inner City	0.85	0.86	0.85	0.85	0.84	1.02	0.99	1.00	0.99	0.99
	Inner Suburb	1.02	0.98	0.96	0.94	0.93	0.95	0.98	0.98	0.99	0.91
	Outer Suburb	1.15	1.11	1.12	1.14	1.11	0.97	1.00	1.02	0.97	0.97
	Fringe/Exurbs	1.09	1.15	1.16	1.13	1.15	1.06	1.01	0.97	1.02	1.06
Kitchener	Core	0.74	0.69	0.64	0.66	0.65	0.94	0.92	1.04	0.98	0.88
	Inner City	0.70	0.64	0.66	0.65	0.70	0.92	1.03	0.99	1.07	1.00
	Inner Suburb	0.97	0.92	0.90	0.87	0.86	0.95	0.98	0.97	0.98	0.88
	Outer Suburb	1.12	1.13	1.15	1.15	1.11	1.01	1.01	1.00	0.97	0.99
	Fringe/Exurbs	1.15	1.22	1.23	1.23	1.25	1.07	1.01	1.00	1.02	1.09
St. Catharines - Niagara	Core	0.60	0.63	0.56	0.59	0.61	1.06	0.88	1.06	1.03	1.02
	Inner City	0.71	0.77	0.70	0.73	0.74	1.10	0.91	1.03	1.01	1.05
	Inner Suburb	1.04	1.00	0.98	0.96	0.96	0.97	0.98	0.97	1.00	0.92
	Outer Suburb	1.15	1.07	1.06	1.10	1.09	0.93	0.99	1.04	0.99	0.95
	Fringe/Exurbs	1.06	1.08	1.12	1.12	1.11	1.02	1.04	1.00	0.99	1.05
Halifax	Core	0.64	0.64	0.55	0.57	0.50	0.99	0.86	1.04	0.87	0.77
	Inner City	0.87	0.91	0.86	0.90	0.84	1.05	0.94	1.04	0.94	0.96
	Inner Suburb	0.99	0.94	0.91	0.89	0.87	0.95	0.97	0.97	0.98	0.88
	Outer Suburb	1.15	1.17	1.15	1.19	1.14	1.02	0.98	1.03	0.96	0.99
	Fringe/Exurbs	1.08	1.09	1.12	1.10	1.14	1.01	1.04	0.98	1.04	1.06
Oshawa	Core	0.53	0.46	0.41	0.45	0.44	0.88	0.89	1.09	0.98	0.84
	Inner City	0.95	0.82	0.91	0.87	0.76	0.87	1.11	0.95	0.87	0.80
	Inner Suburb	0.96	0.91	0.87	0.84	0.82	0.95	0.95	0.96	0.98	0.85
	Outer Suburb	1.13	1.13	1.17	1.19	1.14	1.00	1.04	1.02	0.95	1.01
	Fringe/Exurbs	1.06	1.11	1.10	1.05	1.09	1.05	0.99	0.96	1.04	1.03
Victoria	Core	0.58	0.58	0.63	0.62	0.64	1.00	1.09	0.97	1.04	1.10
	Inner City	0.84	0.83	0.85	0.85	0.84	0.98	1.03	1.00	0.99	1.00
	Inner Suburb	1.02	1.00	0.97	0.97	0.96	0.98	0.97	1.00	0.99	0.94
	Outer Suburb	1.26	1.17	1.15	1.15	1.15	0.93	0.99	1.00	1.00	0.91
	Fringe/Exurbs	1.18	1.19	1.18	1.17	1.18	1.00	0.99	1.00	1.00	1.00

Table D-2: Average value of dwelling Relative Values and Indices of Change, 1986-2006.

		Average Value of Dwelling Relative Value					*Index of Change*				
	Zone	*1986*	*1991*	*1996*	*2001*	*2006*	*'86-'91*	*'91-'96*	*'96-'01*	*'01-'06*	*'86-'06*
Toronto	Core	1.21	1.00	0.88	0.88	0.80	0.82	0.88	1.00	0.90	0.66
	Inner City	1.08	1.12	1.13	1.22	1.25	1.04	1.00	1.09	1.02	1.17
	Inner Suburb	0.98	0.98	0.98	0.98	0.97	1.00	1.00	1.00	0.99	0.99
	Outer Suburb	1.01	0.96	0.97	0.95	0.96	0.94	1.02	0.98	1.01	0.95
	Fringe/Exurbs	0.96	1.01	1.00	0.98	0.99	1.05	0.99	0.98	1.01	1.03
Montreal	Core	1.59	1.65	1.51	1.71	1.70	1.04	0.91	1.13	0.99	1.07
	Inner City	1.03	1.27	1.28	1.37	1.39	1.23	1.01	1.07	1.02	1.35
	Inner Suburb	1.12	1.09	1.10	1.09	1.09	0.98	1.01	1.00	1.00	0.98
	Outer Suburb	0.89	0.90	0.91	0.89	0.90	1.01	1.01	0.98	1.01	1.01
	Fringe/Exurbs	0.81	0.83	0.85	0.83	0.84	1.02	1.03	0.97	1.01	1.03
Vancouver	Core	1.00	0.93	0.77	0.83	0.95	0.92	0.83	1.08	1.15	0.95
	Inner City	1.27	1.36	1.37	1.34	1.33	1.08	1.00	0.98	0.99	1.05
	Inner Suburb	0.98	0.99	1.01	0.98	0.97	1.00	1.02	0.98	0.99	0.99
	Outer Suburb	0.84	0.81	0.80	0.84	0.84	0.97	0.99	1.05	1.00	1.00
	Fringe/Exurbs	0.95	0.94	0.95	1.01	1.03	1.00	1.01	1.06	1.02	1.09
Ottawa - Gatineau	Core	1.36	1.29	1.25	1.27	1.27	0.95	0.97	1.02	1.00	0.93
	Inner City	1.30	1.49	1.43	1.49	1.52	1.15	0.96	1.04	1.02	1.17
	Inner Suburb	0.98	0.95	0.97	0.93	0.94	0.97	1.02	0.96	1.01	0.96
	Outer Suburb	0.97	0.95	0.94	0.90	0.90	0.98	0.99	0.96	1.00	0.93
	Fringe/Exurbs	0.95	0.98	0.99	1.05	1.03	1.03	1.01	1.06	0.98	1.08
Calgary	Core	1.39	1.39	1.33	1.22	1.18	1.01	0.95	0.92	0.96	0.85
	Inner City	0.76	0.78	0.82	0.94	1.02	1.03	1.05	1.16	1.05	1.83
	Inner Suburb	0.97	0.93	0.92	0.96	1.00	0.96	0.99	1.04	1.04	1.03
	Outer Suburb	0.96	0.98	0.94	0.96	0.93	1.02	0.96	1.02	0.97	0.96
	Fringe/Exurbs	1.14	1.10	1.12	1.13	1.09	0.96	1.02	1.01	0.97	0.96
Edmonton	Core	0.85	0.85	0.88	0.85	0.83	1.00	1.03	0.97	0.98	0.97
	Inner City	0.73	0.69	0.67	0.67	0.65	0.96	0.97	0.99	1.08	1.35
	Inner Suburb	1.02	0.99	0.98	0.96	0.95	0.97	0.98	0.98	1.00	0.93
	Outer Suburb	0.99	0.98	0.95	0.97	0.94	0.99	0.97	1.02	0.97	0.95
	Fringe/Exurbs	1.00	1.03	1.07	1.07	1.08	1.04	1.03	1.01	1.01	1.09
Quebec	Core	0.91	0.96	0.98	1.01	1.09	1.05	1.02	1.04	1.08	1.20
	Inner City	0.88	0.85	0.89	0.92	0.94	0.96	1.04	1.03	1.02	1.06
	Inner Suburb	1.06	1.08	1.06	1.04	1.00	1.02	0.98	0.98	0.96	0.94
	Outer Suburb	1.07	1.05	1.05	1.01	1.02	0.97	1.00	0.97	1.00	0.95
	Fringe/Exurbs	0.95	0.94	0.95	0.96	0.99	0.99	1.01	1.01	1.02	1.04
Winnipeg	Core	0.70	0.73	0.67	0.62	0.69	1.05	0.91	0.93	1.11	0.99
	Inner City	0.78	0.78	0.78	0.74	0.75	1.00	0.99	0.95	1.03	0.97
	Inner Suburb	1.04	0.96	0.94	0.93	0.90	0.93	0.98	0.98	0.97	0.87
	Outer Suburb	1.24	1.09	1.08	1.08	1.06	0.88	0.99	1.01	0.98	0.86
	Fringe/Exurbs	1.09	1.25	1.25	1.28	1.28	1.15	0.99	1.03	1.00	1.17

Table D-2: Average value of dwelling Relative Values and Indices of Change, 1986-2006. (continued)

		Average Value of Dwelling Relative Value					*Index of Change*				
	Zone	*1986*	*1991*	*1996*	*2001*	*2006*	*'86-'91*	*'91-'96*	*'96-'01*	*'01-'06*	*'86-'06*
Hamilton	Core	0.77	0.83	0.80	0.71	0.77	1.08	0.96	0.88	1.08	1.00
	Inner City	0.68	0.74	0.71	0.66	0.61	1.09	0.97	0.92	0.92	0.89
	Inner Suburb	0.98	0.94	0.95	0.94	0.92	0.96	1.01	0.99	0.98	0.93
	Outer Suburb	1.06	1.06	1.03	1.09	1.10	1.00	0.97	1.06	1.01	1.04
	Fringe/Exurbs	1.22	1.19	1.19	1.19	1.19	0.98	1.00	0.99	1.00	0.98
London	Core	0.84	0.94	0.89	0.84	0.85	1.12	0.94	0.95	1.01	1.01
	Inner City	0.85	0.90	0.87	0.89	0.86	1.05	0.98	1.02	0.96	1.01
	Inner Suburb	0.98	0.95	0.95	0.94	0.94	0.96	1.00	0.99	0.99	0.95
	Outer Suburb	1.16	1.04	1.07	1.06	1.03	0.90	1.03	0.99	0.98	0.89
	Fringe/Exurbs	1.02	1.07	1.06	1.06	1.09	1.05	0.99	1.00	1.03	1.07
Kitchener	Core	0.79	0.81	0.80	0.77	0.76	1.02	1.00	0.96	0.99	0.97
	Inner City	0.84	0.87	0.90	0.90	0.92	1.03	1.04	1.00	1.02	1.09
	Inner Suburb	0.96	0.92	0.93	0.90	0.88	0.96	1.00	0.97	0.97	0.92
	Outer Suburb	1.02	1.01	0.99	1.04	1.01	0.99	0.98	1.05	0.97	0.99
	Fringe/Exurbs	1.16	1.19	1.18	1.15	1.20	1.03	0.99	0.98	1.04	1.03
St. Catharines - Niagara	Core	0.80	0.87	0.79	0.80	0.75	1.08	0.91	1.02	0.93	0.93
	Inner City	0.71	0.74	0.74	0.70	0.70	1.04	1.01	0.95	0.99	0.98
	Inner Suburb	1.02	0.96	0.97	0.95	0.95	0.95	1.00	0.98	0.99	0.93
	Outer Suburb	1.01	0.97	0.95	0.95	0.97	0.96	0.98	1.00	1.01	0.96
	Fringe/Exurbs	1.06	1.10	1.10	1.13	1.13	1.04	1.00	1.03	1.00	1.07
Halifax	Core	1.56	1.62	1.42	1.81	7.00	1.04	0.88	1.27	3.88	4.50
	Inner City	1.32	1.38	1.33	1.44	1.51	1.04	0.97	1.08	1.04	1.14
	Inner Suburb	1.09	1.05	1.04	1.03	1.01	0.96	0.99	0.99	0.98	0.93
	Outer Suburb	0.83	0.79	0.78	0.91	0.92	0.94	0.99	1.17	1.01	1.10
	Fringe/Exurbs	0.89	0.93	0.96	0.93	0.94	1.04	1.04	0.96	1.01	1.06
Oshawa	Core	0.76	0.71	0.71	0.65	0.61	0.94	0.99	0.91	0.94	0.80
	Inner City	0.93	0.86	0.89	0.88	0.84	0.92	1.04	0.99	0.95	0.90
	Inner Suburb	0.91	0.86	0.86	0.82	0.78	0.95	0.99	0.95	0.95	0.85
	Outer Suburb	1.12	1.05	1.14	1.13	1.10	0.94	1.08	0.99	0.97	0.98
	Fringe/Exurbs	1.06	1.11	1.05	1.04	1.08	1.05	0.94	1.00	1.03	1.01
Victoria	Core	0.78	0.77	0.77	0.74	0.73	0.98	1.01	0.95	0.98	0.93
	Inner City	1.04	1.08	1.02	1.04	1.02	1.04	0.94	1.02	0.99	0.99
	Inner Suburb	0.95	0.93	0.93	0.93	0.94	0.99	1.00	1.00	1.01	1.00
	Outer Suburb	1.02	0.96	1.16	1.16	1.14	0.95	1.20	1.00	0.99	1.13
	Fringe/Exurbs	1.05	1.05	1.04	1.03	1.03	0.99	1.00	0.99	1.00	0.98

Table D-3: Average gross rent Relative Values and Indices of Change, 1986-2006.

		Average Gross Rent Relative Value					*Index of Change*				
	Zone	*1986*	*1991*	*1996*	*2001*	*2006*	*'86-'91*	*'91-'96*	*'96-'01*	*'01-'06*	*'86-'06*
Toronto	Core	1.03	1.00	0.97	1.00	1.04	0.97	0.97	1.04	1.04	1.01
	Inner City	1.04	1.02	0.97	0.99	1.00	0.98	0.95	1.03	1.01	0.96
	Inner Suburb	0.93	0.93	0.96	0.97	0.96	0.99	1.04	1.00	1.00	1.03
	Outer Suburb	1.21	1.18	1.17	1.12	1.07	0.98	0.99	0.96	0.96	0.89
	Fringe/Exurbs	1.03	1.10	1.04	0.99	1.02	1.06	0.95	0.94	1.03	0.98
Montreal	Core	1.12	1.12	1.12	1.15	1.21	1.00	0.99	1.03	1.05	1.08
	Inner City	0.93	0.99	0.98	0.99	1.01	1.07	0.99	1.02	1.01	1.09
	Inner Suburb	1.02	0.99	1.00	0.99	0.98	0.98	1.00	0.99	0.99	0.97
	Outer Suburb	1.04	1.00	1.02	1.05	1.04	0.96	1.02	1.03	0.99	1.00
	Fringe/Exurbs	0.97	1.00	1.00	0.96	0.95	1.04	1.00	0.95	1.00	0.99
Vancouver	Core	0.97	0.96	0.95	0.99	1.07	0.99	0.99	1.04	1.09	1.11
	Inner City	0.94	0.93	0.95	0.97	0.98	0.99	1.01	1.03	1.01	1.05
	Inner Suburb	1.02	1.03	1.01	0.99	0.98	1.00	0.99	0.98	0.98	0.95
	Outer Suburb	1.04	1.02	1.02	1.01	0.93	0.98	1.00	0.99	0.92	0.89
	Fringe/Exurbs	1.05	1.06	1.08	1.08	1.09	1.01	1.02	1.00	1.01	1.04
Ottawa - Gatineau	Core	1.01	1.01	1.00	1.04	1.04	1.01	0.98	1.04	1.01	1.04
	Inner City	1.00	1.02	1.01	0.99	1.00	1.02	0.99	0.98	1.01	1.00
	Inner Suburb	0.96	0.96	0.96	0.96	0.95	0.99	1.00	1.01	0.98	0.98
	Outer Suburb	1.07	1.06	1.06	1.04	1.04	0.98	1.00	0.99	1.00	0.97
	Fringe/Exurbs	1.04	1.04	1.06	1.03	1.07	1.01	1.01	0.97	1.03	1.03
Calgary	Core	0.97	0.86	0.83	0.86	0.87	0.89	0.97	1.03	1.01	0.90
	Inner City	0.92	0.87	0.87	0.90	0.88	0.94	1.00	1.03	0.98	0.96
	Inner Suburb	0.98	0.99	0.96	0.98	0.96	1.01	0.98	1.01	0.98	0.98
	Outer Suburb	1.08	1.12	1.14	1.12	1.11	1.03	1.02	0.98	1.00	1.03
	Fringe/Exurbs	1.03	1.07	1.20	1.04	1.18	1.04	1.12	0.86	1.14	1.15
Edmonton	Core	0.96	0.94	0.85	0.87	0.87	0.98	0.90	1.03	0.99	0.90
	Inner City	0.97	0.94	0.95	0.88	0.93	0.97	1.01	0.93	1.06	0.97
	Inner Suburb	0.97	0.97	0.96	0.95	0.95	1.00	0.98	1.00	1.00	0.98
	Outer Suburb	1.04	1.05	1.08	1.09	1.07	1.01	1.04	1.00	0.99	1.03
	Fringe/Exurbs	1.08	1.08	1.12	1.13	1.15	0.99	1.03	1.01	1.02	1.06
Quebec	Core	0.94	0.98	0.95	0.98	1.00	1.04	0.97	1.03	1.02	1.06
	Inner City	0.94	0.95	0.96	0.97	0.94	1.01	1.01	1.01	0.96	0.99
	Inner Suburb	1.04	1.03	1.02	1.02	1.03	0.99	1.00	1.00	1.01	0.99
	Outer Suburb	1.00	0.99	1.01	0.97	0.98	0.99	1.02	0.96	1.01	0.99
	Fringe/Exurbs	1.00	0.99	1.01	1.02	0.99	0.99	1.02	1.01	0.97	0.99
Winnipeg	Core	0.88	0.90	0.88	0.86	0.84	1.02	0.97	0.98	0.97	0.95
	Inner City	0.96	0.96	0.97	0.98	0.96	1.00	1.01	1.01	0.99	1.00
	Inner Suburb	1.06	1.02	1.04	1.04	1.06	0.97	1.01	1.00	1.02	1.00
	Outer Suburb	1.09	1.10	1.16	1.18	1.14	1.01	1.06	1.01	0.96	1.04
	Fringe/Exurbs	1.11	1.20	1.07	1.11	1.16	1.08	0.89	1.04	1.04	1.04

Table D-3: Average gross rent Relative Values and Indices of Change, 1986-2006. (continued).

		Average Gross Rent Relative Value					*Index of Change*				
	Zone	*1986*	*1991*	*1996*	*2001*	*2006*	*'86-'91*	*'91-'96*	*'96-'01*	*'01-'06*	*'86-'06*
Hamilton	Core	0.88	0.94	0.87	0.88	0.86	1.07	0.93	1.01	0.98	0.98
	Inner City	0.95	0.97	0.90	0.85	0.88	1.01	0.93	0.94	1.04	0.92
	Inner Suburb	1.02	0.98	1.01	1.05	1.05	0.95	1.04	1.04	1.00	1.03
	Outer Suburb	1.11	1.10	1.12	1.12	1.09	1.00	1.02	1.00	0.98	0.99
	Fringe/Exurbs	1.08	1.16	1.17	1.12	1.09	1.07	1.01	0.96	0.97	1.01
London	Core	1.00	1.01	0.91	0.96	0.96	1.01	0.90	1.05	0.99	0.96
	Inner City	0.99	1.01	0.99	0.94	0.92	1.02	0.98	0.95	0.97	0.93
	Inner Suburb	0.97	0.96	0.98	0.96	0.97	0.99	1.02	0.99	1.01	1.00
	Outer Suburb	1.09	1.07	1.11	1.11	1.10	0.98	1.04	1.00	0.99	1.01
	Fringe/Exurbs	0.98	1.00	1.01	1.00	0.99	1.02	1.02	0.99	0.99	1.01
Kitchener	Core	1.03	0.96	0.90	0.92	0.93	0.93	0.94	1.02	1.02	0.91
	Inner City	0.94	0.95	0.91	0.98	1.00	1.01	0.96	1.08	1.01	1.06
	Inner Suburb	0.99	0.97	0.99	0.97	0.95	0.98	1.02	0.98	0.98	0.97
	Outer Suburb	1.06	1.09	1.08	1.08	1.08	1.04	0.98	1.00	1.00	1.02
	Fringe/Exurbs	0.97	1.04	1.04	1.06	1.11	1.07	1.00	1.02	1.04	1.14
St .Catharines - Niagara	Core	0.95	0.94	0.90	0.93	0.93	1.00	0.96	1.03	1.00	0.99
	Inner City	0.96	0.99	0.89	0.90	0.91	1.03	0.90	1.02	1.00	0.95
	Inner Suburb	1.03	1.01	1.04	1.02	1.03	0.99	1.02	0.98	1.01	1.00
	Outer Suburb	0.99	1.01	1.01	1.02	1.01	1.02	1.00	1.01	0.99	1.02
	Fringe/Exurbs	1.01	1.01	1.03	1.04	1.03	1.00	1.03	1.01	0.99	1.02
Halifax	Core	0.92	0.97	1.02	1.12	7.00	1.06	1.05	1.10	6.27	7.63
	Inner City	1.11	1.07	1.05	1.07	1.12	0.97	0.98	1.02	1.05	1.01
	Inner Suburb	0.98	0.99	1.00	0.98	0.99	1.00	1.01	0.99	1.01	1.01
	Outer Suburb	1.36	1.07	1.04	1.06	1.02	0.79	0.97	1.02	0.97	0.75
	Fringe/Exurbs	0.94	0.96	0.95	0.90	0.87	1.02	0.99	0.95	0.97	0.92
Oshawa	Core	0.92	0.90	0.82	0.83	0.80	0.99	0.91	1.01	0.96	0.87
	Inner City	1.02	1.05	1.05	1.05	1.12	1.03	1.00	1.00	1.06	1.09
	Inner Suburb	0.98	0.96	0.99	1.02	0.96	0.98	1.03	1.03	0.94	0.98
	Outer Suburb	1.12	1.06	1.03	1.03	1.07	0.95	0.97	0.99	1.04	0.96
	Fringe/Exurbs	1.01	1.09	1.07	1.01	1.10	1.08	0.98	0.95	1.09	1.10
Victoria	Core	0.93	0.88	0.84	0.85	0.87	0.95	0.94	1.02	1.02	0.94
	Inner City	0.97	0.98	1.00	1.00	0.99	1.01	1.01	1.00	0.99	1.02
	Inner Suburb	1.01	1.03	1.02	1.01	1.01	1.02	0.99	0.99	1.00	1.00
	Outer Suburb	1.12	1.16	1.09	1.09	1.15	1.03	0.94	1.00	1.06	1.03
	Fringe/Exurbs	1.09	1.06	1.09	1.09	1.06	0.97	1.03	1.00	0.97	0.97

APPENDIX E

In addition to calculating the Index of Change for median household incomes, this research has also calculated the GINI coefficient for this variable. The coefficient can help determine whether median household incomes in different urban zones are becoming more spatially polarized.

Table E-1 provides the GINI coefficient for 9 of the largest CMAs studied. Overall, the results show surprisingly little change in the coefficient during the study period. Therefore, it appears that census tracts within different urban zones, with a few exceptions, are generally declining or appreciating in relative household incomes together. Instead, the results from Table E-1 suggest that relative incomes in most census tracts that compose the inner suburbs have declined, with little increased polarization among the tracts themselves.

The first exception to this conclusion is the Toronto CMA. The GINI coefficient in the inner suburbs of Toronto underwent a notable increase during the study period, suggesting increased inequality in median household incomes in census tracts of the inner suburbs. The second exception to this conclusion is the Calgary CMA; however, it is curious because the GINI coefficient in this case has travelled in the opposite direction: towards increased equality.

The results obtained by the calculation of the GINI coefficient are surprising precisely because of their overall stagnancy. While there are exceptions, little polarization is evident in the inner suburbs with only two CMAs—Toronto and Calgary—experiencing a notable change in spatial equality of median household incomes.

Table E-1: Median Household Income GINI Coefficients, 1986-2006.

CMA	ZONE	1986	1991	1996	2001	2006	'86-'06 Difference
TORONTO	Core	0.23	0.19	0.19	0.20	0.18	-0.06
	Inner City	0.14	0.19	0.22	0.19	0.22	0.09
	Inner Suburbs	0.15	0.16	0.17	0.17	0.19	0.05
	Outer Suburbs	0.09	0.11	0.11	0.13	0.14	0.05
	Fringe/Exurbs	0.09	0.09	0.08	0.10	0.10	0.01
MONTREAL	Core	0.26	0.26	0.27	0.30	0.28	0.02
	Inner City	0.18	0.23	0.24	0.19	0.19	0.01
	Inner Suburbs	0.17	0.18	0.17	0.18	0.17	0.00
	Outer Suburbs	0.13	0.13	0.13	0.14	0.14	0.01
	Fringe/Exurbs	0.10	0.11	0.12	0.13	0.13	0.03
VANCOUVER	Core	0.19	0.17	0.12	0.16	0.16	-0.03
	Inner City	0.22	0.23	0.20	0.21	0.21	0.00
	Inner Suburbs	0.15	0.14	0.11	0.14	0.14	-0.01
	Outer Suburbs	0.13	0.12	0.11	0.13	0.13	-0.01
	Fringe/Exurbs	0.11	0.12	0.09	0.12	0.13	0.02
OTTAWA – GATINEAU	Core	0.17	0.16	0.17	0.16	0.17	0.00
	Inner City	0.23	0.23	0.27	0.25	0.30	0.07
	Inner Suburbs	0.15	0.17	0.16	0.18	0.18	0.02
	Outer Suburbs	0.14	0.16	0.14	0.15	0.15	0.01
	Fringe/Exurbs	0.11	0.11	0.10	0.13	0.13	0.01
CALGARY	Core	0.15	0.16	0.16	0.09	0.17	0.02
	Inner City	0.07	0.08	0.07	0.07	0.07	0.01
	Inner Suburbs	**0.15**	**0.15**	**0.13**	**0.11**	**0.12**	**-0.04**
	Outer Suburbs	0.11	0.14	0.14	0.14	0.15	0.04
	Fringe/Exurbs	0.12	0.13	0.11	0.13	0.15	0.03
EDMONTON	Core	0.03	0.05	0.04	0.05	0.05	0.03
	Inner City	0.07	0.07	0.10	0.14	0.09	0.02
	Inner Suburbs	0.18	0.18	0.14	0.16	0.16	-0.02
	Outer Suburbs	0.08	0.10	0.09	0.12	0.15	0.07
	Fringe/Exurbs	0.10	0.12	0.09	0.11	0.12	0.02
QUEBEC	Core	0.20	0.19	0.20	0.18	0.17	-0.03
	Inner City	0.14	0.17	0.14	0.15	0.12	-0.02
	Inner Suburbs	0.17	0.19	0.17	0.19	0.18	0.01
	Outer Suburbs	0.13	0.15	0.14	0.15	0.15	0.01
	Fringe/Exurbs	0.08	0.07	0.07	0.08	0.08	0.01
WINNIPEG	Core	0.13	0.17	0.15	0.12	0.17	0.04
	Inner City	0.17	0.17	0.16	0.17	0.17	0.00
	Inner Suburbs	0.13	0.13	0.12	0.14	0.12	-0.01
	Outer Suburbs	0.09	0.10	0.10	0.11	0.12	0.04
	Fringe/Exurbs	0.08	0.10	0.12	0.12	0.12	0.04
HAMILTON	Core	0.17	0.14	0.14	0.15	0.14	-0.02
	Inner City	0.15	0.14	0.14	0.17	0.16	0.01
	Inner Suburbs	0.13	0.13	0.11	0.14	0.14	0.01
	Outer Suburbs	0.11	0.11	0.10	0.12	0.12	0.01
	Fringe/Exurbs	0.08	0.10	0.07	0.08	0.08	0.00

APPENDIX F

An expanded set of variables is used to analyze the nine largest CMAs in greater detail. These variables represent the demographic, socio-economic, and housing characteristics of a CMA and are identical to the variables used in the final factor analysis which omits the immigration variable. The specific variables are found in Table F-1.

Table F-1: Variables Used in Factor Analysis

	Variables		
Category	Name	Calculation*	Time
Demographic	YOUNGPOP	Proportion of young population (0-14) in comparison to population total	'86, '91,' 96, '01, '06
	ELDPOP	Proportion of elderly population (65+) in comparison to population total	'86, '91, '96, '01, '06
Socio-economic	UNEMP	Percentage of unemployed	'86, '91, '96, '01, '06
	LOWINCFAM	Percentage of low income families	'86, '91, '96, '01, '06
	UNIVPOP	Proportion of university graduates compared to total population 15+	'86, '91, '96, '01, '06
	MHHINC	Median household income	'86, '91, '96, '01, '06
Housing	HSVAL	Average value of dwelling	'86, '91, '96, '01, '06
	RENTVAL	Average gross rent	'86, '91, '96, '01, '06
	OWNPROP	Proportion of owned dwellings in comparison to total dwellings	'86, '91, '96, '01, '06

* All variables are expressed as ratios relative to the CMA average.

Tables F-2 to F-10 show all of the variables analyzed in the nine largest CMAs studied by the use of an ANOVA Games-Howell mean comparison test. In this test, the inner suburban means are compared against means of the other urban zones between 1986 and 2006. This Games-Howell test was used because it can account for unequal group sizes (Field, 2009).

Table F-2: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Toronto CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.354	*	0.344	*	0.412	**	0.457	**	0.511	**	0.157
		- Inner City	0.118	**	0.116	**	0.147	**	0.178	**	0.195	**	0.077
		- Outer Suburbs	-0.321	**	-0.311	**	-0.170	**	-0.109	**	-0.094	**	0.227
		- Fringe/Exurbs	-0.342	**	-0.312	**	-0.222	**	-0.220	**	-0.161	**	0.181
ELDPOP	Inner Suburbs	- Core	0.126		0.445	**	0.456	**	0.456	**	0.451	**	0.325
		- Inner City	-0.090		0.073		0.161	**	0.225	**	0.197	**	0.287
		- Outer Suburbs	0.515	**	0.671	**	0.591	**	0.500	**	0.398	**	-0.117
		- Fringe/Exurbs	0.475	**	0.540	**	0.517	**	0.498	**	0.389	**	-0.087
UNEMP	Inner Suburbs	- Core	-0.375		-0.220		-0.054		-0.125		0.088		0.463
		- Inner City	-0.145	**	0.008		0.135	*	0.137	**	0.212	**	0.357
		- Outer Suburbs	0.215	**	0.265	**	0.278	**	0.264	**	0.202	**	-0.012
		- Fringe/Exurbs	0.172	**	0.388	**	0.472	**	0.518	**	0.475	**	0.302
LOWINCFAM	Inner Suburbs	- Core	-1.386	*	-1.124	*	-0.527		-0.403		-0.274		1.112
		- Inner City	-0.295	**	-0.139		0.080		0.193	*	0.302	**	0.597
		- Outer Suburbs	0.506	**	0.522	**	0.459	**	0.547	**	0.433	**	-0.073
		- Fringe/Exurbs	0.579	**	0.739	**	0.775	**	0.901	**	0.892	**	0.313
UNIVPOP	Inner Suburbs	- Core	-0.956	**	-0.968	**	-0.969	**	-0.959	**	-0.762	**	0.194
		- Inner City	-0.571	**	-0.645	**	-0.680	**	-0.517	**	-0.484	**	0.087
		- Outer Suburbs	-0.228	**	-0.140	**	-0.118	*	-0.047		-0.002		0.226
		- Fringe/Exurbs	0.135	**	0.111		0.143	**	0.193	**	0.227	**	0.092
MHHINC	Inner Suburbs	- Core	0.331	**	0.289	**	0.142		0.138		0.196	*	-0.134
		- Inner City	0.133	**	0.046		-0.127	*	-0.022		-0.080		-0.213
		- Outer Suburbs	-0.251	**	-0.294	**	-0.236	**	-0.339	**	-0.298	**	-0.048
		- Fringe/Exurbs	-0.170	**	-0.248	**	-0.244	**	-0.343	**	-0.379	**	-0.209
HSVAL	Inner Suburbs	- Core	-0.222	*	-0.028		0.071		0.074		0.136	**	0.358
		- Inner City	-0.145	*	-0.175	**	-0.194	**	-0.230	**	-0.300	**	-0.155
		- Outer Suburbs	-0.040		0.019		-0.012		0.005		0.017		0.057
		- Fringe/Exurbs	-0.007		-0.086		-0.071		-0.021		-0.044		-0.037
RENTVAL	Inner Suburbs	- Core	-0.120		-0.061		0.019		-0.069		-0.096		0.024
		- Inner City	-0.060		-0.084	*	0.002		0.013		-0.036		0.024
		- Outer Suburbs	-0.286	**	-0.348	**	-0.256	**	-0.214	**	-0.173	**	0.113
		- Fringe/Exurbs	-0.065		-0.194	**	-0.095	**	-0.026		-0.104	**	-0.039
OWNPROP	Inner Suburbs	- Core	0.742	**	0.649	**	0.640	**	0.462	**	0.367	**	-0.375
		- Inner City	0.120	*	0.119	*	0.121	**	0.137	**	0.101	**	-0.019
		- Outer Suburbs	-0.305	**	-0.357	**	-0.345	**	-0.351	**	-0.341	**	-0.036
		- Fringe/Exurbs	-0.339	**	-0.395	**	-0.392	**	-0.407	**	-0.377	**	-0.038

**p < .01; *p < .05.

Table F-3: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Montreal CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.445	**	0.409	**	0.407	**	0.385	**	0.415	**	-0.030
		- Inner City	0.163	**	0.145	**	0.145	**	0.180	**	0.182	**	0.019
		- Outer Suburbs	-0.355	**	-0.343	**	-0.261	**	-0.232	**	-0.168	**	0.187
		- Fringe/Exurbs	-0.426	**	-0.383	**	-0.315	**	-0.300	**	-0.242	**	0.184
ELDPOP	Inner Suburbs	- Core	-0.492		-0.211		0.048		0.238		0.210		0.702
		- Inner City	-0.193	**	-0.007		0.173	**	0.324	**	0.423	**	0.616
		- Outer Suburbs	0.581	**	0.646	**	0.613	**	0.571	**	0.451	**	-0.130
		- Fringe/Exurbs	0.540	**	0.591	**	0.589	**	0.581	**	0.489	**	-0.051
UNEMP	Inner Suburbs	- Core	-0.456	**	-0.301		-0.334	*	-0.476		-0.215		0.240
		- Inner City	-0.403	**	-0.252	**	-0.236	**	-0.172	**	-0.011		0.392
		- Outer Suburbs	0.138	**	0.240	**	0.243	**	0.423	**	0.470	**	0.331
		- Fringe/Exurbs	0.205	**	0.297	**	0.365	**	0.450	**	0.526	**	0.321
LOWINCFAM	Inner Suburbs	- Core	-0.772	**	-0.699	**	-0.513	*	-0.570		-0.552		0.220
		- Inner City	-0.661	**	-0.565	**	-0.470	**	-0.322	**	-0.307	**	0.354
		- Outer Suburbs	0.248	**	0.356	**	0.326	**	0.491	**	0.632	**	0.384
		- Fringe/Exurbs	0.404	**	0.544	**	0.542	**	0.606	**	0.803	**	0.398
UNIVPOP	Inner Suburbs	- Core	-1.019	**	-1.165	**	-1.376	**	-1.209	**	-1.116	**	-0.097
		- Inner City	-0.219		-0.398	**	-0.511	**	-0.539	**	-0.593	**	-0.374
		- Outer Suburbs	0.180		0.117		0.152		0.095		0.119		-0.061
		- Fringe/Exurbs	0.205	*	0.154		0.206	**	0.316	**	0.288	**	0.083
MHHINC	Inner Suburbs	- Core	0.355	**	0.262	*	0.122		0.143		0.142		-0.214
		- Inner City	0.343	**	0.232	**	0.142	**	0.176	**	0.119	*	-0.224
		- Outer Suburbs	-0.234	**	-0.312	**	-0.204	**	-0.390	**	-0.382	**	-0.148
		- Fringe/Exurbs	-0.245	**	-0.325	**	-0.195	**	-0.332	**	-0.374	**	-0.129
HSVAL	Inner Suburbs	- Core	-0.284		-0.220		-0.198		-0.332		-0.382		-0.098
		- Inner City	0.215	**	0.076		0.050		0.014		-0.069		-0.284
		- Outer Suburbs	0.217	**	0.179	**	0.179	**	0.195	**	0.214	**	-0.002
		- Fringe/Exurbs	0.298	**	0.256	**	0.239	**	0.282	**	0.272	**	-0.026
RENTVAL	Inner Suburbs	- Core	0.017		-0.022		-0.106		-0.112		-0.204	*	-0.220
		- Inner City	0.106	**	-0.005		0.030		0.010		-0.022		-0.128
		- Outer Suburbs	-0.025		-0.034		-0.069		-0.089	**	-0.066		-0.041
		- Fringe/Exurbs	0.061		0.007		0.006		0.016		0.016		-0.045
OWNPROP	Inner Suburbs	- Core	0.624	**	0.517	**	0.498	**	0.416	**	0.300	**	-0.325
		- Inner City	0.509	**	0.458	**	0.434	**	0.429	**	0.359	**	-0.150
		- Outer Suburbs	-0.578	**	-0.599	**	-0.577	**	-0.575	**	-0.554	**	0.024
		- Fringe/Exurbs	-0.805	**	-0.735	**	-0.651	**	-0.652	**	-0.633	**	0.171

**p < .01; *p < .05.

Table F-4: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Vancouver CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.706	**	0.719	**	0.685	**	0.680	**	0.582	**	-0.124
		- Inner City	0.149	*	0.149	*	0.167	**	0.198	**	0.158	**	0.009
		- Outer Suburbs	-0.385	**	-0.339	**	-0.281	**	-0.277	**	-0.258	**	0.127
		- Fringe/Exurbs	-0.330	**	-0.282	**	-0.243	**	-0.162	**	-0.142	**	0.188
ELDPOP	Inner Suburbs	- Core	-0.202		0.012		0.122		0.221		0.250		0.452
		- Inner City	-0.075		0.058		0.103		0.082		0.119		0.194
		- Outer Suburbs	0.515	**	0.476	**	0.469	**	0.368	**	0.316	**	-0.199
		- Fringe/Exurbs	0.303	**	0.234	*	0.154		0.013		-0.006		-0.309
UNEMP	Inner Suburbs	- Core	-0.355		-0.462		-0.039		-0.068		0.028		0.383
		- Inner City	-0.224		-0.201		-0.096		-0.104		-0.026		0.198
		- Outer Suburbs	-0.047		-0.049		-0.066		0.106		0.050		0.097
		- Fringe/Exurbs	0.041		0.214	**	0.282	**	0.366	**	0.292	**	0.251
LOWINCFAM	Inner Suburbs	- Core	-0.627		-0.503		-0.083		0.165		0.051		0.677
		- Inner City	-0.548	**	-0.449	*	-0.149		-0.001		0.084		0.632
		- Outer Suburbs	-0.067		0.113		0.076		0.197	*	0.228	**	0.295
		- Fringe/Exurbs	0.209	**	0.459	**	0.538	**	0.684	**	0.675	**	0.467
UNIVPOP	Inner Suburbs	- Core	-0.775	*	-0.672	**	-0.881	**	-0.785	**	-0.630	**	0.145
		- Inner City	-0.665	**	-0.758	**	-0.734	**	-0.609	**	-0.469	**	0.195
		- Outer Suburbs	0.181		0.214	*	0.191	*	0.181	**	0.190	**	0.008
		- Fringe/Exurbs	0.139		0.093		0.125		0.121		0.214	**	0.075
MHHINC	Inner Suburbs	- Core	0.395	**	0.390	**	0.119		0.208	*	0.194	*	-0.202
		- Inner City	0.181	*	0.098		0.004		0.019		-0.004		-0.186
		- Outer Suburbs	-0.107		-0.114		-0.062		-0.192	**	-0.176	**	-0.069
		- Fringe/Exurbs	-0.105		-0.185	**	-0.180	**	-0.274	**	-0.305	**	-0.200
HSVAL	Inner Suburbs	- Core	-0.127		0.035		0.260	*	0.206	**	0.103		0.230
		- Inner City	-0.258	*	-0.311	*	-0.276		-0.263		-0.304	**	-0.046
		- Outer Suburbs	0.125		0.156	*	0.190	*	0.128	*	0.117	*	-0.008
		- Fringe/Exurbs	0.026		0.065		0.077		-0.052		-0.075		-0.101
RENTVAL	Inner Suburbs	- Core	0.053		0.064		0.068		0.019		-0.065		-0.117
		- Inner City	0.074		0.059		0.042		-0.024		-0.028		-0.102
		- Outer Suburbs	-0.046		-0.013		-0.016		-0.015		0.035		0.081
		- Fringe/Exurbs	0.014		-0.035		-0.077		-0.124	*	-0.103	*	-0.116
OWNPROP	Inner Suburbs	- Core	0.903	**	0.758	**	0.657	**	0.559	**	0.511	**	-0.392
		- Inner City	0.261	*	0.238	**	0.253	**	0.249	**	0.225	**	-0.036
		- Outer Suburbs	-0.155		-0.165		-0.146	*	-0.190	**	-0.187	**	-0.032
		- Fringe/Exurbs	-0.225	**	-0.309	**	-0.289	**	-0.288	**	-0.246	**	-0.021

**p < .01; *p < .05.

Table F-5: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Ottawa-Gatineau CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.393	**	0.406	**	0.440	**	0.484	**	0.418	**	0.025
		- Inner City	0.072		0.076		0.095		0.110		0.047		-0.025
		- Outer Suburbs	-0.379	**	-0.317	**	-0.223	**	-0.239	**	-0.192	**	0.187
		- Fringe/Exurbs	-0.415	**	-0.385	**	-0.349	**	-0.316	**	-0.341	**	0.074
ELDPOP	Inner Suburbs	- Core	-0.302		-0.089		0.132		0.172		0.295		0.597
		- Inner City	-0.342		-0.045		0.113		0.196		0.228		0.569
		- Outer Suburbs	0.781	**	0.778	**	0.780	**	0.727	**	0.587	**	-0.194
		- Fringe/Exurbs	0.662	**	0.836	**	0.869	**	0.707	**	0.640	**	-0.023
UNEMP	Inner Suburbs	- Core	-0.050		-0.111		-0.007		-0.043		0.091		0.141
		- Inner City	0.001		-0.039		0.046		0.041		-0.045		-0.046
		- Outer Suburbs	0.207		0.230	**	0.297	**	0.246	**	0.222	**	0.015
		- Fringe/Exurbs	0.235	*	0.306	**	0.504	**	0.450	**	0.358	**	0.123
LOWINCFAM	Inner Suburbs	- Core	-0.478		-0.297		-0.188		-0.009		-0.085		0.392
		- Inner City	-0.126		-0.075		0.092		0.137		0.207		0.333
		- Outer Suburbs	0.378		0.492	*	0.564	**	0.650	**	0.676	**	0.298
		- Fringe/Exurbs	0.608	**	0.915	**	1.022	**	1.104	**	1.163	**	0.555
UNIVPOP	Inner Suburbs	- Core	-0.749	**	-0.750	**	-0.773	**	-0.762	**	-0.712	**	0.037
		- Inner City	-0.692	*	-0.813	*	-0.879	**	-0.729	**	-0.812	**	-0.120
		- Outer Suburbs	-0.187		-0.199		-0.189		-0.103		-0.102		0.085
		- Fringe/Exurbs	-0.035		-0.085		-0.099		-0.045		-0.098		-0.062
MHHINC	Inner Suburbs	- Core	0.235	**	0.196	*	0.086		0.121		0.077		-0.157
		- Inner City	0.021		-0.037		-0.210		-0.171		-0.311		-0.332
		- Outer Suburbs	-0.236	**	-0.313	**	-0.236	**	-0.302	**	-0.316	**	-0.080
		- Fringe/Exurbs	-0.241	**	-0.358	**	-0.287	**	-0.443	**	-0.477	**	-0.236
HSVAL	Inner Suburbs	- Core	-0.353	*	-0.340	*	-0.261		-0.220		-0.336	*	0.017
		- Inner City	-0.242		-0.282		-0.398		-0.360		-0.529		-0.287
		- Outer Suburbs	0.006		-0.047		-0.029		0.005		-0.002		-0.008
		- Fringe/Exurbs	0.013		-0.070		-0.067		-0.141		-0.127	*	-0.140
RENTVAL	Inner Suburbs	- Core	-0.019		-0.058		-0.028		-0.022		-0.093		-0.074
		- Inner City	-0.108		-0.108		-0.163		-0.116		-0.186		-0.078
		- Outer Suburbs	-0.157	*	-0.198	**	-0.256	**	-0.154	**	-0.203	**	-0.046
		- Fringe/Exurbs	-0.060		-0.127	*	-0.166	**	-0.154	*	-0.210	**	-0.150
OWNPROP	Inner Suburbs	- Core	0.519	**	0.474	**	0.460	**	0.455	**	0.382	**	-0.137
		- Inner City	0.079		0.102		0.045		0.068		0.033		-0.045
		- Outer Suburbs	-0.266	*	-0.307	**	-0.352	**	-0.360	**	-0.344	**	-0.078
		- Fringe/Exurbs	-0.585	**	-0.568	**	-0.559	**	-0.571	**	-0.515	**	0.070

**p < .01; *p < .05.

Table F-6: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Calgary CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.403	**	0.446	**	0.481	**	0.440	*	0.420	*	0.016
		- Inner City	0.118		0.130		0.117		0.056		0.031		-0.087
		- Outer Suburbs	-0.529	**	-0.415	**	-0.316	**	-0.367	**	-0.328	**	0.201
		- Fringe/Exurbs	-0.561	**	-0.558	**	-0.496	**	-0.469	**	-0.486	**	0.075
ELDPOP	Inner Suburbs	- Core	-0.827		-0.606		-0.340		0.202		0.053		0.880
		- Inner City	-0.955		-0.435		-0.104		0.150		0.205		1.160
		- Outer Suburbs	0.950	**	0.880	**	0.785	**	0.750	**	0.548	**	-0.402
		- Fringe/Exurbs	0.818	**	0.922	**	0.920	**	0.860	**	0.731	**	-0.088
UNEMP	Inner Suburbs	- Core	-0.516		-0.320		-0.413		-0.122		0.024		0.541
		- Inner City	-0.222		-0.199		0.122		0.090		0.095		0.317
		- Outer Suburbs	0.113		0.180	*	0.088		0.009		0.064		-0.050
		- Fringe/Exurbs	0.188		0.246	**	0.312	**	0.244	**	0.298	**	0.110
LOWINCFAM	Inner Suburbs	- Core	-0.935		-1.110		-0.831		-0.291		-0.661		0.274
		- Inner City	-0.591		-0.328		-0.026		0.093		-0.163		0.428
		- Outer Suburbs	0.169		0.243		0.175		0.305	*	0.247		0.078
		- Fringe/Exurbs	0.220		0.466	**	0.490	**	0.594	**	0.655	**	0.435
UNIVPOP	Inner Suburbs	- Core	-0.349		-0.241		-0.237		-0.595	*	-0.409		-0.060
		- Inner City	0.245		-0.132		-0.318		-0.301		-0.408		-0.653
		- Outer Suburbs	0.025		-0.112		0.047		0.081		0.127		0.103
		- Fringe/Exurbs	0.086		0.080		0.182		0.272		0.167		0.081
MHHINC	Inner Suburbs	- Core	0.415	**	0.386	**	0.242		0.215		0.249		-0.166
		- Inner City	0.328	**	0.045		-0.108		-0.113		-0.194		-0.522
		- Outer Suburbs	-0.237	**	-0.349	**	-0.199	**	-0.347	**	-0.312	**	-0.074
		- Fringe/Exurbs	-0.218	*	-0.345	**	-0.257	**	-0.353	**	-0.448	**	-0.230
HSVAL	Inner Suburbs	- Core	-0.332		-0.466		-0.281		-0.252		-0.097		0.235
		- Inner City	0.209	**	-0.026		-0.146		-0.256		-0.328		-0.536
		- Outer Suburbs	0.013		-0.047		-0.005		0.010		0.081		0.069
		- Fringe/Exurbs	-0.121		-0.132		-0.185		-0.101		-0.149		-0.028
RENTVAL	Inner Suburbs	- Core	0.065		0.166		0.186	*	0.156	**	0.126		0.060
		- Inner City	0.067		0.040		0.041		-0.093		-0.036		-0.103
		- Outer Suburbs	-0.107	**	-0.195	**	-0.230	**	-0.269	**	-0.246	**	-0.139
		- Fringe/Exurbs	-0.012		-0.092		-0.244	**	-0.056		-0.243	**	-0.231
OWNPROP	Inner Suburbs	- Core	0.714	**	0.678	**	0.608	**	0.440	**	0.418	**	-0.296
		- Inner City	0.153		0.042		0.004		0.020		-0.013		-0.166
		- Outer Suburbs	-0.279	**	-0.305	**	-0.301	**	-0.359	**	-0.308	**	-0.028
		- Fringe/Exurbs	-0.386	**	-0.444	**	-0.452	**	-0.412	**	-0.380	**	0.006

**p < .01; *p < .05.

Table F-7: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Edmonton CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.252		0.294		0.307		0.368		0.342		0.090
		- Inner City	-0.128		-0.138		-0.169	*	-0.098		-0.050		0.077
		- Outer Suburbs	-0.568	**	-0.473	**	-0.365	**	-0.311	**	-0.270	**	0.297
		- Fringe/Exurbs	-0.533	**	-0.437	**	-0.375	**	-0.353	**	-0.353	**	0.180
ELDPOP	Inner Suburbs	- Core	0.106		0.302		0.312		0.311		0.397		0.291
		- Inner City	-0.469		-0.105		0.153		0.348		0.408	*	0.878
		- Outer Suburbs	1.232	**	1.135	**	0.974	**	0.749	**	0.570	**	-0.662
		- Fringe/Exurbs	0.918	**	0.922	**	0.867	**	0.715	**	0.644	**	-0.274
UNEMP	Inner Suburbs	- Core	-0.579	*	-0.512		-0.437		-0.465		-0.224		0.355
		- Inner City	-0.395		-0.462		-0.773		-0.460		-0.379		0.015
		- Outer Suburbs	0.043		0.173		0.132		0.210	**	0.056		0.013
		- Fringe/Exurbs	0.209	**	0.478	**	0.427	**	0.374	**	0.271	**	0.061
LOWINCFAM	Inner Suburbs	- Core	-0.737		-0.862		-0.870		-0.918		-0.904		-0.167
		- Inner City	-0.459		-0.572		-0.778		-0.767		-0.507		-0.048
		- Outer Suburbs	-0.041		0.090		0.078		0.035		0.016		0.057
		- Fringe/Exurbs	0.578	**	0.813	**	0.796	**	0.827	**	0.860	**	0.282
UNIVPOP	Inner Suburbs	- Core	0.013		0.101		0.213		0.009		-0.186		-0.199
		- Inner City	0.656	*	0.680	*	0.647		0.543		0.414		-0.242
		- Outer Suburbs	0.154		0.223		0.285		0.249		0.228		0.074
		- Fringe/Exurbs	0.323		0.294		0.389	*	0.395	**	0.352	**	0.029
MHHINC	Inner Suburbs	- Core	0.379	**	0.375	**	0.318	**	0.321	**	0.318	*	-0.061
		- Inner City	0.221		0.179		0.222		0.148		0.125		-0.096
		- Outer Suburbs	-0.163	**	-0.192	**	-0.097		-0.211	**	-0.205	**	-0.042
		- Fringe/Exurbs	-0.286	**	-0.363	**	-0.270	**	-0.405	**	-0.436	**	-0.150
HSVAL	Inner Suburbs	- Core	0.085		0.055		0.062		0.064		0.111		0.026
		- Inner City	0.265	**	0.261	**	0.260	**	0.253	*	0.268	**	0.003
		- Outer Suburbs	0.019		-0.014		0.014		0.021		0.027		0.008
		- Fringe/Exurbs	0.023		-0.028		-0.072		-0.107		-0.118		-0.142
RENTVAL	Inner Suburbs	- Core	0.039		0.077		0.173	**	0.140		0.154		0.115
		- Inner City	0.024		0.075		0.050		0.127	**	0.055		0.032
		- Outer Suburbs	-0.047		-0.050		-0.105	**	-0.101	**	-0.102	*	-0.054
		- Fringe/Exurbs	-0.107	*	-0.122		-0.129	**	-0.153	**	-0.173	**	-0.066
OWNPROP	Inner Suburbs	- Core	0.692	**	0.642	**	0.589	**	0.547	**	0.424	*	-0.268
		- Inner City	-0.123		-0.105		-0.131		-0.144		-0.140		-0.016
		- Outer Suburbs	-0.109		-0.135		-0.175	*	-0.198	**	-0.184	**	-0.075
		- Fringe/Exurbs	-0.518	**	-0.538	**	-0.474	**	-0.457	**	-0.427	**	0.091

**p < .01; *p < .05.

Table F-8: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Quebec CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.304	**	0.275	**	0.288	**	0.311	**	0.260	**	-0.043
		- Inner City	0.107		0.049		0.021		0.026		0.031		-0.076
		- Outer Suburbs	-0.309	*	-0.363	**	-0.333	**	-0.447	**	-0.393	**	-0.084
		- Fringe/Exurbs	-0.549	**	-0.582	**	-0.557	**	-0.525	**	-0.477	**	0.072
ELDPOP	Inner Suburbs	- Core	-0.636	*	-0.276		0.021		0.266		0.367		1.002
		- Inner City	-0.486	*	-0.451	*	-0.216		-0.007		0.161		0.647
		- Outer Suburbs	0.287		0.473	*	0.582	**	0.773	**	0.699	**	0.413
		- Fringe/Exurbs	0.621	**	0.779	**	0.919	**	0.937	**	0.847	**	0.227
UNEMP	Inner Suburbs	- Core	-0.539	**	-0.508	*	-0.498		-0.370		-0.519	*	0.020
		- Inner City	-0.443	*	-0.402		-0.442		-0.686	*	-0.512	*	-0.069
		- Outer Suburbs	0.118		0.208	*	0.247	*	0.408	**	0.338	**	0.220
		- Fringe/Exurbs	0.179	*	0.257	**	0.343	**	0.437	**	0.388	**	0.210
LOWINCFAM	Inner Suburbs	- Core	-1.031	**	-0.823	*	-0.579		-0.629		-0.636		0.395
		- Inner City	-0.869	**	-0.874	*	-0.846	**	-1.034	*	-1.134	*	-0.265
		- Outer Suburbs	0.097		0.272		0.365	*	0.503	**	0.525	**	0.428
		- Fringe/Exurbs	0.307	**	0.516	**	0.540	**	0.668	**	0.720	**	0.413
UNIVPOP	Inner Suburbs	- Core	-0.278		-0.387		-0.369		-0.454		-0.536	*	-0.258
		- Inner City	0.387		0.397		0.387		0.294		0.218		-0.169
		- Outer Suburbs	-0.224		-0.047		-0.100		-0.050		0.004		0.228
		- Fringe/Exurbs	0.187		0.223		0.207		0.182		0.155		-0.033
MHHINC	Inner Suburbs	- Core	0.456	**	0.405	**	0.205		0.239	*	0.264	**	-0.193
		- Inner City	0.348	**	0.367	**	0.296	**	0.311	**	0.288	**	-0.060
		- Outer Suburbs	-0.171		-0.232	*	-0.202		-0.357	**	-0.326	**	-0.155
		- Fringe/Exurbs	-0.158	*	-0.222	**	-0.121		-0.321	**	-0.329	**	-0.170
HSVAL	Inner Suburbs	- Core	0.212		0.189		0.177		0.086		-0.016		-0.228
		- Inner City	0.238	*	0.275	**	0.228	*	0.193		0.167		-0.070
		- Outer Suburbs	-0.072		-0.026		-0.042		-0.031		-0.044		0.027
		- Fringe/Exurbs	0.074		0.081		0.073		0.047		-0.010		-0.084
RENTVAL	Inner Suburbs	- Core	0.134		0.064		0.058		0.063		0.050		-0.084
		- Inner City	0.126		0.146		0.123		0.101		0.132		0.007
		- Outer Suburbs	0.030		0.012		-0.011		0.024		0.015		-0.015
		- Fringe/Exurbs	0.069		0.052		0.051		0.026		0.064		-0.006
OWNPROP	Inner Suburbs	- Core	0.511	**	0.473	**	0.435	**	0.384	**	0.364	**	-0.148
		- Inner City	0.303	*	0.332	*	0.342	**	0.312	**	0.323	**	0.020
		- Outer Suburbs	-0.362	*	-0.393	**	-0.364	**	-0.458	**	-0.417	**	-0.055
		- Fringe/Exurbs	-0.612	**	-0.607	**	-0.566	**	-0.598	**	-0.567	**	0.044

**p < .01; *p < .05.

Table F-9: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Winnipeg CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.080		0.062		-0.019		-0.035		-0.052		-0.132
		- Inner City	-0.042		-0.100		-0.145	*	-0.134	*	-0.157	*	-0.115
		- Outer Suburbs	-0.449	**	-0.380	**	-0.280	**	-0.188	**	-0.156	*	0.293
		- Fringe/Exurbs	-0.394	**	-0.357	**	-0.287	**	-0.250	**	-0.246	**	0.148
ELDPOP	Inner Suburbs	- Core	-0.438		-0.107		0.168		0.285		0.425		0.863
		- Inner City	-0.109		0.122		0.344	**	0.443	**	0.544	**	0.654
		- Outer Suburbs	0.743	**	0.836	**	0.806	**	0.693	**	0.610	**	-0.133
		- Fringe/Exurbs	0.630	**	0.749	**	0.693	**	0.656	**	0.638	**	0.008
UNEMP	Inner Suburbs	- Core	-0.977	**	-1.222	**	-1.675	**	-1.280	**	-1.175	**	-0.198
		- Inner City	-0.262	*	-0.424	**	-0.548	**	-0.340	*	-0.252		0.010
		- Outer Suburbs	0.201	*	0.105		0.066		0.083		-0.007		-0.208
		- Fringe/Exurbs	0.247	**	0.207	**	0.227	**	0.131		0.171		-0.076
LOWINCFAM	Inner Suburbs	- Core	-1.898	**	-1.781	**	-1.781	**	-2.061	**	-2.092	**	-0.194
		- Inner City	-0.510	**	-0.567	**	-0.586	**	-0.522	*	-0.544	*	-0.034
		- Outer Suburbs	0.225		0.221		0.188		0.271		0.287		0.062
		- Fringe/Exurbs	0.244	*	0.468	**	0.437	**	0.532	**	0.525	**	0.281
UNIVPOP	Inner Suburbs	- Core	0.275		0.186		0.190		0.164		0.129		-0.146
		- Inner City	-0.101		-0.134		-0.129		-0.154		-0.154		-0.053
		- Outer Suburbs	-0.300		-0.272		-0.301		-0.236		-0.215		0.085
		- Fringe/Exurbs	0.130		0.072		0.044		-0.042		-0.010		-0.139
MHHINC	Inner Suburbs	- Core	0.608	**	0.553	**	0.435	**	0.516	**	0.419	**	-0.189
		- Inner City	0.212	**	0.161		0.131		0.141		0.071		-0.141
		- Outer Suburbs	-0.310	**	-0.306	**	-0.195	*	-0.353	**	-0.392	**	-0.082
		- Fringe/Exurbs	-0.228	**	-0.338	**	-0.212	*	-0.407	**	-0.464	**	-0.236
HSVAL	Inner Suburbs	- Core	0.326	**	0.163		0.271	**	0.324	**	0.211		-0.115
		- Inner City	0.240	**	0.188	**	0.180	**	0.199	**	0.148		-0.092
		- Outer Suburbs	-0.233	*	-0.151	*	-0.150	*	-0.180	**	-0.181	**	0.052
		- Fringe/Exurbs	-0.151		-0.252	*	-0.242	*	-0.289	**	-0.340	**	-0.188
RENTVAL	Inner Suburbs	- Core	0.220	**	0.165	**	0.237	**	0.245	**	0.241	**	0.021
		- Inner City	0.079		0.053		0.106	**	0.074		0.087		0.008
		- Outer Suburbs	-0.105		-0.101		-0.135		-0.169	*	-0.123		-0.018
		- Fringe/Exurbs	0.071		-0.143		0.042		-0.090		-0.025		-0.096
OWNPROP	Inner Suburbs	- Core	0.679	**	0.652	**	0.616	**	0.644	**	0.535	**	-0.144
		- Inner City	0.008		0.002		0.022		0.026		-0.029		-0.037
		- Outer Suburbs	-0.174		-0.184		-0.199	*	-0.205	*	-0.245	**	-0.071
		- Fringe/Exurbs	-0.356	**	-0.341	**	-0.391	**	-0.380	**	-0.399	**	-0.043

**p < .01; *p < .05.

Table F-10: ANOVA Mean Comparisons between the inner suburbs and other urban zones in the Hamilton CMA, 1986-2006.

Variable	Pairs		1986		1991		1996		2001		2006		'86-'06 (Difference)
YOUNGPOP	Inner Suburbs	- Core	0.328		0.289		0.238		0.196		0.213		-0.115
		- Inner City	-0.094		-0.152	*	-0.148	**	-0.141	**	-0.113	*	-0.019
		- Outer Suburbs	-0.494	**	-0.372	**	-0.281	**	-0.234	**	-0.228	**	0.266
		- Fringe/Exurbs	-0.321	**	-0.342	**	-0.267	**	-0.250	**	-0.200	**	0.121
ELDPOP	Inner Suburbs	- Core	-0.623		-0.278		0.024		0.269		0.262		0.885
		- Inner City	-0.172		0.116		0.336	**	0.441	**	0.523	**	0.694
		- Outer Suburbs	0.717	**	0.681	**	0.678	**	0.615	**	0.529	**	-0.188
		- Fringe/Exurbs	0.369	**	0.505	**	0.573	**	0.567	**	0.483	**	0.114
UNEMP	Inner Suburbs	- Core	-0.586	**	-0.502		-1.033	**	-1.070	*	-0.384		0.202
		- Inner City	-0.405	**	-0.692	**	-0.647	**	-0.469	**	-0.410	**	-0.005
		- Outer Suburbs	0.048		-0.040		0.012		0.109		0.121		0.073
		- Fringe/Exurbs	0.149	*	0.152		0.235	**	0.287	**	0.337	**	0.188
LOWINCFAM	Inner Suburbs	- Core	-1.365	*	-1.250	*	-1.525	**	-1.641	**	-1.587	*	-0.222
		- Inner City	-0.851	**	-1.014	**	-0.827	**	-0.896	**	-0.798	**	0.052
		- Outer Suburbs	0.055		0.038		0.061		0.220		0.261		0.206
		- Fringe/Exurbs	0.332	**	0.352	**	0.455	**	0.509	**	0.539	**	0.207
UNIVPOP	Inner Suburbs	- Core	-0.104		-0.286		-0.197		-0.272		-0.285		-0.181
		- Inner City	0.119		0.158		0.215		0.181		0.187		0.068
		- Outer Suburbs	0.006		0.011		-0.014		-0.214		-0.232		-0.239
		- Fringe/Exurbs	-0.339		-0.224		-0.305		-0.181		-0.188		0.151
MHHINC	Inner Suburbs	- Core	0.505	**	0.467	**	0.372	**	0.441	**	0.409	**	-0.096
		- Inner City	0.286	**	0.259	**	0.184	**	0.226	**	0.187	**	-0.099
		- Outer Suburbs	-0.161		-0.226	**	-0.139	*	-0.344	**	-0.351	**	-0.190
		- Fringe/Exurbs	-0.219	**	-0.293	**	-0.254	**	-0.398	**	-0.421	**	-0.202
HSVAL	Inner Suburbs	- Core	0.255	*	0.158		0.161		0.246	**	0.170		-0.085
		- Inner City	0.296	**	0.228	**	0.243	**	0.284	**	0.313	**	0.017
		- Outer Suburbs	-0.060		-0.092		-0.072		-0.107		-0.141		-0.081
		- Fringe/Exurbs	-0.247	**	-0.246	**	-0.267	**	-0.272	**	-0.334	**	-0.087
RENTVAL	Inner Suburbs	- Core	0.206	**	0.107		0.184	**	0.229	**	0.275	**	0.069
		- Inner City	0.122		0.046		0.100		0.187	**	0.202	**	0.080
		- Outer Suburbs	-0.201		-0.167		-0.212	**	-0.166	*	-0.102		0.099
		- Fringe/Exurbs	0.003		-0.153		-0.174	*	-0.095		-0.022		-0.025
OWNPROP	Inner Suburbs	- Core	0.661	**	0.667	**	0.659	**	0.626	**	0.557	**	-0.104
		- Inner City	0.053		0.075		0.082		0.062		0.063		0.010
		- Outer Suburbs	-0.150		-0.159		-0.140		-0.222	**	-0.228	**	-0.078
		- Fringe/Exurbs	-0.279	**	-0.314	**	-0.319	**	-0.310	**	-0.296	**	-0.017

**p < .01; *p < .05.

APPENDIX G

A factor analysis is conducted for the nine largest CMAs studied. Factors are extracted from ten variables which are grouped into demographic, socio-economic, and housing categories. The specific variables are found in Table G1. The factors were, however, extracted from only nine variables for this thesis as the immigrant variable proved to be an insignificant loading on any factor.

Table G-1: Variables used in factor analysis.

	Variables		
Category	Name	Calculation*	Time
Demographic	YOUNGPOP	Proportion of young population (0-14) in comparison to population total	'86, '91,' 96, '01, '06
	ELDPOP	Proportion of elderly population (65+) in comparison to population total	'86, '91, '96, '01, '06
	IMMIG	Proportion of immigrant population in comparison to population total	’86, ’91, ’96, ’01, ‘06
Socio-economic	UNEMP	Percentage of unemployed	'86, '91, '96, '01, '06
	LOWINCFAM	Percentage of low income families	'86, '91, '96, '01, '06
	UNIVPOP	Proportion of university graduates compared to total population 15+	'86, '91, '96, '01, '06
	MHHINC	Median household income	'86, '91, '96, '01, '06
Housing	HSVAL	Average value of dwelling	'86, '91, '96, '01, '06
	RENTVAL	Average gross rent	'86, '91, '96, '01, '06
	OWNPROP	Proportion of owned dwellings in comparison to total dwellings	'86, '91, '96, '01, '06

* All variables are expressed as ratios relative to the CMA average.

The validity of factor analysis for the given data set is examined by using the KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity tests. The results obtained are available in Table F2. The minimal threshold established by the KMO test for validity of factor extraction in a given set is 0.5. Good results can be expected at a score equal or greater to 0.7 (Hinton, et. al., 2004; Field, 2009). Therefore, the given data set is a good candidate for factor reduction.

Bartlett's test is designed to examine whether the variable correlation matrix is an identity matrix, making it inappropriate for factor analysis (Field, 2009). The obtained results are highly significant; thus, the null hypothesis can be rejected.

Table G-2: KMO and Bartlett's Test of Sphericity results.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.741
Bartlett's Test of Sphericity	Approx. Chi-Square	60149.043
	Df	36
	Sig.	.000

The principal components method is used for factor extraction. Furthermore, only factors with eigenvalues that are close to 1.00 (or greater) are retained, as smaller factors are unlikely to explain data to any significant level (de Vaus, 2002; Hinton et. al., 2004). Table G-3 shows the extracted factors, as well as the amount of variance in data that the retained factors explain. The solution is initially unrotated; hence, the majority of variation is explained by the first factor. Overall, the retained factors explain roughly 76% of data.

The extracted component matrix is available in table F4. In the unrotated solution, seven of nine variables have factor loadings over 0.4 for the first factor. Generally, factor loadings over 0.4 are considered significant in large sample sizes (Hinton, et. al. 2004; Field, 2009). Five variables have loadings over 0.4 for the second factor, and one variable has a loading over 0.4 for the third factor. As is generally the case with unrotated solutions, the unrotated factor solution concentrates factor loadings on the first extracted factor (de Vaus, 2002).

The loadings are re-distributed by rotating the values using Varimax rotation. Varimax rotation simplifies factor analysis by associating each variable with a fewer number of factors, thus allowing for a clear interpretation of data (Pett et. al., 2003; Field, 2009). Table F5 shows the

Table G-3: Factor eigenvalues and variance explained (unrotated solution). Retained factors are bolded.

	Initial Eigenvalues		
Factor	Total	% of Variance	Cumulative %
1	**3.641**	**40.458**	**40.458**
2	**2.184**	**24.263**	**64.721**
3	**.995**	**11.060**	**75.781**
4	.598	6.642	82.423
5	.507	5.630	88.053
6	.413	4.587	92.641
7	.291	3.230	95.870
8	.221	2.455	98.325
9	.151	1.675	100.000

Table G-4: Unrotated component matrix.

	Component		
	1	2	3
YOUNGPOP	.309	**-.800**	.297
ELDPOP	-.213	**.660**	**-.527**
UNEMP	**-.776**	.036	.395
LOWINCFAM	**-.852**	.017	.387
UNIVPOP	**.467**	**.686**	.317
MHHINC	**.779**	-.038	.126
HSVAL	**.544**	**.593**	.333
RENTVAL	**.697**	.246	.231
OWNPROP	**.753**	**-.470**	-.207

amount of variance each factor explains once rotated, while Table F6 shows the rotated component matrix. The rotated component matrix is then scored for each census tract using an Anderson-Rubin, which is one of the appropriate scoring methods of scoring Varimax solutions

(Field, 2009). This allows for a detailed comparison of factor scores between urban zones of the nine largest CMAs.

Table G-5: Variance explained (Varimax rotated solution).

Factor	% of Variance	Cumulative %
1	30.289	30.289
2	25.070	55.360
3	20.421	75.781

Table G-6: Varimax rotated component matrix.

	Component		
	1	2	3
YOUNGPOP	.233	-.167	**.861**
ELDPOP	.002	.004	**-.871**
UNEMP	**-.852**	-.184	.019
LOWINCFAM	**-.904**	-.242	.009
UNIVPOP	.059	**.861**	-.210
MHHINC	**.557**	**.474**	.299
HSVVAL	.129	**.854**	-.110
RENTVAL	.377	**.664**	.128
OWNPROP	**.810**	.003	**.417**