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Eight Canadian Metropolitan Areas: Who Lived Where in 2006?

Robert Murdie, Jennifer Logan, and
Richard Maaranen

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Executive Summary

This report introduces a typology of neighbourhoods for eight Canadian CMAs, using a joint analysis of 2006 census tract data. It includes an overview of the background literature and information on the data and methods used in developing the typology.

The study draws on 2006 census tract data for 3,139 tracts in eight CMAs and includes 30 variables related to economic status, age, family, and household status, immigrant and ethnic status, migrant status, and housing status. A principal components analysis of these variables resulted in five interpretable components accounting for about 77 percent of the variance in the original 30 variables. The components are Economic Status, Family/Housing Status, Immigration/Ethnic Status, Residential Mobility, and Immigrant Disadvantage.

A cluster analysis resulted in 15 clusters organized into 6 summary groups: Older Working Class, Urban/Suburban Homeowner, Old City Establishment, Disadvantaged Groups, and Family Ethnoburbs. Separate clusters in all but one group further differentiated the groups. Toronto includes all 15 clusters, while Halifax (the smallest city in the study) has only 9. The number of tracts in the other CMAs lies between these two CMAs, depending on city size and social complexity. Larger and more socially complex cities exhibit the largest number of clusters.

The clusters were mapped for each CMA. Although not all clusters appear in every CMA, the location of the clusters shows some common patterns:

- The “Older Working Class” group is generally found in the inner suburbs.
- The “Urban/Suburban Homeowner” group is located primarily in stable residential areas constructed mainly after the Second World War.
- The “Old City Establishment” group is situated in older high-income, inner-city areas and areas in which gentrification has taken place, especially in Ottawa, Toronto, and, to a lesser extent, Montréal.
- “Young, Single and Mobile Renters” are found in the central areas of many CMAs.
- “Disadvantaged Groups” exhibits a complex distribution that varies from cluster to cluster as well as by CMA.
- “Family Ethnoburbs” are found in the suburbs of only four of the cities studied.

The typology is an important portrayal of the increasingly complex social geography of Canada’s CMAs. It is one of the few Canadian studies to include all census tracts simultaneously in a single analysis rather than analyzing each CMA separately. In that respect, it permits a comparison of census tracts and ultimately neighbourhood types among the eight CMAs in the analysis. This achievement is important in itself, but it also provides a sampling frame for comparative neighbourhood studies across CMAs. Careful analysis of the results will highlight areas for future research.

Authors

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1. Background, Data, and Methodology

1.1 Objective

The objective of this research is to develop a typology of neighbourhoods (that is, census tracts) by analyzing a set of demographic, socio-economic, and housing data and classifying the census tracts using these data for eight Canadian census metropolitan areas (CMAs) simultaneously, rather than analyzing each CMA separately. We refer to this as a joint analysis.

A joint analysis has three major advantages over separate analyses of each CMA:

- It allows a comparison of the differentiation of neighbourhoods (census tracts) and changes over time within and between CMAs. The ultimate outcome is a typology of neighbourhoods and neighbourhood change for the CMAs.
- It provides a sampling frame for comparative neighbourhood studies across CMAs.
- It highlights possible areas for future comparative research with a focus on the "why" questions. A joint analysis answers "what " (pattern) but not "why"(process), at least not in detail.

1.2 Context

Classification approaches in neighbourhood research date back to the late 19th and early 20th centuries, especially the work of Charles Booth in London (Booth, 1902) and Ernest Burgess in Chicago (Burgess, 1925). Booth, in the course of his social welfare studies, mapped a wide variety of socio-economic indexes for London. Burgess and his colleagues, using Chicago as an example, undertook a variety of neighbourhood-based analyses. Burgess also developed the first spatial model of socio-economic status in cities, which became known as the concentric zone model.

This work was followed in the 1950s by social area analysis (Shevky and Bell, 1955), a precursor to the multivariate approaches to neighbourhood classification that are common today. Social area analysis is designed to provide a systematic classification of residential areas within cities using census tracts as the basic unit of study. As initially conceived by Shevky and Bell, social area analysis was based on the grouping of a set of census characteristics into three hypothesized indexes: economic status (income, occupation, education); family status (age, type

of household, labour force participation by women); and ethnic status (clusterings of people with common cultural backgrounds).

More recently, emphasis has been placed on the empirical testing of social area analysis using multivariate statistical methods, such as factor (principal components) analysis (see, for example, Murdie, 1969; Perle, 1982-3). These are often referred to as factorial ecology studies. The general conclusion from these analyses is that the three indexes proposed by Shevky and Bell are necessary but not sufficient to describe the socio-economic differentiation of a city's neighbourhoods.

From the 1970s to the 1990s, interest in factorial ecology research declined, partly because of an emphasis on "why" in addition to "what" questions and a focus on local neighbourhood studies. Beginning in the 1990s, however, there has been a resurgence of interest in classification approaches to neighbourhood research, aided by the enhanced computer power that is necessary to handle large data sets. This growing interest in such studies has led to methodological refinements and increased recognition of the advantages and disadvantages of classification techniques.

One methodological refinement was the development of joint analysis, whereby census tract data for several metropolitan areas can be considered simultaneously. One of the few early studies using this method was a comparative analysis of Canadian CMAs using census tract data from the 1980s (Davies and Murdie, 1991a, 1991b). These studies confirmed the increased complexity of the social dimensions of Canadian CMAs and in some cases mapped the dimensions by census tract, but without extending the analysis to a classification of the census tracts.

More recent research has focused on the development of typologies of urban neighbourhoods (e.g., Hanlon, 2009; Mikelbank, 2004, 2011; Vicino, Hanlon, and Short, 2011) and the development of indexes of urban distress (e.g., Institute of Urban Studies, 2008). All are cross-sectional studies undertaken for a single point in time or for two or more points without specifically considering measures of change.

A few studies have looked more directly at change by combining data for two or more census years and analyzing measures of change (e.g., Baum et al., 2002; Kitchen and Williams, 2009; LeBourdais and Beaudry, 1988; Murdie, 1969). These studies are more challenging than cross-sectional studies, particularly given the changes in the numbers and/or boundaries of census tracts over time and the lack of consistency in the availability and definition of variables.

As part of the current research, we have undertaken an extensive literature review of neighbourhood typologies focusing on more recent research and countries where most of this research has been undertaken (Canada, the United States and Australia/New Zealand). We have compiled a list of approximately 50 items with abstracts where available and summarized the most relevant items in more detail. This information will be published in a separate document.

1.3 Data

1.3.1 CMAs, Observational Units, and Time Period

The eight CMAs include the original six partners in the Neighbourhood Change Research Partnership project (Calgary, Halifax, Montréal, Toronto, Vancouver, and Winnipeg) and two others (Hamilton and Ottawa), where researchers are eager to start. In all cases, we have local researchers who are able to interpret the results. These CMAs represent 7 of the 10 largest CMAs in Canada. Halifax was selected to provide regional representation. Data have been assembled for three other CMAs that might be added to the analysis at some future date (Edmonton, Oshawa, and Québec City).

This report highlights the results from a cross-sectional analysis of census tract data for 2006. A subsequent report will analyse change data from 1981 to 2006.

We use 2006, because it is the most recent year for which a full set of census data are available at the tract level. It should also be noted that the reliability and comparability of census tract data from the 2011 National Household Survey (NHS) – the replacement for the long form census – are in doubt. These issues cannot be resolved until the 2011 NHS data are released at the tract level.

All census tracts of more than 150 people or more than 50 households are included in the data. Relatively few tracts needed to be dropped from the study due to this restriction. The number of census tracts available for analysis in 2006 is 3,139, out of a total of 3,179 tracts (see Table 1).

Table 1: Number of Census Tracts in Each Census Metropolitan Area, 2006

Census Metropolitan Area	Census Tracts, 2006	
	Total*	Available for Analysis
Calgary	203	202
Halifax	88	87
Hamilton	178	175
Montréal	878	860
Ottawa	251	248
Toronto	1,003	993
Vancouver	410	408
Winnipeg	168	166
TOTAL	3,179	3,139

***** Refers to all census tracts in the census boundary files, which is greater than the total included in the Profile Series.

1.3.2 Variable Selection

The first step was to develop hypothesized relationships (sources of variation) based on previous analyses and recent trends (such as the emergence of a post-industrial society) concerning the social structure of Canadian cities. Much of the literature is based on some variant of social area analysis (which dates from the 1950s and 1960s) and factorial ecology (starting in the 1970s). The major dimensions and trends that have been identified and examples of potential variables are shown below:

- Economic status

  Trends: changes in the distribution of skills from manual to semi-skilled to skilled white-collar jobs, gentrification, increased long-term poverty

  Variables: education, occupation, income, impoverishment, unemployment

- Family status

  Trends: emergence of empty nesters, aging of the population, increase in the number of childless couples

  Variables: early/late family; young adult/prefamily; seniors; non-family; single-parent family

- Ethnic status

  Trends: concentrations of recently arrived groups

  Variables: immigration, ethnicity, “race”

- Migrant status

  Trends: increased movement – local, national, and international

  Variables: move in last five years

- Housing status

  Trends: changes in tenure (renting vs. owning), age of housing, changes in the predominance of certain housing forms, households in core housing need (affordability, suitability, condition)

  Variables: renters, owners, period of construction, number of single detached houses, number of apartments, number of households paying more than 30 percent of income on housing, number of persons per bedroom, need for major repairs

- Gender

  There are no clear guidelines in this area. Some studies have looked at female labour force participation, female unemployment, and female single-parent households. Aside from female single-parent households, no variables have been particularly effective in identifying dimensions in social area or factorial ecology studies. Most relate modestly to other dimensions. Also, male and female occupation characteristics (e.g., male pro-

fessional and female professional) tend to correlate highly with each other, meaning that for this analysis, individual labour force figures by gender may be redundant.

The next step is to develop criteria for the selection of variables. In choosing which variables to use, we were guided by the following considerations:

- Include a balanced set of variables, not weighted towards a particular dimension.
- Avoid closed numbers that require an either/or choice (e.g., either immigrant or non-immigrant).
- Use simple percentages rather than more complex derived variables such as location quotients.
- Avoid highly specific variables (such as ethnic or visible minority groups that are unique to particular cities) in favour of more general variables (e.g., persons born outside Canada, recent immigrants, ethnic groups that predominate in more than one CMA). More focused studies for individual CMAs can capture the specific variations.
- Use total labour force figures for specific occupations, which may be as effective as gender-specific variables for this kind of multivariate analysis. Many gender-specific variables are best analyzed in a separate study where important differences between males and females can be evaluated in detail. These variables include educational achievement, labour force participation, and income.
- Limit the number of variables to no more than 40.
- Exclude variables that are not strongly correlated with other variables in the data set. Principal components analysis is a data reduction technique designed to detect structure in a set of interrelated variables. If a variable is not strongly related to any other variable in the data set, it will likely emerge as a single variable component.
- Include variables that are available for both 1981 and 2006 (for the analysis of change).

Using these considerations, we chose a range of variables for the 2006 analysis. We began with 39 variables and narrowed the final selection to 30 by examining the correlations between the 39 variables including (a) the average correlation between the variables and (b) the number of correlations >0.5 or <-0.5.

Nine variables with low average correlations and/or no or only one correlation >0.5 or <-0.5 were eliminated from the principal components analysis. The relationship between these nine variables and the clusters that form the basis of the typology is shown in Table 12, found in Section 5: Additional Tables. Aboriginal ethnic origin was one of these variables. The correlations between this variable and others in the analysis were very low, perhaps because Aboriginals are not spatially concentrated in most CMAs. Winnipeg, with its large Aboriginal population, is a notable exception. Details of the 30 variables are shown in Table 2.

Table 2: Joint Analysis, 30 Variables, 2006 Analysis

Domain	Indicators	Variables	Variable definition
Economic Status	Education	DEGREE06	% Population 25 years and over with a degree
		ELEMENTARY06	% Population 25 years and over without a high school certificate
	Occupation	MAN06	% Labour Force Managerial and Administrative
		PROF06	% Labour Force Professional
		SALESERVICE06	% Labour Force Sales & Service
		MANUF06	% Labour Force Manufacturing, Construction and Trades
	Income	HIGHINCHH06	% High Income Households ($99,860 or more in 2005)
		LOWINCOME06	% Families Below the Low Income Cut-Off
	Government Transfer	GOVTRANSFER06	% Unattached Individual Income from all Government Sources in 2005.
	Unemployment	UNEMP06	Unemployment Rate, Persons 15 Years and Over
Age, Family, and Household Status	Age	POPLT1506	% Population Less Than 15 Years
		POP253406	% Population 25-34 Years of Age
		POP506406	% Population 50-64 Years of Age
	Family and Household	ONEPERS06	% One-Person Households
		SINGLEPAR06	% Single-Parent Families
		PPERHH06	Persons per Household
Immigrant and Ethnic Status	Immigration	IMMIG06	% Population Immigrant
		RECIMMIG06	% Population Recent Immigrant (previous five years)
	Ethnic Origin	LATINSACARIB POP06	% Population Latin American, South American and Caribbean
		AFRICANPOP06	% Population African
		SOUTHASIANPOP06	% Population South Asian
		EASTASIANPOP06	% Population East Asian
	Home Language	LANGNOTEF06	% Home Language Neither English nor French
Migrant Status	Movers	TOTMOVERS06	% Persons (5 years +) who did not live at the same address 5 years ago
Housing Status	Tenure	RENTED06	% Private Dwellings Rented
	Physical Structure	SINGDET06	% Dwellings Single Detached
		LOWRISE06	% Dwellings Apartment Under 5 Storeys
	Affordability*	AFFORDABLE06	% Income Spent on Housing (Owners & Renters)
	Suitability	SUITABLE06	Persons Per Bedroom
	Condition	CONDITION06	% Dwellings Needing Major Repairs

* Affordability: How we calculated Housing Cost to Household Income ratio (AFFORDABLE06):

AVGRRENT x TOTRENTER = RENTWEIGHTED

AVGOWNERPAYMENT x TOTOWNER = OWNERWEIGHTED

(RENTWEIGHTED + OWNERWEIGHTED) / TOTDWELL = AVGHOUSINGCOST

(AVGHOUSINGCOST * 12) / HSLDINCOME = Housing Cost to Household Income ratio = AFFORDABLE06

1.3.3 Methodology

The analysis included three major steps.

Step 1: Descriptive statistics, including the correlations between the variables

Descriptive analysis of the data included the calculation of means, standard deviations, minimum/maximum, and correlations between variables. The principal components analysis is based on the correlation matrix of the 30 variables.

Step 2: Principal components analysis

The primary purpose of principal components analysis is to identify the major interrelated dimensions in the data set. Once the major components have been determined, component scores can be calculated for each summary component for each census tract. The component scores are then used as input to a cluster analysis that is the basis of the neighbourhood typology.

We do not discuss the computational details of principal components analysis in this research paper, but it is important to note that there are several decisions to be made. These include the method of analysis, the initial number of components to extract, and which rotation to employ (orthogonal or oblique). We should also mention the distinction between principal components analysis and factor analysis. Technically, principal components analysis is a data reduction technique while factor analysis is a hypothesis testing method. In practice, the results from the two procedures are usually quite similar. In this research we use principal components analysis because of our interest in data reduction.

The components were extracted in sequence according to the amount of variance they account for. This is measured by a statistic called an *eigenvalue* and is best exemplified by the scree plot in Figure 1.[1] The objective is to find the point in the graph at which the decrease in eigenvalues levels off. Another consideration is that only eigenvalues with a value greater than 1.0 should be retained. Specific details for the 2006 analysis are given in Section 2.

In addition to relying on the scree plot to determine the number of components to extract, we extracted different numbers of components to see which solution yielded the result that was best for interpretation. Finally, component rotation was based on an oblique solution whereby the components are permitted to correlate with each other. This is a less rigid approach than an orthogonal rotation.

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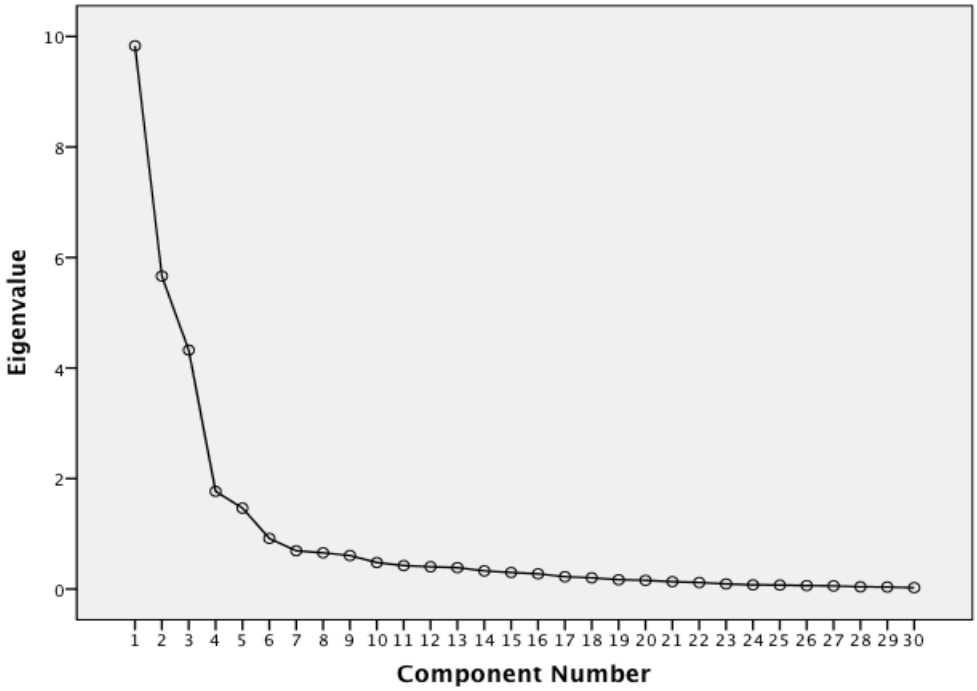
1 Scree is the geological term for loose rocks at the bottom of a cliff. Here it refers to the point beyond which there is only “component scree,” components that account for only a small proportion of the variance in the data set and are deemed to be relatively unimportant.

Figure 1: Scree Plot, 2006 Analysis



Step 3: Hierarchical Cluster Analysis of the Component Scores

Hierarchical cluster analysis begins with each census tract as a separate cluster. Based on a measure of similarity between the tracts and a statistical algorithm, tracts are combined into successively larger groups until only one group is left that contains all tracts. The objective is to end up with groups containing census tracts that are as similar as possible to each other and as different as possible to tracts in the other groups. As with principal components analysis, there are decisions to be made in undertaking the analysis. These include the measure of similarity between the tracts and the statistical algorithm used to combine the tracts into larger groups.

In this analysis, squared Euclidean distance was used as the measure of similarity and Ward's method as the statistical algorithm. Squared Euclidean distance is the sum of the squared differences over all the components. Another important decision is selecting the optimum number of clusters or the "best" cluster solution. Evaluation of a *dendrogram* (a hierarchical tree diagram) or the changes in the coefficients of an agglomeration schedule can be used as a guide. More details are given in Section 2 for the 2006 analysis.

After the clusters have been defined, based on the component scores, additional variables (e.g., ethnic groups, visible minority groups, gender-specific variables) can be used to further distinguish the nature of the clusters (see Table 12 in Section 5: Additional Variables).[2] This was done for the nine variables excluded from the principal components analysis, including Aboriginal ethnic origin.

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2 We also undertook a cluster analysis of the 30 variables, but this this solution was not as easily interpreted as that based on the five components.

2. Typology of Neighbourhoods, 2006

2.1 Principal Components Analysis

The analysis was based on census tract data for the eight CMAs (Calgary, Halifax, Hamilton, Montréal, Ottawa, Toronto, Vancouver, Winnipeg,) and included the 30 variables listed in Table 2. All of the 2006 census tracts noted in Table 1 (N=3139) were included in the joint analysis.

To identify the optimum number of components, reference was made to the scree plot (Figure 1). The scree plot shows the eigenvalues on the vertical axis and the components on the horizontal axis. As Figure 1 shows, component solutions one through five have eigenvalues exceeding 1.0; the eigenvalue for the sixth component is just below 1.0. We undertook evaluations of the four-, five-, and six-component solutions and on this basis deemed the five-component solution the best for interpretation. The five-component solution accounted for about 77 percent of the total variance in the 30 original variables, about the same as previous principal components analyses of census tract data for metropolitan areas.

The component loadings are shown in Table 3. The loadings represent the correlations between the variables and the five components and are used to interpret the components. For ease of interpretation, only loadings with values greater than 0.3 or less than -0.3 are shown in the table. Component loadings are interpreted in the same way as correlation coefficients and, like correlation coefficients, can range from +1.0 to –1.0. For example, persons with elementary education only, in manufacturing and sales and service occupations and unattached individuals receiving government transfer payments correlate strongly with the first component. Persons with a university degree, in managerial and professional occupations and with high incomes also correlate strongly with this component, but in the opposite direction. We can conclude that this component identifies census tracts on the basis of their economic status, from relatively low to relatively high.

Referring to the loadings for each component, the components can be interpreted as follows.

1. Economic Status: variations in education, occupation, income and government transfer payments.
2. Family/Housing Status: variations in size of household, age of housing, tenure, structural type of housing, condition of housing.

3. Immigration/Ethnic Status: variations in immigrant population, recent immigrants, language not English or French, persons of East or South Asian ethnic origin.
4. Residential Mobility: variations in residential mobility and age: young adults vs. older adults.
5. Immigrant Disadvantage: variations in low income, unemployment, single-parent households, persons of Latin American, South American, Caribbean or African ethnic origin.

Table 3: Component Pattern Matrix: Rotated Loadings, 2006 Analysis

	Component				
	1: Economic Status	2: Family/ Housing Status	3: Immigration/ Ethnic Status	4: Residential Mobility	5: Immigrant Disadvantage
DEGREE06	-0.982				
ELEMENTARY06	0.869				
MANUF06	0.860	0.338			
PROF06	-0.856				
MAN06	-0.806				
SALESSERV06	0.657				
GOVTRANSFER06	0.640	-0.335			0.343
HIGHINCHH06	-0.605	0.565			
PPERHH06		0.893			
ONEPERS06		-0.858			
POPLT1506		0.848			0.304
RENTED06		-0.725			0.327
LOWRISE06		-0.667			
SINGDET06		0.628		0.308	
CONDITION06		-0.543			0.330
SOUTHASIANPOP06		0.495	0.423		
EASTASIANPOP06			0.888		-0.303
LANGNOTEF06			0.887		
IMMIG06			0.854		
RECIMMIG06			0.639		
AFFORDABLE06	0.371	0.421	0.535	-0.333	
TOTMOVERS06				-0.853	
POP506406				0.804	
POP253406		-0.397		-0.788	
SUITABLE06			0.349	-0.367	0.322
AFRICANPOP06					0.848
LATINSACARIBPOP06					0.763
UNEMP06					0.605
SINGLEPAR06	0.393	-0.356			0.519
LOWINCOME06		-0.409	0.390		0.433

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
Rotation converged in 20 iterations.

As indicated earlier, this is an oblique rotation and therefore the components are allowed to correlate with each other. The correlations between the components in Table 4 are not high, although the two correlations >+0.3 and <-0.3, between the fifth component and both the first and fourth components, are worth noting. As expected, census tracts with relatively high levels of immigrant disadvantage (component 5) are associated with lower levels of economic status (component 1) and high levels of residential mobility (component 4).

Table 4: Component Correlation Matrix, 2006 Analysis, 2006 Analysis

Component	1	2	3	4	5
1: Economic Status	1.000	-0.050	0.103	-0.096	0.357
2: Family/ Housing Status	-0.050	1.000	0.023	0.150	-0.148
3: Immigration/ Ethnic Status	0.103	0.023	1.000	-0.234	0.244
4: Residential Mobility	-0.096	0.150	-0.234	1.000	-0.315
5: Immigrant Disadvantage	0.357	-0.148	0.244	-0.315	1.000

Extraction Method: Principal Component Analysis
Rotation Method: Oblimin with Kaiser Normalization

The results are generally similar to the findings from previous social area/factorial ecology analyses of census tract data for individual Canadian CMAs. The first three components approximate the hypothesized social area indexes (economic status, family status, and ethnic status). The last two components reflect the increased social complexity of many census metropolitan areas, especially following changes in immigration policy in the 1970s.

Component scores were also calculated for each census tract for each of the five components. The scores can be mapped by individual component, but in this analysis they are used as input to the hierarchical cluster analysis.

2.2 Hierarchical Cluster Analysis

As noted earlier, in hierarchical cluster analysis, each census tract is treated as a separate cluster, and then the tracts are combined into successively larger groups until only one group is left that contains all tracts. Squared Euclidean distance was used as the measure of similarity between tracts and Ward's method as the statistical algorithm.

A key consideration in cluster analysis is selecting the optimum number of clusters or the "best" cluster solution. For analyses with a large number of observations, coefficients from the agglomeration schedule can help. One stops clustering when the increase in the value of the coefficients between two adjacent steps becomes too large.

As indicated in Table 5, the rate of change in the coefficients accelerates exponentially from 20 clusters to two clusters. There seems to be a clear demarcation between the seventh and the sixth clusters, indicating that six might be an optimal number of clusters. Six clusters, however, seemed too few to fully capture the differentiation among 3,139 census tracts. From cluster 7 to cluster 20, however, there was no clear demarcation. Upon evaluation of the cluster means for

the 30 original variables for 12 to 16 clusters, it seemed that 15 clusters was a reasonable compromise.

Table 5: Reformed Agglomeration Table

Number of Clusters	Agglomeration Last Step	Coefficients this Step	Change
2	15,960	12,940	2,750
3	12,940	11,327	1,612
4	11,327	9,930	1,397
5	9,930	8,782	1,148
6	8,782	7,834	948
7	7,834	7,288	546
8	7,288	6,847	441
9	6,847	6,474	373
10	6,474	6,184	290
11	6,184	5,903	281
12	5,903	5,629	274
13	5,629	5,398	231
14	5,398	5,218	180
15	5,218	5,058	160
16	5,058	4,900	158
17	4,900	4,750	150
18	4,750	4,614	136
19	4,614	4,495	119
20	4,495	4,385	110

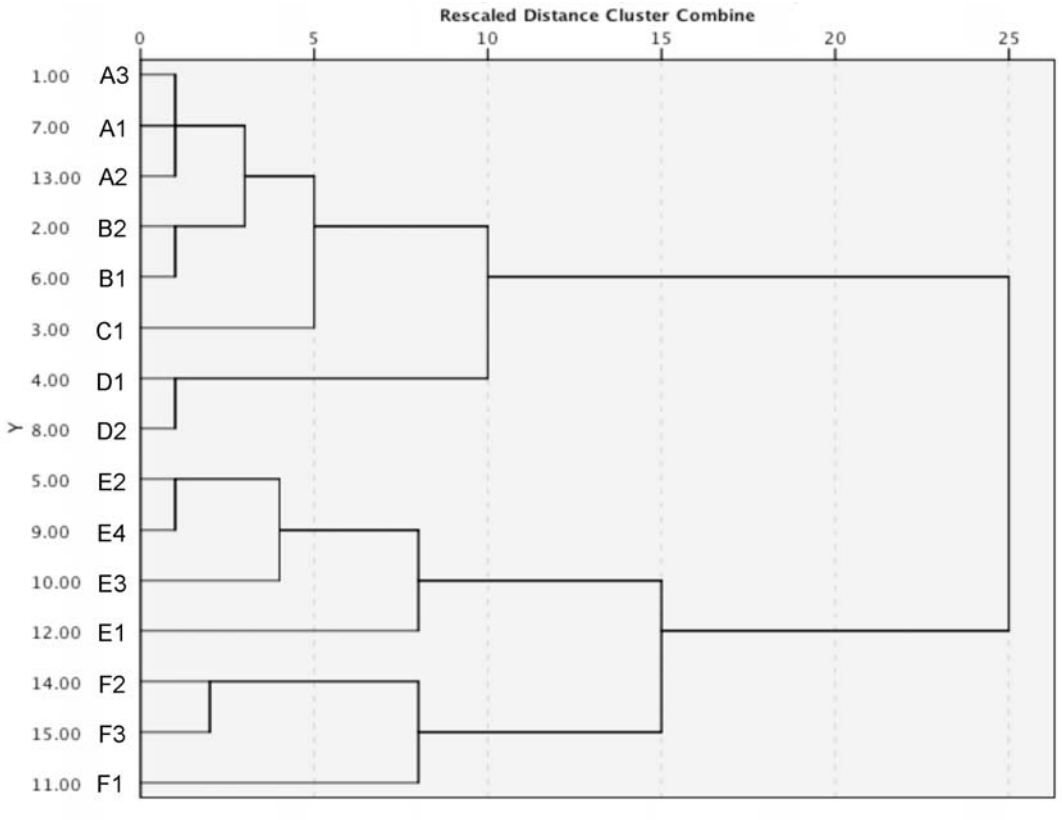
In the tables and maps that follow, we identify two levels of clusters: 15 clusters organized into six broad groups. To substantiate the validity of the six summary groups, average scores for the five components were computed for the 15 groups and analysed using cluster analysis.

The result is shown in the dendrogram in Figure 2. The branching nature of the dendrogram allows the researcher to follow a cluster forward until all 15 clusters are combined into one. Two identifiers are shown on the vertical axis: the initial numerical identification of the 15 clusters as input to SPSS (1, 7, 13 etc.) and the renumbered groups and clusters as they appear in the tables and maps that follow (A3, A1, A2 etc.). The letters designate the six broad groups and the numbers identify the clusters. This designation is used consistently in the tables and maps that follow.

We used the dendrogram as a guide for organizing the 15 clusters into fewer groups. Other considerations were the income ranking of the clusters, the maps, the cluster profiles based on the original variables, a desire to avoid single-member groups, and our understanding of the social geography of Canada's CMAs.

The result was a customized solution that differs a little from the precise six-group solution of the dendrogram. The precise six-group solution would combine the groups as follows: (A3, A1, A2, B2, B1 and C1) (D1 and D2) (E2, E4, E3) (E1) (F2, F3) and (F1). Instead we have used the following grouping: (A3, A1, A2) (B2, B1) (C1) (D1, D2) (E2, E4, E3, E1) and (F2, F3, F1). The only single member group is C: Old City Establishment. Compared to groups A and B the upper-income census tracts that form group C are located in older central cities.

Figure 2: Dendrogram Using Ward Linkage, 2006 Analysis



The next step is to identify the clusters. Rather than relying on the component scores, we used the original variables to identify the content of the clusters. Brief descriptive names for the six broad groups and the 15 clusters are shown in Table 6. The names are based on the more detailed information in Tables 8 (Economic Status), 9 (Age and Family and Household Status), 10 (Immigrant and Ethnic Status), 11 (Migrant and Housing Status), and 12 (Additional Variables). The nine variables not included in the principal components analysis due to low correlations (including Aboriginal ethnic origin) are shown in Table 12. Tables 8 to 12 are presented in Section 5: Additional Tables.

The values in the first part of Tables 8 to 12 indicate the mean values for each of the 30 variables for the six broad groups (shown in red) and the 15 clusters. The values in the second part of these tables are derived from dividing the cluster mean by the overall mean (e.g., in Table 8, Cluster 1: POP6506 = 16.8%/13.1% = 1.28), indicating that persons 65 years and over are disproportionately represented in this cluster. Variables that are substantially overrepresented (above 1.25) in each cluster are highlighted in yellow and variables that are notably underrepresented (below 0.75) are highlighted in green.

The distribution of cluster membership by census metropolitan area (CMA) is presented in Table 7 and Figure 3. Aside from Toronto, not all clusters are represented in each CMA. The difference is primarily by size of city, an indication of the social complexity of each CMA: Toronto (15 clusters), Montréal and Vancouver (14 each), Calgary, Hamilton, and Ottawa (12 each), Winnipeg (11), and Halifax (9).

Table 6: Neighbourhood Clusters, 2006 Analysis

(15 Clusters Organized into 6 Broad Groups Based on a Hierarchical Cluster Analysis of 5 Component Scores Derived from a Principal Components Analysis of 30 Variables at the Census Tract Level)

A: Older Working Class

- A1 Non-Immigrant
- A2 Immigrant
- A3 Almost Middle Class

B: Urban/Suburban Homeowner

- B1 Affluent
- B2 Working Class

C: Old City Establishment

- C1 Affluent Professionals

D: Young, Single & Mobile Renters

- D1 Well-Educated Professionals
- D2 Low-Income Recent Immigrants

E: Disadvantaged Groups

- E1 Impoverished Recent Immigrants in High-Rise Apts
- E2 Lower Status in Older Low-Rise Apts
- E3 Better-Educated Recent Immigrants in High-Rise Apts
- E4 Immigrant Diversity in Mixed Residential Areas

F: Family Ethnoburbs

- F1 East Asian Lower Income
- F2 Multicultural Middle Income
- F3 South Asian Larger Families

Maps for the individual census metropolitan areas appear in alphabetical order at the end of the report. A separate file contains PDF versions of the maps that can be expanded. An asterisk indicates clusters not represented on an individual map.

A brief discussion of each cluster follows. We have not attempted a detailed interpretation of the spatial representation of the typology for each census metropolitan area. We leave that to the researchers in each CMA who are familiar with the local social geography.

2.3 Interpretation of the Typology

2.3.1 Group A: Older Working Class

This group is characterized by census tracts with average values on many of the 30 variables. The population in these tracts is best identified as lower middle class: slightly lower than average levels of educational achievement and income. There is also an above-average incidence of seniors and single-person households, as well as renters living in older low-rise apartments where maintenance is a problem.

Of the three clusters in this group, cluster A1 (Non-Immigrant) is of considerably lower economic status, with a larger proportion of single-person households, single-parent families, and an older population. This cluster also has a substantially lower incidence of immigrant population, but a relatively high prevalence of Aboriginals.

In contrast, cluster A2 (Immigrant) is distinguished by a higher incidence of immigrants, including Southern Europeans. This cluster also has a higher prevalence of persons employed in manufacturing.

The third cluster in this group (A3: Almost Middle Class) includes persons of a slightly higher economic status, especially evident by the percentage with a university degree and employed in managerial or professional occupations. As with cluster A1 (Non-Immigrant), there is a relatively high level of single-person households. The housing stock is a mix of older low-rise and high-rise housing.

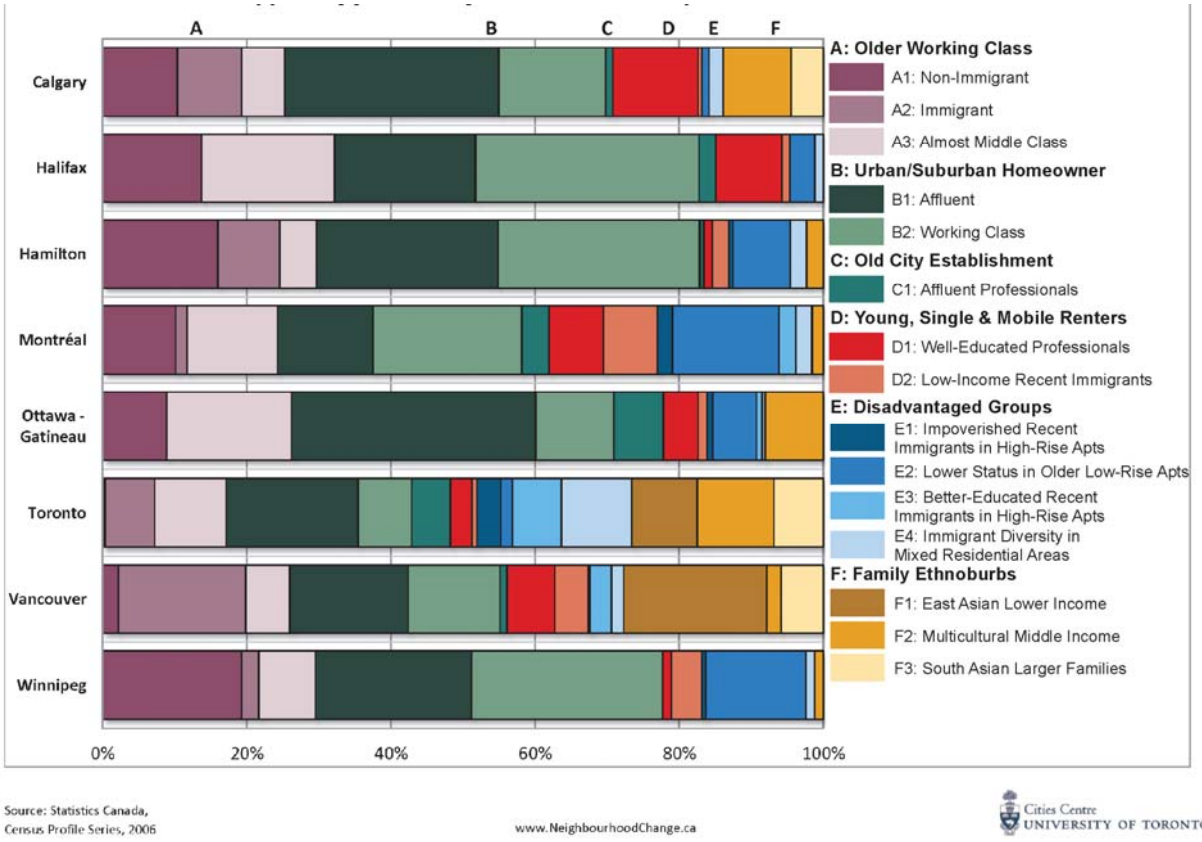
Almost one-quarter of the census tracts fall into this group. The incidence of Older Working Class tracts is spread between the eight CMAs with a slightly higher proportion in Halifax, Hamilton, and Winnipeg. Generally, these tracts are located in older inner suburbs. Cluster A1 (Non-Immigrant) is more apparent in Halifax, Hamilton, and Winnipeg, while Cluster A2 (Immigrant) is especially evident in Vancouver. In contrast, Cluster A3 (Almost Middle Class) appears most often in Halifax and Ottawa, cities with a high proportion of professional employees, especially in the government sector.

Table 7: Cluster Membership by Census Metropolitan Area (CMA), 2006 Analysis

(Percentage of census tracts in each CMA in each cluster: e.g., 25.2% of Calgary's census tracts are in Cluster A, 10.4% in Cluster A7, etc.)

Cluster	Calgary	Halifax	Hamilton	Montréal	Ottawa	Toronto	Vancouver	Winnipeg	TOTAL
A: Older Working Class	25.2	32.2	29.7	24.3	26.2	17.1	25.9	29.5	23.2
A1: Non-Immigrant	10.4	13.8	16.0	10.1	8.9	0.3	2.2	19.3	6.8
A2: Immigrant	8.9	0.0	8.6	1.6	0.0	6.9	17.6	2.4	6.1
A3: Almost Mid. Class	5.9	18.4	5.1	12.6	17.3	9.9	6.1	7.8	10.3
B: Urb/Sub Homeowner	44.6	50.5	53.1	33.9	44.8	25.8	25.1	48.2	34.5
B1: Affluent	29.7	19.5	25.1	13.3	33.9	18.3	16.4	21.7	19.2
B2: Working Class	14.9	31.0	28.0	20.6	10.9	7.5	12.7	26.5	15.3
C: Old City Establishm't	1.0	2.3	0.6	3.8	6.9	5.3	1.0	1.0	3.6
C1: Affl. Professionals	1.0	2.3	0.6	3.8	6.9	5.3	1.0	1.0	3.6
D: Young, Single, Mobile Renters	12.4	10.3	3.4	15.0	6.0	3.7	11.3	5.4	8.8
D1: Well-Educated Professionals	11.9	9.2	1.1	7.6	4.8	3.0	6.6	1.2	5.4
D2: Low-Income Recent Immigrants	0.5	1.1	2.3	7.4	1.2	0.7	4.7	4.2	3.4
E: Disadvantaged Groups	3.0	4.5	10.9	21.4	8.1	21.4	4.8	15.7	15.7
E1: Recent Immigrants in High-Rise Apts.	0.0	0.0	0.6	2.1	0.8	3.3	0.0	0.6	1.8
E2: Lower Status in Older Low-Rise Apts.	1.0	3.4	8.0	14.8	6.0	1.6	0.2	13.9	6.4
E3: Better Educated in High-Rise Apts.	0.0	0.0	0.0	2.3	0.8	6.7	2.9	0.0	3.2
E4: Imm. Diversity in Mixed Res. Areas	2.0	1.1	2.3	2.2	0.4	9.8	1.7	1.2	4.3
F: Family Ethnoburbs	13.9	0.0	2.3	1.6	8.1	26.6	27.8	1.2	14.2
F1: East Asian Lower Income	0.0	0.0	0.0	0.1	0.0	9.2	19.9	0.0	5.5
F2: Multicultural Middle Income	9.4	0.0	2.3	1.5	8.1	10.6	2.0	1.2	5.4
F3: South Asian Larger Families	4.5	0.0	0.0	0.0	0.0	6.8	5.9	0.0	3.2
Total CTs	202	87	175	860	248	993	408	166	3,139

**Figure 3: Eight Canadian Metropolitan Areas:
A Typology of Neighbourhoods by Census Tracts, 2006**



2.3.2 Group B: Urban/Suburban Homeowner

As the title suggests, this group is identified by a low level of rental occupancy (that is, a high level of owner occupancy). Census tracts in this group also have a high incidence of single detached dwellings, a low incidence of immigrants, a relatively high proportion of persons from British and other European ethnic backgrounds, and a low level of residential turnover during the previous five years. These tend to be stable residential areas constructed primarily in the post–Second World War period, most often, but not exclusively, in the outer suburbs.

The group is further identified by level of economic status. Cluster B1 (Affluent) includes persons with a relatively high level of educational achievement and household income. The population is strongly British and other European.

Cluster B2 (Working Class) contains a population with lower levels of educational achievement and more people employed in the manufacturing sector. It also contains proportionately more Aboriginals and people of French ethnic background than Cluster B1 (Affluent).

This group accounts for about one-third of the census tracts in the analysis, almost evenly split between the two clusters. Cluster B1 (Affluent) is most prevalent in Ottawa and Calgary, the

two cities of the eight with the highest levels of household income and amongst the highest with respect to university degree holders.

In contrast, cluster B2 (Working Class) is most evident in Halifax, Hamilton, and Winnipeg, cities with an above-average incidence of manufacturing and/or sales and service employment.

2.3.3 Group C: Old City Establishment

Group C, with only one cluster (C1: Affluent Professionals), is characterized by the highest incidence of persons with university degrees and employment in managerial and professional occupations. Like cluster B1 (Affluent), many persons in this cluster also have high household incomes. Compared to cluster B1 (Affluent), however, almost 40 percent of the housing stock in this cluster was built before 1946 and an equal percentage of the stock is rental. Furthermore, the physical type of housing includes a disproportionate amount of high-rise housing. Members of this affluent group spend a relatively low proportion of their income on housing. Like Group B, this cluster includes a comparatively low proportion of immigrants and a high proportion of persons of British and other European origins.

Although this cluster is found in all eight CMAs, it includes only 3.6 percent of the tracts. However, given the high economic status of persons in this cluster, these areas of the city are occupied by individuals and families whose influence in city affairs likely exceeds their relatively modest spatial representation. Ottawa, Toronto, and to a lesser extent Montréal have an above-average representation of tracts in this cluster. Of the eight CMAs in the analysis, Ottawa and Toronto have the highest proportion of degree holders and employees in managerial and professional occupations. The comparable figures for Montréal are lower, but Montréal is the business centre of Québec province and in that respect it is not surprising that Montréal is the only other CMA with an above-average representation of tracts in this cluster.

As suggested by the prevalence of older housing stock, the majority of tracts in this cluster are found in the historic high-income and highly desirable central areas of these CMAs. This is especially evident in Ottawa, Toronto, and Montréal and the historic south end of Halifax. In some neighbourhoods, such as Don Vale (Cabbagetown) in Toronto, these are areas where extensive gentrification has taken place.

2.3.4 Group D: Young, Single, and Mobile Renters

The major distinguishing features of this group are relatively high levels of degree holders and persons working in professional occupations, a young adult population, single-person households, a high incidence of residential turnover in the previous five years, rental tenancy, and disproportionate occupancy of older low-rise and high-rise apartment buildings, many needing major repair. In contrast, this group ranks considerably below average on high-income households and above average on low-income individuals. This is a relatively highly qualified group professionally that has not yet achieved a high level of household earnings. A disproportionate proportion of persons in this group are of French ethnic origin.

Two separate clusters further identify this group. Cluster D1 (Well-Educated Professionals) is distinguished by a higher proportion of degree holders and professional employees and slightly higher household incomes than Cluster D2 (Low-income Recent Immigrants). The latter are

identified by lower economic status, especially income, a relatively high incidence of unemployment and government transfer payments, and a greater prevalence of recent immigrants. Housing tends to be in greater need of major repair.

Group D accounts for about 9 percent of the tracts: 5.4 percent in Cluster D1 (Well-Educated Professionals) and 3.4 percent in Cluster D2 (Low-Income Recent Immigrants).

Census tracts in this group are over-represented in Montréal, Calgary, Vancouver, and Halifax. Calgary and Halifax have very little representation in cluster D2 (Low-Income Recent Immigrants). Most tracts from cluster D2 are located in Montréal, with Vancouver and Winnipeg accounting for many of the remaining tracts in this cluster.

Spatially, this group is located in the central areas of many CMAs. Cluster D1 (Well-Educated Professionals) is especially evident east of St. Laurent Boulevard in Montréal and in the downtown areas of Calgary, Vancouver, Halifax, and Toronto. Cluster D2 (Low-Income Recent Immigrants) is characteristic of parts of east-end Montréal and downtown Vancouver and Winnipeg. In both areas, the two clusters tend to be interspersed throughout the same general part of the CMA.

2.3.5 Group E: Disadvantaged Groups

Group E, consisting of four clusters, is characterized by a low level of educational achievement, persons engaged in manufacturing occupations, low income, a relatively high incidence of unemployment and government transfer payments, a high proportion of single-parent families, and a relatively high incidence of immigrants and recent immigrants, including persons of Caribbean and Latin American, African, South Asian and Southern European ethnic origins. Persons in this group tend to live in rented high-rise or low-rise apartments.

Cluster E1 (Impoverished Recent Immigrants in High-Rise Housing) exhibits the lowest economic status of the four clusters, especially with respect to income, unemployment, and government transfer payments. A disproportionate number of residents live in high-rise apartments that are often crowded and in need of substantial repair. Many residents also spend a large proportion of their income on rent.

Cluster E2 (Lower Status in Older Low-Rise Apts) is characterized by a relatively high proportion of single-person households, a lower proportion of immigrants than the other three clusters, a higher proportion of Aboriginals and persons of Latin America and Caribbean origins, and a high incidence of low-rise and older housing that is often in need of major repair. In contrast to the other three clusters, these apartments tend to be more affordable and less crowded.

Cluster E3 (Better-Educated Recent Immigrants in High-Rise Apartments) identifies persons with an average level of educational achievement, better than those in the other three groups, and not quite as high as the other three groups on low income, unemployment, and government transfer payments, although still substantially higher than average. This cluster has the highest incidence of recent immigrants and the second-highest incidence of total immigrants. It also has the highest incidence of people living in crowded high-rise apartments. This reflects the personal and housing status of recently arrived immigrants, many of whom are well

educated, but have difficulty finding a well-paying job and therefore spend a high proportion of their income on rent.

Cluster E4 (Immigrant Diversity in Mixed Residential Areas) differs from the other three clusters in that it has a high incidence of persons of Southern European origin. However, it also has a relatively large number of persons of Caribbean and Latin American, African, and South Asian origins. Thus, the descriptor immigrant diversity is appropriate. The dwelling indicators of affordability, suitability, and condition of dwelling are not as negative as for the other three clusters.

Group E accounts for almost 16 percent of the tracts in the analysis: 6.4 percent in cluster E2 (Lower Status in Older Low-Rise Apartments), 4.3 percent in cluster E4 (Immigrant Diversity in Mixed Residential Areas), 3.2 percent in cluster E3 (Better-Educated Recent Immigrants in High-Rise Apartments), and 1.8 percent in cluster E1 (Impoverished Recent Immigrants in High-Rise Apartments).

The spatial distribution of these clusters is rather complex and varies from cluster to cluster as well as by CMA. Cluster E1 (Impoverished Recent Immigrants in High-Rise Housing) is most evident in Toronto and Montréal, CMAs with the largest number of recent immigrants from impoverished non-Asian countries. Census tracts in this cluster are notably absent in Vancouver, where the predominant immigration stream in the last few decades has been from Asian countries. In Toronto, these census tracts are most clearly associated with social housing developments such as Regent Park, Alexandra Park, Weston–Mount Dennis, and Jane-Finch.

Cluster E2 (Lower Status in Older Low-Rise Apartments) is most evident in Montréal, where low-rise apartment stock predominates in neighbourhoods such as Saint-Léonard and Montréal Nord, and in Winnipeg, especially the North End, a close second, followed by Hamilton and Ottawa. In Toronto, a notable example is Lawrence Heights, a social housing complex and one of the few extensive low-rent and low-rise developments in the city.

Cluster E3 (Better-Educated Recent Immigrants in High-Rise Apartments) predominates in Toronto and to a lesser extent Vancouver and Montréal. In Toronto, these census tracts are spread in clusters throughout the city and include relatively low-cost private rental apartments that house recent immigrants from a variety of source countries. Examples include Parkdale (primarily Tibetan), Crescent Town (Bangladesh and other Asian groups), and Thorncliffe Park/Flemingdon Park (multicultural).

Cluster E4 (Immigrant Diversity in Mixed Residential Areas) dominates in Toronto, but is found in all other CMAs. In Toronto, these census tracts are located in the older northwest corridor and central Scarborough, areas of post–Second World War Southern European settlement that have become more ethnically diverse.

2.3.6 Group F: Family Ethnoburbs

As implied by the name, these are areas of immigrant settlement in the suburbs. The major distinguishing factors are an above-average number of persons per household, a very high immigrant and recent immigrant population, and recently constructed housing stock, primarily single detached. Because of its recent construction, the housing stock exhibits very little need

for major repair. Although the economic status variables are close to the mean, they vary by the three clusters that differentiate the group.

Cluster F1 (East Asian Lower Income) is an East Asian (primarily Chinese) immigrant enclave. This cluster has a higher incidence of degree holders than the other two clusters, and a considerably higher incidence of low-income families. In addition, the housing stock is slightly older.

Cluster F2 (Multicultural Middle Income) is characterized by a considerably higher income than the other two clusters, a substantially lower level of recent immigration, more Southern Europeans and single-parent families, and a greater prevalence of single detached dwellings and recently constructed houses.

Cluster F3 (South Asian Larger Families) is differentiated by a lower level of educational attainment than the other two groups and more people working in manufacturing jobs. Incomes and other indicators of economic status are about average. These households have more members and a higher proportion of children under 15 than the other two clusters. There is a relatively high percentage of immigrants and recent immigrants and, although South Asians predominate, other ethnic origins are also represented. The housing stock is relatively new and affordability is a potential problem, more so than for any of the other 14 groups.

Group F accounts for 14 percent of the census tracts in the analysis: 5.5 percent in cluster F3 (East Asian Lower Income), 5.4 percent in cluster F2 (Multicultural Middle Income), and 3.2 percent in cluster F1 (South Asian Larger Families).

Over half of the census tracts from group F are found in Toronto and Vancouver. Most of the rest are in Calgary and Ottawa. There are important differences in CMA membership among the three groups. Vancouver accounts for a disproportionate number of tracts in cluster F1 (East Asian Lower Income), followed by Toronto. Five CMAs are not represented in this cluster. Toronto, Calgary, and Ottawa predominate among the tracts in cluster F2 (Multicultural Middle Income) and Toronto, Vancouver, and Calgary are the only CMAs represented in cluster F3 (South Asian Larger Families).

In Toronto and Vancouver, these clusters occupy distinct social geographies. For example, in Toronto, cluster F1 (East Asian Lower Income) is located in both the City of Toronto (northeast North York and northwest Scarborough) and in the outer suburbs immediately to the north (southeast Markham and part of Richmond Hill). Cluster F2 (Multicultural Middle Income) is situated in the outer suburbs (north and northeast Markham, northern Richmond Hill, Vaughan, and large parts of Brampton and Mississauga). In Toronto, Cluster F3 is located primarily in northwest Etobicoke, Mississauga north of Highway 401, and suburban Brampton, important areas of South Asian settlement.

3. Summary and Conclusion

This report includes an overview of the background literature and the data and methodology used in developing a typology of neighbourhoods for eight Canadian CMAs and a typology of these neighbourhoods, using a joint analysis of 2006 census tract data. A typology of neighbourhood change between 1981 and 2006 will be presented in a separate report.

The context for the research draws from neighbourhood-based studies in the late 19th and early 20th centuries, followed by social area and factorial ecology studies in the post–Second World War period. The factorial ecology studies were designed to test assumptions of the social area analysts and generally confirmed the existence of three major dimensions of socioeconomic structure in industrialized cities: economic status, family status, and ethnic status. Later studies confirmed the increased complexity of Canada's urban social geography. Following a hiatus in this type of research from the 1970s to the 1990s, an increased number of studies now focus on methodological refinements and the development of typologies of urban neighbourhoods.

The present study draws on 2006 census tract data for 3,139 tracts in eight CMAs and includes 30 variables related to economic status, age, family, and household status, immigrant and ethnic status, migrant status, and housing status. A principal components analysis of these variables resulted in five interpretable components accounting for about 77 percent of the variance in the original 30 variables. The components are Economic Status, Family/Housing Status, Immigration/Ethnic Status, Residential Mobility, and Immigrant Disadvantage.

A cluster analysis was undertaken using the component scores from the five components. This resulted in two levels of clusters: 15 clusters organized into 6 summary groups. Based on their position relative to the original 30 variables, the six groups were identified as: Older Working Class, Urban/Suburban Homeowner, Old City Establishment, Disadvantaged Groups, and Family Ethnoburbs. Separate clusters in all but the "Old City Establishment" group further differentiated the individual groups. Toronto includes all 15 clusters while Halifax has only 9. The number of tracts in the other CMAs lies between these two CMAs, depending on city size and social complexity. Larger and more socially complex cities exhibit the largest number of clusters.

The clusters were mapped for each CMA. Although not all clusters appear in every CMA, there is a degree of commonality to the location of the clusters. Of the 6 broad groups, the "Older Working Class" group is generally found in the inner suburbs. In contrast, the "Urban/Suburban

Homeowner" group is located primarily in stable residential areas constructed mainly in the post–Second World War period, while "Old City Establishment" group is situated in older high-income, inner-city areas and areas in which gentrification has taken place, especially in Ottawa, Toronto, and, to a lesser extent, Montréal. A fourth group, "Young, Single and Mobile Renters," consists of two contrasting clusters based on economic status: "Well-educated Professionals" and "Low-income Recent Immigrants." Like "Old City Establishment," this group is located in the central areas of many CMAs.

The remaining two groups, "Disadvantaged Groups" and "Family Ethnoburbs" are characterized by differentials in immigrant status, ethnic origin, and economic status. They are complex groups both structurally and spatially, with "Disadvantaged Groups" subdivided into four clusters, and "Family Ethnoburbs" into three. Clusters in the "Disadvantaged Groups" category consist primarily of persons of Caribbean and Latin American, African, South Asian, and Southern European ethnic origins who are likely to experience considerably lower economic status and be housed in rental accommodation than members of the "Family Ethnoburbs" group that primarily consists of South and East Asian newcomers and earlier arrivals from Southern Europe. Spatially, clusters identified as "Disadvantaged Groups" tend to be located in multifamily housing in post–Second World War inner suburbs while clusters in the "Family Ethnoburbs" group are more likely to be located in the inner and outer suburbs, primarily in new-build, single-family housing. Together, these two groups reflect the diversity of Canada's dramatically changed post–Second World War ethnocultural character.

The typology is an important portrayal of the increasingly complex social geography of Canada's CMAs. It is one of the few Canadian studies to include all census tracts simultaneously in a single analysis rather than analyzing each CMA separately. In that respect, it permits a comparison of census tracts and ultimately neighbourhood types among the eight CMAs in the analysis. This achievement is important in itself, but it also provides a sampling frame for comparative neighbourhood studies across CMAs. Careful analysis of the results will highlight areas for future research particularly focusing on the "why" questions rather than the "what" questions, which the method used in this report is most effective in answering.

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5. Additional Tables

Table 8: Economic Status (Education, Occupation, Income, Govt. Transfer Payments, Unemployment), 2006 Analysis

CLUS	DEG 06	ELEM 06	MAN 06	PROF 06	SALE SERV	MAN UF06	HIGH$ 06	LOW$ 06	GOVT TRAN	UNEM 06
A	28.8	19.9	15.7	21.8	24.9	18.3	16.3	16.1	11.9	6.4
A1	17.8	25.5	12.7	18.4	26.7	23.3	9.8	15.6	14.2	6.1
A2	27.4	20.7	15.0	18.8	26.0	21.3	19.7	17.4	11.5	6.4
A3	36.9	15.8	18.0	25.8	23.1	13.2	18.7	15.7	10.5	6.6
B	31.0	14.1	20.4	22.2	22.3	16.8	33.8	7.0	7.4	4.7
B1	40.1	10.1	24.3	25.1	21.2	11.7	41.9	6.5	5.8	4.7
B2	17.8	25.5	12.7	18.4	26.7	23.3	9.8	15.6	14.2	6.1
C	65.5	5.3	28.3	34.3	16.0	3.7	39.1	9.8	4.0	5.5
C1	65.5	5.3	28.3	34.3	16.0	3.7	39.1	9.8	4.0	5.5
D	46.5	12.7	17.6	28.9	22.4	9.4	11.5	21.6	9.5	7.1
D1	53.2	9.0	19.7	31.2	20.3	7.2	14.5	18.1	6.8	6.1
D2	35.9	18.5	14.2	25.3	25.7	12.9	6.7	27.3	13.7	8.7
E	25.1	26.3	11.3	17.9	27.8	24.4	8.8	30.7	18.4	10.2
E1	19.8	31.5	8.4	14.3	30.7	30.4	5.4	44.7	25.5	14.1
E2	20.1	30.4	10.4	18.1	29.0	23.4	5.7	31.8	20.6	10.6
E3	43.3	14.1	14.7	22.7	25.8	18.3	9.5	33.5	14.0	10.0
E4	20.8	27.1	11.2	15.4	26.4	28.2	14.4	21.3	15.4	8.1
F	36.0	16.5	18.2	20.8	23.2	20.2	29.9	16.7	8.9	6.4
F1	39.6	17.2	18.9	21.9	26.2	15.7	24.5	23.4	10.5	7.3
F2	37.9	12.0	21.2	23.7	20.7	16.9	39.2	9.5	5.9	5.2
F3	26.7	22.6	12.1	14.2	22.4	33.7	23.5	17.5	11.1	7.1
Total	32.9	17.3	17.6	22.3	23.7	17.7	23.5	15.6	10.4	6.4

CLUS	DEG 06	ELEM 06	MAN 06	PROF 06	SALE SERV	MAN UF06	HIGH$ 06	LOW$ 06	GOVT TRAN	UNEM 06
A	0.88	1.15	0.89	0.98	1.05	1.03	0.70	1.03	1.14	1.00
A1	0.54	1.47	0.71	0.83	1.13	1.35	0.42	1.00	1.36	0.94
A2	0.83	1.20	0.84	0.84	1.10	1.24	0.84	1.11	1.11	0.99
A3	1.12	0.92	1.00	1.16	0.97	0.77	0.79	1.00	1.01	1.03
B	0.94	0.82	1.16	1.00	0.94	0.95	1.44	0.45	0.71	0.73
B1	1.22	0.59	1.35	1.13	0.89	0.68	1.78	0.42	0.56	0.73
B2	0.59	1.11	0.86	0.84	1.00	1.35	1.00	0.50	0.90	0.72
C	1.99	0.31	1.57	1.54	0.68	0.22	1.66	0.63	0.38	0.85
C1	1.99	0.31	1.57	1.54	0.68	0.22	1.66	0.63	0.38	0.85
D	1.42	0.73	1.00	1.30	0.95	0.53	0.49	1.38	0.91	1.11
D1	1.62	0.52	1.12	1.40	0.86	0.41	0.62	1.16	0.65	0.95
D2	1.09	1.07	0.81	1.13	1.09	0.73	0.29	1.75	1.32	1.36
E	0.76	1.52	0.64	0.80	1.18	1.38	0.37	1.97	1.78	1.56
E1	0.60	1.83	0.47	0.64	1.30	1.77	0.23	2.86	2.45	2.20
E2	0.61	1.76	0.59	0.81	1.23	1.32	0.24	2.04	1.98	1.64
E3	1.09	1.07	0.81	1.13	1.09	0.73	0.29	2.15	1.35	1.36
E4	0.63	1.57	0.64	0.70	1.11	1.59	0.61	1.37	1.48	1.27
F	1.10	0.95	1.04	0.94	0.98	1.14	1.27	1.07	0.85	1.00
F1	1.21	1.00	1.07	0.98	1.11	0.88	1.04	1.50	1.01	1.13
F2	1.15	0.70	1.18	1.06	0.87	0.98	1.67	0.61	0.57	0.81
F3	0.81	1.31	0.69	0.64	0.95	1.90	1.00	1.12	1.07	1.10

Table 9: Age & Family and Household Status, 2006 Analysis

CLUSTER	POPLT1506	POP253406	POP506406	ONEPERS 06	SINGLEPAR 06	PPERHH06
A	15.0	13.9	18.8	14.5	20.0	2.4
A1	14.3	13.7	19.2	16.9	22.1	2.2
A2	16.5	13.8	18.3	9.0	17.9	2.8
A3	14.7	14.1	18.7	16.1	19.7	2.3
B	18.7	10.2	20.2	6.4	13.0	2.8
B1	18.2	8.9	21.3	6.0	11.8	2.9
B2	19.3	11.9	18.8	6.9	14.5	2.8
C	14.8	13.5	20.8	16.4	13.5	2.3
C1	14.8	13.5	20.8	16.4	13.5	2.3
D	9.3	25.8	15.9	28.5	18.2	1.8
D1	8.3	28.1	15.5	29.4	15.1	1.8
D2	10.8	22.1	16.5	27.0	23.2	1.9
E	18.2	15.6	16.1	13.3	26.8	2.5
E1	23.9	14.4	14.0	10.4	35.0	2.8
E2	17.0	15.6	17.0	17.2	29.6	2.3
E3	17.0	18.5	14.3	14.2	20.8	2.5
E4	18.6	13.9	16.9	8.1	23.7	2.8
F	20.3	14.2	16.4	4.5	14.5	3.3
F1	15.3	12.5	19.4	6.1	15.8	3.1
F2	23.2	14.7	14.7	3.6	12.4	3.3
F3	24.0	16.2	14.1	3.2	15.7	3.6
Total	17.0	14.0	18.3	11.4	17.5	2.6

CLUSTER	POPLT1506	POP253406	POP506406	ONEPERS 06	SINGLEPAR 06	PPERHH06
A	0.88	1.00	1.02	1.27	1.14	0.90
A1	0.84	0.98	1.05	1.48	1.27	0.83
A2	0.97	0.99	1.00	0.79	1.02	1.05
A3	0.86	1.01	1.02	1.42	1.13	0.86
B	1.10	0.73	1.10	0.56	0.74	1.08
B1	1.07	0.63	1.16	0.52	0.68	1.10
B2	1.13	0.85	1.03	0.61	0.83	1.05
C	0.87	0.97	1.14		0.77	0.88
C1	0.87	0.97	1.14	1.44	0.77	0.88
D	0.54	1.85	0.87	2.50	1.04	0.69
D1	0.49	2.01	0.84	2.58	0.87	0.68
D2	0.64	1.58	0.90	2.37	1.33	0.71
E	1.07	1.12	0.88	1.17	1.53	0.97
E1	1.40	1.03	0.76	0.91	1.33	1.05
E2	1.00	1.12	0.93	1.51	1.69	0.86
E3	1.00	1.33	0.78	1.25	1.19	0.96
E4	1.10	0.99	0.92	0.71	1.36	1.09
F	1.19	1.02	0.90	0.39	0.83	1.27
F1	0.90	0.89	1.06	0.54	1.19	1.18
F2	1.36	1.05	0.80	0.31	1.36	1.24
F3	1.41	1.16	0.77	0.28	0.83	1.38

Table 10: Immigrant and Ethnic Status (Immigration, Ethnic Origin, Home Language), 2006 Analysis

CLUSTER	IMMIG06	REC-IMMIG06	LATINSA CARIB06	AFRICAN 06	SOUTH ASIAN06	EAST ASIAN06	LANG NOTEF06
A	27.3	5.0	4.2	1.7	4.1	7.3	15.8
A1	12.6	2.2	2.5	0.9	0.9	1.8	6.0
A2	42.8	7.4	4.5	1.6	9.6	15.8	28.2
A3	27.8	5.5	5.1	2.2	3.0	5.9	14.9
B	18.3	1.9	2.5	0.9	2.6	4.0	7.3
B1	22.3	2.3	2.7	1.0	3.3	5.7	8.8
B2	13.2	1.4	2.2	0.7	1.8	1.9	5.4
C	27.0	4.7	3.4	1.7	2.4	6.3	9.6
C1	27.0	4.7	3.4	1.7	2.4	6.3	9.6
D	25.7	7.1	4.7	2.3	2.3	8.0	13.1
D1	25.3	6.9	4.3	2.2	2.5	8.1	11.5
D2	26.2	7.6	5.3	2.4	2.0	8.0	15.5
E	43.4	11.2	11.2	5.6	10.1	7.4	28.9
E1	55.8	14.5	20.1	13.3	18.0	6.2	39.3
E2	28.8	6.8	2.7	1.0	3.3	3.3	19.0
E3	58.6	21.6	6.9	3.7	17.4	17.4	40.4
E4	48.8	8.6	13.6	5.2	12.9	6.6	39.3
F	51.9	9.8	6.6	2.2	19.9	24.4	35.8
F1	62.4	11.4	3.2	1.2	11.2	49.0	48.4
F2	38.0	6.4	7.2	2.3	14.1	10.8	21.0
F3	55.2	13.0	11.1	3.5	44.5	5.5	39.4
Total	30.0	5.8	5.0	2.1	6.6	8.6	17.3

CLUSTER	IMMIG06	REC-IMMIG06	LATIN CARIB06	AFRICAN POP06	SOUTH ASIAN06	EAST ASIAN06	LANG NOTEF06
A	0.91	0.87	0.84	0.80	0.62	0.85	0.91
A1	0.42	0.38	0.49	0.44	0.13	0.21	0.35
A2	1.43	1.28	0.90	0.75	0.38	1.80	1.63
A3	0.93	0.96	1.00	1.06	0.46	0.68	0.86
B	0.61	0.33	0.49	0.41	0.4	0.47	0.42
B1	0.74	0.39	0.53	0.48	0.51	0.66	0.51
B2	0.44	0.25	0.45	0.33	0.27	0.22	0.31
C	0.90	0.81	0.88	0.80	0.36	0.73	0.56
C1	0.90	0.81	0.68	0.80	0.37	0.73	0.56
D	0.86	1.24	0.93	1.08	0.35	0.93	0.75
D1	0.84	1.19	0.85	1.04	0.38	0.95	0.67
D2	0.87	1.32	1.04	1.14	0.31	0.93	0.90
E	1.45	1.93	2.25	2.68	1.54	0.87	1.67
E1	1.86	2.52	3.97	6.32	2.75	0.72	2.27
E2	0.96	1.18	1.86	0.48	0.38	0.38	1.10
E3	1.95	3.72	1.38	1.77	2.65	2.02	2.33
E4	1.63	1.48	2.69	2.50	1.96	0.70	2.27
F	1.73	1.68	1.31	1.03	3.01	2.84	2.07
F1	2.08	1.98	0.64	0.59	1.71	5.70	2.80
F2	1.27	1.11	1.43	1.09	2.15	1.26	1.21
F3	1.84	2.26	2.19	1.69	6.79	0.65	2.28

Table 11: Migrant and Housing Status (Recent Movers, Tenure, Physical Structure, Affordability, Suitability, Condition), 2006 Analysis

CLUSTER	MOVERS 06	RENTED 06	SINGDET 06	LOWRISE 06	AFFORD 06	SUITABLE 06	CONDITION 06
A	43.2	43.1	32.3	29.5	33.8	0.99	8.0
A1	44.3	46.6	37.5	34.9	31.0	0.95	8.7
A2	42.3	31.8	38.8	20.1	40.7	1.02	6.8
A3	43.1	47.5	25.1	31.6	31.5	1.00	8.3
B	33.8	14.0	73.2	7.9	30.8	0.91	5.2
B1	31.8	12.3	74.3	6.5	28.9	0.89	4.8
B2	36.4	16.1	71.9	9.6	33.1	0.93	5.7
C	42.9	40.1	31.1	23.4	22.3	0.96	7.4
C1	42.9	40.1	31.1	23.4	22.3	0.96	7.4
D	59.6	70.1	4.6	54.5	31.4	1.17	9.8
D1	62.2	68.2	5.5	49.1	30.6	1.16	9.0
D2	55.5	73.3	3.2	63.1	32.6	1.18	11.2
E	48.3	61.7	16.7	35.9	40.0	1.22	10.2
E1	46.9	74.2	9.3	33.3	43.6	1.42	12.3
E2	47.5	68.5	13.2	53.6	34.6	1.12	11.6
E3	60.3	68.2	8.1	24.5	44.6	1.43	8.6
E4	41.0	41.7	31.1	19.2	43.1	1.12	8.4
F	49.5	18.7	51.2	9.2	47.2	1.06	3.9
F1	42.3	25.4	44.0	12.8	46.6	1.06	5.5
F2	51.8	9.7	63.6	4.2	42.4	1.00	2.4
F3	57.9	22.4	42.7	11.6	56.3	1.17	3.6
Total	43.1	34.8	44.2	22.2	35.0	1.02	6.9

CLUSTER	MOVERS 06	RENTED 06	SINGDET 06	LOWRISE 06	AFFORD 06	SUITABLE 06	CONDITION 06
A	1.00	1.24	0.73	1.33	0.96	0.97	1.16
A1	1.03	1.34	0.85	1.57	0.89	0.93	1.26
A2	0.98	0.91	0.88	0.91	1.16	1.00	0.98
A3	1.00	1.37	0.57	1.43	0.90	0.97	1.20
B	0.79	0.40	1.66	0.36	0.88	0.89	0.75
B1	0.74	0.35	1.68	0.29	0.83	0.88	0.69
B2	0.84	0.46	1.63	0.43	0.95	0.91	0.82
C	1.00	1.15	0.70	1.05	0.64	0.94	1.07
C1	1.00	1.15	0.70	1.05	0.64	0.94	1.07
D	1.38	2.02	0.10	2.46	0.90	1.14	1.42
D1	1.44	1.96	0.12	2.22	0.87	1.14	1.30
D2	1.29	2.11	0.07	2.85	0.93	1.15	1.61
E	1.12	1.77	0.38	1.62	1.14	1.20	1.48
E1	1.09	2.11	0.07	1.50	1.23	1.39	1.78
E2	1.10	1.97	0.30	2.84	1.01	0.99	1.68
E3	1.40	1.96	0.18	1.10	1.27	1.40	1.25
E4	0.95	1.20	0.70	0.87	1.23	1.19	1.22
F	1.15	0.54	1.16	0.41	1.35	1.04	0.52
F1	0.98	0.73	1.00	0.58	1.25	1.04	0.80
F2	1.20	0.28	1.44	0.19	1.21	0.98	0.35
F3	1.34	0.64	0.97	0.52	1.61	1.15	0.52

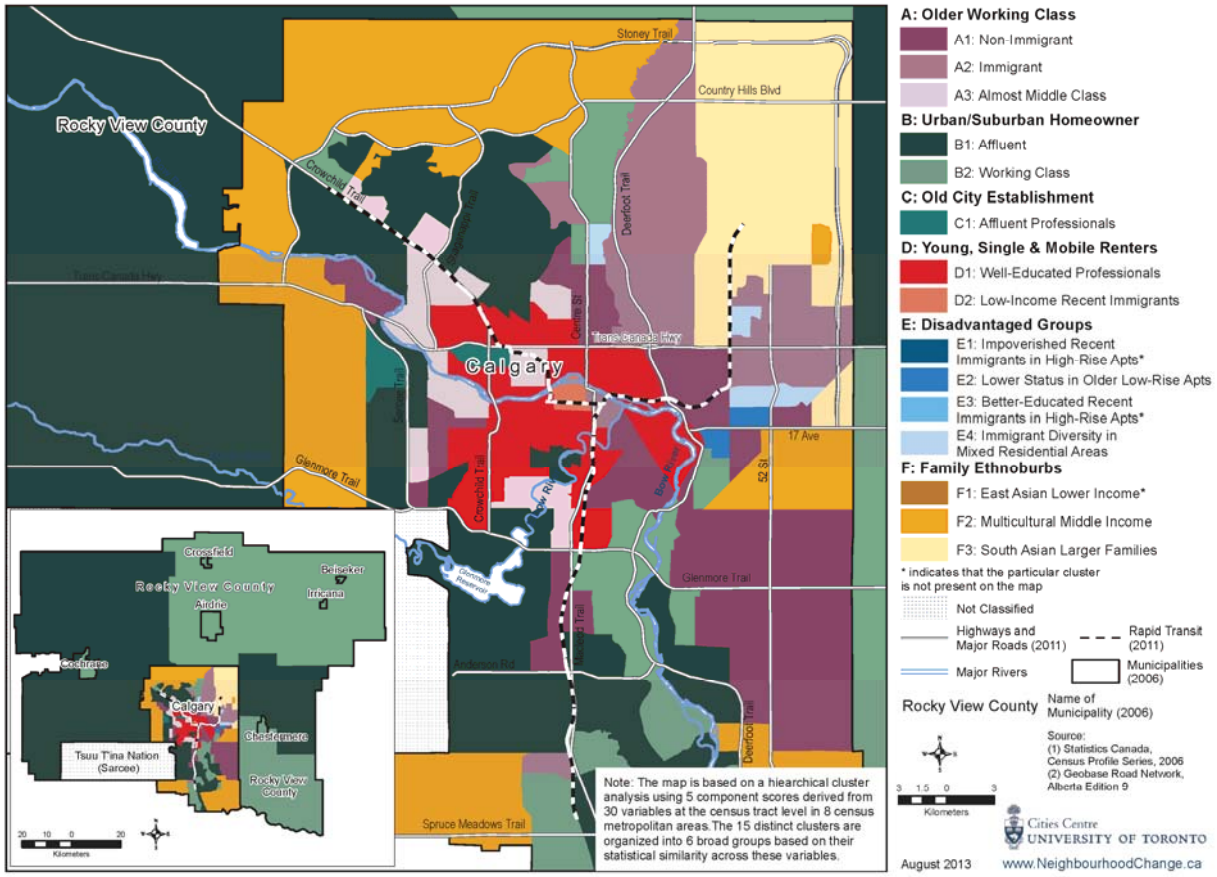
Table 12: Extra Variables (Population Over 65, Dwellings Built Before 1946, Dwellings Built 1996-2006, High Rise Apts, Aboriginals, British, French, Western Europeans, Southern Europeans), 2006 Analysis

CLUSTER	POP65	CBEF 1946	C960606	HIGH RISE	ABORIG-INAL	BRITISH	FRENCH	WNEEUR	SOUTH EUR
A	16.2	15.7	7.5	13.8	3.7	30.3	15.9	22.9	12.7
A1	17.3	14.8	7.1	8.4	5.7	30.1	23.2	22.3	7.7
A2	13.8	9.3	10.2	11.6	2.4	26.8	6.3	23.4	17.7
A3	16.8	20.1	6.2	18.8	3.0	32.5	16.9	23.1	13.1
B	12.3	6.0	15.0	2.8	3.1	38.5	16.9	28.3	12.0
B1	13.2	6.3	13.1	3.8	2.2	42.4	14.6	30.9	13.4
B2	11.3	5.7	17.4	1.7	4.1	33.6	19.7	25.0	10.2
C	15.7	38.6	9.2	25.3	1.4	39.8	16.2	29.8	11.3
C1	15.7	38.6	9.2	25.3	1.4	39.8	16.2	29.8	11.3
D	11.9	30.3	10.8	29.8	3.7	28.6	22.3	23.1	10.5
D1	10.7	29.7	13.3	34.4	3.2	32.8	21.4	26.0	10.6
D2	13.9	31.2	6.8	22.5	4.5	21.7	23.8	18.4	10.4
E	13.1	14.4	5.7	26.9	3.3	15.4	10.5	12.1	16.9
E1	10.1	9.5	3.5	43.1	1.8	8.6	4.2	6.3	14.2
E2	14.4	22.3	3.6	12.5	5.9	16.3	18.1	12.4	15.1
E3	11.5	8.1	11.7	56.3	1.2	14.6	5.6	15.5	11.0
E4	13.4	9.5	5.1	19.6	1.8	17.3	5.4	11.6	25.1
F	9.9	2.7	35.9	9.2	1.3	18.1	4.9	14.8	12.0
F1	14.4	5.7	17.8	15.6	0.8	12.6	2.3	11.5	7.7
F2	6.6	0.8	51.6	3.0	1.6	26.5	8.7	20.7	17.1
F3	7.9	1.0	40.5	8.5	1.4	13.4	2.9	10.5	10.5
Total	13.1	12.4	14.2	13.2	3.0	29.3	14.4	22.2	12.8

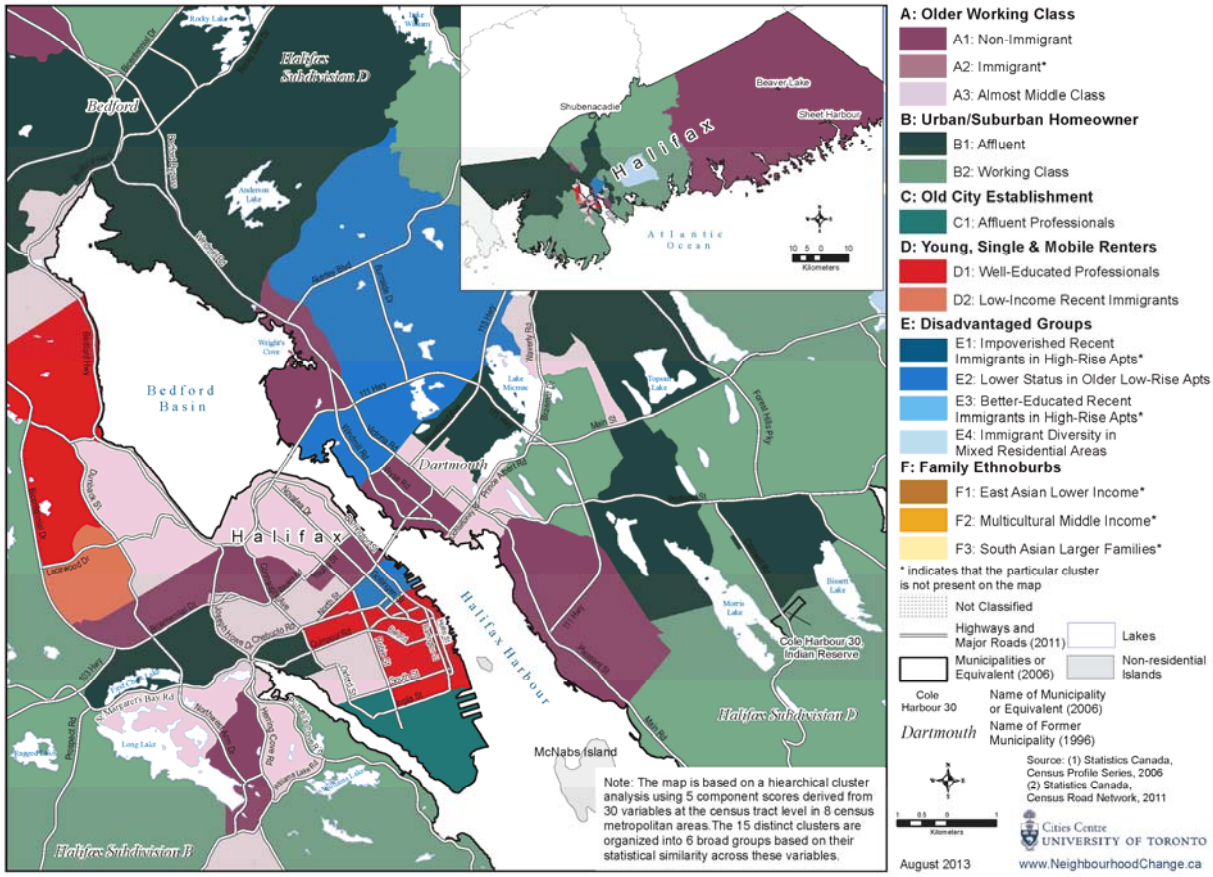
CLUSTER	POP65	CBEF 1946	C960606	HIGH RISE	ABORIG-INLA	BRITISH	FRENCH	WNEEUR	SOUTH EUR
A	1.24	1.27	0.53	1.05	1.23	1.03	1.10	1.03	0.99
A1	1.32	1.19	0.50	0.63	1.9	1.03	1.61	1.01	0.60
A2	1.06	0.75	0.72	0.88	0.8	0.91	0.43	1.05	1.38
A3	1.28	1.62	0.44	1.42	1.0	1.11	1.17	1.04	1.03
B	0.94	0.48	1.06	0.21	.33	1.31	1.17	1.27	0.94
B1	1.01	0.51	0.92	0.29	.73	1.45	1.02	1.39	1.05
B2	0.86	0.46	1.23	0.13	1.37	1.15	1.37	1.13	0.80
C	1.20	3.11	0.65	1.92	.47	1.36	1.13	1.34	0.89
C1	1.20	3.11	0.65	1.92	.47	1.36	1.12	1.34	0.89
D	0.91	2.44	0.73	2.26	1.23	0.98	1.55	1.04	0.82
D1	0.82	2.40	0.94	2.60	1.1	1.12	1.49	1.17	0.83
D2	1.07	2.51	0.48	1.70	1.5	0.74	1.65	0.83	0.81
E	1.00	1.16	0.4	2.04	1.1	0.53	0.73	0.55	1.32
E1	0.77	0.77	0.25	3.26	0.6	0.29	0.29	0.29	1.11
E2	1.11	1.79	0.25	0.94	1.97	0.56	1.26	0.56	1.18
E3	0.88	0.65	0.77	4.25	0.4	0.50	0.39	0.70	0.86
E4	1.02	0.77	0.36	1.48	0.6	0.59	0.37	0.52	1.96
F	0.76	0.22	2.53	0.70	.43	0.62	0.34	0.67	0.94
F1	1.10	0.46	1.25	1.18	.27	0.43	0.16	0.52	0.61
F2	0.51	0.06	3.63	0.23	.53	0.90	0.60	0.93	1.34
F3	0.61	0.08	2.86	0.64	.47	0.46	0.20	0.47	0.82

6. Maps

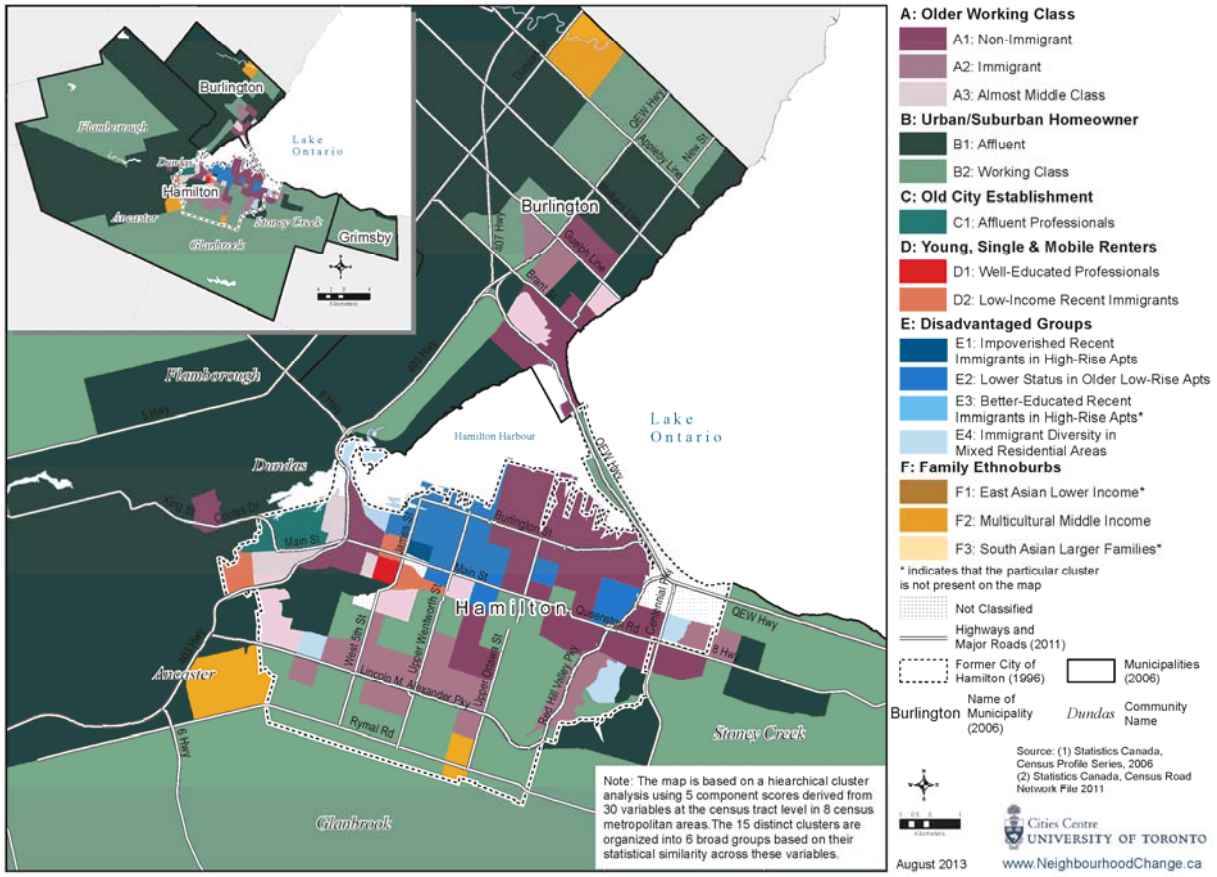
Calgary CMA: Typology of Neighbourhoods by Census Tracts, 2006



Halifax CMA: Typology of Neighbourhoods by Census Tracts, 2006



Hamilton CMA: Typology of Neighbourhoods by Census Tracts, 2006



A: Older Working Class
- A1: Non-Immigrant
- A2: Immigrant
- A3: Almost Middle Class

B: Urban/Suburban Homeowner
- B1: Affluent
- B2: Working Class

C: Old City Establishment
- C1: Affluent Professionals

D: Young, Single & Mobile Renters
- D1: Well-Educated Professionals
- D2: Low-Income Recent Immigrants

E: Disadvantaged Groups
- E1: Impoverished Recent Immigrants in High-Rise Apts
- E2: Lower Status in Older Low-Rise Apts
- E3: Better-Educated Recent Immigrants in High-Rise Apts*
- E4: Immigrant Diversity in Mixed Residential Areas

F: Family Ethnoburbs
- F1: East Asian Lower Income*
- F2: Multicultural Middle Income
- F3: South Asian Larger Families*

* indicates that the particular cluster is not present on the map

Not Classified

Highways and Major Roads (2011)

Former City of Hamilton (1996)

Municipalities (2006)

Burlington Name of Municipality (2006)

Dundas Community Name

Source: (1) Statistics Canada, Census Profile Series, 2006
(2) Statistics Canada, Census Road Network File 2011

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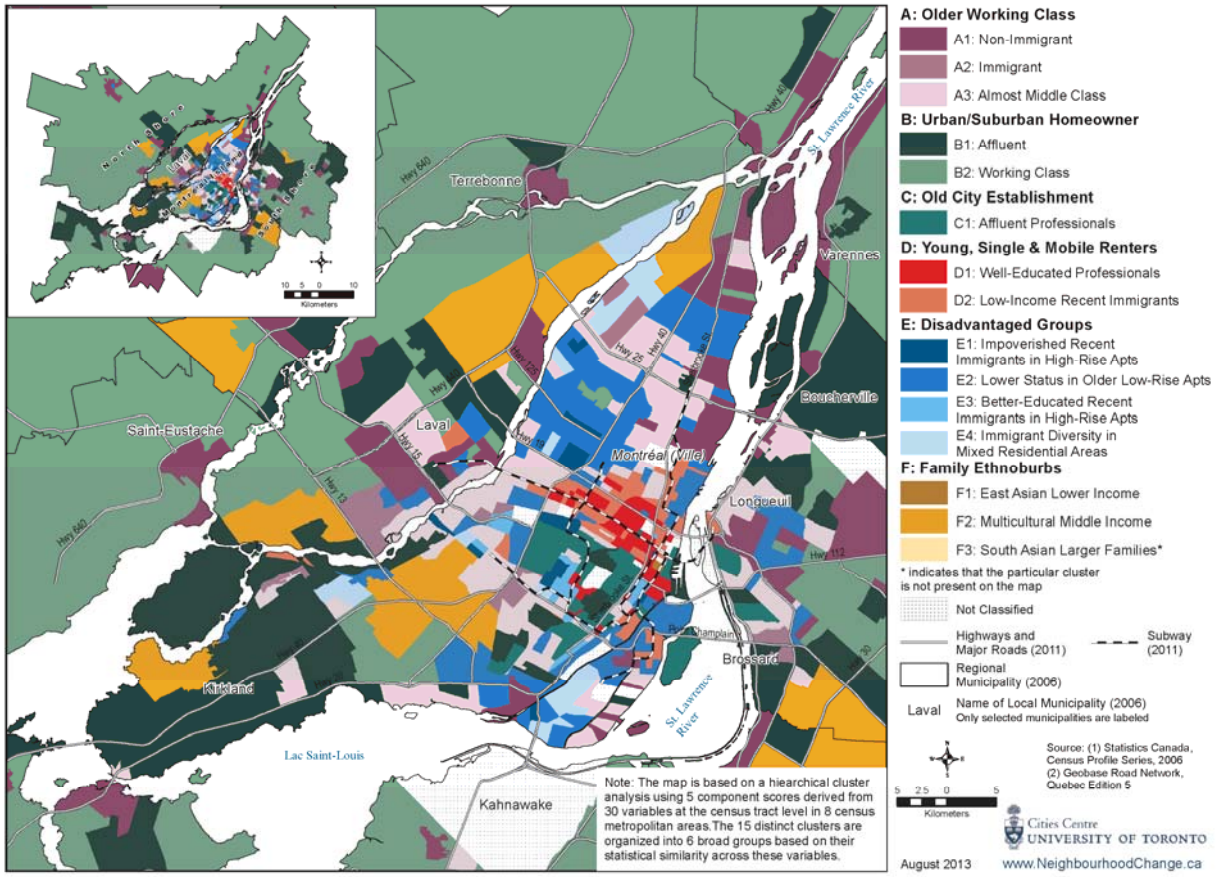
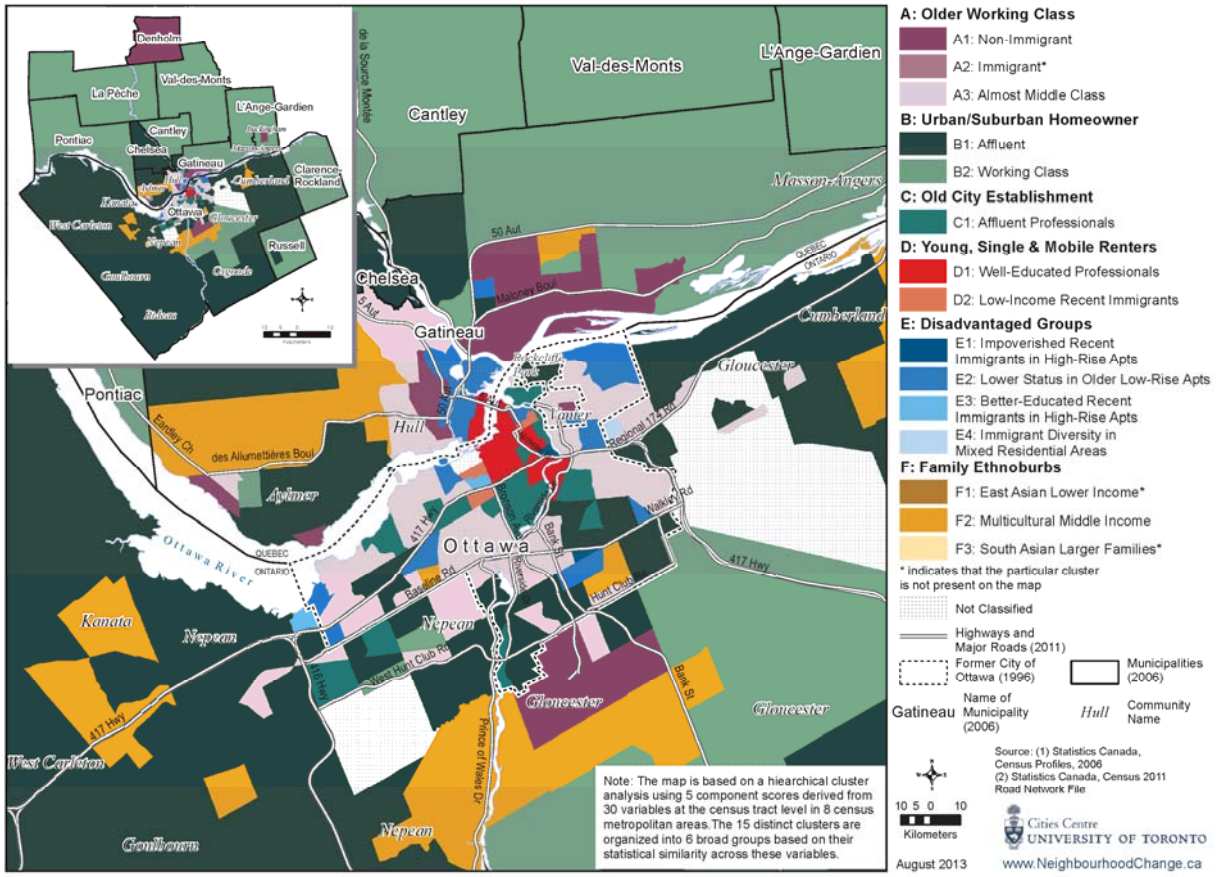
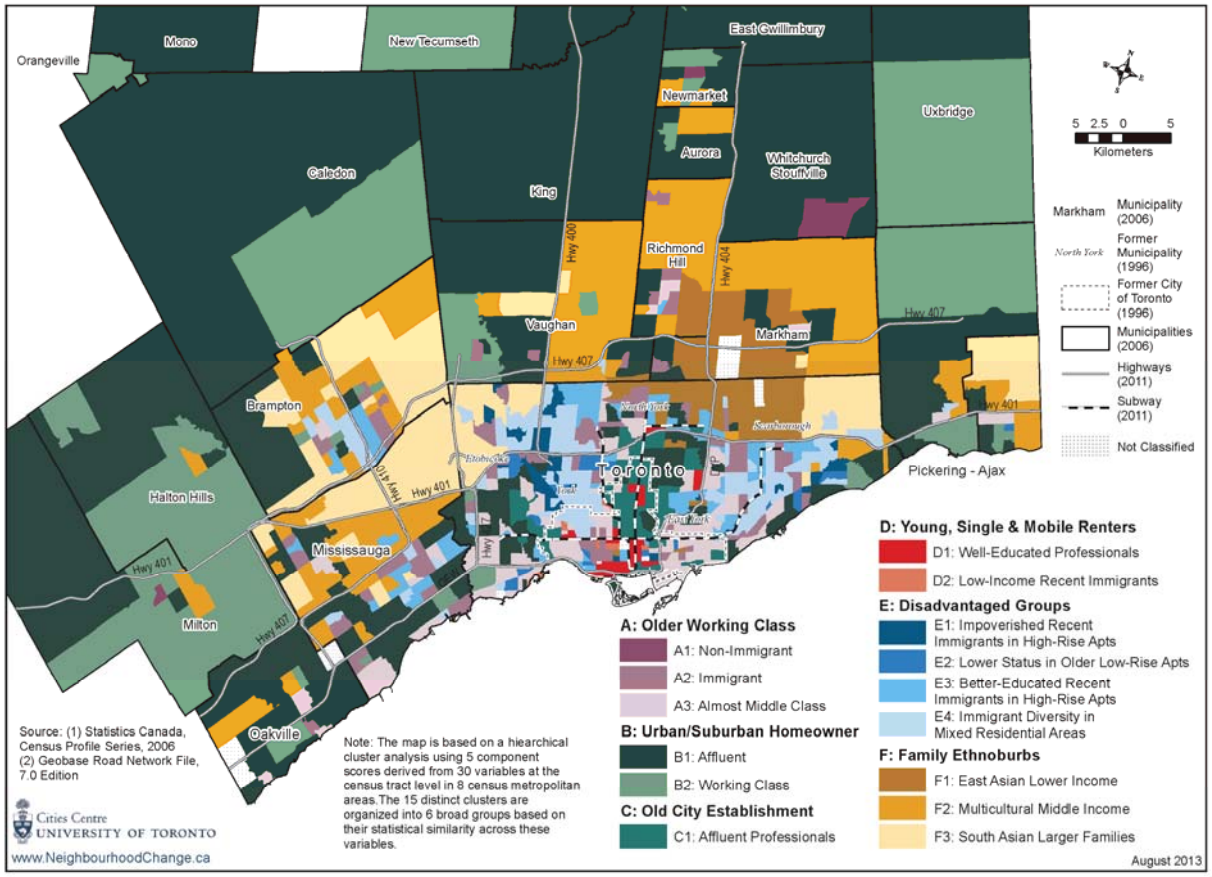
Montréal CMA: Typology of Neighbourhoods by Census Tracts, 2006



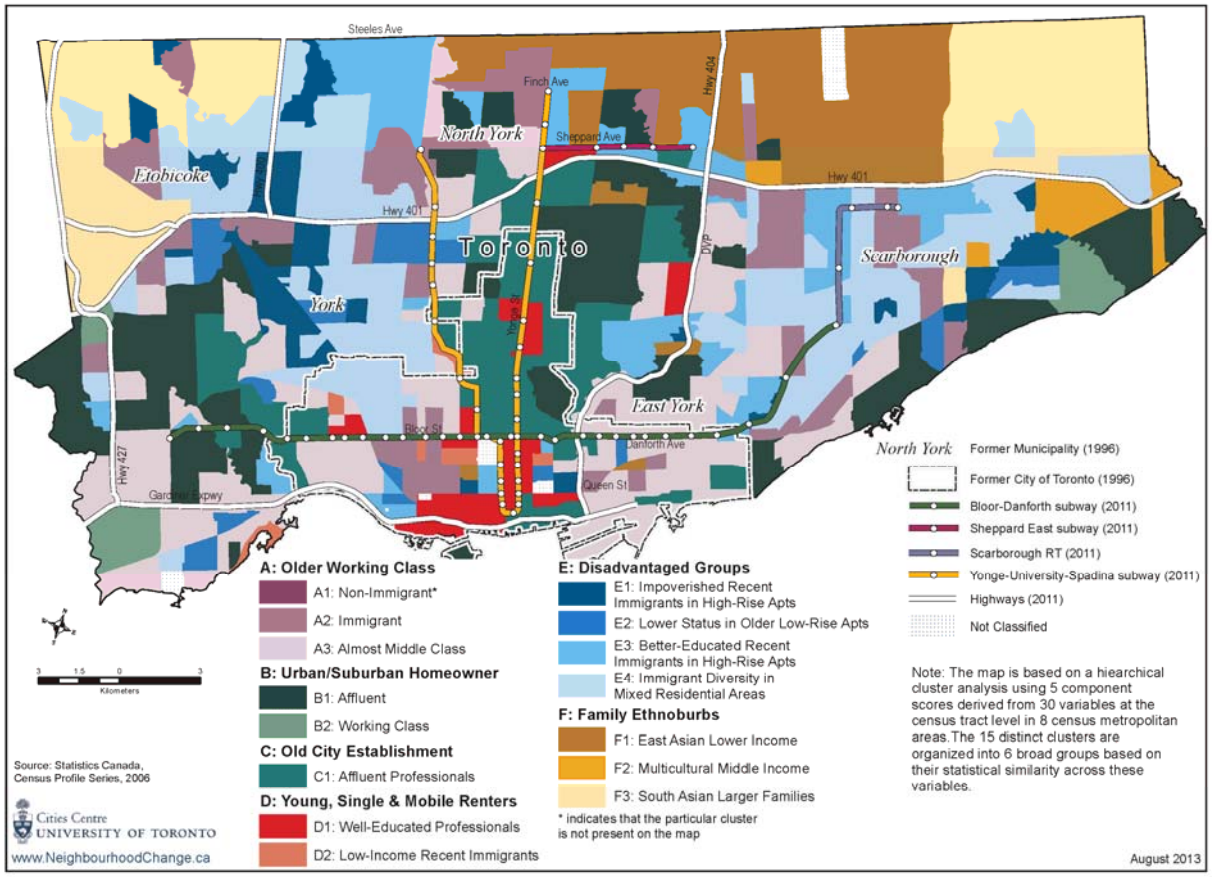
Ottawa - Gatineau CMA: Typology of Neighbourhoods by Census Tracts, 2006



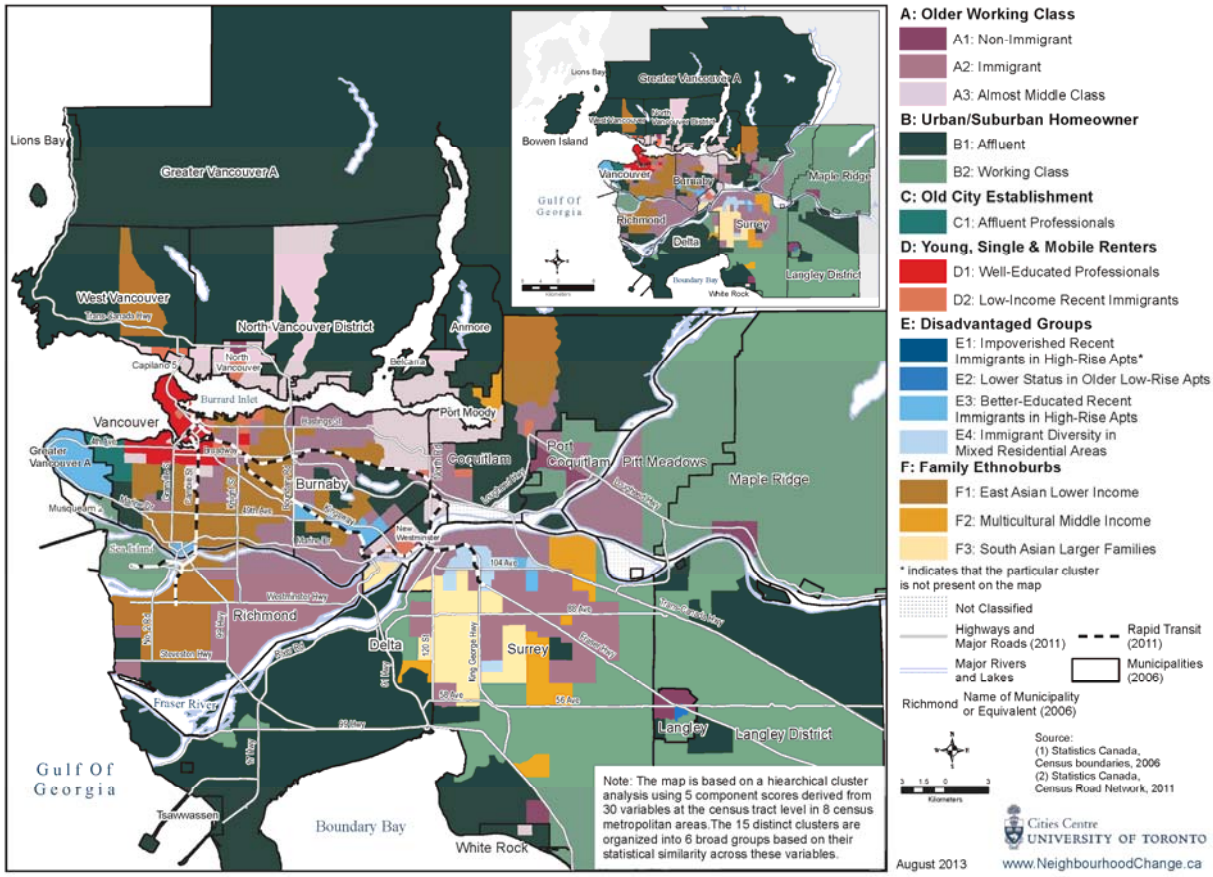
Toronto CMA: Typology of Neighbourhoods by Census Tracts, 2006



City of Toronto: Typology of Neighbourhoods by Census Tracts, 2006



Vancouver CMA: Typology of Neighbourhoods by Census Tracts, 2006



Winnipeg CMA: Typology of Neighbourhoods by Census Tracts, 2006