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Canadian well-being but rather as a contribution to policies dedicated to dealing constructively with regional disparities.

In setting the stage for this kind of study, there is a need to consider firstly some of the broader issues and concepts within this field. As has been noted, the subject of well-being can be examined from many different perspectives. With this in mind, the thesis introduces and discusses some of the more conceptual and theoretical points to have been raised with respect to welfare. Throughout this discussion, the approach will be one which exposes the reader to what may be referred to as the "continuum of well-being". This continuum extends from the metaphysical to the concrete. In this presentation, the most general level will be that which considers the matter of "social justice" and "equality". This will then be made more tangible by considering applications as developed in the field of "social welfare". At this stage, the remarks will focus on contributions from the social sciences. Finally, the matter of well-being will focus on the more disaggregative and substantive elements of "social indicator analysis". The opening chapters of this presentation will treat each of these individually in providing a conceptual background and will then test this foundation through a Canadian case study.

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The undersigned recommend to the Faculty of Graduate Studies
and Research acceptance of the thesis

"SOCIAL WELL-BEING: AN ANALYSIS OF THE CANADIAN URBAN SYSTEM"

submitted by

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in partial fulfillment of
the requirements for the degree of
Master of Arts

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Abstract

This study investigates the spatial nature of social well-being in Canada. It is premised on the hypothesis that, despite greater affluence within Canadian society, there are reminders that the prosperity is not equally distributed. In providing for an empirical context to this hypothesis, the study focusses on an investigation of Canadian cities, documenting well-being through the use of social indicators.

In the early stages, the presentation explores the more conceptual aspects related to the definition and composition of social well-being. It raises both philosophical and theoretical issues of justice and welfare in situating the concept of well-being along a continuum. It then examines the utility of social indicators in studies of this nature.

The use of social indicators as measures of regional variation in well-being serves to document the situation in urban Canada. The application compares cities across a variety of techniques and clearly points to regional differences. The differences in living conditions are exhibited at both a regional and a city scale.

The principal findings depict an urban system which is differentiated on the grounds of economic, family and cultural dimensions. Moreover, the results point to a geographical variation which distinguishes central Canada from western Canada. In the end, the study raises broader policy issues associated with regional development programs aimed at redressing imbalances arising out of recent effects of social and economic restructuring.

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Chapter 1

1.1 Introduction & Overview

Living standards throughout the western world have risen markedly since the end of the Second World War. Between the late 40's and the late 60's, North America and Western Europe enjoyed unprecedented increases in real personal income and gross domestic product, yielding ever greater levels of affluence. According to Olson (1982), European and Scandinavian nations averaged annual growth rates in GDP of 3% to 4% during this time period. Despite this economic prosperity, there was growing evidence of regional disparities in the industrialized world, tending to overshadow the full benefits of social and economic performance. While the overall levels of national economic indicators were encouraging, not all regions were receiving nor contributing equally to the prosperity.

Recently, the industrialized world has had to face other damaging economic circumstances which have further aggravated regional disparities. These include a lengthy recession, ever increasing levels of seemingly permanent unemployment and inflation, and industrial restructuring due to rapid technological innovation. At the same time, social institutions such as the family unit have also changed in concert with variations in lifestyles. These major economic and social shifts have, in some respects, further undermined attempts to redress the existing disparities between

regions.

In Canada the matter of regional disparity is relatively common given the country's physical dimensions and the distribution of its population. Regional performance has generally been tied to individual parts of the urban system. Cities have for some time now constituted the points at which most of the competing and complementary demands meet. They contain the majority of human activity and, increasingly, serve as the arenas for modern living. As such, urban communities offer the most appropriate scale at which to document the character and composition of Canadian regionalism.

This thesis explores in detail the matter of regional diversity by way of an analysis of social indicators of experienced life conditions within the larger Canadian urban centres. The paper not only documents the spatial variation in urban conditions but also more broadly defines and measures the "quality of life". The criteria by which this diversity is to be measured will initially be broad in scope, encompassing general conditions associated with economic, social, cultural and environmental characteristics. A consideration of more specific conditions including employment, education, health, housing, family character and occupational structure will then be undertaken. In all, the analytical framework uses some 50 different variables in documenting regional variance.

In the preliminary stages, the focus will be on

exploring the diagnostic features of the data set. Following this, the study will construct and evaluate a model based on a standardized set of data. This will ultimately allow for direct comparisons between individual Canadian regions. Finally, the analysis will use a more rigorous technique to delimit the underlying features which distinguish regional well-being in Canada. In highlighting these regional constructs we will raise and address some of the urban policy and programme issues confronting regional analysts.

In considering 'regional variations in living conditions there is a temptation to go in any number of different directions. This is so because the subject is admittedly broad and open to many interpretations. For example, the matter of regional variation in well-being could be explored in strict economic terms having to do with capital, human or fiscal resources. Alternatively, the issue could be examined in terms of general living standards such as employment, income or education levels, with national averages being compared to regional averages. As well, the matter of regional well-being could be documented very precisely by actually interviewing key experts in this field and conducting a "delphi" study for each region.

This thesis will be relatively simple and direct in its treatment of "indicators" of well-being. The evaluation of regional variations in conditions of well-being will be by an analysis of carefully selected empirical data. The results of the study are not meant to serve as a normative model of

Canadian well-being but rather as a contribution to policies dedicated to dealing constructively with regional disparities.

In setting the stage for this kind of study, there is a need to consider firstly some of the broader issues and concepts within this field. As has been noted, the subject of well-being can be examined from many different perspectives. With this in mind, the thesis introduces and discusses some of the more conceptual and theoretical points to have been raised with respect to welfare. Throughout this discussion, the approach will be one which exposes the reader to what may be referred to as the "continuum of well-being". This continuum extends from the metaphysical to the concrete. In this presentation, the most general level will be that which considers the matter of "social justice" and "equality". This will then be made more tangible by considering applications as developed in the field of "social welfare". At this stage, the remarks will focus on contributions from the social sciences. Finally, the matter of well-being will focus on the more disaggregative and substantive elements of "social indicator analysis". The opening chapters of this presentation will treat each of these individually in providing a conceptual background and will then test this foundation through a Canadian case study.

1.2 Social Well-Being: Early Treatments and Contemporary Views

If you are asked colloquially how you feel, the questioner is soliciting an impression of your sense of well-being. This sense may be interpreted in a variety of general ways and may be measured by many different specific criteria. You may choose to respond by relating personal feelings such as whether you feel happy, sad, healthy, contented or frustrated. This type of response represents judgments of life's concerns based on a personal system of values, beliefs and perceptions. As such, the response is related to "subjective" measures of well-being.

A different response to the question may be to compare your situation with that of others across a number of tangible elements. Among the many items that could be considered, those tracing economic, social, physical or environmental conditions figure prominently. In other words, by referring to such matters as level of income, occupational status or education, an individual can ascertain his or her level of well-being in terms of others. Such a response is generally defined as being based on "objective" measures of well-being. When both objective and subjective responses are combined one approaches the concept of "quality of life".

Historically, the most acceptable way of determining the quality of life was to rely on selected yardsticks. In gauging the state of individual or societal welfare, social historians have generally adopted an approach that relies

upon the compilation and analysis of quantitative information as recorded in the social and economic activities of the population (Shaw & Miles, 1979, Johnston, 1979, Carley, 1982). The "indicators" most often employed were those common to the workings of the market system. Observations of human activity, such as those of the practices of economic exchange, were the essential means from which to draw conclusions about regional differences. Since labour, capital and resources were regarded as the essential elements of the economic system, some quantitative expression of them was naturally seen to represent the proper measure of well-being. Through meticulous record keeping of these "economic" variables, researchers believed that society's progress could be charted.

Reliance upon the more easily quantifiable aspects of economic livelihood was, generally, in keeping with many of the philosophical ideas of the 19th century which held that the laws of human nature resembled those of the natural world (Young, 1979). Such a view maintained that social or economic enquiry should be guided by the collection of objective and tangible facts. The procedure would yield an accurate account of reality and ultimately would explain the phenomena or processes in a manner similar to that of the pure sciences (Keat, 1979). This perspective presupposed that the world operated according to clear and precise principles of social and economic behaviour.

Sir William Petty of Britain is generally recognized as

having been instrumental in originating the practice of regularly collecting social statistics during the late 17th century. The objective in establishing such practices was the development of programs for the better allocation of government resources and the institutionalization of a more equitable taxation system. With economic prosperity continuing during the industrial revolution there also came greater social and economic consequences. These then provoked the need for greater care in collecting representative indicators of change. The spread of epidemic disease due to unsanitary conditions, for example, triggered the collection of detailed mortality data. What had originally begun as a simple exercise in drawing up balance sheets of economic transactions soon led to the development of comprehensive statistical records yielding details about both the economic and social consequences of industrialization. With time these accounting procedures were extended to the point where recurring censuses of the population were conducted as a means of documenting many socio-demographic characteristics and social conditions. This systematic approach was to also flourish in other countries such as Belgium, Germany and the U.S., serving as the most standardized means of compiling national records for static or comparative analysis (Shaw & Miles, 1979, Carley, 1982).

The conventional view, which held that welfare was best monitored by simple applications of economic principles,

persisted well into the 20th century. During the early 1900's, however, social scientists began to question the assumptions of the classical model. Welfare, it seemed, went beyond the pure economic relationships of labour, capital and resources, requiring the active consideration of other factors. In the U.S., a sociologist from the University of Chicago pointed out in 1922 that "social change" could in fact be measured by relying on observations about social evolution and culture. William F. Ogburn's conclusions about social enquiry were subsequently put to the test as he was chosen to head a national committee which was to find ways of improving upon the procedures for reporting on social stress in American society. The topics under consideration spanned a number of social dimensions including education, the arts, recreation and leisure, health, occupational status and crime (Carley, 1982). Ogburn's work was to become indispensable in launching other endeavours during the 20's and 30's into studies of social change (Park & Burgess, 1925). The work would do much for all social enquiry to follow, particularly that dealing with the spatial consequences of social and economic change (Wirth, 1938, Thorndike, 1939). As well, such efforts would spark other government sponsored research such as Recent Social Trends (1933) which produced more documentation concerning the availability, collection and comparability of suitable statistics (de Neufville, 1975).

Economists, who had maintained a rather rigid approach

to the study of welfare, also responded by reassessing the broader theoretical principles that guided human behaviour. In Britain, Pigou (1924) presented a well reasoned treatise on the existence of "cardinal measures of welfare". His principal findings discussed the broader concepts of "utility" and "preference", in terms of individuals acting according to measurable factors. This eventually raised the issue of individuality in the determination of social welfare. By admitting that the individual not only played an active role in the process of material satisfaction but that he or she also attached degrees of satisfaction to the material components, economists such as Robbins (1937) soon developed alternative views on the theoretical structure of welfare. The quality of one's life would therefore be linked to both objective and subjective criteria of living conditions. It was this view that was to provoke much rethinking in the field of social enquiry.

A more contemporary view of the quality of life has been summarized by Wingo (1973,5) who notes that it is "...an internal psycho-physiological mechanism which produces the sense of gratification and external phenomena which engage that mechanism...". This brief description adequately sums up the main points having to do with current investigations into well-being. While preliminary investigations into well-being had been satisfied with a simplified model of economic accountability, subsequent research sought to delve deeper into both the "objective" and "subjective" attributes of

personal well-being. The totality of life's concerns could be thought of in terms of tangible economic and social characteristics, but it could also be seen in terms of less structured factors such as those dealing with psychological values and ethical beliefs. The contemporary view was therefore seen to differ from earlier views in its appreciation of the "softer" or more subtle conditions of well-being (Maslow, 1954, Cantrill, 1965, Campbell and Converse, 1972, Andrews and Withey, 1976).

The realization that well-being was influenced by different motivating factors soon led to greater advocacy of new ways of broaching the subject. Some critics found fault with the analytical relevance of a model which could not account for essential criteria such as the degrees of personal satisfaction. Moreover, the traditional economic approach excluded the effects of non-market activities, and the importance of environmental conditions, and tended to oversimplify the process of distributional effects (Juster, 1980, Carley, 1982). The problems associated with defining the concept of "utility" in all human activities also raised basic inconsistencies in the accepted model (Nordhaus & Tobin, 1972). The concern over limitations eventually led to ever increasing questions about the usefulness of such a rigid perspective.

During the 50's and 60's, increasing economic prosperity coupled with continued development in the statistical sciences provided for the implementation of sophisticated

accounting procedures. These rather complex models subsequently allowed for greater policy guidance in a number of matters such as tax reform. These procedures were in turn thought to be quite useful in addressing other pressing problems in the area of social reform and were subsequently utilized in measuring social progress. Social scientists saw in this approach an opportunity to argue quite convincingly for the establishment of models of social indicators as a basis for social accounting (Bauer, 1966, Duncan, 1969).

The call for a system of social accounts, similar to that used for economic accounts, acknowledged the urgency of capturing indicators of the fundamental conditions of life such as health, education, crime or pollution. Further elaboration of such a system also sought to incorporate other indicators of a more general nature. These included such matters as consumer behaviour, the use of time, social participation and other psychological attributes (Sheldon & Land, 1972, Koelle, 1974, Campbell, Converse and Rodgers, 1976, Gillingham & Reece, 1980). From the outset, advocates of the accounting approach envisaged a theory which went beyond simple description. The process would ideally help to resolve social issues by allowing for decision making and evaluation of policies and programs (Shonfield & Shaw, 1972, Land, 1975, Angrist & Belkin, 1976).

The establishment of a comprehensive social information system, similar to that used in economic modelling, was, however, bound to be fraught with problems. The most serious

of these was related to data representativeness and compilation. It had taken economists many years to develop real and surrogate measures of the principles and processes of economic behaviour. It was therefore quite conceivable that the development of representative measures of social processes would easily take as much time. In view of these difficulties some analysts felt that there was a need to reaffirm the more conceptual elements as a way of bypassing the inevitable pitfalls of empiricism (Land, 1975, deNeufville, 1975 Andrews & Withey, 1976). Others believed that the continued refinement of social indicators should proceed regardless of the possible inconsistencies in the analytical process (Duncan, 1969, Kamrany & Christakis, 1970, Drewnowski & Scott, 1968, Drewnowski, 1974).

The arguments favouring the development of a social indicator model maintained that the availability of socio-economic data was such that it was preferable to explore pertinent issues of social monitoring through empirical analysis rather than wait on further developments of a more conceptual nature. One idea proposed that one could formally account for changes in the social system within a three dimensional matrix built on the understanding - who gets what, where and how? (Smith, 1973, 1977) (see Figure 1). This perspective held that matters of social welfare could be analysed by the selective, yet representative, combination of data in the areas of goods, services and clients. The proper evaluation of the data would render profiles of well-being

Figure 1: The Welfare Matrix

which could then be incorporated into policy or program analysis.

In contrast, those who defended the conceptual approach noted that there was no sense in embarking on in-depth studies if the findings lacked theoretical foundations. Both schools of thought persisted in their arguments, the ultimate result being a considerable body of research with both theoretical and empirical benefits.

Throughout the 70's, social scientists from a number of disciplines sought the further definition and measurement of well-being. At the national level, policy analysts in various countries such as the U.S., Canada, Britain and other European nations built and evaluated large sets of social indicators as a means of programming for social welfare. Other applications were generated at the regional and local levels as economists, geographers, city administrators and planners relied upon statistical methods to summarize social and economic data in the hopes of assessing the changing nature of the quality of life (Smith, 1973, 1977, 1979, Knox, 1975, 1978).

While advances in both the theory and application of a social indicator system had been significant, progress was hindered somewhat by a lack of consensus. There was a general failure to acknowledge the need for standardized theories and practices. Both the scope of the exercise and the problems to be tackled were becoming more and more complex, and the methods of evaluation and prescription were

becoming equally sophisticated. To avoid the possibility of confusion and misinterpretation in treating social accounting some research tended to concentrate on individual issues or conditions for specified spatial units.

More recently, Juster (1980), Carley (1982) and Ley (1983) concluded that the solution to the problem of the proper measurement of social change was to be found within an integrated framework which brings together the descriptive advantages of trend analysis of social conditions and the theoretical benefits associated with taking a better account of the decision making process. As a result of this, there was an attempt to bring together positivists and behaviouralists into social enquiry. The approach favoured the examination of "sub-system" components of social change and stressed the need to take full account of the use of time as the key ingredient in measuring well-being. The allocation of time when coupled with the existing "capital stocks" of the world, provided the essential element in judging the quality of life. As Juster concluded...

"A framework in which time use is the core and associated "stocks" or "states" of well-being are the conditioning factors that influence the outputs derived from the use of time is proposed as a way to think systematically about all of those facets

that influence the generation and distribution of well-being"

Juster, 1980, 29-30

This perspective supported those theoreticians who proposed that the analytical process should be based on the individual's use of time as the input to well-being. It therefore tended to move away from the longstanding tradition of only collecting facts about the outputs of the social system as a means of studying well-being. It however recognized the need to consider existing "stocks" or "states" in the analysis, which represented those objective characteristics or conditions of individuals which could be accounted for by social indicators.

At the same time, others such as Bennett (1980), Terleckyj (1981), or Kirby and Pinch (1983) chose to view the distributional aspects of well-being from another perspective - that of a system of public financing and service allocation. In this instance, the focus was on the operations of the political economy in assigning and regulating public goods and services. Earlier geographical efforts in this area had been started by Harvey (1972, 1973) and Smith (1977); however they had spent much of their time simply exposing and describing the essential spatial context of well-being. The more contemporary views moved closer to an evaluation of the distributional mechanisms of social welfare. Generally speaking, the approach was moving from one of substance of well-being to one of process of well-

being.

In Canada, studies of well-being flourished during the early 70's, due in large part to government initiated research (Dept. of Regional Economic Expansion, 1972, Statistics Canada, 1973, Economic Council of Canada, 1974, Ministry of State for Urban Affairs, 1976, Canada Mortgage and Housing Corporation, 1979). The work was generally built on earlier work by Maslow (1954) of establishing objective criteria, suggesting that the basic needs of society were to be tracked through the development of a system of social accounts that would then be translated into a detailed system of statistical accounts. Before deriving these statistical accounts, however, there was a need to define more clearly the principal goals and objectives of society. Henderson's study for The Economic Council of Canada (1974) concluded that research was often too open ended and complex. In his view, the problems of social monitoring could only be addressed by reverting to an analysis of "sub-system" components or "goal areas". Accordingly, Henderson identified a total of nine such areas, including individual rights and responsibilities, social rights and national identity, health, command over knowledge and skills, natural environment, man-made environment, production and consumption of final goods and services, employment, and financial status.

The application of social monitoring concepts was subsequently initiated and thoroughly documented in reports

produced by Statistics Canada (1973, 1977). These reports were essentially statistical compendiums which brought together a variety of indicators of socio-economic conditions, including family, health, education, justice and the environment. Drawing upon data from the census or other publicly sponsored surveys, the documents summarized the state of well-being of Canadians across a number of topics. They ultimately served as national social reports.

Canadian studies also favoured an approach which stressed the use of social indicators in summarizing well-being (Palys, 1973, Stewart, 1976, Kuz, 1978, Dale, 1980, Davies, 1984). Unlike the reports from Statistics Canada, these studies employed quantification as a means of collapsing large sets of data for a clearer and more manageable representation of well-being. They sought to go beyond description toward some form of evaluative model. In defence of the social report format, Brusegard (1978) argued that such undertakings picked up the challenge of providing more "social intelligence" through government sponsored research programs and actively organized or distributed the findings to a wider audience.

More recently, attempts at documenting the changes in well-being have been directed towards expanding the set of indicators by instituting national surveys of public opinion about certain conditions (Atkinson, 1979, 1983, Loetscher, 1981). The need for more public input into research on well-being had been advanced earlier as part of the "relevance"

movement in geography (Bunge, 1975, Michelson, 1977, Herbert, 1979,). In the U.S., there had been a longstanding tradition of studies that relied on opinion surveys as a means of gathering perceptual data (Cantrill, 1965, Campbell et al 1972, 1976, 1981). In Canada, the active use of attitudinal data in research on social change was taken up in the mid 70's by research organizations such as the Institute for Behavioural Research at York University. Major surveys conducted in 1976 and later in 1979 provided information on individual assessments of conditions across a number of social, economic and physical dimensions.

The practice of seeking the opinions and attitudes of the public to certain conditions or issues also emerged as an important component of social research. One need only to scan the daily newspapers to become aware of the latest poll results from Gallup, CROP or Decima. The results of these are fast becoming key variables in judging the reaction of the public to public sector policies and programs as well as private sector market goods and services. In short, public polling may be seen to represent some form of "pulse taking" as a means of determining public perceptions of various social and economic conditions. This, in turn, can be viewed as another way of measuring social well-being.

The history of enquiry into social well-being can be seen to have evolved from a perspective which relied on economic indicators to one that was more open to many different sources of information. The analytical approach

has therefore gone beyond the relatively simple process of documenting much like an accountant's ledger to one that seeks personal opinions and personal uses of time as criteria for judging the quality of life. It remains to be seen if this progression in the analytical framework coincides with some of the changes which have occurred at the more conceptual level.

Chapter 2

Social Justice The Distribution of Welfare

The concern for a theory and a methodology appropriate to the measurement of social well-being was originally founded on deeply held beliefs and values. These beliefs could then be said to have ultimately rested on certain fundamental social ideals. The ways and means by which one achieves a social ideal such as "equality" or "justice" have also been the subject of considerable debate over the years. The following will briefly explore some of the philosophical arguments which have been advanced as a means of satisfying the greater goal of social justice. We will then expose some of the more traditional approaches which have been proposed in applying the concepts. To conclude, the discussion will treat the relatively recent interest by geographers in matters of welfare.

Broadly speaking, the manifestation of social justice - as distinct from legal justice - is reflected in the structure of society. More precisely it is found in the system of rules that guide the actions taken by a group of individuals in providing a greater good (Rawls, 1971). Its essential application is associated with the mechanisms by which social institutions distribute benefits and burdens throughout society (Rescher, 1966). In considering the fundamentals of justice, account must firstly be taken of the essential principles of equality. These maintain that, in

matters of judgment, individuals must be given equal consideration regardless of any fundamental differences. Aristotle first articulated this position when he remarked that "justice consisted in treating equals equally" (Edwards, 1967, 40). In dealing with the ideals of moral or social equality therefore, there may be some cause to argue that no difference should be held to be important in the treatment of individuals.

The standards for equality were largely explored during the 18th century within the works of Hobbes, Locke and Rousseau who promoted the idea of the existence of a universal set of natural laws and in particular the concept of "natural equality". The concept maintained that at birth all individuals were equal in all respects. This was in keeping with a theory of human nature whereby men and women were born with unlimited potential. This then served as the primary reason why no distinction should be made between one person and another. The concept further argued that natural inequalities between persons were largely explainable by differences in the environment or in social and political conditions (Edwards, 1967). This doctrine of equality was further developed, eventually serving as the basis for the social philosophy of "egalitarianism".

The most often noted criterion in determining whether justice has been satisfied is that of "utility". In a universal sense, utility is defined as "possessing that quality or state of being useful". To assert that something

is of use to society is to suggest that it is of direct benefit to the overall welfare of that society. In the simplest of terms, the doctrine of "utilitarianism" represents the philosophical perspective which encourages the realization of the greatest good for the greatest number. While much of the early thoughts on the principles of utility were developed by political philosophers, economists were recognized as being responsible for seeking out the means by which to accurately measure utility and to dictate its distribution in maximizing benefits and minimizing burdens to society.

The principle of utility has nevertheless been criticized as a representative measure of justice, as being inadequate and limiting. According to Williams(1973), the achievement of the greatest satisfaction in one particular instance could ultimately result in some form of victimization or injustice. By rendering a judgement of the "best" alternative, one could adversely affect certain other members of society. Therefore, individuals who endure the greatest hardships through personal sacrifice or through an imposition by others are necessarily seen to be unjustly treated.

In adjusting for this imbalance, it is generally recommended that a compromise be struck between the marked increase in happiness or distress based on an aggregate utility. Rawls(1971) argued against the use of the principle of utility, noting that it neglected to account for

the impacts of political bargaining and the effects of special interests. According to Rawls, a fundamental weakness persisted in underestimating the considerable power which lay in the hands of those with vested interests. Controlling groups were seen to pose a problem to the basic realization of justice since they maintained and often exceeded their benefits at the expense of those less fortunate or less powerful than themselves.

Further problems existed in the definitions attributed to utility. Some challenges suggested that the conventional interpretation incorrectly represented society's expectations. The belief that an individual's assignment of a specific utility to a good or a service would necessarily coincide with that of others, in both its original state and its final distribution, was highly suspect. The meaning of utility was therefore prone to many and varied interpretations which rested on subjective factors including personal values and beliefs (Rescher, 1966). It was unrealistic to expect that an aggregation of these utilities across all individuals could be accomplished in order to then assign a proper distribution.

As a result of the inherent difficulties in using utility to assess justice, some social philosophers reconsidered the conceptual relationships. That taken by John Rawls in "Theory of Justice" stands as one of the most fully reasoned. While not totally divorced from the utilitarian doctrine, Rawls (1971, 9) developed a concept

which sought a balance between competing claims in reaching desired ends. The favoured principle in his approach was that of the "social contract".

Simply stated, the Rawlsian view supposed that equality would result from agreements among rational persons as to what was just. It assumed at the outset that individuals displayed characteristics of the "original position". In other words "... they are self-interested, they are equal to one another in their freedom to advance principles and ideas, they are rational, they choose effective means to the ends, they know many things of a general nature, they are absolutely ignorant of their own individual futures in the society..." (Rawls, 1971, 58). Subject to what Rawls had identified as the "veil of ignorance", each individual was prevented from enjoying the benefits of social position or natural abilities and was thus placed on an equal footing with others. Through this assumption, Rawls argued that persons would not violate the original state of equality since the attainment of greater satisfaction would ultimately benefit all persons. It would then be fairer to work together so that everyone had the same rights and were all basically rational in their actions.

Weale (1978) found some difficulty in accepting the argument for rational behaviour, noting that some individuals could rationalize arbitrary decisions in making the worst-off members slightly more worse off, provided they did better. The "rational choice" strategy was somewhat inconsistent

since it lacked an ethical principle, namely that of equality. The proposition advanced by Weale was to adopt a principle of equality stressing that each person was entitled to the same maximum welfare in keeping with the levels of welfare of all others (Weale, 1978, 38).

Included in Rawls' theory were two essential principles that argued firstly for the provision of equal rights and liberties to all and secondly proposed that social and economic inequalities were to be distributed amongst everyone (Rawls, 1971, 60). Simply stated, the first was interpreted as guaranteeing freedom and liberty as legislated in most democracies. The second however was more controversial in its treatment of the immediate social and economic imbalances in modern societies.

There were three possible interpretations of the distributive aspects of the second principle. The first, labelled "natural liberty", incorporated the objective of efficiency and in so doing was related with the early works of welfare economists, particularly with Pareto's discussion of optimality. According to this view society would attain equality through greater efficiency. This would be done by imposing a condition where it would be impossible to make someone better off if it meant that someone else would be made worse off. Holding to this condition would result in a just distribution as benefits would only be assigned when all imbalances had been rectified. Such a solution was deemed to be inappropriate, however, since it ruled out the

inequalities which arose out of the initial distribution of benefits. Thus, certain natural, social or economic advantages could prove beneficial to some but not to others. Moreover, the achievement of an efficient distribution would not necessarily produce the "best" or "just" distribution, only the most efficient.

Unlike the natural liberty option, where social and economic institutions were open to all individuals in the system, the "liberal equality" interpretation further proposed that persons also be given an equal chance to advance and that they not be discriminated against or favoured on the basis of natural or inherited gifts and benefits. Despite these modifications, this view was criticized in not guaranteeing that power or influence could not be used in limiting or denying individuals opportunities for advancement and development.

The final interpretation dealt with "democratic equality", combining the commitment to equal opportunity with the need to recognize the "difference principle". This view accepted that differences between individuals existed as a product of natural or social conditions. It stressed however that an improvement in the expectations of the least favoured should be the primary objective. In some ways, it adopted a position that certain minimum standards were to be maintained by which to compare the distribution of both social and economic benefits. If, in the end, the least favoured members of society received benefits resulting from a

decision on the distribution of these benefits, then justice had been served. Rawls (1971,75) had summarized the point as "...the social order is not to establish and secure the more attractive prospects of those better off unless doing so is to the advantage of the less fortunate...".

This perspective accepted as legitimate the inequalities of distributions but only did so if the advantages accruing to the more fortunate were somehow used to improve the situation of the less fortunate. The proposal reiterated the conditions of the efficiency option but recognized the potential benefits to be gained by enduring certain inequalities for the common good rather than preventing them on the grounds that they were inefficient.

In addition to these broader principles, there was a need to specify the grounds upon which legitimate claims could be made for a just distribution. A listing of these had been previously noted by Rescher (1966), who suggested that the basis lay in "canons of distribution" which served as the principal determinants of what people expected. The criteria were generally thought of as the main reasons for equal shares among members of society. They were summarized as follows:

1) **Equality**: where people were treated as equals according to egalitarian principles of democratic theory;

2) **Need**: where people were treated in relation to need under the principles of socialistic theory;

3) **Ability**: where people were treated according to

their achievements under the meritocratic theory;

4) **Effort**: where people were treated in relation to their efforts under puritanical principles;

5) **Productivity**: where people were treated in relation to their productivity under capitalistic principles;

6) **Social utility**: where people were treated in relation to the advancement of the common good;

7) **Supply and demand**: where people were treated in relation to an appraisal or market value of their contribution (Rescher, 1966, 73-81).

Several criticisms were levelled at these criteria in terms of their shortcomings and oversimplifications. In considering a distribution based on need, for example, problems could readily occur in trying to distinguish between "real" or "felt" needs. While equality could be seen as an extension of needs, one had to be careful to make a distinction between the contents (needs) and the process (equality) (Weale, 1978). Moreover, caution was required in considering needs that were deemed essential and those that were more closely related to expectations. A judgement based solely on ability could result in inequities when natural abilities were taken into account. Complications could arise in accepting a common definition of what properly constituted effort. And finally, reliance on productivity measures or "laissez faire" criteria of the market system would tend to oversimplify the process of distribution.

From this it was concluded that reliance on a single criterion was unachievable. A more realistic method consisted in adopting several of the criteria so as better to register the variety of individual claims. Such an approach would then allow for a broader and more heterogeneous appreciation of the foundations of justice. In this way, the social system would be more responsive to the claims for justice.

2.2 Social Welfare: Traditional Approaches

Aside from the philosophical perspective of distributive justice, attention can also be paid to its more substantive elements. In doing so, however, the focus shifts from emphasis on the broader concerns for justice to the more specific issues of "social welfare". Moving to the matter of social welfare in this way is seen as a natural progression from what may be termed the world of ideas to that of the world of action. In other words, it is a step closer to the way policy makers and decision takers have proceeded in ensuring the application of principles of social justice.

The study of social welfare has existed as long as individuals have found enjoyment, satisfaction and contentment from the physical, social and spiritual experiences of life. It is based on the need to measure the degree to which basic requisites of life are satisfied, and is generally thought to include elements of physiological and economic adequacy (Rescher, 1972). The suggestion that social

welfare is a reflection of the fulfillment of basic requirements of life presupposes in some way that there are certain standards to be met.

The attainment of social welfare does not necessarily occur when an average satisfaction of its constituent parts is met, but rather when improvement through a combination of its individual parts is realized. It cannot be argued for instance that a deficiency in one particular dimension of welfare such as health can be adequately compensated by rendering a surplus in another dimension. Welfare therefore cannot be viewed strictly in terms of a unidimensional or personal view but more as an amalgamation of common needs. While individuals can demonstrate differing levels of welfare (see the "difference principle" p.25), those commonly shared human needs are the ones to be given a higher priority. This view is supported by the fact that social interaction also plays an important role in determining one's own welfare. This is accomplished through a mechanism that provides for comparisons of oneself to others (Rescher, 1972). Therefore, the recognition of common elements of welfare and their interpretation are prerequisites to understanding well-being.

It is generally acknowledged that society as a whole maintains a set of common values that are central to its continued existence. But while social values are admittedly intangible and personal views of what the world should be like, there is an argument that some of these are held in

common. These "focal" values are not necessarily goals or objectives but rather evaluative criteria around which society can agree (Hayden, 1977). Among the more prominent ones, those of the survival of the society, its welfare, and the prosperity of its citizens are thought to be essential (Rescher, 1972).

Playing an influential role in determining social values are beliefs. These too have also been grouped according to whether they are central, derived or personal, depending upon the degree of flexibility and change of individuals (Hayden, 1977). Central beliefs are understood to be the catalysts of focal values and are responsible in setting out the universal concerns of society. The notion that social values are part and parcel of the matter of social welfare has been recognized by welfare economists who interpret them as ethical judgements or self-evident truths (Nath, 1973).

The proposition that society holds a common set of welfare values has been developed into something more imperative. The result is a clearly specified set of social needs. These represent the necessary conditions for the fulfillment of an expected end-state. They are not in themselves a basis for distribution yet their satisfaction is in itself the benefit that can be justly distributed. When everyone has an equal chance of having their needs satisfied, it is said that welfare is equally distributed (Weale, 1978).

Basic needs have been thought to fall into three categories: physical, material and spiritual (Rescher, 1972).

This taxonomy offers the first opportunity to actually define the components of welfare. More importantly though, the delineation of these standards and their satisfaction, whether partial or complete, sets out the guidelines on which welfare can be measured. It should be noted that the degree of satisfaction can differ between individuals and groups. Additionally, the hierarchy of individual or group needs may often be re-ordered depending on social or cultural norms.

The issue of "wants" versus "needs" served in many respects to trigger the broader concerns for well-being. While these had been the subject of much philosophical debate, the interest in the social sciences was sparked during the 50's and 60's by the works of Maslow(1954) and Cantrill(1965). Maslow approached the subject by delimiting the "basic needs" for human development. His theoretical discussion concluded that human development was driven by a series of critical needs which, in order of importance, spanned physical, emotional and spiritual dimensions of existence. In brief, these needs were:

physiological: bringing together what the body needed to survive;

safety: taking account of personal security and the freedom from fear;

belongingness: requiring love and friendship;

esteem: desiring achievement and exuding confidence;

self-actualization: becoming everything that one is

capable of being.

In contrast, Cantrill (1965) sought to gain a better understanding of "human wants" as well as the motivating factors behind achieving them. In identifying these, he employed survey techniques that polled individuals according to a "striving scale". Consolidation of these scales then produced definite patterns of human concerns. His conclusions demarcated phases of development that initially began with simple acquiescence, grew through awakening, and ultimately resulted in assurance and satisfaction.

It is easy to see why these two studies are often examined in parallel when discussing well-being, since they both recognize the various stages through which the individual proceeds in order to aspire to a better life. Yet, conversely, each approach is substantially different in its premise for judging human development; that of needs versus wants. In subsequent research, the concern for these fundamentally different elements was to fuel much of the debate on representative measures of the quality of life (Smith, 1973, 1977, Drewnowski, 1974, Fox, 1974, Land, 1975, Knox, 1975, 1978, Bennett, 1980, Juster, 1980, Carley, 1982).

The major contributions to exploring the structure and process of needs satisfaction within the social welfare system have come, by and large, from economics. Bringing together theory, statistical information and ethical reasoning, this discipline has addressed the basic questions of how resources should be used, what organizations are

needed to allocate resources properly, how best to measure whether society has profited and finally, what are the essential properties of welfare functions (Nath, 1973, Layard & Walters, 1978).

Welfare economics is founded on defining the theory of utility. The elaboration of this theory produced two major schools (Cooter & Rappoport, 1984). The first is called the "material welfare school" which had its beginnings in the 20's in the work by Pigou (1924). According to this perspective, utility was measured by degrees of satisfaction which could be arranged against a hierarchy of needs ranging from essential physical and material requirements to secondary comforts and luxuries. Needs were regarded as basic goods contributing to material well-being of society. By confining the concept to the satisfaction of needs, it was argued that certain observations and comparisons could be made. Utility, in this sense, was a verifiable "cardinal" measure of society's satisfaction that could be calculated and summed to produce an indication of overall social utility. The sum of all utilities, which in large part were aggregated and averaged by larger groups of society, offered the grounds for determining a social optimum or a best solution to welfare.

The belief by material economists that this viewpoint was the most feasible resulted from their close association with empiricism and the thesis that knowledge came from experience (Cooter & Rappoport, 1984). The objective of

identifying economic needs was held as the basis upon which to "total" social needs and then to implement proper distributive mechanisms to provide welfare. While the empiricists relied as much as possible on information and experience as a guide in building the theory of utility, abstract argument and common sense were often used in ordering individual needs. This practice would eventually serve as the critical basis for considering alternative models.

Questions about the narrow interpretation of social welfare were posed by L.C. Robbins(1937) who favoured a newly developed perspective of "logical positivism". While sharing many of the same predilections of empiricism, the positivist view queried the possibility of summing "interpersonal" comparisons of utility and stressed the importance of human behaviour in well-being. Utility was equated more with preferences as represented in economic behaviour within the system. The new focus suggested that, first and foremost, there was a need to expand the inventory of conventional needs to include a greater number of human concerns. Secondly, there was a need to put them on an equal footing such that food and entertainment were to be thought of as equal needs. As well, positivists abandoned all references to ethical interpretations of satisfaction, arguing that they were unobservable and therefore fell beyond the purview of the research. Cooter & Rappoport(1984) maintain that this position misread the original thinking. Positivists believed

that needs were subjective judgements of satisfaction rather than the intended objective measures of real needs. Robbins' criteria were for the most part based on preference and behaviour and were more akin to subjective interpretation. The reliance on preference as the prime concern in utility was seen to have a closer relationship to "wants" and "desires" rather than to more objective measures of real needs (Cooter & Rappoport, 1984).

Positivists also challenged the criterion of "diminishing marginal utility", in which utility could be increased through the transfer of income from the rich to the poor. Pigou had noted that the transfer of income could lead to greater satisfaction given that the value of the transfer would in fact do more to alleviate a greater desire of the poor at the expense of a lesser desire of the rich. Simply put, the poor could look upon the transfer as something of much greater value than its perceived value by the rich. Such a proposition introduced some subjectivity into the process; it did not however harbour any ethical overtones which were apparently the main reason for rejecting the material welfare position.

These points were largely responsible for creating the second school: ordinalist welfare economics. Under this view, utility was derived from personal preferences which could be ordered. The theory was more in keeping with consumer behaviour as it faced decisions about different commodities and services. Consumer choice, in the

conventional approach, provided for the maximization of satisfaction and was bound to the value judgements of individuals who were the best source of knowledge in making final decisions. Both social and economic optimality was reached when factors such as cost and preference were applied against each other. The approach maintained that welfare was best measured against what people wanted since they were responsible for their actions. The maximization of satisfaction was considered to be the primary goal and the best way of judging a just distribution was to let preference curves interact with cost curves in deriving the optimal solution.

The ordinalist perspective was also criticized because of its reliance on a subjective view of utility which was laden with ethical judgements. Nath(1973) noted that the use of the Pareto principles within the ordinalist model omitted a number of special considerations. He suggested that ethical judgements in determining utility could vary considerably between social groups or nations and normative propositions respecting welfare could also have differing implications for differing societies. The narrow views which resulted from normative statements could further bias welfare solutions; free choice in the market place had led to both good and bad effects for example. And finally, by holding that individuals had an equal capacity to enjoy a given share of welfare, it could not be accepted that the rich would have a higher capacity to enjoy than the poor. ●

The growing disenchantment with the ordinalist view has resulted in a reconsideration of the materialist perspective. It further spawned other views such as those of "social economists" who expressed dissatisfaction with the short term view of economic theory and its preoccupation with maximization (Hagenbuch, 1958, Pettman, 1979). Continued reliance upon a market mechanism was seen to be short sighted given the growing presence of monopolies and cartels in regulating the distribution of goods and services. The conventional view held that the individual was central to well-being. Social economists sought to take a fuller account of human satisfaction while minimizing disruptions to physical and human resources. As such, issues of environmental constraints and diseconomies took precedence over traditional issues of profit and productivity. The concern over the limitations of the economic perspective was not only evident within the discipline itself but was also being raised by many who felt that, in matters of social well-being, there was a need to go beyond the conventional practices of the past and actively to seek more information about the structure, composition and motivational character of social welfare.

2.3 Welfare Geography: The Case for Territorial Justice

Geographical interest in well-being began, to all intents and purposes, during the early 70's following the publication of Harvey's "Social Justice and Spatial Systems".

In it, Harvey argued that the normative view of locational determinants based on economic criteria as developed in neo-classical models needed to be reassessed in relation to broader concerns of social justice and spatial allocation. (Harvey, 1972, 97) According to this viewpoint, the geographical unit presented an easier scale on which to consider the distribution of social benefits and burdens. As a first step in treating the concept of territorial justice, Harvey reviewed the basic criteria for evaluating a just distribution. In many respects, these resembled those identified by Rescher (1966) as the "canons of distribution" (see Part 1 page 26) and included: inherent equality, valuation of services, need, inherited rights, merit, contribution to common good, productive contribution, efforts and sacrifices. Harvey concluded that three in particular had direct implications for spatial systems: need, contribution to common good and merit.

The criterion of need was considered to be the most critical, but was also recognized as being the most relative and subject to a variety of demand forces. On the one hand, need could be created or influenced by the market system. Moreover, it was also manipulated through consumer demand relative to the characteristics of the population. This was commonly referred to as "expressed" or "felt" need. Conversely, latent demand, or the difference between expectations and the provision of services, could also be seen as a valid criterion for determining need. A further

suggestion was that need could be defined by relying on the assessments of experts who had direct experience in social monitoring. This, however, was often challenged as leading to some form of "cultural imperialism" since experts could not be expected to be entirely unbiased in imposing their views in such critical areas. (Knox, 1975). Finally, and perhaps most importantly, need could be defined in terms of physiological criteria such as the basic requirements for human survival. The conclusion reached by Harvey suggested that a view of "relative deprivation" as exemplified in both the latent demand criteria and the physiological criteria held the most promise (see also Knox, 1975, Coates, Johnston, Knox, 1977).

Harvey identified the following basic needs as being of primary importance:

- . food
- . housing
- . medical care
- . education
- . social and environmental services
- . consumer goods
- . recreational opportunities
- . neighbourhood amenities
- . transportation facilities

He then argued that an analysis of these conditions, along with measures of their spatial variation would provide greater insight into the social and economic expressions of

well-being.

The criteria of contribution to common good and merit applied more to larger scale units, such that issues of resource allocation, regional disparities or inter-regional transfers could better serve as appropriate measures of distributive equality. Social needs, as depicted through relative deprivation, could however be further defined at the regional scale through consideration of mechanisms for measuring economic and institutional transactions which went beyond individual interests. Formal arrangements such as fiscal transfers, equalization payments or various other economic and industrial incentives could then be depended on for judging inequities between regions and used in implementing effective compensation for regional imbalances.

In reaching a just distribution, Harvey recommended an institutional structure similar to that proposed by Rawls. The requirement sought the establishment of institutions at four (4) political levels. An "allocation" branch would maintain market competition, a "stabilization" branch would ensure full employment, a "transfer" branch would satisfy unanswered needs and a "distribution" branch would regulate the provision of public goods and prevent over-concentration. This preferred solution also noted other Rawlsian principles such as equality according to opportunity and the maximization of the benefits of the least fortunate. Translated into a spatial context, this view held that weaker or less fortunate regions could serve as a representative

measure of the minimum standards needed to redress and correct social or economic imbalances.

The approach and substance of Harvey's arguments on distributive justice set down some of the critical parameters for social geography. In the years that followed, many geographers redirected their efforts towards developing and expanding social geography, such that the understanding of spatial systems was viewed more in terms of their impacts and relations to differing levels of well-being (Smith, 1973, 1975, 1977, 1979, Knox, 1975, 1977, 1979, 1982, Coates, Johnson, Knox, 1977, Herbert & Smith, 1979, Jackson & Smith, 1984). The social turbulence of the 60's, which had not only raised the level of consciousness but also a number of objections to longheld perceptions, had challenged academia in many of its traditional practices. According to Knox (1982, 92) "...Society in general became sensitized to a wide range of social and environmental issues; and geographers and other social scientists, in parallel with politicians and the media, began to examine these issues more closely..." Within geography, Harvey and others set out new guidelines for the spatial analysis of social welfare.

Among geographers, D.M. Smith (1973, 1977, 1979) took bold steps in coming to grips with both the theory and the applications of social well-being. In his review of historical developments in human geography, Smith (1977, 131) concluded that the geographer needed new rules to assess existing patterns of spatial well-being and to address

adequately its redistribution through social change.

In his most ambitious work, "Human Geography: A Welfare Approach" (1977) Smith chronicled and discussed the contributions made by political philosophers and classical economists. In reviewing ethical issues of equality and distributive justice he concluded that two primary views could ultimately be supported. Firstly, arithmetic equality, founded on egalitarian and idealistic principles was acceptable. Secondly, proportional equality, based on the assignment of certain weights which took account of extraordinary circumstances and depended on the measures of "desert" was also conceivable.

The criteria for accepting differential treatment in realizing equality were identified as belonging to one of three categories: survival, efficiency, or equity. The first two related directly to measures of individual output, while the third encompassed the view of fairness. While the most common practice had always been to accept efficiency, as measured in the production of output, Smith favoured a derivation of the Rawlsian concept of "constrained equality". The existence of inherent inequities in social and economic systems was acceptable in so far as steps would be taken to improve the situation of the disadvantaged. In doing so, he acknowledged Harvey's earlier acceptance of this criterion in performing spatial analysis.

In setting out the desired structure for analysing welfare, however, Smith reconsidered the classical

interpretations of utilitarianism, Pareto optimality and material welfare. The desired set of measurement criteria were represented in techniques such as the Lorenz curve or the Gini coefficient that compared existing conditions for certain pre-selected attributes against the equal distribution of these same conditions. In considering the classical approach to the study of economic welfare, Smith stressed that virtually no thought had been given to the spatial dimensions of welfare issues and that little or no reference had been made to distributional aspects of the maximization process of economic behaviour. Smith consequently proposed an approach that accepted utility as a "cardinal" measure as developed earlier by the material welfare school. In its simplest form, the welfare function was seen as a formula:

$$W_t = W(S_1, S_2, S_3, \dots, S_n)$$

where S brought together cardinal measures of community utility that would then sum to a regional utility index. The acceptance of a cardinal measure signified that individual, as well as group, levels of welfare could be ascertained and compared across spatial units. The adoption of the cardinalist principle also allowed for a simplified analysis that could be achieved through simple additive models of aggregated scores of utilities which in themselves represented a listing of social needs.

In applying these theoretical constructs to the

geographical perspective of well-being, Smith chose to utilize social indicators as suitable measures of "who gets what, where and how?". While the author acknowledged the inevitable problems in deciding upon a series of representative measures of social welfare, he concluded that a list of concerns could be elaborated for the purposes of social enquiry (see Table 1). The subject areas in Table 1, along with their respective variables, represented the "cardinal" measures by which the geographer could discern the spatial variations in well-being. By gathering data within these categories and comparing their findings across various spatial units, both large and small, geographical analysis was said to have established some rudimentary findings about human welfare.

In his reports on territorial well-being, Smith chose to conduct studies at various spatial scales including larger regions such as American states as well as denser, more compact urbanized regions such as metropolitan centres. The approach usually entailed the building of a social indicator model subjected to statistical treatment. The results allowed Smith to draw general conclusions relating to the spatial distribution of conditions of welfare.

Other geographers generally used Harvey and Smith as starting points in conducting further applied research. Much of the subsequent attention in welfare geography consisted of commenting on preliminary findings or elaborating alternative perspectives. In Britain for example, Knox(1975) and Knox

and MacLaren(1977) spent considerable time re-examining the social indicator model in spatial analysis, both in terms of its theoretical foundations and its applications. Picking up on some of the historical literature, Knox (1975) specified a number of critical indicator categories more closely associated with spatial interests. These included those that were either absolute or relative, informative, predictive, problem-oriented or programme-evaluative. In validating the final selection of indicators, he proposed that five basic conditions were to be met:

- . comprehensiveness and aggregation of social conditions
- . availability as time series;
- . disaggregation according to geographic area;
- . measurability as outputs;
- . relation to public policy goals.

The use of informative indicators was generally thought to be the most acceptable since they quantified ongoing trends and conditions. Commonly used procedures involved the derivation of standardized statistical scores for individual variables within a specified territory. More rigorous approaches, using advanced statistical methods were also recommended.

The use of problem-oriented and programme-evaluative indicators ranked highly in any analysis of social well-being (Knox, 1975, noted in particular the example of the London Education Authority study). In some instances, the approach

focused on deriving a series of standardized indices of "deprivation" as being representative of welfare conditions. Following the review of the major issues, Knox concluded that spatial analysts would do better to accept a conceptual framework founded on the "level of living" rather than the "quality of living". In this sense, the researcher could concentrate on measuring the actual components of life such as those proposed by Drewnowski & Scott (1968) or Smith(1973). Thus, the argument for utilizing indicators as reliable representations of living was thought to be easier to advance.

Later, authors interested in social welfare reviewed matters in terms of other pertinent operations such as public financing or service allocation. (Bennett,R.J.1980, Kirby & Pinch,1983) R.J. Bennett's major contributions addressed welfare with respect to needs assessment in the delivery of public goods, and the allocation, distribution and stabilization of public expenditures. Throughout his discussion, much effort was spent on reiterating the importance of spatial variation in most industrialized economies. In assessing needs, Bennett suggested five (5) possible measures, which ranged from individual or composite indicators of conditions, through to standard or representative indices of input and output of services.

Kirby & Pinch(1983) on the other hand, explored the effects of service provision on questions of welfare distribution. Services were firstly distinguished as either

pure (i.e., open space, cultural facilities, fire & police protection) or impure (i.e., education, shelter, social security). Their provision was then evaluated against three forms of public administration: pluralism, managerialism, structuralism. While the first was characteristic of democracies and the third was generally associated with socialist systems, they were eventually rejected as being too ideological with little in the way of empirical weight. The authors proposed that the managerialism option offered the best chance within which to guarantee some autonomy to decision-makers who were charged with ensuring a just distribution of public services. The recent geographical studies in the area of public financing and programming are in effect closely associated with Knox's final category of indicators: that of programme-evaluative indicators. Geographical interest in welfare can be said to have progressed beyond the descriptive and informational to entertain that which tackles the causes of spatial variation and finally to broach the ever important public policy and programme areas of social well-being.

During its relatively short history, social geography has undergone significant changes in purpose and methodology. In its early treatments it was content with describing the interaction of society with its surrounding environment. As society developed and achieved greater control of its physical resources, however the relationship between the elements, and more importantly, the human reaction in a

spatial sense became more pronounced. In larger urban areas for example, sociologists traced the movements of social classes within the city. Urban geographers soon expanded upon these findings by statistically distinguishing spatial sectors according to social attributes (Smith & Herbert, 1979, Knox, 1982, Ley, 1983).

The tradition of socio-spatial analysis eventually moved beyond the purely descriptive to the explanatory. There was growing pressure on social investigators to seek out new and better means of explaining the actual processes at work in spatial terms. In developing spatial theories though, a growing number of academics concluded that, in areas involving human behaviour, an objective perspective could not be solely depended on. In trying to understand the underlying mechanisms of socio-spatial processes, geographers required better measures of subjective data such as beliefs and attitudes. Throughout this period, geographical research held a firm belief in quantification as a means of substantiating its findings.

In many instances, the concern for the subjective factors associated with spatial well-being led geographers to retrace some of their earlier steps and to reconsider theories of the human ecologists (Knox, 1982, Ley, 1983). It also encouraged the further development of attitudinal survey techniques and alternative research methods of enquiry into the social dimensions of spatial change. As part of this changing perspective, there was renewed interest in small

scale analysis at the neighbourhood level. This was somewhat in keeping with earlier work in factorial ecology and social area analysis; however, in this case, the techniques were significantly different as analysts relied on specialized surveys of behaviour rather than conventional secondary socio-economic data.

Chapter 3

3.1 Social Indicators: A History

Another point along the continuum of well-being refers to those more precise aspects which can be readily measured and compared. In other words, it considers the variety of real world conditions which are reflections of the wants and needs described earlier and are relied upon as representative indicators of existing welfare. In contrast to the more philosophical aspects, this point treats concrete aspects and hard evidence in judging social change.

This chapter will briefly summarize the character and composition of a formalized system of social monitoring. It will describe the historical circumstances leading to the formulation of information systems on social welfare and will then review the pertinent issues associated with these systems.

It has been noted that during the early 60's well established practices were in place to measure the economic state of society. These were contained in the econometric modelling exercises which on the one hand, replicated systems of national accounts and, on the other, generated complex input-output tables of productivity. Systems of social accounts modelled after these initiatives were then reconsidered as feasible and complementary to the process of monitoring change.

Among the earliest studies to discuss issues of social monitoring, Social Indicators (Bauer(ed.), 1966) brought

together a variety of opinions describing a comprehensive and systematic approach. Commissioned to explore as broadly as possible the consequences of major technical innovation resulting from the NASA space program, the team of prominent social researchers assembled for the task concluded that insufficient insight could be gleaned from the available information. In setting out the objective of the task, the editor admitted that "...for many of the important topics on which social critics blithely pass judgment, and on which policies are made, there are no yardsticks by which to know if things are getting better or worse..." (Bauer, 1966, 20). In view of this major obstacle, the report conceded that no formal analysis could in fact be carried out to judge the social impacts of the space program. The contributors then set out to assess the structure and composition of the most appropriate information system which could accommodate a proper evaluation. The document was therefore largely devoted to a discussion of a system of time series social indicators.

As a first step in the process, the opening chapter by Biderman reviewed the historical antecedents of social statistics and their use in certifying preconceived notions. Gross, Rosenthal and Weiss then considered the advantages and disadvantages of constructing large systems of social statistics similar to that used in economic planning. They concluded that most indicators should concern "distributed benefits" or "outputs" rather than the traditional measures

of "input" such~~as~~ those of human or financial resources. In terms of selecting appropriate indicators, the authors noted the need to be much more attuned to the full complement of possible social effects. Often, true measures of a social situation or an effect could not readily be found within existing data bases. This would then require the use of surrogate variables. While this might contravene highly held principles of enquiry, it was essential that, at the very least, crude measures be available. The report concluded that social accounting systems were critical to evaluating how public sector programs (inputs) and social conditions (outputs) were interrelated.

Social Indicators was the first of many reports to treat the problems of social accountability. Many others were subsequently initiated by the U.S. government as a way of taking responsibility at the national level (National Commission on Technology: Automation and Economic Progress (Bell, 1966), Social Goals and Indicators for American Society (Gross, 1966), Full Opportunities and Social Accounting Act (Mondale, 1967), Toward a Social Report (Olson, Rivlin, 1969)). During this same period, other noteworthy studies were being published by the Russell Sage Foundation and other research institutes (Sheldon & Moore, 1968, Duncan, 1969, Campbell & Converse, 1972, Campbell, Converse, Rodgers, 1976). These explored both objective measures of the structural and distributional features of social well-being as well as the more subjective measures of individual behaviour and reaction

to change. For the most part, the purpose of the studies was to raise the concern and commitment for better measures of the level of living. They also sought to devise more accurate ways and means for calculating changes in these levels.

The recommendations in virtually all cases called for more data collection by way of a systematic recording of social indicators. They often cautioned however that existing practices were largely dictated by what was termed the "normative process" (Juster, 1981). In many instances the areas of most concern were under the direct responsibility of the government and were therefore subject to political manipulation. Because of the limited availability of information and the difficulty in devising proper analytical tools, public authorities could appeal for more time while proper mechanisms were put in place. Finally, some concern was expressed about the limitations of the existing social sciences in coping with the entire field (Land, 1975, de Neufville, 1975).

The movement for social indicators was aided by an ever increasing mistrust of traditional methods of problem solving. The social and economic turbulence of the 60's was being felt in all aspects of living. Social protest against established norms was on the rise and both economic and social relationships, which had once been thought of as relatively simple, were found to be more complex. In some areas of social science research there emerged new ideas

about social responsibility as a result of the loss of faith in the impartiality of acceptable empirical practices (Griffiths, Irvine & Miles, 1979). While this perspective threatened all forms of societal monitoring, a number of reports urged that suitable accounting of a broader set of social conditions and attitudes would serve as a better source of information for responsible decision making.

Over the years, social indicators meant many things to many people. An early definition maintained that they were "...a statistic of direct normative interest which facilitates concise, comprehensive and balanced judgments about a society..." (Toward a Social Report, 1969, 97). Horn (1978) identified no less than ten (10) different definitions which suggested that at any one time they could be social statistics, statistical time series data, quantitative variables, measurements of social phenomena, social monitors or social information systems. Despite the multitude of interpretations, most applications have generally accepted indicators as raw numerical values of conditions as recorded in census data or unique surveys (Bunge, 1976). The acceptance of a method that collects raw data from primary or secondary sources has been the most favoured way of tracing the changes in conditions within a time series format (Sheldon & Freeman, 1970, Carlisle, 1972, Cazes, 1972). In some cases, the data have been consolidated or transformed into aggregates or general indices. This has allowed for ease of

comparison across broader socio-demographic domains and more realistic summaries of specified areas of concern. Despite this relatively simple process, some reservations were expressed concerning the volatility of conditions and longer term trends (Duncan, 1969, Land, 1971). Notwithstanding these concerns, the greater availability of information was generally sufficient cause for further social monitoring.

With time, researchers began to differentiate between the more subtle characteristics of social indicators. Distinction was firstly made between "descriptive" and "analytic" indicators, with the latter comprising measures that corresponded to a well structured theory or a model of the social system (Land, 1971). Some thought that much of the traditional indicator analysis had only incorporated descriptive indicators as expedient measures of the social system. Land (1971) proposed that the development of analytic indicators would benefit the monitoring of functions and relationships of this changing social system. His argument for more conceptual thinking was countered by others who believed that efforts would be better focussed on the development of more precise quantitative measures and procedures (Duncan, 1969, 1974).

A further differentiation noted that indicators could be "direct" or "indirect" (Rossi & Gilmartin, 1979). This touched upon the notion that some indicators were surrogate measures. Given the likelihood of incomplete or inadequate data, researchers often employed these types of variables

since they best approximated the conditions under review. In judging health standards for example, such variables as hospital beds per capita or expenditures on cancer research could be utilized in conjunction with more direct measures such as infant mortality rates.

A final distinguishing feature of social indicators sought to relate them closer to decision making (Land, 1975). "Input indicators" were described as measures of actions or directions aimed at rectifying specific problems. Among the most often used, "resources" such as financial expenditures or human labour were commonly applied. Allowance was also made in this category to include "non-manipulable input indicators" which took account of less tangible factors such as the behaviours and practices of individuals who were to take action. "Output indicators" on the other hand, were the results of actions taken and were by far the most often relied upon in studies of well-being. They summarized actual conditions which were reflected in the social system. It was further suggested that a fourth category of "side effect" or "contextual" indicators also existed. These could be characterized as either inputs or outputs depending on how and where they were viewed within the process under study. Despite these subtleties, social indicators were still generally viewed as representative measures of current conditions. They were tools by which the social scientist could investigate change, but in doing so however, they were to be treated with care.

Social indicators as tools for social monitoring could be evaluated in a number of ways. Rossi and Gilmartin (1979) identify three of particular note: the quality of the data, the relationships with other variables, and the breadth of comparability and usefulness of their findings. The quality of the information was perhaps one of the most critical aspects since it raised issues of validity, reliability, stability and availability of information. Paramount in this was the actual selection of the indicators themselves for it is that process which serves to represent reality as the analyst perceives it (Gehrmann, 1978). Other authors have noted that characteristics such as simplicity, flexibility and pertinence are essential to validate social enquiry (Drewnowski, 1974). The matter of interrelationships, where indicators are grouped statistically, recognizes the need for disaggregation and representativeness in gaining greater levels of detail of dimensions of well-being. And a final evaluative method suggests that the tried and tested indicators are often the most desirable, allowing for greater ease of collection, interpretation and consistency.

3.2 Social Indicators: Applications

Social indicators have been applied in a variety of capacities. During early development they were the statistical foundations of "state of the nation" reports. The first attempts at social monitoring using indicators were by public administrators who wished systematically to record

societal change in key areas and to relate this change to public policy and programming. The scale of analysis in most instances was national or international and the components under study were generally associated with "goal areas" or essential fields of social well-being. Zapf(1974), in his review of a number of social reports, indicates that during the late 60's and early 70's many public agencies throughout the world devoted much time and effort to developing comprehensive systems of social indicators (Toward a Social Report, 1969(U.S.), Social Trends, 1972(U.K.), Donnees Sociales, 1973(France), Perspectives Canada, 1973, 1977 (Canada), Gesellschaftliche Daten, 1973(Germany) O.E.C.D., 1978). In virtually all the cases a standardized list of goal areas was identified. Those most often reported included health, public safety, education, employment, income, housing, leisure, and recreation and population. However, within each of these areas certain more specific dimensions were covered in an attempt better to measure the actual condition. Under housing, for example, national reports sought to cover aspects such as quality, cost, density, supply and satisfaction while under employment, characteristics such as participation, unemployment, labour force structure and occupational mobility were documented.

The use of social indicators in national reports has persisted to the present as more governments have instituted formalized gathering of information. In the U.S. for instance, the Department of Commerce released a report in

1980 that contained no fewer than 550 charts and tables of social indicators covering a multitude of conditions in some 19 different areas. According to "Social Indicators III" (1980) there are no fewer than 33 countries that have now established systems of indicators. During the 80's, private research initiatives have also increased dramatically such that major corporate interests have now formalized the practice of scanning and tracking changes in the socio-economic environment (Taylor & Jodice, 1983, Estes, 1984, World Bank, 1985, Marlin, Ness, Collins, 1986).

In a more limited spatial context, social indicators have also been used to compare conditions between macro and micro regions. The initial interest in sub-national regions began during the 70's as social researchers explored the rapidly changing character of urban environments (Jones & Flax, 1970, Flax, 1972, Hughes, 1973, Palys, 1973, Smith, 1973, 1976, Liu, 1973, 1975, Stewart, 1976, Knox & MacLaren, 1977, O'Loughlin, 1983). The growth of urban centres was particularly evident at this time and the size and character of cities was being significantly altered. With continued developments in statistical analysis and greater availability of disaggregated data, social indicator analysis at this scale prospered. The approach resembled that of national studies in that it chose a set of standardized indicators. The main difference from the earlier applications however lay in the selection and composition of the critical variables. Given that the analysis at the urban

scale was meant to compare the conditions of well-being within a relatively homogeneous society, greater effort was needed in selecting those conditions which would register the major differences between the spatial units.

The earliest studies recognized the need to restrict the number of indicators to those of "output" measures common to all cities and to select single variables for each of the main domains (Jones & Flax, 1970, Flax, 1972). Analysis was usually restricted to a limited number of urban centres and conclusions were drawn from comparisons of individual ranks across the selected conditions. Few attempts were made during these early stages to devise ways of aggregating the ranks so as to derive an overall index of well-being. Subsequent work employing more rigorous statistical manipulation such as "standard scores" did improve inter-city comparisons in determining "best" and "worst" rankings (Smith, 1973, 1976, Liu, 1976). In these latter applications more attention was paid to expanding the model to include many more cases and comparable variables. More use was made of multivariate statistical techniques such as factor analysis in reducing the total number of indicators and explaining the majority of the variance. Smith's study of urban well-being in the United States for example found that of a total of some 30 socio-economic conditions, two components labelled "affluence" and "crime", were instrumental in describing the variance in well-being between major urban centres.

The availability of larger volumes of data and advanced statistical software allowed advocates of social indicator analysis to broaden their range of study. The argument stated that if one could utilize the methodology to compare large urban centres then it was also possible to explore well-being at the intra-urban level (Smith, 1976, Knox, 1976, Knox & MacLaren, 1977). The social indicator model was therefore appropriate in comparing conditions in smaller communities and neighbourhoods. The studies of the "Chicago School" of the 20's, could be further tested in exploring the social processes that occurred within the urban setting. More detailed findings about urban deprivation or changes to the economic and cultural homogeneity of neighbourhoods would then be possible. In moving toward ever smaller spatial units of analysis, it became increasingly evident that the dependence on "output" measures would need to be re-examined. At this scale, many more "subjective" or personal variables were seen to play an important role in the way well-being was experienced and manifested.

An argument favouring the use of subjective indicators in studies of social well-being was advanced during the 70's following the works of Maslow and Cantrill (Shonfield & Shaw, 1972, Andrews & Withey, 1974, Campbell, Converse & Rodgers, 1976). In further support of this, a recent review concluded that "... the identification of this link between objective conditions of life and subjective experiences of these conditions is of crucial importance, especially within

the context of the modern industrial society..."(Greer-Wooten & Velidis, 1983, 12) In proposing the use of subjective indicators, researchers were seen to refine the concept of well-being. Many agreed that the data were critical in gaining information about life's perceptions and that this was most crucial for small scale analysis (Allardt, 1975, Dale, 1977, 1980, Knox & MacLaren, 1977). While the topic received some support there were many who noted inherent problems in data capture and difficulties in measuring relationships statistically (Knox, 1976, Kuz, 1978, Greer-Wooten & Velidis, 1983).

The notion that the indicator model could record true measures of satisfaction, aspiration, perception, belief and value of an individual was under question. The intent was highly desirable in achieving a better understanding of concerns and feelings as well as gaining knowledge of the mechanisms of satisfaction and dissatisfaction (Pacione, 1982). The combination of objective and subjective indicators in spatial analysis, however, received mixed reviews. Some claimed that no correlation existed and that there was no cause for retaining both types (Kuz, 1978) while others noted that the relationships were significant and warranted further application (Dale, 1977, 1980, Knox & MacLaren, 1977).

Recent applications of social indicator analysis have added to the existing volume of research on the subject of well-being. The development of the periodical "Social

Indicators Research" is a testament to an approach that has been adapted to a multitude of scales ranging from the global to the household and across many varied dimensions of social experience. In many instances, the goal of deriving hard findings has resulted in the application of standardized analytical methods. These studies are largely seen as exercises in the manipulation of social statistics. This notwithstanding, more recent applications of social indicator analysis have tried to view the relationship at its most fundamental level, that of the household. A number of studies, including those by Stone(1971,1975), Felson(1976), Fox(1980), Juster(1981) and House(1981), have focussed on the concepts of "demographic accounting" and "time based accounting" as a means of consolidating objective and subjective indicators into a single framework. The key variables in this perspective are the use of time in performing activities and the linkages between this allocation and the existing stock of resources. The approach has not been without its critics who maintain that while it is conceptually valuable it lacks in substance what it offers in form (House,1981). As an alternative, Terleckyj(1979) has proposed an indicator model of household well-being based on the pattern of government expenditures as "input" measures and the social impacts of this spending behaviour. This too has been questioned as it is seen to be too aggregative and abstract as a solution to measuring well-being at the household level.

3.3 Social Indicators: Issues

This discussion has pointed out that for the many applications using social indicator analysis in reporting on well-being, there have been many who have raised concerns about its effectiveness. Given the nature of the topic it is not surprising that a number of issues have been raised with respect to the application. Among the numerous problems to have plagued social indicator analysis many may be grouped as either theoretical or technical.

As previously noted, most theoretical problems are related to the concern that social indicators lack a proper foundation in social theory (Sheldon & Freeman, 1970, Land, 1971, 1975, Henderson, 1974, Edwards, 1975, Andrews & Withey, 1976, Hirshfield, 1978, Carley, 1982, Greer-Wooten & Velidis, 1983). The contentious issue here is that there is as yet no consensus about what formally constitutes the quality of life. Is the concept meant to reflect the level of living, the standard of living, social welfare, human deprivation or social values? Studies of each of the above have been performed; however, in most cases the research has had to clearly spell out definitions and objectives rather than accept certain standards and take them as understood or granted. Johnston & Carley (1981, 247) recognize this as a classical issue of validity, whereby "...the validity of a postulated correspondence between an indicator and that which it indicates cannot be empirically determined if the property or characteristic to be indicated is itself unobservable...".

According to the authors, only a well defined and articulated social theory could help to resolve this basic problem.

The concern for a theoretical framework also raises the issue of what may be termed "social applicability". Since the application of social indicators is presumed to serve both policy analysts and decision makers in public programming, the lack of an overall conceptual foundation only serves to weaken the empirical argument (Edwards, 1975). Throughout its history, social indicator analysis has steadfastly maintained a technical or statistical approach despite the many undefined and conflicting issues. It may even be said that empiricists profited from this lack of theory. The increasing availability of time series data and statistical tools was also very opportune. The outcome was a proliferation of descriptive analyses that did little to confirm the dynamic conditions of social processes but was sufficient in serving as a foundation to public policy. The analyses also produced rather discrete findings as opposed to an integrated understanding of the phenomenon under study (House, 1981).

The issues of most importance to social indicator analysis were, however, related to technical attributes. The first, and perhaps the most critical, was that of quantification and measurement. In particular, it was that of the selection, aggregation and weighting of indicators needed to properly assess well-being (Bunge, 1976, Johnston & Carley, 1981, Carley, 1982, Pacione, 1982). Repeatedly, reviews

maintained that the selection of indicators was dictated by a normative process that relied on the use of crude measures or at best proxies of social conditions. Attempts to derive more appropriate and representative measures often resulted in more costly and controversial measures. This then initiated a return to more acceptable or believable indicators that were more accountable to external influences and interests (Johnston & Carley, 1981).

The selection of key indicators also raises an issue commonly referred to as "cultural imperialism" (Knox, 1975) and sums up in some respects many of the issues related to bias and weighting of information in research. Both academic or applied research cannot be said to be completely objective since it is often assumed that there are explicit, implicit or arbitrary forces which can influence the conduct of the research (Drewnowski, 1974). This is most evident in studies of well-being given that there are a variety of special interests (i.e., political, economic, social or psychological) which come to bear on an enquiry into the quality of life. Regardless of the intent therefore, all social indicator research is subject to value judgements and value weightings. These could occur during the selection of variables or during the interpretation of empirical results. Carley (1982, 91) concludes that "...social indicator research is imbued with cultural value assumptions, indeed whenever a social indicator is normative, that is, indicates some positive or negative change in a social phenomenon related to

well-being, it is impossible that it be value free..."

As a means of correcting for the biases inherent in value laden research, some have sought to use additional measures of subjective phenomena. This was originally proposed to ensure comprehensiveness in the selection of factors of well-being. It was also meant to help in gaining a better appreciation of how certain factors were related to real life conditions. The use of subjective measures however has not been totally successful. Again, the issues have largely been technical, dealing particularly with data capture and analytical methods. Johnston & Carley(1981,246-247) note three serious drawbacks in their use: the volatility of subjective phenomena, the intensity of feelings and attitudes, and the legitimacy of recording inner thoughts or beliefs. Pacione(1982) also points to weaknesses in validation and the absence of reliable analytical techniques. While it may be conceded that public opinion polling has, of late, been received with more favour, the fact that subjective indicators are generally short lived, very individualistic and prone to influences such as "yea saying" or "bandwagon" trends, does little to improve their chances of being accepted. Despite these limitations, public opinion polling cannot be ignored as a source of information for both researchers and policy makers. The relatively recent interest in greater public participation, as exemplified in "balance sheet" analysis (Lichfield,1975), sensitivity analysis or Likert scale continuums, should not be

discouraged. As Carley(1982) recommends, greater emphasis should be placed on establishing some form of "institutionalization" of procedures and practices in order to legitimize the use of social indicators in public policy. Such endeavours would necessarily require long term commitment to reliable measures, an expressed need for time series data, clearly defined linkages between indicators and policy and finally suitable respect for the institution charged with the task (Carley,1982,110).

Technical problems afflicting social indicator analysis have tended to occur when relationships are postulated and modelled. It has already been noted that in some cases data limitations and inadequate statistical methods have hampered the analytical process. But in addition, certain underlying issues concerning the limits of the system under study or more importantly the cause and effect relationships may also come into play (Johnston & Carley,1981, House,1981). The problems in this instance are more those of omission, where certain critical factors are missed, and those of unexplained variance, where residuals are so large that they throw into question the choice of independent variables.

A final issue which can also impede the results of social indicator analysis is that of an overabundance of data, generated by a great many special purpose or ad hoc tabulations. This has not only led to a problem of information overload, presenting policy makers with complicated choices in decision making, but has also strained

or damaged the reputations of social scientists. The proliferation of concepts, techniques and tabulations has, in some respects, produced a process of social measurement which is in a state of confusion and expediency rather than one fully devoted to problem resolution and political action. It may in fact be said that the situation is likely to get worse since our management of information is a further contribution to the explosion of data.

Chapter 4

4.1 Introduction

To this point, we have reviewed various conceptual aspects of social well-being. On a continuum extending from the general to the specific the matter of well-being was explored from various perspectives. The final points of the discussion noted that social indicators offered appropriate and representative measures of the character and content of social change.

This chapter shows how indicators of living conditions can further our understanding of the spatial aspects of social well-being. As noted earlier, the emphasis is on the major urban concentrations in Canada since it is between these that variation is most likely to be pronounced. We begin with a brief historical review of urban indicator applications. This is then followed by a three (3) stage analysis using various statistical techniques. The underlying objectives are (1) to document the character of variation in conditions of well-being and (2) to test certain hypotheses of both spatial and policy issues. In this way the thesis gradually moves away from the contextual perspective and towards the substantive perspective of Canadian regionalism.

4.2 Urban Well-Being: How Best to Understand It?

The urban environment may be explored at two different scales: intra-urban and inter-urban. Analysing socio-economic data at the inter-urban scale has been a

longstanding tradition with spatial analysts concerned with social well-being (Flax, 1970, Coughlin, 1970, Smith, 1973, Berry, 1974, Liu, 1975, Knox, 1977, Simmons & Bourne, 1979, 1980, 1982). This is most often the case given the relative ease with which data can be assembled and the regularity with which it is published. This larger scale of analysis has also been preferred because it is more in keeping with the scale of much of the conceptual thinking about theoretical applications in spatial systems.

The analysis of variation at the intra-urban or neighbourhood scale has also received some attention. During the quantitative revolution of the 60's, spatialists pursued this detailed approach through the conduct of "factorial ecologies", stressing the explanatory power of intra-urban patterns as judged by statistical treatments of socio-economic data (Berry, 1974, Abu-Lughod, 1974). Despite its success as an empirical application, this small scale perspective was criticized on the grounds of a tenuous relationship between the larger scale data and the smaller scale of analysis. More recently, renewed efforts at documenting spatial disparities at the intra-urban scale have been initiated so as to address some of the irregularities in urban policy planning and programming (Knox & MacLaren, 1977, Hirshfield, 1978, Ley, 1983, O'Loughlin, 1983). Supporting these new initiatives is the fact that some of the basic inconsistencies in the practice of data collection have been rectified with increased use of personal interviews and

public polls. Notwithstanding this, technical problems associated with standardization and representativeness persist, limiting its applicability in urban research.

Investigations of urban conditions have most often relied on the use of so-called objective measures. This approach has also been favoured since it rests on traditions of regularity and consistency in the collection of data. The application of a set of objective indicators of existing conditions, across a number of cases has been the accepted practice in most studies of spatial well-being. A more difficult, yet more personal, approach advocates subjective measures as truer reflections of social change. This methodology seeks to obtain individual or group opinions and reactions to urban phenomena. These indicators are admittedly harder to assemble and interpret; however, they are increasingly thought to be critical to the study of urban dynamics. They represent personal attitudes which are important in evaluating the success or failure of specific programs. They can also be used as corroborative evidence in judging objective conditions. Recent developments in the field of public opinion polling have helped the cause of subjective measures within policy analysis.

In this study we will endeavour to understand regional variation in well-being by adopting an inter-urban perspective and by utilizing both objective and subjective measures. The approach will consider "output" indicators of experienced life conditions which could ultimately serve in

follow-up evaluative studies within the public policy field (Flax, 1972).

The application of urban indicators to the study of the spatial distribution of well-being was generally favoured in the past because it established benchmarks for judging the relative states of cities. Given this role, early proponents spent much of their time justifying the analytical advantages of their individual studies. The study by Flax (1970), for example, which looked at various socio-economic conditions in 18 American centres saw the bulk of the conclusions as having more to do with the criteria for selecting variables and the interpretation of indicators than with the spatial variation in the quality of life. The findings noted that it was far better to examine a wide variety of conditions, that it was preferable to select a single variable for each of the conditions under study and finally, that output measures were better reflections of the situation.

With time, more detailed studies employing larger data sets, both in terms of indicators and observations, were launched so as to test other methodologies and confirm earlier findings (Coughlin, 1970, Smith, 1973, Liu, 1975). In virtually every case, the objective was to devise a standardized approach that relied on transforming raw data into "standard scores" before subjecting this data set to statistical manipulation. The results would then provide a more manageable and interpretable set of "descriptors" of

the urban environment. Noteworthy studies of inter-city conditions by Smith(1973) and Liu(1975) for example found that two fundamental constructs of well-being could generally be extracted from the data. Smith's application of factor analytic techniques to American data produced two principal axes of well-being: affluence, bringing together many of the economic and welfare conditions, and crime, accounting for data on social order and security. Liu's structures of well-being were equally explained by two major dimensions; one was characterized as an economic/political factor while the second described a social/health factor.

Canadian work on urban indicators was originally sparked by interest from the federal government (Economic Council, 1974, Ministry of State for Urban Affairs, 1976, Statistics Canada, 1977, Canada Mortgage and Housing Corporation, 1979). However, the earliest empirical example was that by Palys(1973) who set out to replicate the Flax model in documenting 14 carefully selected indicators for 10 cities. As in the Flax study, Palys directed most of his attention to a critical examination of the strengths and weaknesses of the indicators. Particular attention was paid to the practices of selection without proper justification and it was recommended that much was to be done in standardizing the indicator approach.

A more rigorous study was completed by the Ministry of State for Urban Affairs in 1976. The analysis considered 32 variables, divided into three categories: social development,

economic development, physical development. The selection of variables was judged on the basis of five (5) criteria: comprehensiveness, availability, reliability and consistency, validity and topicality. The study recorded raw data scores for each of the 1971 census metropolitan areas (CMA) across each of the selected conditions. The results were depicted in bar charts which, in one instance, placed the cities in descending rank order according to raw scores while in another, the cities were arranged from east to west according to geographic location. In terms of statistical analysis, the report included a brief technical appendix on the findings of a principal components analysis of the data. Among the major findings, the authors noted the problems of redundancy in the data set and the lack of clearly defined factors. The analysis concluded that no overall summary measure of the quality of life could be detected, but that this quality was manifested more in terms of clusters of highly interrelated indicators. Most of these described conditions related to ethnic or cultural dimensions of the Canadian urban system.

There are several reasons for conducting further statistical analysis at this time. First, the exercise will permit the gathering of more current information regarding regional variation of conditions of well-being in Canada. Second, in performing statistical manipulations, there will be an opportunity to test and comment on various hypotheses. Third, the results could be compared to previous findings as

a way of documenting changes over time. Finally, the conclusions and recommendations could then be reviewed in terms of broader policy and program initiatives.

4.2 Urban Indicator Analysis: A Canadian Study

Presently, census figures are available every five (5) years and the number and quality of independently administered surveys is on the rise. Despite some inconsistencies with data coverage, it can generally be concluded that the social scientist is well placed to undertake investigations of contemporary issues. On the other hand, the fact that so much data is being generated could lead one to conclude that too much information is being made available, causing new found concerns about representativeness and applicability.

Notwithstanding the availability of vast amounts of data, there are still problems in ensuring a complete coverage of some of the more subtle conditions currently occurring in the urban environment. Moreover, faced with a wealth of information, the analyst must be particularly cautious in making a final selection of appropriate indicators. The once limiting factor of availability is therefore no longer a severe impediment. In its place criteria related to selectivity, reliability and topicality have taken on greater importance.

The choice of individual variables for use in a study of social well-being must be based on a combination of caution

and foresight. To begin, there must be links with the conceptual foundations as described previously: We earlier observed that the matter of well-being was generally associated with human needs. In our daily lives, there are well defined basic needs which include essential requirements such as food, shelter and clothing. More indirectly however, there are other social needs such as health and education services. And in a more metaphysical context, the earlier discussion also recognized the existence of higher-order needs related to psychological and emotional requirements. In trying to capture representative indicators of these types of needs, care must be taken to ensure that excessive bias is not introduced. This bias could be in the form of "ethnocentrism" whereby "western" values might preclude the consideration of other worthy indicators. As well, bias in the form of over-representation, redundancy or overlap could jeopardize the interpretation of the final results (Davies, 1984). The objective is to be selective in the choice of proxy or general indicators while still striving to obtain indicators that reflect the present situation.

For the purposes of this presentation, criteria for indicator selection were limited to consistency, validity and topicality. In terms of consistency, the study tried to refrain from collecting information from a wide variety of sources. It is presently possible to choose from among many different sources of data as well as any number of spatial units to which the data applies. In looking at a larger data

set, however, it was felt preferable to limit the choices so as to be more consistent in developing a cohesive set of indicators. The criterion of topicality was applied so as to ensure that the study be current and contemporary. The character of urban living is such that new trends are continually emerging. For the results to be timely and meaningful, the data set must try to pick up on some of the current changes occurring at the urban level.

Information was selected from a minimum number of sources and in many instances, the data were collected from the Census of Canada. Concerning the areas of housing, environment and personal attitudes, the Canada Mortgage and Housing Corporation, Environment Canada and the Institute for Behavioural Research at York University were consulted. The limiting of the sources ensured overall spatial consistency to units such as census metropolitan areas (CMA) and census agglomerations (CA)(see technical appendix for details). These units formed the most appropriate reference points in measuring regional variation of well-being. Admittedly, there were other sources of dependable data including private (i.e., A.E. Lepage reports), academic or other public bodies (i.e., provinces, municipalities); however, they could not often be relied upon to provide disaggregated and consistent data for urban centres.

The choice of individual indicators was guided by a conceptual model which described the major character of urban well-being. To help in devising the model, background

information gleaned from previous studies was assembled. Table 1 itemizes the larger fields of well-being as identified in studies done during the mid 70's, including a listing of the preferred categories used in the present study. This final set of categories is an attempt to reflect many of the communalities which run throughout the table.

A total of 10 separate categories were retained as being comprehensive and representative of the Canadian scene. The more traditional fields related to economic and social matters are well represented in items 3,4,7,and 8. In virtually all studies of this nature, there is the need to gather indicators which are thought to be distinctive or diagnostic of the population and the regions under study. For the purposes of this exercise, efforts were also made to pick up some of the cultural dimensions related to ethnic background, mother tongue and bilingualism. In addition, it became clear that other fields associated with demographic and household character should also be explored given the recent impacts being generated by the "baby boomers" as they pass into middle age. In providing for greater numbers of variables however, there was the risk of introducing bias within the set. To offset this risk, efforts were made to choose uni-dimensional variables, measuring individual conditions.

Among the selected categories the study also collected data on personal attitudes as taken from a national survey. The issue of whether to include subjective data is as yet

Table 1
Major Dimensions of Well-Being

	Drenowski & Scott 1968 (global)	Flax 1972 (urban)	O E C D. 1973 (national)	Smith 1973 (urban)	Drenowski 1974 (global)	Henderson 1974 (national)	Liu 1975 (urban)	Present Study, 1986 (urban)
1 Nutrition	X	X	X	X	Nutrition	X	X	X
2. Shelter	Housing	Physical Environment	Living Environment	Shelter	Man-made Environment	Environment	Shelter (6 variables)	
3 Health	Health/ Mental Health	Health	Health	Health	Health	Health & Education	Health (5 variables)	
4. Education	Educational Attainment	Individual Development	Education	Education	Knowledge & Skills	X	Education (2 variables)	
5. Leisure & Recreation	X	Time & Leisure	Recreation & Leisure	Leisure	X	X	Personal (6 variables)	
6. Security	Public Order	Personal Safety	Social Order	Security	Individual Rights	X	see No 5&8 (3 variables)	
7. Surplus Income	Income/ Poverty	Command over goods & services	Income/ wealth/ Employment	X	Production Consumption Goods	Economic	Economic (5 variables)	
8 X	Social Disintegration	Social Opportunity	Social Belonging	Social Environment	Social Rights	Social	Social (3 variables)	
9 X	Unemployment	Employment	see No 7	X	Employment/ Financial	see No. 7	see No. 7	
10 X	see No 2	Air Quality	see No 2	Physical Environment	Natural Environment	see No 2	Environment (4 variables)	
11 X	X	X	X	Clothing	X	X	X	
12. X	X	X	X	X	X	X	Demographic (6 variables)	
13 X	X	X	X	X	X	X	Household (5 variables)	
14 X	X	X	X	X	X	X	Cultural (4 variables)	

unresolved. Knox & MacLaren(1977) for example chose to include subjective indicators in their study of Dundee, Scotland and their findings indicated that high correlations existed between objective and subjective variables. From this the authors concluded that "...for the purpose of generally describing or evaluating ecological disparities in well-being, conventional hard data are as good a surrogate as any..."(1977,241). This finding was then challenged by Kuz(1978) in his study of urban centres in Manitoba using both types of indicators. Kuz(1978,416-417) concluded that there was "...no relationship between the structural reality of a place and the way its residents perceive it as a place to organize, to interact, and to make friends...". Subsequent reviews of the matter have revealed that it is not as simple as it seems (Dale,1980, Wasserman & Chua,1980). In this instance, the availability of disaggregated subjective data allowed further probing of the objective/subjective polarity.

A more detailed description of the data set is provided in Table 2. It can be seen that among the more conventional economic and social fields, the study selected many separate indicators that represented a variety of conditions such as employment status, demographic growth, family poverty, health services, educational attainment and criminal activity. In some instances the choice of an appropriate variable was in keeping with earlier studies. Variables such as the unemployment rate, the price of a single detached house or

Table 2
Selected Indicators of Social Well-Being

I. Demographic:	. population change 1971-76, 1976-81
	. population density change 1976-81
	. net migration ratio 1976-81
	. youth dependency ratio, 1981
	. elderly dependency ratio, 1981
II. Household:	. population living in province of birth, 1981
	. families with 0 children, 1981
	. families with 2 + children, 1981
	. households with 0 families, 1981
	. change in lone parent families 1976-81
III. Cultural	. population with other mother tongue, 1981
	. ratio of multiple origin population to total
	. population speaking english and french, 1981
	. population with no religious preference, 1981
IV. Shelter	. owner occupied dwellings, 1981
	. occupied dwellings in need of major repair, 1981
	. occupied dwellings built before 1946
	. change in the cost of a s.d. dwelling, 1976-81
	. average price for a s.d. dwelling, 1981
	. average monthly rental/owner costs, 1981
	. change in dwelling starts 1976-81
V. Economic	. unemployment rate, 1981
	. youth unemployment rate, 1981
	. change in female participation rate 1976-81
	. incidence of low income, 1978
	. ratio of tertiary employment to other employment
	. income distribution ratio, 1981
	. ratio of managers to clerical staff, 1981
	. ratio of professionals to population, 1981
	. value added of manufacturing activity per employee, 1981
	. families with less than \$10,000 income, 1981
VI. Social	. age standardized mortality rate (male), 1979
	. age standardized heart disease rate (male), 1979
	. age standardized traffic death rate (male), 1979
	. hospital beds per 10,000 population, 1977
	. ratio of population to physicians, 1979
	. population with less than grade 9, 1981
	. population with university degree, 1981
	. criminal offences per 100,000 population, 1981
	. violent crimes per 100,000 population, 1981
	. property crimes per 100,000 population, 1981
VII. Environmental	. total number of hours of sunshine, 1980
	. annual number of days of precipitation, 1980
	. average of suspended particulate matter, 1980
	. sulfur dioxide content, 1980
VIII. Personal	. evaluation of local government, medical care, recreational facilities, public transport
	. general fear of crime, 1979
	. index of liking, 1979

(See Appendix 1 and 2 for details)

the rate of violent crime have often been acknowledged as very standard measures. In ensuring that many of the more conventional conditions were accounted for, the study also tried to be thorough in its coverage. For this reason, the field of housing for example was explored from many points, including cost, age, construction activity and condition.

While the final choice of variables was geared to gathering longstanding measures, the study also dealt with contemporary manifestations of urban living. In considering emerging issues, the study selected variables on dependency ratios, childless families and non-family households. These were picked as representative of the significant changes occurring within the family as a result of the "baby boom" generation dominating the middle stages of the life cycle. In terms of the economic and social categories, variables on female participation, the impact of the service sector economy, youth unemployment and heart disease rates were documented. Again, the reasoning for these choices was in direct response to the dramatic changes presently affecting the size, structure and composition of the labour force.

There were a great many other current conditions which also warranted documentation, including child care services, consumer habits, media exposure and consumption. However, in terms of reliable and consistent evidence, such matters were difficult to record. Sadly, such a situation is generally indicative of the present state of social enquiry. Regardless of the numerous references to current social and

economic changes in the media, it is often the case that the collection of detailed pertinent data is left to specialized surveys which, more often than not, are limited, incomplete, and rarely repeated. An appropriate example has to do with the probable significant impacts of the "baby boom" generation in matters such as the family and the work environment. At present, it is virtually impossible to measure with any degree of consistency the full impact of this phenomenon given inconclusive evidence or dated material. For this study, the potential effect of new and emerging demographic, social or economic trends was accounted for, in albeit limited fashion, through various indicators. By selecting indicators of matters such as religious preference, demographic mobility, managerialism and university education, it was hoped that the study would be able better to document regional variation in current life cycle and life style conditions.

As noted earlier, the study tried to include dimensions which were felt to be intrinsically Canadian. The variables of particular note were part of the cultural field and, to a lesser degree, in the household and personal categories. Matters of bilingualism and multiculturalism were therefore captured within indicators of language, ethnic background, mother tongue and province of birth. For the most part, the selected data dealt directly with cultural origins rather than the more general aspects of culture (i.e., the arts).

Personal indicators provided for disaggregated data on attitudes towards a variety of urban conditions. The areas which appeared to be of most interest had to do with government, medical care, recreational facilities, security, and public transportation as well as a general index of satisfaction. In some instances, the choice was dictated by the fact that an objective indicator dealing with the matter had already been selected. Otherwise, the indicators were examined in terms of their contribution to a better overall understanding of regional differences.

Virtually all the selected variables document the period 1979-1981. The proposed analysis is therefore cross-sectional and represents a one time "snapshot" of the situation. In matters of well-being it is generally difficult to accept cross-sectional analysis since it is too time specific. Time series analysis is more appropriate since it is better suited to detecting spatial changes over time. This method does suffer, however, in terms of data collection. There is the problem of the changing boundaries of the spatial units under study. Decisions must be taken at the outset as to which geographic boundaries are to be retained during the study period. This often causes omissions or over-estimates in the collection of data and ultimately jeopardizes the results.

The spatial parameters of the study were determined by the extent and composition of the urban system. In Canada there are presently 24 census metropolitan areas (CMA) which

are home to over two thirds of the total national population. Another level of urban concentration, however, can be found in census agglomerations (CA) which account for cities of between 10,000 and 99,999 population. For the present study, all 24 CMA's and 21 CA's with population over 50,000 were selected (see Table 3 & Map 1 for details). In selecting the final set of cities, attention was paid to a number of specific criteria related to regional representation, locational attributes and magnitude of centre. Table 3 identifies the selection criteria and lists individual cases within each group.

In order to ensure statistical significance, efforts were made to guarantee that groups of cities were sufficiently large to withstand certain tests. Based on the selected criteria, comparisons between individual regions could prove problematic. This was the case with Eastern cities of which there are only seven (7) in contrast to Ontario with 18 cities. Regardless of the differences, the total cases per group were sufficient to allow for testing.

The analysis was divided into three separate phases. The first reports on the results of standardized statistical tests of association. Student's t and analysis of variance test hypotheses of significant differences between groups of cities across selected indicators. The second phase proceeds with a more detailed application of a model of "standard scores". These standardized scores allow for further disaggregation or combination in providing for overall

2

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Table 3
Case Selection Criteria

<u>Criteria</u>	<u>Scale</u>	<u>Cases</u>
1. REGION:		
West	Census Metropolitan Areas:	Calgary, Edmonton, Regina Saskatoon, Vancouver, Victoria, Winnipeg,
	Census Agglomeration Areas:	Kamloops, Kelowna, Nanaimo Prince George, Medicine Hat
Ontario	Census Metropolitan Areas:	Hamilton, Kitchener, London, Oshawa, Ottawa- Hull, St. Catharines, Sud- bury, Thunder Bay, Toronto Windsor
	Census Agglomeration Areas:	Barrie, Brantford, Corn- wall, Guelph, Kingston, Peterborough, Sarnia, Sault Ste Marie
Quebec	Census Metropolitan Areas:	Chicoutimi-Jonquiere, Montreal, Quebec, Trois Rivieres
	Census Agglomeration Areas:	Drummondville, St. Jean, Shawinigan, Sherbrooke
Maritime	Census Metropolitan Areas:	Halifax, Saint John, St. John's
	Census Agglomeration Areas:	Fredericton, Moncton Sydney, Charlottetown

Table 3(cont'd)
Case Selection Criteria

2. LOCATION

Central Canada (23 cities)	Chicoutimi, Hamilton, Kitchener, London, Montreal, Oshawa, Ottawa-Hull, Quebec, St. Catharines, Toronto, Trois Rivières Windsor, Barrie, Brantford, Cornwall, Drummondville, Guelph, Kingston, Peterborough, St. Jean, Sarnia, Shawinigan, Sherbrooke
Non-central Canada (22 cities)	Calgary, Edmonton, Halifax, Regina, Saint John, Saskatoon, St. John's, Sudbury, Thunder Bay, Vancouver, Victoria, Winnipeg Fredericton, Kamloops, Kelowna, Moncton, Nanaimo, Prince George, Sault Ste. Marie, Sydney, Charlottetown, Medicine Hat

3. SIZE

Cities with more than 100,000 Population (24 cities)	Calgary, Chicoutimi, Edmonton, Halifax, Hamilton, Kitchener, London, Montreal, Oshawa, Ottawa-Hull, Quebec, Regina, Saint John, Saskatoon, St. John's, St. Catharines Sudbury, Thunder Bay, Toronto, Trois Rivières, Vancouver, Victoria, Windsor, Winnipeg.
Cities with less than 100,000 population (21 cities)	Barrie, Brantford, Cornwall, Drummondville, Fredericton, Guelph, Kamloops, Kelowna, Kingston, Moncton, Nanaimo, Peterborough, Prince George, St. Jean, Sarnia, Sault Ste. Marie, Sydney, Charlottetown, Medicine Hat.

MAP - CANADIAN URBAN CENTRES

indices of well-being. This procedure is common to many previous studies of well-being. The final phase of the analysis uses multivariate techniques to reduce the overall dimensions of the data matrix into - it is hoped - interpretable components. The object in this case is to determine the underlying regional dimensions of well-being in urban Canada.

4.2.1 Phase 1:

It was noted earlier that the overall objective of the exercise was to compare conditions of life across Canadian cities. By first subdividing these urban centres into larger groups and measuring the statistical significance of the regional variation the first step will have been taken in accounting for changes in social well-being. To do this, however, there is a need to know on what grounds the differences are thought to exist. In other words there is a need to evaluate certain hypotheses related to regional variation and to confirm their statistical significance. The first part of the analysis was meant to address these issues.

Within the Canadian urban system there are any number of characteristics and peculiarities which deserve further documentation and testing. In the broader context of this study those associated with "regionalism" are perhaps the most crucial. In 1981 over two thirds of Canadians living in

larger urban centres were residing within the Québec-Windsor corridor of central Canada. This fact serves as the basis for the first hypothesis which suggests that conditions of the central or "core" cities are significantly different from "non-core" cities. The availability of statistical techniques such as the analysis of variance also allows for further grouping of cities into western, central and eastern regions in order to test for significance. Additional disaggregation of this nature permits the testing of a hypothesis that explores the degree to which the Maritimes may be different from the Prairies.

Apart from spatially founded hypotheses, there is an opportunity to measure the effect of urban size on social well-being. For example, can it be statistically shown that the attributes of those living in metropolitan Toronto, an urban area of over 2 million people, are different from those of residents in Kamloops or Barrie or Charlottetown, cities of less than 100,000 people? Such an hypothesis can be posed and tested for both large and small groups of cities in evaluating the effect of the urban dimension on the quality of life.

The first part of the analysis involved the construction of the raw data matrix composed of 45 cases and 51 variables. In many instances, interval or ratio scale data were used so as to be compatible with parametric methods of hypothesis testing. Table 4 summarizes some of the more conventional statistics, confirming that many of the variables were

Table 4
Descriptive Statistics

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Kurtosis</u>	<u>Skewness</u>
PCHG2	6.69	6.50	-4.52	25.74	0.86	0.98
DENCHG	-23.27	36.17	-95.97	14.06	-0.95	-0.79
YDR	32.66	3.23	25.86	40.63	0.03	0.12
EDR	14.20	3.76	4.57	25.85	1.81	0.42
NMR2	0.74	4.98	-8.15	29.60	20.92	1.14
NOCHD	14.49	2.41	8.35	20.81	0.35	0.21
CHD	42.65	3.86	31.81	53.01	1.47	0.16
FAMLP	32.97	10.12	14.48	60.11	-0.23	0.23
POB	71.05	16.39	34.94	97.43	-0.40	-0.31
NOFAM	24.66	4.14	14.53	34.05	0.20	0.10
ETHN	8.91	4.25	0.62	14.51	-0.37	-0.87
POPBIL	12.89	12.17	2.92	44.54	0.97	1.53
NORELG	7.27	5.72	0.77	22.39	0.97	1.22
DWLREP	5.74	1.65	3.17	12.17	4.38	1.71
RENT	316.69	50.72	214.00	460.00	0.57	0.46
OWN	390.62	54.94	285.00	557.00	0.98	0.46
DWLPR	67929.29	26967	35160	171726	4.35	1.92
UNEMP	8.45	2.81	3.80	17.40	1.68	1.04
YUNEMP	14.37	6.25	5.10	34.10	1.93	1.34
WFCHG	19.42	5.37	9.18	35.54	0.61	0.50
HRTDIS	386.73	74.71	234.90	554.90	-0.17	0.03
TRFCAC	52.37	15.90	26.40	96.90	1.28	1.03
LOWINC	12.83	2.96	8.90	19.60	-0.42	0.76
INDMIX	1.81	0.72	0.98	4.08	1.45	1.38
HSPBDS	8.87	2.79	4.86	17.63	2.07	1.23
PPHYS	630.88	164.40	325.73	1031.68	-0.08	0.25
INCDIS	0.80	0.03	0.72	0.87	0.03	-0.44
SALES	2.76	1.66	1.31	11.11	16.31	3.70
MGRCLR	39.93	6.46	30.15	59.95	1.18	1.04
ED9	17.26	4.79	8.08	28.73	-0.37	0.35
EDDG	8.20	2.79	3.89	15.07	-0.63	0.52
VIOL	776.05	309.19	351.70	1692.70	0.21	0.67
PROP	7644.12	1882.95	4140.60	12070.0	-0.72	0.34
FAMPOV	13.76	3.12	9.13	21.48	-0.29	0.71
INDACT	52671	13549	33644	97901	3.27	1.55
SULDI	6956.55	1642.79	3237	8649	-0.19	0.93
PCHG1	8.08	7.97	-6.60	29.60	1.01	0.92
TONG	9.90	7.38	0.41	27.23	-1.02	0.24
DWLOWN	61.98	7.30	41.66	75.72	-0.05	-0.47
DWL46	22.04	8.41	2.71	45.78	0.82	0.16
DWLCST	11.06	26.23	-32.29	85.18	0.99	0.93
DWLSTR	-24.43	65.63	-80.85	287.41	14.94	3.40
MORT	911.25	93.81	692.90	1163.90	0.15	0.24
POPRAT	34.46	61.74	4.51	299.91	13.08	3.57
CRIME	1129.20	665.70	281.20	3207.60	2.27	1.49
PRORAT	0.39	0.14	0.13	0.72	0.01	0.56
SUN	1923.43	85.31	1800	2113	-0.40	0.49
RAIN	1398.83	240.22	770	1790	-0.14	-0.57
SUSPAR	59.24	21.54	25	117	0.39	0.80

normally distributed with most observations falling within the acceptable range of three standard deviations from the mean, either way.

For variables with skewed distribution, transformations were considered but were eventually rejected as being ineffective in contributing to greater degrees of reliability. In his review of this matter, Bennett(1982,146-149) found that such procedures were unnecessary when "standard scores" were being assessed and furthermore, that no significant difference could be detected when the data were submitted to more rigorous testing. Davies(1984) later noted that the interpretation of results could be made more difficult if transformed data were being considered.

Parametric tests such as Student's t and analysis of variance were used to test the noted hypotheses. The Student's t was used to measure the statistical difference between two large populations such as that of the core/non-core comparisons while the analysis of variance allowed for further consideration of "between" group and "within" group variation for smaller aggregations of cities. As a rule, the results were tested at the 95% confidence limit, meaning that there was a 1 in 20 probability that the results of the tests would occur by chance.

The results of the Student's t test along core/non-core and CMA/CA dimensions are in Table 5. It is clear from this listing that more conditions of well-being differed across

Table 5
Student's t Test Results
Indicators Registering Significant Results

<u>Core/Non-Core Comparisons</u>	<u>CMA/CA Comparisons</u>
1. Population Change 1976-81 (2.02)	1. Population Density Change 1976-81 (7.16)*
2. Youth Dependency Ratio (2.13)	2. Families with 0 Children (2.06)
3. Population Living in Province of Birth (3.12)*	3. Lone Parent Family Change 1976-81 (2.30)
4. Ratio of Multiple Origin Population to Total Population (3.55)*	4. Households with 0 Families (2.28)
5. Population Speaking English & French (2.23)	5. Population with Mother Tongue other than English & French (2.77)*
6. Population with no Religious Preference (3.19)*	6. Owner Occupied Dwellings (2.47)*
7. Dwellings Built Prior to 1946 (2.18)	7. Average Gross Monthly Rent (3.10)*
8. Change in the Cost of a Single Family Dwelling (2.87)*	8. Rate of Traffic Accident Deaths for Males (3.32)*
9. Average Gross Monthly Rent (3.45)*	9. Ratio of Managers to Clerical Staff (4.89)*
10. Average Price for a House (2.28)	10. Population with University Degree (2.90)*
11. Rate of Male Heart Disease Deaths (2.08)	11. Families with less than \$10,000 income (2.88)*
12. Incidence of Low Income (2.07)	
13. Population with less than Grade 9 Education (2.64)*	
14. Owner Occupied Dwellings (2.46)	
15. Criminal Code Offences per 100,000 population (2.41)	
16. Crimes of Violence per 100,000 population (2.50)*	
17. Ratio of Professionals to Population (2.14)	
18. Annual Hours of Sunshine (2.42)*	
19. Sulfur Dioxide Content (4.28)*	

(T-test scores included in parentheses; pooled variance estimate is used at the 95% confidence level; values significant at 99% noted by *).

the locational character than across the magnitude character. Almost half (42%) of the total set of variables recorded statistical significance in terms of whether or not a city was situated within the Quebec-Windsor urban corridor. A closer examination indicates that, of the fields contained in Tables 1 and 2, six (6) dimensions are represented including demographic, household, cultural, shelter, social and environmental. The housing and the cultural fields are dominant with indicators such as housing age, cost, ethnic background, bilingualism and religious preference registering the highest degrees of variability. Other indicators in the traditional fields of social and economic conditions (i.e., criminal activity, education levels, mortality and environment) also displayed spatial variation but to a lesser degree.

The composition and strength of the results point to the first signs of differing levels of well-being within Canadian regions, particularly in the areas of housing and cultural characteristics. This coincides with regional trends during the early 80's which saw significant fluctuations in regional housing markets. Similarly, there is acknowledgement that the regions of the country offer very different cultural profiles. One need only think of the province of Quebec in order to realize how culturally distinct these regions can be. This fact is borne out in the findings which show locational variation in terms of core (Quebec) and periphery (Eastern and Western regions) across

indicators of bilingualism, population of multiple origin and population residing in province of birth. It should be noted that while the results are clearly pointing to regions of Quebec in certain cases, they are also picking up other regional groupings such as that of the Prairies with respect to ethnic origins.

The core/periphery comparisons also provided other variations in fields such as mortality (i.e., heart disease rates), violent crime, poverty, and low levels of education. These results would appear to confirm that, in general, the levels of social well-being are regionally distinguishable with respect to location within or outside the principal corridor of the urban system. Unfortunately, the test results cannot show what specific groups of observations are more critical respecting the various fields under investigation. It cannot be concluded for example that conditions of crime are more pronounced in core cities or periphery cities. The findings simply indicate that across this condition there is a significant difference between these groups of cities.

The t test results for the metropolitan/non-metropolitan comparisons point to some significant differences although to a lesser extent than the first series. The so-called "big city/small town" variation would appear to be concentrated within the fields of household and social areas, even though there is a more even distribution of variables amongst six (6) of the eight (8) dimensions. The fact that each field

is equally represented may signify that differences between large and small cities are consistent across many conditions of well-being.

The larger t values for variables of population density, ratio of managers to clerical staff and traffic deaths are clear distinguishing features. As well, household differences in terms of family size, composition and lone parent status would further support an argument that lifestyle conditions in large cities were significantly different from those in smaller cities.

Indicators were then compared using analysis of variance, given its ability to conduct tests on more than two sets of observations. The sampling groups in this instance were the five geographic macro-regions of Canada: West Coast, Prairies, Ontario, Quebec, and Maritimes (see Table 3). The application of the technique tested whether the variability between the selected groups was significantly different from the variability within the specified groups. Table 6 identifies the general fields as well as the individual indicators which registered significant scores based on the comparisons between pairs of regions.

The results show that 32 separate variables from all identified dimensions of well-being were significantly different for at least two of the selected regions. Grouped indicators in the shelter and economic fields slightly outnumbered those in other areas, and the variation was mostly associated with housing costs and conditions of

Table 6
Analysis of Variance Results
Indicators and Dimensions Registering Significant Results

1. Demographic: Population Change 1976-81 (7.995)
Youth Dependency Ratio (3.699)
Population Change 1971-76 (5.694)
Net Migration Rate 1976-81 (5.454)
2. Household: Families with 0 Children (6.484)
Population Living in Province of
Birth (26.991)*
Households with 0 Families (5.110)
3. Cultural: Population with Mother Tongue other
than English & French (14.258)*
Population Speaking English & French
(7.635)
Ratio of Multiple Origin Population to
Total Population (34.837)*
Population with no Religious Preference
(73.960)*
4. Shelter: Owner Occupied Dwellings (8.792)
Dwellings Needing Major Repairs (7.142)
Dwellings Built Prior to 1946 (7.223)
Change in the Cost of New Dwelling (15.909)*
Average Gross Monthly Rent (15.347)*
Average Price for New Dwelling (14.520)*
5. Economic: Unemployment Rate (10.711)*
Youth Unemployment Rate (12.980)*
Change in Number of Working Women (4.062)
Ratio of Tertiary Employment to Primary +
Secondary Employment (3.806)
Families with less than \$10,000 Income (6.807)
6. Health: Age Standardized Male Mortality Rate (4.821)
Rate of Male Heart Disease Deaths (11.444)*
7. Education: Population with less than Grade 9
Education (12.042)*
8. Social: Criminal Code Offences per 100,000
Population (4.991)
Crimes of Violence per 100,000 Population
(7.142)
Property Crimes per 100,000 Population
(8.693)
9. Environmental: Annual Hours of Sunshine (5.496)
Annual Days of Precipitation (6.493)
Sulfur Dioxide Content (9.653)

(F values in parentheses are at the 95% confidence level, those significant at the 99% level are noted by *)

unemployment. In terms of the most extreme regional variation, however, indicators of religious preference (F value: 73.960), population living in province of birth (F value: 26.991) and ratio of multiple origin population to total population (F value: 34.837) are clearly the most regionally distinct. With respect to the conditions of religion and ethnic background, the further application of the Scheffe test (see Appendix 2 for details) revealed that the variation was most evident in West Coast and Prairie cities when compared to Quebec and Maritime cities. This is generally in keeping with earlier findings which cast Quebec cities as culturally and religiously relatively unidimensional while western cities were traditionally multicultural and multi-faith in character.

With respect to some of the other fields, housing indicators having to do with age, annual costs, average price and state of repair are most regionally significant in West Coast cities. On the other hand, economic indicators of unemployment, low income and family poverty are mostly associated with Quebec cities and to a lesser extent Maritime cities when compared to other Canadian cities. Social conditions such as violent crime, property crime and heart disease rates are once again strongly linked to West Coast centres, while education indicators are more specific to Quebec cities.

With these preliminary results in mind, Tables 7 and 8 combine additional information on the details associated with

Table 7
Analysis of Variance
Results of Scheffe Test

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	MARITIMES	QUEBEC	ONTARIO	PRAIRIES	WEST COAST
(Rankings of regions with greatest number of significant indicators)					
MARITIMES	X	9	8	3	4
QUEBEC		X	6	2	1
ONTARIO		10	X	7	4
PRAIRIES		17	9	X	10
WEST COAST		20	13	4	X
(Number of individual indicators with significant differences)					

Table 8
Results of Scheffe Test
Significant Indicators

	MARITIMES	QUEBEC	ONTARIO	PRAIRIES	WEST COAST
MARITIMES				12.TONG 48.RAIN 15.NORELG	15.NORELG 10.POB 20.RENT
QUEBEC			13.ETHN 16.DWLOWN 15.NORELG 30.LOWINC 25.YUNEMP	13.ETHN 48.RAIN 15.NORELG 27.MORT 12.TONG	15.NORELG 10.POB 28.HRTDIS 41.VIOL 13.ETHN
ONTARIO		Cultural Economic		11.NOFA 28.HRTDIS 15.NORELG 1.PCHG 20.RENT	15.NORELG 19.DWLCST 10.POB 20.RENT 42.PROP
PRAIRIES	Economic Cultural Household	Cultural Economic Social	Demographic Household Social		15.NORELG 41.VIOL
WEST COAST	Shelter Social Cultural	Cultural Shelter Social	Shelter Social Demographic	Shelter Social	

stronger regional variation in the analysis of variance. The matrix of results is again divided into two parts, with the upper right side listing those indicators which yielded higher test results of regionally paired comparisons. The listing of indicators is also arranged in descending magnitude of values such that the first variable was the most significantly different. Of particular note are the religion variable as well as certain other cultural variables such as mother tongue and ethnicity. This reconfirms to some degree the strength of the cultural variability when regional setting is taken into account. In virtually every pairing, cultural variables made up between 30% and 50% of the composite total. As was noted earlier, other highlights show that conditions of safety and security (crime, heart disease) are also as prominent as those of the shelter field.

The lower left side of the matrix groups indicators according to dimensions of well-being, lending additional weight to some of the early findings related to spatial variation. It can be seen for example, that in terms of regional conditions, the cultural dimension of Quebec centres is dominant throughout their comparisons with other regions. On the other hand, the results indicate that a greater variety of dimensions are represented when comparisons are made between the Prairies and other regions. Hence, Prairie cities differ from Maritime cities economically while they differ more in demographic terms from Ontario cities. Of particular interest in this stage of the analysis is the

relatively low impact of the economic indicators. During these current times when economic disparity is so prevalent in the eyes of politicians and policy makers, it is somewhat surprising that the selected economic variables do not register more statistical difference. This may be due in part to the chosen variables, however. Throughout the selection process efforts were made to capture significant and representative measures. While this period was prosperous for the West, the overall impact of this economic growth in terms of other regions, as measured by the selected indicators, does not record many statistically significant differences between major Canadian regions. Upon review of the test findings it may well be that the variability in conditions of culture and housing may have overshadowed that variation due to economic disparity. On the other hand, the lack of evidence of this economic disparity may show that it is of no great consequence at this time.

The first phase of the analysis has provided some preliminary insight into the regional character of the Canadian urban system. The spatial variation was detected in terms of central and non-central cities as well as between larger and smaller cities.

4.2.2 Phase 2:

The second phase of the analysis uses the more conventional approach of "standard score analysis" as

popularized by Smith(1973,1977) in studies of social well-being. The objective in employing this technique is to move beyond the "macro-regional" scale and to pursue a more detailed investigation of individual conditions across individual urban centres. In the preceding section, the hypotheses stressed the statistical relationships between larger groups of cities, be they assembled by region or by size. The purpose of phase 2 is to provide a means of ranking individual cases and to develop overall indices of social well-being.

The standard score procedure relies upon the transformation of raw data into "z scores", allowing for the consolidation of both variables and observations. Z scores are characterized by a mean of zero (0) and a standard deviation of one (1). The conversion thus allows for any degree of aggregation or disaggregation since the values are standardized. Appendix 3 contains the complete listing of all calculated standard scores. Table 9 provides a selective listing of some of the more interesting findings as determined by standard score values. The utility of the model lies in the ease with which the analyst can quickly scan the results to pick out the more extreme cases.

The information contained in Table 9 also provides more insight, given that the standard score model allows for direct comparisons between individual cities. The results show, for example, that Calgary rated highest in terms of demographic growth during the 1976-1981 period while Sudbury

Table 9
High and Low Standard Scores
Across Selected Indicators

<u>Indicator</u>	<u>High</u>	<u>Low</u>
Population Turnover	Calgary (2.93)	Sudbury (-1.72)
Net Migration Rate	Calgary (2.68)	Sudbury (-1.78)
Childless Families	Calgary (-2.63)	Sydney (2.55)
Sedentary Population	Chicoutimi (1.61)	Kelowna (-2.20)
Dwellings Needing Repair	Sydney (-3.90)	Kelowna (1.56)
Price of Standard Dwelling	Vancouver (-3.85)	Sydney (1.22)
Unemployment Rate	Shawinigan (-3.18)	Calgary (1.66)
Traffic Deaths	Toronto (1.63)	Kamloops (-2.80)
Criminal Offences	Calgary (-3.12)	St. Jean (1.27)
Family Poverty	Sydney (-2.47)	Oshawa (1.48)
Economic Productivity	Sarnia (4.79)	Fredericton (-1.06)

fared the worst in terms of population losses. Calgary's demographic growth was not, however, without side effects such as the number of childless families or the rate of criminal offences. Sydney enjoyed lower housing prices and had on the average greater numbers of larger families. It too, however, showed signs of decline with respect to the state of its housing stock and the overall proportion of families living in poverty. These extremes, while limited in their substance, are useful in highlighting some of the "best" and "worst" situations.

The scores are summed across all dimensions. This "score additive" procedure is often used to determine a total index of well-being. In summing the scores for each city however, care must be taken in interpreting the aggregate score. Particular attention must be paid to each indicator such that it is evaluated in terms of what it actually represents. For example, negative scores for the criminal offence indicator are representative of low crime rates while positive scores record high rates. In adding the score for crime with that of other scores, the benefit of a lower rate would be lost since it would reduce the overall index value. As compensation, indicators are often multiplied by (-1) in order to bring their directions into a uniform interpretation. The transformation ensures that positive scores represent "best" conditions while negative values indicate "worst" conditions.

The results of the additive procedure are contained in Table 10 which ranks cities from highest to lowest total scores. According to these ranks, Eastern Canadian cities clearly dominate occupying the top three positions and registering four of their five representatives within the top twenty. There is also a second group of scores, ranging between 7.5 and 8.7, which contain a wider regional spectrum with equal representation from central and Western Canada. In terms of some of the earlier noted criteria, the distribution according to core/periphery favours non-core cities almost 2 to 1 for the top twenty positions. The split between metropolitan (CMA) and agglomeration (CA) cities is not as discernible with slightly more smaller cities in the top positions.

The somewhat surprising result in the first three positions may be due in part to two factors. Firstly, since the study used data from the 1981 census, some of the findings may be reflecting the renewal of economic growth in the Maritimes as a result of the Hibernia oil exploration. A scan of the values along the economic variables shows that St. John's, which usually scores rather badly in this area, has in fact registered a net positive total. The scores of Fredericton and Charlottetown may be somewhat higher due to the nature of their occupational profile. They are both provincial capital cities and as such may tend to do somewhat better economically as a result of the public sector presence.

Table 10
Standard Score Additive Model Results

Urban Centre	Score
1. Fredericton	11.90
2. St John's	11.17
3. Charlottetown	11.10
4. Guelph	8.69
5. Barrie	8.50
6. Regina	8.23
7. Ottawa-Hull	8.16
8. Medicine Hat	7.83
9. Edmonton	7.48
10. Saskatoon	6.51
11. Oshawa	6.32
12. Calgary	6.10
13. Sault Ste. Marie	5.89
14. Kamloops	4.87
15. Kitchener	4.70
16. Sarnia	4.45
17. Kelowna	4.42
18. Kingston	3.98
19. Moncton	2.81
20. Halifax	2.10
21. Toronto	1.95
22. Nanaimo	1.35
23. Sherbrooke	1.00
24. Winnipeg	0.50
25. Prince George	0.02
26. London	-0.54
27. Hamilton	-0.67
28. Quebec	-1.09
29. Thunder Bay	-1.56
30. St. Jean	-1.68
31. Peterborough	-2.05
32. Sudbury	-2.31
33. Saint John	-4.34
34. St. Catharines	-5.01
35. Chicoutimi	-5.57
36. Brantford	-6.26
37. Cornwall	-6.63
38. Windsor	-8.27
39. Victoria	-8.62
40. Montreal	-9.89
41. Trois Rivières	-10.95
42. Vancouver	-11.98
43. Sydney	-14.95
44. Drummondville	-15.15
45. Shawinigan	-21.69

A further reason for the final ranking may be the way by which positive and negative signs were assigned to the indicators. It must be admitted that in deciding upon the signs, a bias toward more so-called "traditional" values could have surfaced. When considering indicators such as "childless families" and "households with no families" for example, cities which did not record a strong presence of these conditions were viewed more favourably and subsequently scored positively across all cases. Moreover, cities with more traditional characteristics also scored well in terms of other associated conditions such as housing costs and cultural mix. This then may have contributed to relatively higher totals for cities which would not otherwise be thought of as being in the forefront of change in the urban system. According to this application however, they are nevertheless ranked as offering overall better conditions of well-being.

Among the group of 20 cities with negative total scores, 13 are census metropolitan areas and 14 are located within the Quebec-Windsor corridor of central Canada. Those with the most severe problems are dominated by Quebec centres which occupy four (4) of the last six (6) positions. The results are the first indication that well-being at this time tended to be higher in non-central areas and within the smaller settlements rather than larger cities.

The "rank additive" model differs from the previous example in its numerical foundation. In this instance, it is

Table 11
Score Rank Additive Model Results

<u>Urban Centre</u>	<u>Score</u>
1. Fredericton	787
2. Kitchener	814
3. Edmonton	816
4. Regina	819
5. Calgary	828
6. Saskatoon	833
7. Sault Ste Marie	840
8. Oshawa	846
9. St. John's	852
10. Guelph	855
11. Barrie	870
12. Kamloops	873
13. Charlottetown	883
14. Winnipeg	889
15. Toronto	903
16. Moncton	907
17. Halifax	926
18. Victoria	930
19. Kingston	933
20. Ottawa-Hull	933
21. Sudbury	938
22. Sherbrooke	947
23. Kelowna	948
24. Thunder Bay	958
25. Medicine Hat	961
26. Hamilton	966
27. St. Jean	974
28. Vancouver	986
29. Nanaimo	989
30. Saint John	994
31. Sarnia	996
32. Peterborough	1004
33. St. Catharines	1007
34. London	1012
35. Cornwall	1014
36. Prince George	1025
37. Quebec	1026
38. Windsor	1034
39. Trois Rivières	1043
40. Chicoutimi	1055
41. Brantford	1066
42. Sydney	1085
43. Montreal	1089
44. Drummondville	1097
45. Shawinigan	1226

the individual rankings of each case for each indicator that are summed to provide the final index. Table 11 presents the findings of this procedure and gives considerably different ratings. As before, Fredericton continues to maintain first place. However, the arrangement of the other centres is altered quite significantly. For example, positions two (2) through five (5) from the score additive model have now declined to positions nine (9) through thirteen. The Maritime cities and the smaller central Canadian cities have been replaced by CMA's from Western Canada which have jumped between three (3) and seven (7) positions. Table 12 arranges the results from both approaches so as to visually appreciate the shifts which have occurred. Regarding those cities with the worst scores, the ratings of both models are similar. There is evidence of further declines by cities in Quebec, but generally the picture is one of consistency in representation at this level. One surprising feature is that some cities with "bad" scores jump significantly depending on the model of choice. This happens in the case of Vancouver and Victoria which rank as the fourth and seventh worst cities on one scale yet fail to rank at all in the fifteen worst cities along the other scale.

The variation in results from these two approaches is due in part to the interval in calculating the total scores. Whereas the use of standard score values usually ranges from -3.0 to +3.0, the dependence on overall rankings can result in a score from 1 to 45. As a result of this numerical scale

Table 12
Standard Score Comparisons

Score Additive

Rank Additive

Best Performers:

1. Fredericton
2. St. John's
3. Charlottetown
4. Guelph
5. Barrie
6. Regina
7. Ottawa-Hull
8. Medicine Hat
9. Edmonton
10. Saskatoon
11. Oshawa
12. Calgary
13. Sault Ste. Marie
14. Kamloops
15. Kitchener

1. Fredericton
2. Kitchener
3. Edmonton
4. Regina
5. Calgary
6. Saskatoon
7. Sault Ste. Marie
8. Oshawa
9. St. John's
10. Guelph
11. Barrie
12. Kamloops
13. Charlottetown
14. Winnipeg
15. Toronto

Worst Performers:

15. Peterborough
14. Sudbury
13. Saint John
12. St. Catharines
11. Chicoutimi
10. Brantford
9. Cornwall
8. Windsor
7. Victoria
6. Montreal
5. Trois Rivières
4. Vancouver
3. Sydney
2. Drummondville
1. Shawinigan

15. Sarnia
14. Peterborough
13. St. Catharines
12. London
11. Cornwall
10. Prince George
9. Quebec
8. Windsor
7. Trois Rivières
6. Chicoutimi
5. Brantford
4. Sydney
3. Montreal
2. Drummondville
1. Shawinigan

effect, the final ranking of the cities can easily be altered.

A closer look at disaggregated figures from the standard score model allows for even more subtle distinctions to be made. In Table 13, the results of the model are broken down according to more specific criteria such as economic, social, health and security. In terms of broad regional variation, the findings reveal the dominance of periphery cities which take four of the top five positions for best scores in the economic, health and urban professionalism (i.e., higher education, service sector employment, higher incomes) categories. Hence, in these categories it may be said that central Canada was lagging behind in 1981. Conversely, the periphery and in particular cities in B.C. have very poor records in security and safety. Similarly, the shelter dimension (i.e., cost) registers poorly in western cities while being less expensive in urban centres in Quebec. Comparisons across the division of "big cities versus small cities" indicated overall better social and safety conditions in smaller centres while larger metropolitan areas dominated in terms of health facilities and urban professionalism. This would tend to confirm the longstanding perception that smaller cities are generally safer but that large cities offer a greater variety of higher order services. With respect to professionalism, its presence is in evidence across the country, denoting the relative success of what may be called "regional cities" in maintaining higher standards of economic health. Despite recessionary forces,

Table 13
Standard Score Criteria Comparisons

<u>Criteria</u>	<u>Best Scores</u>	<u>Worst Score</u>
1. Economic	1. Calgary 2. Ottawa-Hull 3. Edmonton 4. Vancouver 5. Regina	5. Cornwall 4. Drummondville 3. Trois Rivières 2. Sydney 1. Shawinigan
2. Social	1. Kingston 2. Fredericton 3. Guelph 4. Sherbrooke 5. Saskatoon	5. Shawinigan 4. Sydney 3. Thunder Bay 2. Drummondville 1. Prince George
3. Shelter (1)	1. Shawinigan 2. Drummondville 3. Sydney 4. St. Jean 5. Trois Rivières	5. Prince George 4. Toronto 3. Edmonton 2. Vancouver 1. Calgary
4. Security & Safety	1. Guelph 2. St. Jean 3. Sudbury 4. Kitchener 5. Fredericton	5. Kamloops 4. Kelowna 3. Nanaimo 2. Prince George 1. Vancouver
5. Health & Medical Facilities	1. Saskatoon 2. Victoria 3. Regina 4. Edmonton 5. Kingston	5. Chicoutimi 4. Thunder Bay 3. Shawinigan 2. Sydney 1. Sudbury
6. Urban Professionalism	1. Victoria 2. Ottawa-Hull ² 3. Vancouver 4. Halifax 5. Edmonton	5. St. Catharines 4. Drummondville 3. Brantford 2. Sydney/Shawinigan 1. Medicine Hat

(1) The indicators selected for this group refer entirely to cost of shelter and do not include other matters such as tenure or age.

these centres have managed to withstand economic downturn effects. Those cities with lower rankings are those which would appear to have ongoing problems in terms of economic restructuring. They are generally representative of traditional industrial centres with a significant dependence on primary and secondary occupations. As such they have perhaps suffered from the economic recession and the changes to the industrial infrastructure.

The standard score model is revealing in the way it allows for regional differentiation. It stresses the ordering of individual cases according to their scores for certain conditions. This view though lacks one perspective which is also essential in further documenting spatial variation and pattern of well-being. While it provides information on the spatial distribution of conditions of well-being, it is incapable of testing the relationships between these conditions at a very detailed spatial level.

4.2.3 Phase 3:

The final phase of the analysis employed multivariate techniques to explore the regional character of well-being as measured by urban indicators. The purpose in proceeding this way was first to generate a more manageable set of underlying "components" which serve to differentiate between selected regions. The second objective was to derive a series of "urban scores" which would permit the rank ordering of cities

across these major dimensions. While this approach is empirically more rigorous, the results and the conclusions must still be interpreted with some degree of caution. This is because the selection of variables which are representative of the quality of life may still be incomplete or contentious. The strength of the analysis will ultimately lie in its ability to reduce the factors contributing to regional variation into relatively simple and understandable dimensions.

Principal components analysis is a statistical technique commonly used to establish order in large sets of data. Its primary objective is data reduction where numerous variables are rearranged into fewer major groups of interdependent variables. It is a procedure which allows for the detection of patterns in the data based on the correlations within the data set.

Generally speaking, principal components analysis proceeds in four distinct stages. The first step involves the computation of an inter-variable correlation matrix. The correlation coefficients between each pair of variables for all observations serve as the foundation in detecting the strength of the statistical relationships. The degree of correlation is therefore the basis upon which the broader components are calculated. The second step involves the extraction of the principal components as derived from the linear combinations of variables. These components may in fact be seen to be new variables which represent vectors that

minimize the distance between the scatter of all data points. The first component to be extracted assembles those variables with the largest degree of inter-correlation, the shortest distance between data points, and in so doing accounts for the largest amount of the statistical variation. The actual correlations between individual variables and their corresponding components are known as "loadings" and their squared values represent the variance that is explained by each variable within each major component. The total of the squared loadings for each component produces the total variance explained by each component. This is referred to as the "eigenvalue". The sum of all eigenvalues will equal the number of variables in the data set. The extraction of the second component will result in a vector that is orthogonal to the first and it too will capture as much of the remaining statistical variation as possible. The process of extracting components will continue until all the variation has been accounted for. A commonly used cut-off point for determining which components to retain in the analysis is that of an "eigenvalue greater than 1.0". Hence, the study will generally only utilize the first few components for further interpretation. In many cases, these components are responsible for much of the statistical variance.

The final two steps in the procedure involve the rotation of components in the hope of getting more interpretable findings. The process of rotating the eigenvectors also yields more independent components for ease

in the final interpretation of the results. The last step allows for the production of individual case scores for each of the derived components. In other words, rather than displaying individual loadings of variables on components, the technique calculates the individual scores of the selected cases on each of the components. In this study this will permit the assignment of separate scores for each selected city across each of the extracted components. The results will document the regional variation evident in the statistically derived components of well-being.

The application of principal components analysis was undertaken as an "exploratory" rather than an "confirmatory" exercise. The procedure was therefore not meant to test nor confirm predetermined hypotheses of the spatial nature of conditions of well-being. It was initiated as a means of gaining further insight into what is considered a complex set of relationships. The report to this point has been clear in its belief that well-being has not been definitively operationalized or standardized. The procedures will not, however, "explain" in the true sense of the word how well-being is created and administered. It will only describe how it may differ regionally within the urban system.

The use of factor analytic techniques in urban studies has some tradition in Canada (King, 1966, Bunting and Baker, 1968, Ray and Murdie, 1972, Goldberg and Mercer, 1986). The analysis by Ray and Murdie (1972) for example examined 84 socio-economic variables across 174 Canadian cities,

generating a model with eight (8) factors which were then grouped according to two (2) major themes. Under the cultural dimension, three (3) factors assembled individual variables having to do with mother tongue, education, place of birth and occupation in distinguishing between english/french cities, Prairie type and B.C. type cities. In terms of the economic dimension, a total of five (5) factors were differentiated according to industrial structure. In this case, the critical variables measured occupation, family income, housing activity, and labour force. The groupings provided for a division of cities according to their specialized functions such as being resource based, manufacturing or service based.

As part of their review the authors commented upon earlier works by King (1966) and Bunting and Baker (1968), noting the similarities in factor structures having to do with "regionalism" and "economic development". More recently, Goldberg and Mercer (1986) employed these techniques in comparing American and Canadian urban centres. While their factors focussed more on intra-urban disparities, they noted that both economic and household criteria played major roles in the structuring of the urban system.

The present application considered a model of 36 socio-economic variables by 45 selected urban centres (see Table 14 for a listing of indicators). The reduced number of variables was largely due to incomplete or missing data for certain cases. The principal components analysis (p.c.a.)

Table 14
List of 36 Variables for Multivariate Analysis

<u>Variable Name</u>	<u>Acronym</u>
1. Population Change 1976-1981	PCHG2
2. Population Density Change 1976-1981	DENCHG
3. Youth Dependency Ratio, 1981	YDR
4. Elder Dependency Ratio, 1981	EDR
5. Net Migration Rate 1976-1981	NMR2
6. Families with 0 Children, 1981	NOCHD
7. Families with 2+ Children, 1981	CHD
8. Change in Lone Parent Families 1976-1981	FAMLP
9. Population Living in Province of Birth, 1981	POB
10. Households with 0 Families, 1981	NOFAM
11. Ratio of Multiple Origin Population to Total Population, 1981	ETHN
12. Population Speaking English & French, 1981	POPBIL
13. Population with no Religious Preference, 1981	NORELG
14. Dwellings in Need of Major Repairs, 1981	DWLREP
15. Average Monthly Gross Rent, 1981	RENT
16. Average Monthly Owner Costs, 1981	OWN
17. Average Price for a Single Detached Dwelling, 1981	DWLPR
18. Unemployment Rate, 1981	UNEMP
19. Youth Unemployment Rate, 1981	YUNEMP
20. Change in Working Women in the Labour Force, 1981	WFCHG
21. Standardized Heart Disease Rates (males) 1981	HRTDIS
22. Standardized Traffic Accident Rates (males) 1981	TRFCAC
23. Incidence of Low Income, 1981	LOWINC
24. Ratio of Service Employment to Primary & Secondary Employment, 1981	INDMIX
25. Hospital Beds per 100,000 Population, 1979	HSPBDS
26. Population per Physician, 1979	PPHYS
27. Income Distribution Ratio, 1979	INCDIS
28. Retail Sales per Capita, 1981	SALES
29. Ratio of Managers to Clerical Staff, 1981	MGRCLR
30. Population with Less than Grade 9 Education, 1981	ED9
31. Population with University Degree, 1981	EDDG
32. Crimes of Violence per 100,000 Population, 1981	VIOL
33. Property Crimes per 100,000 Population, 1981	PROP
34. Sulfur Dioxide Content	SULDI
35. Families with less than \$10,000 income, 1981	FAMPOV
36. Value Added of Manufacturing Activity per Employee, 1981	INDACT

uncovered seven (7) major components with eigenvalues greater than 1.0 and took account of 75.3% of the total variance contained in the data set.. Table 15 summarizes the higher component loadings which were then interpreted in terms of the constructs of social well-being.

An initial review of the components appears to suggest that they may fall into one of two groups: space economy or social demography. Components one (1) and two (2) for example register definite links with matters of the regional economy. Indicators associated with income, employment, poverty, housing conditions and education load very heavily on the first component while indicators of dwelling prices, monthly rents and criminal activity are critical to the second. As for the overall interpretation of the first component, it is clear from its composition that it is related to "economic hardship" with its higher loadings on low income (LOWINC), poverty (FAMPOV), unemployment (UNEMP, YUNEMP) and lower education (ED9). It should also be noted that this first component is responsible for absorbing one third of the overall variance. The fact that the most critical component was so easily interpretable would seem to point to a strong regional character in matters of economic performance. Reference to Table 16, which lists the highest and lowest component scores for the selected cases, confirms that the importance of region is quite evident across this first component, with Quebec and Maritime cities at one end of the spectrum and Western Canadian cities at the other.

Table 15
Component Loadings - Stage 1 (36 Variables)

	<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>	<u>C6</u>	<u>C7</u>	<u>C8</u>
LOWINC	0.902							
UNEMP	0.896							
YUNEMP	0.887							
FAMPOV	0.883					-0.310		
ED9	0.776	-0.409						
ETHN	-0.753							
DWLREP	0.750							
RENT	-0.708	0.545						
POB	0.694	-0.584						
POPBIL	0.503				0.329			
VIOL		0.772						
NORELG	-0.551	0.719						
PROP		0.678					-0.325	
DWLPR	-0.487	0.665			0.303			
HRTDIS	0.334	-0.509	-0.375					
INCDIS		-0.418				-0.382		0.331
TRFCAC		0.313		-0.312				
MGRCLR			0.746					
PCHG2	-0.350	0.371	0.734					
NMR2	-0.381	0.331	0.728					
DENCHG			-0.538			0.388		
FAMLP			0.518			0.383		-0.515
PPHYS				-0.803				
INDMLX				0.801				
EDDG	-0.417			0.651	0.305		0.332	
HSPBDS			0.499	0.542				
SULDI				-0.406				
YDR					-0.851			
NOCHD				0.315	0.748	0.354		
CHD			-0.326		-0.613	0.596		
NOFAM	-0.401			0.413	0.549			
EDR						-0.901		
OWN	-0.540	0.419				0.565		
SALES							0.631	
INDACT								
WFCHG	0.415			0.310				0.700
EIGEN VALUE	11.84	3.87	3.26	2.56	1.95	1.82	1.10	0.70
VARIANCE EXPLAINED	32.9%	10.8%	9.1%	7.1%	5.4%	5.1%	3.1%	2.0%
CUMULATIVE VARIANCE	32.9%	43.7%	52.8%	59.9%	65.3%	70.4%	73.5%	75.5%

In interpreting the loadings along the second component, the evidence of economic hardship has virtually disappeared. In its place, conditions of social hardship or instability, including crime rates, traffic accidents and population turnover dominate. The absence of the bilingual indicator would appear to confirm a regional setting outside the central Canadian corridor. A further clue to the regional context of this component is found in loadings on the housing price, rental cost and owner cost indicators, as well as the religion indicator. In phase 1 of the study it was found that these variables were most important to the Prairie and West Coast regions. Reference to Table 16 indicates that West Coast cities dominate this component, describing what may be labelled "west coast growth/social hardship".

Component three (3) has closer ties to matters of social demography since its indicator loadings are mostly in areas of demography, migration, population density and family composition. It is only responsible for 9% of the total variance but from its composition it describes an urban condition which was subject to significant change both in terms of demographic growth and make-up. The findings of Table 16 reveal that Calgary is solely responsible for this component in the positive direction while Sudbury and Windsor score significantly in the negative direction. For this reason, the most logical identifier is "demographic growth" and its regional profile is based on core/periphery differences.

The distribution of component loadings in component four (4) describe the somewhat brighter and more positive aspects of the urban condition. For instance, indicators of occupational mixture (INDMIX), university education (EDDG), health services (PPHYS, HSPBDS), clean environment (SULDI) and working women (WFCHG) point to a certain "urban vitality". While the component only accounts for 7% of the total variance, its high loadings on the occupational indicator would seem to indicate service oriented functions, which, for the most part, contrast with the more negative aspects associated with economic and social hardship.

The loadings on indicators such as childless families (NOCHD) and non-family households (NOFAM) begin to highlight some of the changes occurring to these traditional social units within the present day urban environments. As one might expect, the cities which score well on this component are spread across the country. They are for the most part provincial capital cities which contain greater numbers of public sector jobs (i.e., white collar) and represent the more vital and stable regions which have managed to avoid many of the negative effects of economic restructuring and technological change. The fact that loadings on the family indicators are not extremely high would seem to suggest that these regions are witnessing pressures due to lifestyle changes, but that they have managed to withstand them and retain some of the traditional character related to the

family unit. This may be partly due to factors of their industrial heritage, social development or urban history.

The next two components have stronger ties to the changes in the family lifecycle. They are respectively characterized as "neo-family" (component 5) and "family tradition" (component 6). In both instances they record higher scores on dependency (YDR, EDR), number of children (CHD), and childless families (NOCHD), suggesting some linkages with the recent impacts due to the progress of the "baby boom" through the lifecycle. Of particular note are the high loadings on dependency variables which, in the case of component 5, indicate lower ratios of youth and children, while, in the case of component 6, register lower ratios of elderly. When this is translated into regional variation, cities with lower scores across component 5 and higher scores across component 6 represent more traditional situations where both children and elders are present. The listings in Table 16 record Saint John's and Kamloops as fulfilling these requirements while Victoria displays conditions quite to the contrary.

The main distinguishing feature between these two components centres on the indicator "number of children" (CHD). Component 5 shows a positive loading of 0.748 for childless families (NOCHD) accompanied by a negative loading of -0.613 for families with 2 or more children (CHD), confirming its being interpreted as the "neo-family" factor. Some of the larger cities rank highly on

component 5 (i.e., Toronto, Montreal, Ottawa-Hull and Edmonton). Component 6 has a high negative loading on the elderly dependency ratio (EDR) variable and a lower positive loading on number of children (CHD). In this state, it generally reflects those more traditional family characteristics which are found in newly developing urban centres. The fact that Calgary, Edmonton and Ottawa-Hull register high component scores while Victoria records negative scores seems to reconfirm that this component is reinforcing both more family tradition as well as the western growth trend.

The interpretation of the seventh and eight component is rendered more difficult because of the reduced number of significant loadings. Their contribution to the overall explained variance is in the order of 5 %.

As a final means of testing for regionalism in the component structure, the analysis calculated the individual means of the component scores, grouped by major geographic region. Table 17 summarizes the results such that regional variation in terms of core/periphery is clearly shown. Central Canadian cities would appear to be showing some signs of economic hardship coupled with changing conditions within the family. This region is further characterized by slow demographic growth. Cities in Eastern Canada display more traditional dimensions of urban well-being with both economic hardship and slower demographic growth coupled with a reinforced family structure. The mean scores serve to

Table 17
Mean Component Scores

	Western Canada	Central Canada	Eastern Canada
Component 1 "Economic Hardship"	-0.714	0.104	0.684
Component 2 "West Coast Growth/ Social Hardship"	1.112	-0.402	0.080
Component 3 "Demographic Growth"	0.219	-0.664	-0.622
Component 4 "Urban Vitality"	0.728	-0.122	0.763
Component 5 "Neo-Family"	0.262	0.556	-1.425
Component 6 "Traditional Family"	0.318	0.106	0.263
Component 7 "Consumerism"	0.593	0.278	0.054
Component 8 "Working Women"	0.079	-0.099	0.924

generalize a situation whereby more "positive" elements such as economic and demographic growth are more evident in Western Canada while "negative" elements of these same conditions are prominent in Eastern and Central Canada.

Notwithstanding these results, the analysis so far has encountered technical problems. As greater numbers of variables are introduced into a factor model, the situation arises where the data exhibit considerable "multicollinearity". This results in a correlation matrix which is described as being "ill-conditioned for factor processing". Diagnostic checks such as the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy are generally used to confirm the appropriateness of the model. At this stage of the analysis the test figures revealed that the overall findings could lead to some misinterpretation. While the factor analytic procedure still processed the data, certain steps, including factor rotation and the generation of component scores, were inconsistent and jeopardized the veracity of the findings. In view of such complications, it is generally recommended that a reconstructed matrix be assembled and processed (Davie, 1984, Goldberg & Mercer, 1986).

A step-wise approach of adding and deleting individual variables was undertaken in order to compensate for technical problems. In other words, a core group of variables, with no evidence of collinearity, was firstly assembled. To this group individual variables were added one at a time for

Table 18
Set of Variables for Multivariate Analysis

Stage 2 - 21 Variables

1. Population with Mother Tongue Other than English or French	TONG
2. Youth Unemployment Rate	YUNEMP
3. Incidence of Low Income	LOWINC
4. Net Migration Rate 1976-1981	NMR2
5. Households with 0 Families	NOFAM
6. Population Speaking English & French	POPBIL
7. Dwellings in Need of Major Repairs	DWLREP
8. Average Price for a Single Detached Dwelling	DWLPR
9. Standardized Heart Disease Rates for Males	HRTDIS
10. Population per Physician	PPHYS
11. Population with Less than Grade 9 Education	ED9
12. Crimes of Violence per 100,000 Population	VIOL
13. Value Added Manufacturing Activity per Employee	INDACT
14. Suspended Particulate Average	SUSPAR
15. Population Density Change 1976-1981	DENCHG
16. Population Change 1971-1976	PCHG1
17. Owner Occupied Dwellings	DWLOWN
18. Youth Dependency Ratio	YDR
19. Retail Sales per Capita	SALES
20. Ratio of Professionals to Population	PRORAT
21. Elder Dependency Ratio	EDR

Stage 2 - 18 Variables

1. Population Living in Province of Birth	POB
2. Unemployment Rate	UNEMP
3. Standardized Mortality Rate for Males	MORT
4. Dwellings in Need of Major Repairs	DWLREP
5. Population with no Religious Preference	NORELG
6. Families with Less than \$10,000 Income	FAMPOV
7. Standardized Heart Disease Rate for Males	HRTDIS
8. Average Monthly Owner Costs	OWN
9. Ratio of Multiple Origin Population to Total Population	ETHN
10. Annual Days of Precipitation	RAIN
11. Population with University Degree	EDDG
12. Change in Working Women in the Labour Force	WFCHG
13. Families with 0 Children	NOCHD
14. Crimes of Violence per 100,000 Population	VIOL
15. Income Distribution Ratio	INCDIS
16. Families with 2+ Children	CHD
17. Standardized Traffic Accident Rate for Males	TRFCAC
18. Change in Lone Parent Families 1976-1981	FAMLP

factor processing. Successful runs of the procedure allowed for additional new variables while inconsistent runs saw the variable set aside in another group. As a final step, the variables which made up the initial core group were individually introduced and tested with the second set of variables. Those that provided successful runs of the factor procedure were retained. Thus, in some instances, the same variables were represented in both data sets. Table 18 lists the final set of variables which were suitable for further analysis.

It is interesting to note that the step-wise addition and deletion of indicators produced two distinct sets of variables to be processed. The fact that two sets were created pointed to the potential effects and the ultimate problems of redundancy and multicollinearity raised earlier. Within each of the sets in Table 18 for example, it can be seen that variables on employment, education, poverty and family character are represented in both groups. In a way, this may be an argument for limiting the number of indicators within such an exercise so as to reduce the possibility of too much statistical association which can then prevent the establishment of independent components of well-being.

The stage 2 analysis considered two sets of indicators yielding two significantly different sets of component structures. The first exercise combined 21 variables from the original set and generated results considerably different than those of stage 1 of the analysis. Table 19 summarizes

Table 19
Component Loadings - Stage 2 Analysis (21 Variables)

	<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>	<u>C6</u>
TONG	0.830					
YUNEMP	-0.773					
LOWINC	-0.743	-0.441				
ED9	-0.701	-0.436				
DWLREP	-0.670	-0.481				
DWLPR	0.623			0.435		
DENCHG	0.566	-0.404				0.488
POPBIL	-0.562		-0.541			
NOFAM	0.536		-0.612			
NMR2		0.854				
PCHG1		0.803				
HRTDIS		-0.710				
DWLOWN			0.861			
YDR			0.841			
SALES				0.775		
PRORAT				0.675		
CRIME				0.596		
INDACT				-0.436		0.502
SUSPAR					0.836	
PPHYS					0.785	
EDR						-0.900
EIGEN						
VALUE	6.85	3.06	2.06	1.75	1.40	1.10
VARIANCE						
EXPLAINED	32.6%	14.6%	9.8%	8.3%	6.7%	5.3%
CUMULATIVE						
VARIANCE	32.6%	47.2%	57.0%	65.4%	72.0%	77.3%

both the components and the loadings resulting from the first application. In this instance, the first two components explain close to half of the total variance and the indicators which load heavily depict conditions which have a closer link to "affluence" than to the earlier documented "hardship". The direction of the loadings on conditions of employment (YUNEMP), income (LOWINC), education (ED9), and shelter costs (DWLPR) are the reverse of stage 1 results and are more in keeping with more positive characteristics of well-being. The fact that the same variables load significantly in both stages does point to some value in the first stage results. Moreover, the regional distribution of this dimension is significantly different from the earlier application. Whereas cities located in the central urban corridor scored highly along the economic hardship component of stage 1, cities located in the western part of the country had higher scores along the first principal component of stage 2. In fact, Western Canadian cities occupied three of the top five positions in Table 20 within the "economic affluence" component. The fact that both Toronto and Thunder Bay also fared well along this component meant that the component label could not be given a purely western character. A closer look at the low scores for this first component reveals a strong affiliation with the high scores of stage 1 analysis. In other words, the principal component of well-being has been inverted such that the main construct of regionalism is related to economic prosperity rather than to hardship.

The strength of the affluence dimension is also carried over into component two (2). Here, many of the same indicators continued to load significantly along conditions of income and education. In contrast to the first component, however, variables associated with demographic growth (NMR2, PCHG1, DENCHG) registered higher loadings, signalling the emergence of a "growth" dimension similar to that of stage 1 analysis. Reference to Table 20 confirms that this demographic growth dimension was concentrated in the west. Note should be taken of the presence of Moncton within the high scoring cities, denoting other non-core representation associated with the economic/demographic growth component. Given the fact that the regional character of this component is so closely tied to core/periphery differences, the selected identifier in this case was "peripheral growth centres".

The loadings on component three (3) are associated more with the traditional aspects of urban areas, including owner occupied dwellings (DWLOWN), family households (NOFAM) and greater numbers of children (YDR). The fact that the bilingual indicator loaded negatively would seem to suggest that cities outside the central urban core were more likely to be found within this grouping. As well, the fact that the distribution of the loadings are more in line with traditional characteristics may point to a more "small town" profile for this component. The distribution of city scores in Table 20 reveals that census agglomerations do in fact rate better along this third component and that

Table 20 -
Standardized Component Scores
Stage 2 Analysis (21 Variables)

	<u>High Scores</u>	<u>Low Scores</u>
Component 1	Vancouver (1.63) Victoria (1.60) Thunder Bay (1.33) Edmonton (1.20) Winnipeg (1.23)	Shawinigan (-1.92) Moncton (-1.66) Chicoutimi (-1.52) Fredericton (-1.35) Sydney (-0.98)
Component 2	Calgary (1.56) Kamloops (1.21) Prince George (0.79) Victoria (0.69) Edmonton (0.64)	Sydney (-2.28) Sudbury (-1.44) Thunder Bay (-1.43) Windsor (-1.29) Winnipeg (-1.09)
Component 3	St. John's (2.23) Sydney (1.79) Prince George (1.48) Fredericton (1.28) Kamloops (0.75)	Montreal (-2.49) Victoria (-1.54) Ottawa-Hull (-1.53) Quebec (-1.39) Shawinigan (-1.37)
Component 4	Toronto (3.08) Calgary (2.99) Vancouver (1.82) Fredericton (1.73) St. John's (1.13)	Guelph (-.96) St. Catharines (-.82) Quebec (-.78) Windsor (-.74) Ottawa-Hull (-.68)
Component 5	Shawinigan (2.36) Calgary (1.47) Sydney (1.49) St. Catharines (0.82) Windsor (0.77)	Kingston (-1.89) St. John's (-1.82) Halifax (-1.65) Ottawa-Hull (-1.17) Fredericton (-1.00)
Component 6	Prince George (3.02) Chicoutimi (1.93) Calgary (1.23) Kamloops (1.23) Quebec (1.03)	Victoria (-2.17) Peterborough (-1.36) Sydney (-.93) Cornwall (-.92) Fredericton (-.83)

representation for smaller non-core cities from the east and west is most evident. Both CMA's and CA's from Central Canada occupy virtually all the positions in the group of low scores for component 3, such that the character of the component could be "peripheral traditional centres".

Component 4 exhibited conditions associated with what may be termed the "higher order functions" of industrial activity (INDACT), consumerism (SALES) and professionalism (PRORAT) suggesting the attribute of "regional service centre". It also loaded highly along the criminal condition, suggesting that the locational attributes were likely to be with larger rather than smaller cities. While Table 20 confirms to some extent the dominance of larger CMA's along this component, the presence of Eastern cities such as Fredericton and St. John's could mean that they in fact are the primary representatives of "service centres" within this part of the country. In contrast to this, centres with a more industrial character (i.e., St. Catharines, Windsor) are contained within the group of lower component scores. The presence of Quebec City and Ottawa-Hull in this group may be related more to the weight of the crime indicator than to the other variables in the component.

Components 5 and 6 have only two and three significant loadings on which to base a characterization. The higher value across the pollution indicator for component 5 would seem to point to "industrial cities". This is borne out in the component score listing which clearly brings together the

more industrially active centres in Canada. Component 6 scores along the productivity indicator and the younger population indicator, suggesting that it may be characterized as "young workers". Again, the list of component scores distinguishes between these more active centres in both Quebec and B.C..

The Stage 2 analysis also performed a principal components analysis of an 18 variable matrix. As was the case with the first application, the results of this application were dramatically different from the application using 21 variables. The results, which are reproduced in Tables 21 and 22, identify a series of components of well-being having closer ties with the original findings of the stage 1 analysis. While the previous example saw signs of affluence and a new urbanism as dominant themes, this second application recognized contrasting themes of declining prosperity. The values of the component loadings were somewhat higher in this application, the overall explained variance was greater and the eigen value along the first component is also higher.

Component 1, responsible for 40 % of the total variance, projects an image of "hardship" in economic terms (unemployment, poverty) and "rigidity" in socio-cultural terms (religion, ethnic origin). With respect to the latter, it has stronger ties to traditional conditions such as religious beliefs and sedentarianism. For example, variables of place of birth (POB) and ethnic origin (ETHN) point to

Table 21
Component Loadings - Stage 2 (18 Variables)

	<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>
POB	0.568	-0.603		0.424	
UNEMP	0.764		0.476		
MORT	0.524			0.690	
DWLREP	0.662		0.325		
NORELG	-0.400	0.699		-0.415	
FAMPOV	0.696	-0.341	0.512		
HRTDIS				0.692	-0.377
OWN		0.586	-0.576		0.341
ETHN	-0.774	0.426			
RAIN	0.695			0.371	
EDDG			-0.849		
WFCHG	0.665			0.380	
NOCHD			-0.657	-0.411	0.427
VIOL		0.904			
INCDIS		-0.399			-0.680
CHD				0.897	
TRFCAC			0.749		0.386
FAMLP		-0.316			0.858
EIGEN VALUE	7.27	2.27	2.00	1.70	1.27
VARIANCE EXPLAINED	40.4%	12.6%	11.1%	9.5%	7.1%
CUMULATIVE VARIANCE	40.4%	53.0%	64.1%	73.5%	80.6%

urban populations of single origin background and of longstanding settlement. Similarly, a number of economic indicators also load heavily on this component. The resulting character is one of hardship with greater evidence of unemployment (UNEMP), family poverty (FAMPOV) and poor housing stock (DWLREP). The distribution of higher component scores as shown in Table 22 reveals the dominance of both larger and smaller cities from Quebec. Lower component scores on the other hand identify smaller census agglomerations from both central and western Canada. Because of this distribution, the selected component label is that of "Urban Quebec".

What these results may be pointing to are the recent changes which have begun to have an impact on the Canadian industrial sector as it adjusts to forces in the areas of technological change and international competition. It is generally acknowledged that the industrial structure of the U.S. economy is being redefined in terms of the collapse of so-called "sunset" industries and the emergence of "sunrise" industries in the sunbelt and west coast regions. In Canada, this phenomenon could be occurring in regions that are largely dependent on the manufacturing sector (i.e., textiles, shoes). Maritime and Quebec cities listed in Table 22 would appear to be most vulnerable to this economic restructuring. On the other hand, in 1981 urban centres in more prosperous regions or dependent on a broader economic base were well placed to withstand these economic pressures.

Table 22
Standardized Component Scores
Stage 2 Analysis (18 Variables)

	<u>High Scores</u>	<u>Low Scores</u>
Component 1	Shawinigan (2.54) Trois Rivières (1.99) Sydney (1.95) Montreal (1.52) Quebec (1.38)	Kamloops (-1.40) Kelowna (-1.20) Barrie (-1.12) Peterborough (-1.09) Guelph (-1.09)
Component 2	Vancouver (2.68) Prince George (2.33) Nanaimo (1.84) Kamloops (1.70) Victoria (1.62)	Peterborough (-1.69) Kingston (-1.38) Guelph (-1.33) Fredericton (-1.31) Moncton (-1.22)
Component 3	Kelowna (1.98) Drummondville (1.73) Kamloops (1.70) Sydney (1.62) Shawinigan (1.37)	Calgary (-2.10) Ottawa-Hull (-1.73) Toronto (-1.62) Edmonton (-1.23) Quebec (-1.17)
Component 4	St. John's (1.90) Sudbury (1.90) Sydney (1.48) Thunder Bay (1.43) Prince George (1.41)	Kelowna (-2.67) Victoria (-2.48) Nanaimo (-1.47) Shawinigan (-1.02) Vancouver (-1.00)
Component 5	Moncton (2.25) Prince George (2.19) Chicoutimi (1.45) Drummondville (1.28) Kamloops (1.18)	Cornwall (-2.15) Sydney (-1.60) Windsor (-1.59) Winnipeg (-1.47) Thunder Bay (-1.33)

Those in the West and in Ontario therefore register better rankings across this first component.

Component 2 also includes higher loadings across socio-cultural variables; however, in this instance they are in an opposite direction. For example, the most important characteristics would suggest an urban population that was of multiple ethnic origin (ETHN), with fewer ties to religious groups (NORELG) and largely from other parts of the country (POB). In addition, the component is strongly influenced by the violent crime indicator (VIOL), suggesting further instability in the social composition.

The explained variance of Component 2 is much less than the first; however, its locational character is no less specific. The five (5) cities with the largest scores are from British Columbia, while at the other extreme, smaller centres from central Canada and the Maritimes are represented. Given the geographic specificity this component may be called "Urban B.C.". Though the loadings pertain to a broad array of social and economic conditions, the fact that these conditions are most evident in West Coast cities argues for the chosen label.

The distribution of loadings along component three (3) has some relationship with component one (1). In this case, however, the significant indicators are virtually all tied to "economic" and "family" conditions rather than "socio-cultural". Characterized by lower education (EDDG), unemployment (UNEMP), poorer housing stock (DWLREP), family

poverty (FAMPOV) and larger families (NOCHD), this component also records hardship in the more traditional sense of the term. The earlier noted cultural dimension is no longer in evidence, giving way to more conventional indicators of education and economic status. The geographic distribution of the component scores does not restrict itself to any particular region. Table 22 indicates that eastern, central and western urban centres are represented. Unlike component one (1) which may have been driven by the cultural indicators, this vector is more clearly associated with the industrial restructuring which is presently affecting certain traditional industrial centres. The fact that cities such as Sydney, Shawinigan and Kelowna are in this group would tend to confirm that resource-based economies are threatened by change. As a result, the label for component three (3) is "Hardship".

The information provided in components 4 and 5 is once again limiting. Higher loadings across health conditions such as the cause of death and greater numbers of children per family in component four (4) highlights other characteristics affiliated with cities dependent on the more traditional industrial base. In terms of its geographic manifestation, the scores of note are those at the lower end which assemble virtually all the B.C. cities used in the analysis. The higher loadings on component five (5) are more difficult to interpret, registering family breakdown and imbalances in income distribution patterns. As such, it is

hard to assign any particular label, but more importantly, the explained variance does not warrant that much attention be devoted to this matter.

Much like the earlier findings where "hardship" and "growth/professionalism" were derived as the two critical constructs to regional variation in conditions of well-being, this second application of stage 2 of the analysis was successful in bringing forward another dichotomous character to well-being; this based more on geographic evidence than on compositional evidence. Of special interest to the spatial analyst was the fact that the component structure was regionally distinct. In other words, the findings from the second application confirmed that the selected indicators of well-being could be distinguished in terms of Quebec and B.C. cities.

A final test of the component results and in particular their geographic character involved the application of cluster analysis. To this point, the statistical application has relied on an "R" mode perspective. In other words, the analysis has grouped variables rather than observations into representative and statistically independent components. While a product of the factor analysis was the assignment of scores to each of the selected cases, the application of a cluster analysis to these scores will serve to reaffirm the component structure and its geographical character.

Cluster analysis considers component scores as variables and establishes groups of cases based on the Euclidean

distance between their individual scores across each of the major principal components. A method of combining cases into clusters such as the "complete linkage" method relies on a measure of the furthest neighbour as being the technique for building clusters. The process of clustering is, in this instance, agglomerative whereby more and more individual cases are brought together into larger clusters until one final cluster is produced.

Table 23 summarizes the results of a multi-stage analysis and comments on the similarities between clustered cases and component score cases. The findings offer the necessary evidence to support conclusions about the geographic aspects of social well-being in urban Canada. The first part of the table lists the results of a five-stage cluster analysis. It can be seen that the composition of the clusters resembles the groups of component scores in Table 20. Clusters 1 and 3 for example bring together the low scoring cities along the "economic affluence" component of Stage 2 analysis. These cities are for the most part smaller census agglomerations located in central Canada and the Maritimes. Clusters 4 and 5 on the other hand contain those cities which scored positively along the first component and they tend to assemble those larger metropolitan regions in central Canada and the western provinces. The fact that both high and low scoring cities from component 1 are spread throughout four separate clusters reveals the sensitivity of the clustering procedure in distinguishing among smaller

Table 23
Cluster Analysis Results

1. Cluster Solutions: (Based on component scores from the
 21 variable principal components analysis)

Cluster 1: Fredericton, St. John's, Peterborough, Moncton,
 Cornwall, Kingston, Halifax.

Linkages: Cluster associated with component 1 (negative) and
 component 3 (positive)

Character: Largely composed of smaller urban agglomerations with
 geographic locations in Maritimes and central Canada.

Component 1: Economic Affluence

Component 3: Peripheral Tradition

Cluster 2: Prince George, Kamloops, Saskatoon, Regina, Edmonton
 Sudbury, Saint John, Chicoutimi.

Linkages: Cluster associated with component 2 (positive and
 negative).

Character: Largely composed of metropolitan centres with geograph-
 ic locations in western Canada.

Component 2: Peripheral Growth

Cluster 3: Sydney, Shawinigan

Linkages: Cluster associated with component 1⁴ (negative) and
 component 5 (negative)

Character: Composed of smaller urban areas with industrially
 based economy.

Component 1: Economic Affluence

Component 5: Industrial Centres

Cluster 4: Quebec, Ottawa-Hull, Montreal, Victoria, Winnipeg,
 Thunder Bay, Windsor, St. Catharines, Guelph,
 Kitchener, Hamilton.

Linkages: Cluster associated with component 1 (positive) and
 component 3 (negative).

Character: Composed of larger metropolitan areas from central
 Canada.

Component 1: Economic Affluence

Component 3: Peripheral Tradition

Cluster 5: Vancouver, Toronto, Calgary

Linkages: Cluster associated with component 1 (positive) and
 component 4 (positive).

Character: Composed of two largest cities.

Component 1: Economic Affluence

Component 4: Regional Centres

Table 23 (cont'd)
Cluster Analysis Results

2. Cluster Solutions. (Based on component scores from 18 variable principal components analysis)

Cluster 1: Kelowna, Moncton, Drummondville, Peterborough, Barrie
 Linkages: Cluster associated with component 2 (negative)
 Character: Composed of smaller cities from across Canada.
 Component 2: Urban B.C.

Cluster 2a: Sydney, Shawinigan
 Linkages: Cluster associated with component 1 (positive) and component 3 (positive).
 Character: Composed of smaller, industrial cities.
 Component 1: Urban Quebec
 Component 3: Hardship

Cluster 2b: Prince George, Kamloops
 Linkages: Cluster associated with component 2 (positive) and component 3 (positive).
 Character: Composed of smaller industrial cities in B.C.
 Component 2: Urban B.C.
 Component 3: Hardship

Cluster 2c: Nanaimo, Victoria, Vancouver
 Linkages: Cluster associated with component 2 (positive) and component 4 (negative).
 Character: Composed of larger B.C. cities
 Component 2: Urban B.C.
 Component 4: Industrial Centres

Cluster 3: Sault Ste. Marie, Thunder Bay, Sudbury
 Linkages: Cluster associated with component 4 (positive)
 Character: Composed of cities in Northern Ontario
 Component 4: Industrial Centres

Cluster 4: Cornwall, Windsor, Brantford, St. Catharines, Winnipeg, Hamilton
 Linkages: Cluster associated with component 5 (negative)
 Character: Composed largely of cities in central Canada
 Component 5: Family Breakdown

Cluster 5: St. John's, Quebec, Montreal, Ottawa-Hull, Halifax, Sherbrooke, St. Jean, Trois Rivieres, Saint John, Chicoutimi.
 Linkages: Cluster associated with component 1 (positive) and component 5 (positive)
 Character: Composed largely of cities in central Canada
 Component 1: Urban Quebec
 Component 5: Family Breakdown

Cluster 6: Fredericton, Kingston, Guelph, Toronto, Saskatoon
Regina, Kitchener

Linkages: Cluster associated with component 2 (negative)

Character: Mixture of cities from central and western Canada
Component 2: Urban B.C.

Cluster 7: Edmonton, Calgary

Linkages: Cluster associated with component 3 (negative)

Character: Composed of cities from Alberta
Component 3: Hardship

groups of cities based upon component score results. This spread may also be due to the fact that certain cities are important within more than one cluster. Cluster 5 for instance assembles positive scores along the "economic affluence" component (1), as well as the "regional centre" component (4). Hence, this cluster is composed of the two largest metropolitan areas in Canada. Cluster 4 also brings together positive scores along component 1 but is further represented by negative scores along the "peripheral tradition" component (3). Cluster 2 is perhaps the most internally consistent, aggregating both positive and negative-scoring cases along the "peripheral growth" component (2). Overall, the findings provide further evidence of urban differences, both with respect to size of city as well as geographic location, as it pertains to matters of social well-being.

The second part of the table provides the results of clustering cases from the 18 variable solution. It too confirms earlier findings from the factor analysis, discriminating even further between groups of cases. Here again, the clusters are such that subtle differences are recorded. Clusters 2a and 7 contain all the high scoring cases along the "urban Quebec" component; however, since Sydney and Shawinigan also register positive scores along the "industrial tradition" component (3), they are further distinguished from others such as Quebec, Montreal, Sherbrooke and St. Jean. Similarly, clusters 1, 2b and 2c

contain cases from the "urban B.C." component (2). Because of their impacts on other components, including Kelowna (component 1) Prince George and Kamloops (component 3,4) and Nanaimo, Victoria and Vancouver (component 4), they are separated into different clusters.

The findings of the cluster analysis support the earlier conclusions about the regional nature of social well-being. They continue to highlight the fundamental differences which exist between Quebec and British Columbia. This was originally detected in Phase 1 from the results of the Student's t test and in Phase 2 from the Standard Score models. The application of a principal components analysis and a cluster analysis has added to this evidence by confirming the existence of both Quebec and B.C. groups of cities.

Throughout this phase of the analysis there has been evidence of variation based on the size of urban centres. In some instances, the component scores, whether they be high or low, showed some signs of clustering according to urban size. As a way of resolving the issue, the final stage of the study performed separate factor analyses on C.M.A.'s and C.A.'s. The results are contained in Table 24 and it can be seen from the loadings that the suspected difference did not materialize.

Of the eight (8) variables contained in component 1 with significant loadings, five (5) were similar in both applications. In terms of loading weight and sign indicators

such as demographic change (PCHG1), income (LOWINC), migration (NMR2), unemployment (UNEMP) and dwelling prices (DWLPR) showed virtually no change between CMA and CA observations. The overall character of component 1 was "economic affluence/growth" and the regional distribution clearly favoured the western regions of the country. Under this component, the upper part of the Table assembled West Coast C.M.A.'s (i.e., Vancouver, Victoria) while in the lower part C.A.'s (i.e., Kamloops, Kelowna, Prince George,) would be represented.

Of the loadings on component 2, those dealing with education and household composition were similar for both CMA's and CA's. The character in this case is additional evidence of the professional dimension as noted in component 1. Component 3 maintained some links with the preceding in picking up on economic, shelter and educational traits. Under the analysis of census agglomerations there was the added trait of demographic change which could be associated with some of the smaller West Coast centres.

Under Stage 3 of the analysis, the data set included a series of six (6) subjective variables which were to be tested along with the objective data. Table 24 records the presence of a "recreation appreciation" variable (RECEF) and a "fear of crime" variable (CRIMEFEAR) as having significant loadings across factors 3, 4 and 5 of the CMA application. Such a result would tend to confirm earlier findings by Knox & MacLaren (1977) who found high correlations between

Table 24
Component Loadings - Stage 3

Census Metropolitan Areas - Stage 3 PCA Analysis

	<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>
PCHG1	0.913				
LOWINC	-0.798				
NMR2	0.711				
MORT	-0.618	-0.368			
UNEMP	-0.602		-0.525		-0.317
DWLPR	0.454	0.481	0.476		
STRES	-0.397	-0.491			
EDDG	0.372	0.534	0.312	0.376	
NOFAM		0.818			0.320
YDR		-0.810			
CRIME			0.681		
SALES			0.610		
RECEP			0.513	0.626	
SUSPAR			0.399	-0.700	
INDMIX				0.826	
CRIMEFEAR					0.943

Census Agglomeration - Stage 3 PCA Analysis

PCHG1	0.727		0.311		
LOWINC	-0.885				-0.364
NMR2	0.558		0.553	0.312	
MORT			-0.560		
UNEMP	-0.861				
DWLPR	0.772		0.419		
TONG	0.771				
EDDG		0.880			
NOFAM		0.498	0.601		-0.339
YDR					0.738
CRIME			0.657		0.339
SALES				0.831	
WFCHG	-0.670				
POPBIL	-0.415				-0.491
INDMIX		0.838		0.471	
PPHYS		-0.743			

objective and subjective data. As such, the outcome would lend weight to the argument against the need to include perceptual data within an indicator model. On the other hand, the fact that more subjective data are continually being made available should not deter the social scientist from incorporating them within the analysis. In this instance, such data were helpful in further distinguishing between dimensions of well-being.

The results of phase 3 have identified and described the major variations in the character of well-being in urban Canada in the early 80's. Table 25 summarizes the results by individual stages clearly establishing an underlying "core/periphery" variation as well as a "tradition/non-tradition" variation within the Canadian system. In virtually all the case studies, the regional structure of well-being was struck between western cities and cities in Quebec. More importantly though, the regional variations in conditions were more directly tied to the concepts of "best" and "worst", whereby "worst" conditions of well-being (i.e., unemployment, income, poverty) were strongly associated with Quebec cities and "best" conditions of well-being (i.e., growth, higher education, occupational change, income) were identified with the western cities. This was not always the case, however, as social conditions such as crime were also regional, tied to the west. At times there were some links to Maritime cities; however it was in no way similar to that of phase 2 of the study. With respect to the actual

Table 25
Comparison of Principal Component Results

Stage 1 Analysis (36 Variables)	Eigen Value	% Explained
Component 1: Economic Hardship	11.84	32.9%
Component 2: West Coast Growth/ Social Hardship	3.87	10.8%
Component 3: Demographic Growth	3.26	9.1%
Component 4: Urban Vitality	2.56	7.1%
Component 5: Neo-Family	1.95	5.4%
Component 6: Traditional Family	1.82	5.1%
Component 7: Consumerism	1.70	3.1%
Component 8: Working Women	0.70	2.0%

Stage 2 Analysis (21 Variables)

Component 1: Economic Affluence	6.85	32.6%
Component 2: Peripheral Growth	3.06	14.6%
Component 3: Peripheral Tradition	2.06	9.8%
Component 4: Regional Services	1.75	8.3%
Component 5: Industrial Centres	1.40	6.7%
Component 6: Young Workers	1.10	5.3%

Stage 2 Analysis (18 Variables)

Component 1: Urban Quebec	7.27	40.4%
Component 2: Urban B.C.	2.27	12.6%
Component 3: Hardship	2.00	11.1%
Component 4: Industrial Centres	1.70	9.5%
Component 5: Family Breakdown	1.27	7.1%

Stage 3 Analysis (16 Variables)

Component 1: National/Regional	5.84/5.32	36.5/33.2%
Component 2: Professional/Service	1.88/2.64	11.7/16.5%
Component 3: Tradition	1.27/1.48	7.9/9.2%
Component 4: Service Centre	1.23/1.09	7.7/6.8%
Component 5: Crime/Family	1.07/.99	6.5/6.1%

dimensions of the quality of life, the results seem to distinguish "wealth" from "hardship" and "professionalism" from "traditionalism". There appears to be a dichotomous nature to spatial patterns of well-being, similar in some respects to Smith's (1973) findings. In this case, however, the negative aspects are related more to economic conditions such as employment and poverty rather than to matters of safety and crime. Notwithstanding this the results in virtually all the applications do make clear distinctions between the "haves" and the "have nots" as being at the foundation of the quality of life.

Chapter 5

5.1 Conclusions

This thesis set out to respond to the question: how do you define and measure regional variation in the quality of life? It is premised on a growing concern for judging whether individual or societal well-being is decreasing or improving. The study was also prompted by the ever present need for public policy analysts to be both socially and fiscally responsible in matters of public programming. This has been most evident of late given the current environment of restraint and cutbacks within the public sector and a general interest in doing more with less. In view of the increasing pressure placed on the decision making process and the assignment of funds to public programming, this analysis was conceived with a view to shedding more light on some of the problems involved in recording regional patterns of well-being.

In tackling the matter of social well-being, we firstly reviewed conceptual issues and followed this by a more rigorous statistical application. In this particular instance the application used social indicators of experienced life conditions within the major Canadian urban centres as being the most suitable measures of the changing nature of well-being. The empirical approach employed a variety of methods ranging from relatively simple descriptors such as standard scores through to more complex components as

generated by factor analytic and clustering techniques.

Prior to the testing and analysing of social indicators, we discussed the broader issues associated with all matters of welfare and well-being. These remarks were meant to establish a theoretical foundation upon which to construct an appropriate real-life application.

During the early part of the discussion, it was noted that the matter of welfare had traditionally been the domain of economic analysis. Founded on a principle of "utility" whereby goods and services such as labour, capital and resources were the critical elements, the economic perspective had been the longstanding practice in defining changes to well-being. Despite its popularity, this purely economic viewpoint was questioned in terms of its comprehensiveness and applicability. Social scientists, including economists, acknowledged that taking a full account of welfare went beyond simple ledger entries and required more sensitive and comprehensive census taking. At the same time, there was an appreciation that social welfare also went beyond objective reality. The early works of Maslow (1954) and Cantrill (1965), for example, were clear in noting that the individual played a more direct role in the way life quality was perceived. It became evident that a more elaborate system of "social accounting", similar in scope to the already established economic system, was desirable.

The development of a social accounting model was seen to follow a continuum which at one end considered issues having

to do with social justice and equality while at the other identified representative indicators of experienced life conditions as measures of social change.

In respect to philosophical issues Rawls (1971) elaborated a model based on the principle of "democratic equality". The overall appeal of this principle was in the way that it accounted for fundamental issues such as natural or inherited differences in the distribution of social welfare. The Rawlsian system tolerated distributions of unequal proportion only if the least favoured members of society received compensation. This meant that in some instances certain standards could be established in order to better judge whether in fact justice was being satisfied.

A second point along the continuum dealt more directly with the ways of incorporating the broader concepts into a more refined theory of social welfare. The consensus was that the matter had been largely dealt with by one of the two schools of welfare economists: - ordinalists or positivists. Both schools were seen to offer advantages and disadvantages, and it was generally concluded that each could be supported depending on current day circumstances. Each approach contributed substantially to a process of refining a methodology such that the ordinalist view of "cardinal" measures of utility allowed for ease in comparing individuals, while the positivist argument for taking account of subjectivity and behavioural factors was instrumental in broadening the overall base of enquiry. In the end, it was

admitted that the debate would continue indefinitely with real progress generally occurring when both views were considered together within an empirical application.

The final point along the continuum focussed on the development of empirical measures of social welfare. The practice of developing precise indicators of well-being was most active during the the 60's when social indicator analysis gained prominence in both a national and international context as a means of social accounting. U.S. sponsored research during this period had noted the limitations of social impact studies in matters of public policy (Bauer, 1966, Olson, 1969, Duncan, 1969). From this, most reviews concluded that a comprehensive and regular practice of collecting representative data had to be instituted. During the 70's, public agencies initiated the process of further documenting social welfare conditions, academics further explored the conceptual dimensions of the quality of life, and private sector interests used this new found knowledge in the development, design and distribution of their consumer products.

The development of the social indicator model was, however, plagued by a great many problems, the most important of which concerned which social conditions were to be measured and how best to record and evaluate them. While many agreed that welfare was tied to certain fundamental needs of a physiological, psychological or spiritual nature, a debate as to the analytical approach and the composition of

the analysis ensued. There were some who argued that the understanding of welfare was better served by devoting more time and effort to establishing a strong conceptual model. Others felt that there was sufficient and reliable information to warrant the building of more empirical models. Those favouring the latter approach were faced with a further challenge - that of the selection of the exact characteristics on which to base the model. The debate in this instance was whether "objective" conditions such as unemployment rates, the number of doctors or the average cost of a dwelling unit were more appropriate indicators than "subjective" information gathered through opinion and attitude surveys of responses to these same conditions. The resolution to these problems has yet to be seen. However, for the purposes of this exercise, an approach relying on objective indicators and utilizing subjective indicators within an empirical framework was favoured.

In Canada, interest in the composition and distribution of regional disparities has existed since Confederation. More specific interest in the patterns of social well-being however can be traced back to the early 70's when several federal government departments undertook more indepth investigations. While many of the more recent studies of regional disparities have tended to concentrate on broader, public policy matters such as federal-provincial relations and macro-regional programs, this paper sought to re-apply a simple indicator model to major centres within the national

urban system. Given that many of the nation's regions had undergone significant social and economic change during the decade, it was proposed that an empirical study much like those conducted by Smith (1973) and Liu (1975) be attempted. By concentrating on the inter-urban scale it was believed that the findings would be more sensitive to the character of well-being which is at times very volatile. As well, by focussing the analysis at this scale there would be more opportunities to distinguish some intra-regional variation such as that within the Prairies or Central Canada. The scale of the analysis was therefore restricted to the major components of the Canadian urban system including 24 census metropolitan areas and a further 21 census agglomerations. Fifty different variables were identified, and documented. In making the selection of the variables the study retained a conceptual framework of dimensions of well-being which respected earlier studies. It also sought to represent other fields of well-being which could be thought of as being unique to the Canadian environment (i.e., multiculturalism).

From the outset, the results of the three phases of the analysis highlighted regional variation. In the first series there was a clear indication that significant differences existed between larger Canadian regions. The most pronounced regional variation was determined through the testing of a "central/periphery" hypothesis. The character of this variation showed that most major dimensions, but in

particular cultural, shelter and household groups, varied. The preliminary investigation found that the regions with the greatest degree of mutual dissimilarity were those of the West Coast and Quebec. The discriminatory indicators were those of religious affiliation, housing costs and ethnic background. This finding is found to be in keeping with other work on the regional nature of Canadian values where Quebec and British Columbia recorded substantial differences in the priorities assigned to matters such as family and economic security, love, helping others, and friendship (Atkinson, 1982).

In terms of other hypotheses, namely that of the difference between "big cities" and "smaller towns", fewer conditions were recorded and the character of the variation had more to do with the "household" dimension. In particular, family conditions such as childless parents, housing costs including maintenance and purchase price, traffic accidents, university education, and consumer spending were most prevalent. This was found to be in general agreement with established ideas that larger cities tend to be faster paced, professional and more consumer oriented in their character. Surprisingly, other potentially significant indicators such as crime, poverty, unemployment, occupational mix and demographic growth which traditionally could register significant differences failed to record the anticipated results. This could be interpreted as meaning that, apart from areas of household composition and living

costs, the urban system in Canada is much more consistent. In other words, from the preliminary findings it was not possible to state clearly that large cities were dramatically different from smaller towns in terms of the selected indicators of well-being.

The second stage of the analysis made more direct comparisons between individual urban centres. Once again, the general findings were of major differences between cities located within the central urban corridor known as the Quebec-Windsor axis and those outside this corridor. As well, the results of the standard score model registered more evidence of a "large versus small" character within the urban system.

With respect to the overall ranking across all variables, the data showed that more often than not cities located outside the main urban corridor exhibited better all around conditions of well-being. The results also suggested that smaller census agglomerations generally scored better than larger metropolitan areas. Of the nine (9) largest cities for example, only three (i.e., Ottawa-Hull, Edmonton, Calgary) occupied a position in the top twenty ranks of the score additive model. In many cases these positions were occupied by smaller cities such as Fredericton, Guelph, Medicine Hat, Regina, Kamloops or Barrie.

In looking more closely at certain conditions of well-being the standard scores revealed that, in matters of economic livelihood (i.e., employment, poverty, occupation,

education), larger metropolitan centres fared somewhat better, with Western cities dominating the top positions. Only two non-western cities showed signs of economic stability with that of Ottawa-Hull occupying the second rank in this category. Among some of the other more general findings of the second phase, the analysis concluded that the most inexpensive housing was offered in the smaller cities in Quebec and that Western cities on the whole exhibited better health and medical facilities. As for social conditions and matters of security and crime, the data clearly pointed to the advantages of smaller urban cities, particularly those in Central and Eastern Canada.

The application of factor analytic techniques in the third phase of the study provided for a more rigorous analysis of the underlying structures in the data set. Unlike the earlier exercises, the use of principal components analysis produced generalizations about both the composition of the regional variation and the distribution of this composition.

The general results confirmed a regional structure of well-being differentiated on the basis of "affluence" and "hardship". In one instance, the analysis of 21 different conditions indicated that the most important component was associated with the more "positive" characteristics of urban living. This character was defined in terms of a service-sector dominated economy, composed largely of higher paid, higher educated, single family households with childless

families. At the same time, the analysis of an 18 variable model presented a principal component of the more "negative" aspects such as unemployment, poverty, and dependency. This character was tied more closely with traditional conditions of family households, children, elders, and an industrially based economy. Upon closer examination of the data it was concluded that the distribution of these positive and negative aspects was being expressed in regional terms. In point of fact, the components were in themselves exhibiting significant polarity with high positive and high negative scores. This polarity was further recognized in its regional distribution between Central and Western Canada. A review of the component scores pointed to the economic hardship and traditional flavour of the industrial centres of Central Canada which was in direct contrast to the economic vitality and neo-family character of Western Canada.

The study of regional variation in conditions of well-being documented to some degree the rather significant changes which were occurring at the urban level during the early 80's. On one hand the analysis recorded the new found prosperity which was benefiting Western Canada at the expense of some of the more traditional centres in Central Canada. Certainly, the "boom" of the resource sector in Canada, as well as the more global changes in traditional primary and secondary industries, helped shape the profile of well-being at this time. It is interesting to note that recent trends in industrial expansion and economic growth have recently

favoured Central Canada. This would support the argument that in matters of the regional character of social well-being, comprehensive and regular monitoring is recommended.

In another instance though, the findings also noted other emerging trends related to occupational structure and family composition. There appeared to be a growing difference between cities which could be said to be "traditional" in nature as that relates to occupations, families and households, and those more "unconventional" cities, displaying newer characteristics emanating from the impact of the "baby boom generation". The application of empirical techniques tended to confirm the general opinions about the urban system in the early 80's. Simmons and Bourne (1979, 1983) described the significant changes which were occurring within the system as major migration streams headed west in order to benefit from the economic growth of the resource industries. This regional shift was to result in a somewhat better character of well-being for the receiving regions. On the other hand, those regions which were not equipped to withstand the effects of the shift were to show signs of decline. This was especially true of the more industrial centres which were subjected to significant pressures arising out of economic and technological restructuring. The results of the analysis provided some descriptive findings related to Canadian regionalism which serve to emphasize the need for close federal-provincial relations in ensuring that the potential effects of

imbalances are limited. While it is clearly acknowledged that the use of the social indicators was incomplete, lacking depth and substance in matters of fiscal transfers and public programming, the results of the multivariate analysis point to the ever present regional disparities. In this instance, the disparities were noted in terms of affluence and hardship as reflected in the socio-economic conditions under study.

The further study of the regional variation in the quality of life is most opportune in these times when matters of global or regional interest can be altered at a moment's notice. In a recent editorial in the Globe & Mail (January 2, 1987), reference was made to the results of public opinion polls where the family unit was once again being extolled as the basis for personal rewards. Similarly, the December 1986 edition of "The Planner" contained an article which argued favourably for the implementation of a social audit as a public policy tool to complement financial audits in assessing overall impacts of public programmes. Both of these items have direct links with this thesis. The first raises the spatial variation of matters of welfare while the second argues for further formalization of social accounting. In both instances the issues, observations and results of the above exercise could prove beneficial in further endorsing or evaluating their impact and contribution to regional analysis.

Systems, whether they be economic, social, technological, financial or infrastructural, are by and

large responsible for ensuring the proper functioning of private and public interests and are complex. If in some way the analyst is capable of documenting and understanding how these systems affect our lives and how he or she can best measure the changes in our lives, then the analyst is better placed to make sound recommendations about how to improve our lives. Continued efforts at understanding and measuring all aspects related to the quality of life should therefore be promoted as valid evaluative instruments for public policymakers.

In Canada, indicators of social well-being pointed to definite regional patterns. In one case, the results described hardship conditions which could call into question the economic policy issues associated with job creation programs or other forms of social support. In another case, the results identified conditions of affluence and family change, suggesting the need to further explore public policy matters having to do with family support, day care, and affirmative action programs. As such, the findings of this thesis have provided necessary information and insight to serve in further understanding the quality of life and its ramifications to public policy.

Appendices

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Appendix 1

Indicator Descriptions and Sources

<u>Acronym</u>	<u>Description</u>
PCHG1	Rate of change of total population, 1971-1976 Source: Statistics Canada, 1976 Census of Canada
PCHG2	Rate of change of total population, 1976-1981 Source: Statistics Canada, 1981 Census of Canada
DENCHG	Rate of change in total persons per square kilometre, 1976-1981 Source: Statistics Canada, 1981 Census of Canada
YDR	Total population aged 0-14 years / Total population aged 15-64 years, 1981 Source: Statistics Canada, 1981 Census of Canada
EDR	Total population aged 65 years and over / Total population 15-64 years, 1981 Source: Statistics Canada, 1981 Census of Canada
NMR2	Total in-migrants 1976-1981 - Total out-mi- grants 1976-1981 / Total population 1976 Source: Statistics Canada, 1981 Census of Canada
NOCHD	Per cent of childless census families, 1981 Source: Statistics Canada, 1981 Census of Canada
CHD	Per cent of census families with 2 or more children, 1981 Source: Statistics Canada, 1981 Census of Canada
FAMLP	Rate of change in total number of lone parent families, 1976-1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada
NOFAM	Per cent of private households with no families, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada

POB	Per cent of total population living in province of birth, 1981 Source: Statistics Canada, 1981 Census of Canada
TONG	Per cent of total population whose mother tongue is other than english or french, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada
ETHN	Ratio of multiple ethnic origin population to total population, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada
POPBIL	Per cent of total population speaking english and french, 1981 Source: Statistics Canada, 1981 Census of Canada
NORELG	Per cent of the total population having no preferred ties to a religious group, body denomination, sect, cult or community, 1981 Source: Statistics Canada, 1981 Census of Canada
DWLOWN	Per cent of owner occupied dwellings, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada
DWLREP	Per cent of occupied dwellings needing major repairs, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada
DWL46	Per cent of occupied dwellings built before 1946, 1981 Source: Statistics Canada, 1981 Census of Canada
DWLCST	Rate of change in total value of a single detached dwelling 1976-1981 Source: Statistics Canada, 1976, 1981 Census of Canada
RENT	Average monthly gross rent, 1981 Source: Statistics Canada, 1981 Census of Canada

OWN	Average major monthly payments for owners, 1981 Source: Statistics Canada, 1981 Census of Canada
DWLPR	Average price for a single detached dwelling, 1981 Source: Canada Mortgage & Housing Corporation, Canadian Housing Statistics
DWLSTR	Rate of change in total number of dwelling starts 1976-1981 Source: Statistics Canada, Market Research Handbook, 1985-86
UNEMP	Average male and female unemployment rate for labour force aged 15-64 years, 1981 Source: Statistics Canada, 1981 Census of Canada
YUNEMP	Average male and female unemployment rate for labour force aged 15-24 years, 1981 Source: Statistics Canada, 1981 Census of Canada
WFCHG	Rate of change of female participation rate in the labour force, 1976-1981 Source: Statistics Canada, 1976, 1981 Census of Canada
MORT	Age standardized male mortality rate, Source: Health & Welfare Canada, Mortality Atlas, Volume 3
HRTDIS	Age standardized male heart disease death rate, Source: Health & Welfare Canada, Mortality Atlas, Volume 3
TRFCAC	Age standardized male traffic death rate, Source: Health & Welfare Canada, Mortality Atlas, Volume 3
LOWINC	Incidence of low income, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada
INDMIX	Ratio of tertiary employment to primary and secondary employment, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada

HSPBDS	Number of hospital beds per 100,000 population, 1982 Source: Department of Industry, Trade & Commerce, Community Information Sheets
PPHYS	Ratio of total population to total number of physicians, 1982 Source: Department of Industry, Trade & Commerce, Community Information Sheets
INCDIS	Income distribution ratio, 1982 (see Appendix 2 for details) Source: Department of Industry, Trade & Commerce, Community Information Sheets
SALES	Total retail sales per capita, 1981 Source: Statistics Canada, Market Research Handbook, 1985-86
POPRA1	Total population per 10,000 persons, 1981 Source: Statistics Canada, 1981 Census of Canada
MGRCLR	Ratio of managerial occupations to clerical occupations, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada
ED9	Per cent of labour force over 15 years with less than grade 9 education, 1981 Source: Statistics Canada, 1981 Census of Canada
EDDG	Per cent of labour force over 15 years with university degree, 1981 Source: Statistics Canada, 1981 Census of Canada
CRIME	Criminal code offences per 100,000 population, 1981 Source: Statistics Canada, Canadian Crime Statistics, Catalogue 85-205
VIOL	Crimes of violence per 100,000 population, 1981 Source: Statistics Canada, Canadian Crime Statistics, Catalogue 85-205
PROP	Property crimes per 100,000 population, 1981 Source: Statistics Canada, Canadian Crime Statistics, Catalogue 85-205

STRES	Industrial Workers in high stress establishments, 1973 Source: Statistics Canada, Human Activity and the Environment
AIRPAS	Number of air passengers, 1973 Source: Statistics Canada, Human Activity and the Environment
FAMPOV	Per cent families with total family income less than \$10,000 annually, 1981 Source: Statistics Canada, 1981 Census of Canada
PRORAT	Ratio of professional occupations to total population, 1981 (see Appendix 2 for details) Source: Statistics Canada, 1981 Census of Canada
SUN	Total annual hours of sunshine, 1973 Source: Environment Canada, Canadian Normals 1941-1970
RAIN	Total annual days with measurable precipitation, 1973 Source: Environment Canada, Canadian Normals 1941-1970
INDACT	Value added of manufacturing activity per employee, 1981 Source: Statistics Canada, Market Research Handbook 1985-86
SUSPAR	Average suspended particulate matter, micrograms per cubic metre, 1981 Source: Environment Canada, National Air Pollution Surveillance
SULDI	Average parts per hundred million sulfur dioxide content, 1981 Source: Environment Canada, National Air Pollution Surveillance
MEDEF	Standardized Score of Evaluation of Medical Facilities, 1979 Source: The Institute for Behavioural Research, Survey of Urban Concerns
TRANSEF	Standardized Score of Evaluation of Transportation Facilities, 1979 Source: The Institute for Behavioural Research, Survey of Urban Concerns

CRIMEFEAR Standardized Score of Evaluation of Crime,
1979
Source: The Institute for Behavioural
Research, Survey of Urban Concerns

RECEF Standardized Score of Evaluation of Recre-
ational Facilities, 1979
Source: The Institute for Behavioural
Research, Survey of Urban Concerns

GOVTEF Standardized Score of Evaluation of Govern-
ment Effectiveness, 1979
Source: The Institute for Behavioural
Research, Survey of Urban Concerns

LIKING Standardized Score of Overall Liking of
Urban Centre, 1979
Source: The Institute for Behavioural
Research, Survey of Urban Concerns

SPSS/PC+

URBAN CENTRE	FAMILIES WITH 2 OR MORE CHILDREN	CHANGE IN ONE- PARENT FAMILIES 1976-198 1	POPULATI ON LIVING IN PROVINCE OF BIRTH	HOUSEHOL DS WITH NO FAMILIES	POPULATI ON WITH MOTHER TONGUE OTHER THAN	RATIO OF MULTIPLE ORIGIN POPULATI ON TO	POPULATI ON SPEAKING ENGLISH AND FRENCH
WINNIPEG	40 22	19 45	64 99	30 78	21 52	11 25	8 68
BARRE	42 33	36 25	74 51	20 17	6 29	11 73	5 16
BRANTFORD	41 11	28 44	72 71	23 96	11 33	8 91	4 73
CORNWALL	42 45	14 48	78 92	22 99	4 19	10 74	42 98
DRUMMONDVILLE	43 11	41 95	96 61	22 39	42	65	19 78
FREDERICTON	43 19	36 55	77 03	23 01	2 58	7 65	12 28
GUELPH	42 41	37 08	69 51	25 24	13 05	10 81	6 37
KAMLOOPS	45 26	37 79	49 69	23 51	11 36	14 15	4 67
KELOWNA	35 27	40 24	34 94	23 31	17 08	12 06	4 51
KINGSTON	40 53	44 07	70 34	26 29	4 11	10 64	8 47
MONCTON	44 96	60 11	75 91	21 51	1 16	6 79	37 08
NANAIMO	37 24	35 87	51 47	25 57	9 07	11 37	5 09
PETERBOROUGH	40 21	47 61	81 81	23 78	4 19	8 91	4 87
PRINCE GEORGE	49 17	47 92	51 16	21 44	12 04	13 86	4 99
ST JEAN	41 41	45 89	93 02	21 57	1 61	1 34	32 67
SARNIA	43 07	27 55	72 54	23 71	9 75	9 32	7 09
SAULT STE MARIE	47 28	24 08	78 21	20 61	15 29	14 51	8 77
SHAWINIGAN	40 91	32 51	96 88	21 28	41	65	18 87
SHERBROOKE	42 41	45 25	92 91	27 31	1 46	1 64	35 58
SYDNEY	48 97	21 26	87 99	18 87	2 25	7 81	3 14
CHARLOTTETOWN	38 03	18 25	75 16	24 56	1 21	8 22	5 78
MEDECINE HAT	38 37	43 62	52 54	26 71	15 31	11 99	7 97

Childless Families: Refers to those families where the wife has reported that no children were ever born to her.

Family/Household Total Income: Refers to the total income of a census family or household as the sum to the total incomes of the members of that family or household.

Incidence of Low Income: On the basis of the total income of a family unit adjusted for federal child tax credit, size of the family unit and size of the area of residence, the position of each unattached individual and economic family is determined in relation to low income cut-offs based on the 1978 Family Expenditure Survey and updated by changes in the Consumer Price Index. The incidence of low income is the percentage of units below the low income cut-offs.

Income Distribution Ratio: Indicates how evenly the community's total income is distributed among the population, and is computed as the standard deviation from the mean. This value falls between 0 and 1, with a high value indicating an uneven distribution throughout the community.

Tertiary Employment: Refers to employment in the trade, finance, insurance, real estate, community, business, personal service industries, public administration and defence occupations.

Managers: Refers to occupations in the managerial and administrative categories.

Scheffe Test: The Scheffe multiple comparisons test is for pairwise comparisons of means. It requires larger differences between means for significance than most of the other methods.

URBAN CENTRE	POPULATI ON CHANGE 1976-198	POPULATI ON DENSITY CHANGE 1976-198	YOUTH DEPENDEN CY RATIO	ELDER DEPENDEN CY RATIO	POPULATI ON CHANGE 1971-1976	NET MIGRATIO N RATIO 1976-198	FAMILIES WITH NO CHILDREN
CALGARY	25 74	4 61	29 56	8 47	16 5	14 11	20 81
CHICOUTIMI	5 07	5 11	34 27	8 52	1 8	-2 34	12 75
EDMONTON	18 07	10 60	31 48	9 26	11 7	6 29	18 67
HALIFAX	3 63	3 60	31 95	11 33	7 0	-1 77	15 68
HAMILTON	2 40	2 39	30 93	14 93	5 2	- 61	14 42
KITCHENER	5 75	5 75	34 75	13 23	14 1	- 58	14 53
LONDON	4 91	4 92	30 39	14 73	6 9	- 71	15 89
MONTREAL	92	74	28 01	12 96	2 7	-3 77	17 38
OSHAWA	14 07	14 06	35 55	10 94	12 4	6 88	13 45
OTTAWA-HULL	3 56	3 57	29 65	11 46	11 9	1 15	16 47
QUEBEC	6 26	6 24	30 05	11 84	8 1	- 24	18 21
REGINA	8 68	8 67	35 10	13 67	7 4	1 17	14 13
SAINT JOHN	95	1 05	36 65	15 93	5 8	-2 41	12 51
SASKATOON	15 26	-3 95	32 44	13 92	5 8	5 81	16 74
ST CATHARINES	81	81	31 78	17 07	5 6	-1 82	11 86
ST JOHNS	6 48	-19 75	39 47	12 34	8 8	-2 11	11 85
SUDBURY	-4 52	-4 54	36 30	10 38	- 4	-8 15	10 63
THUNDER BAY	1 78	1 70	32 14	15 66	4 0	- 78	12 77
TORONTO	6 99	6 98	29 16	12 96	7 7	- 65	16 15
TROIS RIVIERES	13 06	-35 35	28 90	12 98	7	- 45	15 81
VANCOUVER	8 73	8 74	27 42	16 57	7 8	1 61	17 54
VICTORIA	6 98	6 96	25 84	25 85	11 5	4 1	19 09
WINDSOR	- 59	- 59	44 01	16 60	- 5	6 94	11 91

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	POPULATION CHANGE 1976-1981	POPULATION DENSITY CHANGE 1976-1981	YOUTH DEPENDENT CY RATIO	ELDER DEPENDENT CY RATIO	POPULATION CHANGE 1976-1981	NET MIGRATION RATIO 1976-1981	FAMILIES WITH NO CHILDREN
WINNIPEG	1 15	1 16	30 91	17 05	5 2	-3 97	15 51
BARRIE	12 44	-32 29	35 43	16 89	28 9	6 28	12 53
BRANTFORD	6 66	6 41	34 55	18 35	3 1	1 11	13 03
CORNWALL	77	-75 63	32 27	17 58	-2 1	-2 88	12 41
DRUMMONDVILLE	3 94	-45 21	32 91	13 82	-3 5	-1 73	14 71
FREDERICTON	4 77	-95 97	35 01	13 08	7 9	- 69	13 25
GUELPH	5 21	-44 56	31 85	14 37	12 3	- 93	15 55
KAMLOOPS	9 84	-22 88	35 12	8 73	24 7	1 51	14 03
KELOWNA	18 80	-79 93	30 92	22 88	29 6	12 15	13 12
KINGSTON	81	-65 35	30 16	14 41	5 7	-4 66	14 64
MONCTON	2 83	-83 39	33 97	14 69	10 4	-1 51	13 11
NANAIMO	18 49	-90 73	31 74	15 59	17 7	12 11	14 52
PETERBOROUGH	1 88	-75 92	31 91	19 08	2 8	-1 54	13 86
PRINCE GEORGE	12 73	12 04	40 63	4 57	21 4	12	15 87
ST JEAN	8 01	-67 03	30 27	11 76	6 8	6 31	17 61
SARNIA	3 21	3 31	33 93	13 12	3 7	-1 56	13 14
SAULT STE MARIE	2 45	-44 96	34 41	11 61	8	-2 74	11 23
SHAWINIGAN	-76	-73 17	26 11	14 61	-6 6	-3 95	14 15
SHERBROOKE	6 08	-53 67	32 12	13 57	7 1	-1 52	16 79
SYDNEY	-1 27	-1 32	36 17	17 67	-2 8	-4 72	8 35
CHARLOTTETOWN	8 44	-94 54	37 13	18 39	8 4	3 89	12 74
MEDECINE HAT	19 83	-75 97	36 19	15 69	19 8	11 91	13 59

URBAN CENTRE	FAMILIES WITH 2 OR MORE CHILDREN	CHANGE IN LONE PARENT FAMILIES 1976-198 1.	POPULATI ON LIVING IN PROVINCE OF BIRTH	HOUSEHOL DS WITH NO FAMILIES	POPULATI ON WITH MOTHER TONGUE OTHER THAN FRENCH	RATIO OF MULTIPLE ORIGIN POPULATI ON TO FRENCH	POPULATI ON SPEAKING ENGLISH AND FRENCH
CALGARY	40 58	37 38	39 94	29 95	14 76	12 22	7 21
CHICOUTIMI	50 37	45 78	97 43	14 53	45	62	15 06
EDMONTON	42 18	33 71	51 63	29 12	19 12	13 21	7 91
HALIFAX	43 42	30 93	71 96	25 64	2 91	10 63	7 52
HAMILTON	42 36	20 77	84 33	23 86	18 57	9 17	6 09
KITCHENER	43 17	30 25	68 11	23 51	18 26	11 12	5 36
LONDON	39 95	23 21	69 54	29 51	11 87	9 13	5 84
MONTREAL	40 65	28 59	78 47	28 57	13 14	3 05	44 54
OSHAWA	45 64	39 26	69 55	18 91	11 79	9 84	5 94
OTTAWA-HULL	42 47	29 02	62 34	28 37	8 57	9 33	39 81
QUEBEC	44 79	31 26	94 85	25 55	1 11	1 06	24 85
REGINA	43 13	33 99	73 25	29 34	14 08	12 88	4 11
SAINT JOHN	45 82	35 74	79 47	23 96	1 63	8 28	8 91
SASKATOON	41 63	45 10	70 61	32 86	15 76	13 48	5 29
ST CATHARINES	41 89	19 61	67 11	22 67	17 71	10 56	8 62
ST JOHNS	53 01	33 08	89 95	16 59	1 11	3 04	7 90
SIDDBURY	49 18	27 53	77 45	20 11	12 05	12 81	35 95
THUNDER BAY	42 64	14 95	69 65	25 21	20 77	14 41	5 79
TORONTO	42 01	26 58	51 73	26 72	27 23	7 12	7 78
TROIS RIVIERES	42 38	39 81	96 18	23 79	67	84	21 89
VANCOUVER	38 13	24 63	42 21	32 39	20 92	10 48	6 50
VICTORIA	31 81	25 18	61 37	34 05	9 61	10 24	6 28
WINDSOR	44 28	21 06	71 35	26 11	17 67	17 81	11 16

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URBAN CENTRE	FAMILIES WITH 2 OR MORE CHILDREN	CHANGE IN LONE- PARENT FAMILIES 1976-1981	POPULATI ON LIVING IN PROVINCE OF BIRTH	HOUSEHOL DS WITH NO FAMILIES	POPULATI ON WITH MOTHER TONGUE OTHER THAN FRENCH	RATIO OF MULTIPLE ORIGIN POPULATI ON TO FRENCH	POPULATI ON SPEAKING ENGLISH AND FRENCH
WINNIPEG	40 22	19 45	64 99	30 78	21 52	11 25	8 68
BARRIE	42 33	36 25	74 51	20 17	6 29	11 73	5 16
BRANTFORD	41 11	28 44	72 71	23 96	11 33	8 91	4 73
CORNWALL	42 45	14 48	78 92	22 99	4 19	10 74	42 98
DRUMMONDVILLE	43 11	41 95	96 61	22 39	42	65	19 78
FREDERICTON	43 19	36 55	77 03	23 01	2 58	7 65	12 28
GUELPH	47 41	37 08	69 51	25 24	13 05	10 81	6 37
KAMLOOPS	45 26	37 79	49 69	23 51	11 36	14 15	4 67
KELOWNA	35 27	40 24	34 94	23 31	17 08	12 06	4 51
KINGSTON	40 53	44 07	70 34	26 29	4 11	10 64	8 47
MONCTON	44 96	60 11	75 91	21 51	1 16	6 79	37 08
NANAIMO	37 24	35 87	51 47	25 57	9 07	11 37	5 09
PETERBOROUGH	40 21	47 61	81 81	23 78	4 19	8 91	4 87
PRINCE GEORGE	49 17	47 92	51 16	21 44	12 04	13 86	4 99
ST JEAN	41 41	45 89	93 02	21 57	1 61	1 34	12 67
SARNIA	43 07	27 55	72 54	23 71	9 75	9 32	7 09
SAULT STE MARIE	47 28	24 08	78 21	20 61	15 29	14 51	8 77
SHAWINIGAN	40 91	32 51	96 88	21 28	41	65	18 87
SHERBROOKE	42 41	45 25	92 91	27 31	1 46	1 64	35 58
SYDNEY	48 97	21 26	87 99	18 87	2 29	7 81	3 14
CHARLOTTETOWN	38 03	18 25	75 16	24 56	1 21	8 22	5 78
MEDECINE HAT	38 37	43 62	52 54	26 71	15 31	11 99	2 97

URBAN CENTRE	POPULATI ON WITH NO RELIGIOUS PREFERENCE	DWELLING S OWNED	DWELLING S IN NEED OF MAJOR REPAIR	DWELLING S BUILT -BEFORE 1946	CHANGE IN THE COST OF A SINGLE DETACHED	URBAN CENTRE	AVERAGE MONTHLY RENTAL COST	AVERAGE MONTHLY HOUSING COST
CALGARY	13 77	57 27	4 56	8 26	50 04	1	\$460	\$557
CHICOUTIMI	84	62 24	7 18	19 71	12 67	2	\$292	\$373
EDMONTON	12 43	55 29	4 61	7 54	20 25	3	\$415	\$503
HALIFAX	5 31	55 61	5 96	21 51	35 51	4	\$328	\$439
HAMILTON	7 32	63 41	5 39	24 58	-26 64	5	\$308	\$397
KITCHENER	6 41	60 77	4 71	20 91	-11 22	6	\$297	\$389
LONDON	8 11	56 31	4 55	23 21	4 07	7	\$321	\$392
MONTREAL	3 13	41 66	6 95	21 26	30 42	8	\$293	\$441
OSHAWA	7 45	66 51	4 42	16 42	89	9	\$330	\$435
OTTAWA-HULL	6 69	52 28	4 78	16 15	-5 01	10	\$354	\$444
QUEBEC	1 64	50 53	5 83	21 86	27 17	11	\$293	\$413
REGINA	7 95	64 34	5 78	16 11	14 38	12	\$345	\$410
SAINT JOHN	3 34	57 89	7 54	32 44	2 69	13	\$279	\$365
SASKATOON	9 06	59 08	4 63	15 71	25 62	14	\$337	\$418
ST CATHARINES	5 18	70 96	5 25	28 26	-23 65	15	\$284	\$348
ST JOHNS	1 85	69 51	4 61	20 02	27 58	16	\$284	\$376
SIOBURY	3 85	63 69	6 53	18 72	-7 41	17	\$280	\$387
THUNDER BAY	5 93	69 32	6 41	29 37	-4 71	18	\$328	\$361
TORONTO	9 09	56 45	5 14	19 94	74	19	\$364	\$446
TROIS RIVIERES	91	53 11	8 09	30 90	15 19	20	\$249	\$350
VANCOUVER	22 39	58 49	4 75	17 85	85 18	21	\$411	\$472
VICTORIA	19 11	59 35	3 71	22 43	68 84	22	\$380	\$424
WINDSOR	4 46	67 67	4 28	33 33	5 41	23	\$300	\$375

URBAN CENTRE	POPULATION WITH NO RELIGIOUS PREFERENCE	DWELLING S OWNED	DWELLING S IN NEED OF MAJOR REPAIR	DWELLING S BUILT BEFORE 1946	CHANGE IN THE COST OF A SINGLE DETACHED	URBAN CENTRE	AVERAGE MONTHLY RENTAL COST	AVERAGE MONTHLY HOUSING COST
WINNIPEG	9 18	58 79	5 15	24 95	-18 86	24	\$320	\$366
BARRIE	7 99	71 56	5 68	17 85		25	\$356	\$396
BRANTFORD	6 51	66 58	5 43	35 37	-32 29	26	\$293	\$367
CORNWALL	2 24	59 81	7 39	30 35		27	\$290	\$327
DRUMMONDVILLE	77	56 42	8 15	23 89		28	\$218	\$306
FREDERICTON	6 08	68 73	7 63	21 57		29	\$308	\$337
GUELPH	9 37	61 15	5 04	23 56		30	\$310	\$376
KAMICOOPS	17 27	67 82	3 98	6 89	59 77	31	\$383	\$461
KELOWNA	14 87	70 68	3 17	8 09		32	\$353	\$349
KINGSTON	7 01	59 34	5 14	25 15	78	33	\$294	\$383
MONCTON	3 32	68 18	6 54	24 71	4 21	34	\$294	\$339
NANAIMO	21 99	70 01	5 34	14 11		35	\$370	\$401
PETERBOROUGH	6 07	68 64	5 52	31 41	-9 62	36	\$285	\$346
PRINCE GEORGE	19 69	67 11	4 78	2 71	35 61	37	\$379	\$495
ST JEAN	1 24	55 27	6 78	21 26	13 72	38	\$249	\$339
SARNIA	5 91	66 21	4 04	23 29	-15 76	39	\$316	\$396
SAULT STE MARIE	4 92	70 78	5 09	21 78	83	40	\$311	\$360
SHAWINIGAN	96	55 86	9 68	37 13	1 98	41	\$214	\$301
SHERBROOKE	2 28	47 71	5 44	20 18	16 14	42	\$249	\$384
SYDNEY	91	75 72	12 17	45 78	-6 27	43	\$255	\$285
CHARLOTTETOWN	3 57	63 21	6 07	28 63		44	\$310	\$365
MEDECINE HAT	8 93	69 77	4 47	16 69		45	\$362	\$369

URBAN CENTRE	AVERAGE PRICE FOR A SINGLE DETACHED DWEL	CHANGE IN DWELLING STARTS 1976-1981	UNEMPLOY MENT RATE	YOUTH UNEMPLOY MENT RATE	CHANGE IN FEMALE PARTICIPATION RATE 1976	AGE STANDARDIZED MORTALITY RATE	STANDARD IZED MALE HEART DISEASE RATE
CALGARY	\$114,666	-1 36	3 8	5 1	26 05	827 1	289 7
CHICOUTIMI	\$45,372	-62 21	10 4	34 1	20 33	1025 4	624 6
EDMONTON	\$102,982	-29 69	4 1	6 1	21 34	823 1	297 1
HALIFAX	\$60,542	-42 67	8 2	12 3	22 76	914 2	399 9
HAMILTON	\$66,965	-24 65	6 5	10 9	17 77	829 5	353 9
KITCHENER	\$62,936	1 78	8 2	9 1	15 46	808 6	363 1
LONDON	\$65,784	-63 27	7 1	10 9	13 89	859 3	388 5
MONTREAL	\$66,338	-19 98	9 3	15 7	24 82	960 1	420 6
OSHAWA	\$70,027	-39 03	7 1	12 9		878 1	384 2
OTTAWA-HULL	\$70,138	-46 85	7 2	12 8	18 22	971 8	440 2
QUEBEC	\$52,861	-46 52	10 1	20 8	27 84	970 4	400 4
REGINA	\$60,637	-25 35	4 7	7 8	18 14	835 7	300 6
SAINT JOHN	\$46,945	-47 35	9 1	14 4	21 93	958 1	446 1
SASKATOON	\$69,628	-36 12	6 7	9 7	19 06	854 9	285 4
ST CATHARINES	\$55,551	-70 47	9 7	13 8	17 88	892 9	396 1
ST JOHNS	\$64,805	60 93	11 1	19 9	35 54	984 2	454 4
SUNDBURY	\$54,532	-41 41	8 6	16 7	21 12	1028 8	466 4
THUNDER BAY	\$66,682	-61 69	6 9	12 8	20 05	1048 7	548 5
TORONTO	\$114,784	31	4 9	7 4	17 15	831 4	354 5
TROIS RIVIERES	\$45,106	-57 71	13 2	24 6	24 19	1052 4	418 9
VANCOUVER	\$171,726	24 99	5 1	8 6	19 12	828 6	322 1
VICTORIA	\$132,529	58 14	6 9	8 6	15 53	747 4	345 8
WINDSOR	\$65,217	-75 39	11 6	17 8	21 22	974	478

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URBAN CENTRE	AVERAGE PRICE FOR A SINGLE DETACHED DUEL	CHANGE IN DUELLING STARTS 1976-198	UNEMPLOY MENT RATE	YOUTH UNEMPLOY MENT RATE	CHANGE IN FEMALE PARTICIP ATION RATE 1976	AGE STANDARD 1970 MALE MORTALITY RATE	STANDARD 1970 MALE HEART DISEASE RATE
WINNIPEG	\$58,866	-78 49	6 5	8 6	21 18	853 9	362 4
BARRIE	\$61,996		7 2	11 8	10 64	854 1	367 2
BRANTFORD	\$54,624	-64 78	7 1	13 2	13 28	916 1	388 9
CORNWALL	\$50,802		10 1	17 4	20 11	1007 9	462 1
DRUMMONDVILLE	\$42,160		13 2	22 5	16 67	935 4	444 4
FREDERICTON	\$48,513		8 1	14 9	16 41	802 2	315 1
GUELPH	\$64,437	287 41	6 2	9 4	13 53	828 8	411 5
KAMLOOPS	\$90,852		7 2	10 8	16 71	914 1	280 6
KELOWNA	\$112,120		7 7	10 9	9 18	692 9	234 9
KINGSTON	\$59,529	-36 48	7 2	12 5	18 78	892 1	430 2
MONCTON	\$43,220	-80 85	10 4	18 2	12 51	836 1	338 6
NANAIMO	\$98,195		9 4	14 2	22 73	823 6	274 3
PETERBOROUGH	\$54,572	-7 64	7 1	12 3	13 02	970 6	427 4
PRINCE GEORGE	\$80,756		8 6	12 1	19 75	963 9	343 09
ST JEAN	\$48,605	-45 38	9 6	14 4	21 67	1002 9	499 1
SARNIA	\$63,081	-65 99	7 7	13 1	12 32	903 9	417 1
SAULT STE MARIE	\$57,796	41 82	7 2	13 3	23 41	1005 5	485 5
SHAWINIGAN	\$38,949	-73 33	17 4	30 1	25 96	1042 9	366 4
SHERBROOKE	\$44,765	-56 26	11 4	20 9	21 38	916 2	385 8
SYDNEY	\$35,160	-29 55	15 5	28 9	27 91	1163 9	554 9
CHARLOTTETOWN	\$51,170		9 9	15 9	28 16		
MEDECINE HAT	\$69,407		5 1	8 4	14 69		

URBAN CENTRE	STANDARD SIZED MALE TRAFFIC DEATH RATE	INCIDENCE OF LOW INCOME	RATIO OF SERVICE EMPLOYMENT TO OTHER EMP	HOSPITAL BEDS PER 100,000 POPULATION	POPULATION PER PHYSICIAN	INCOME DISTRIBUTION RATIO	RETAIL SALES PER CAPITA
CALGARY	48.8	10.4	1.54	8.89	739.08	798	6.96
CHICOUTIMI	66.1	18.5	1.59	7.29	711.43	802	2.58
EDMONTON	48.1	10.7	1.85	9.75	594.08	752	2.61
HALIFAX	45.4	12.8	3.34	9.19	431.25	814	2.22
HAMILTON	37.4	12.3	1.19	6.08	556.57	803	1.89
KITCHENER	41.7	10.7	1.08	5.09	779.95	803	2.63
LONDON	44.1	11.7	1.91				
MONTREAL	38.2	16.3	1.57	8.13	526.69	795	3.84
OSHAWA	45.9	9.2	1.07	4.86	694.67	759	1.31
OTTAWA-HULL	37.2	12.5	4.08	5.44	509.57	721	2.31
QUEBEC	57.6	15.1	3.29	15.57	394.57	824	2.28
REGINA	41.7	11.4	2.51	9.66	496.41	747	51
SAINT JOHN	58.6	14.6	1.63	8.85	609.88	791	1.75
SASKATOON	37.7	11.4	2.26	11.64	390.41	809	3.04
ST CATHARINES	44.3	13.8	1.18	5.64	749.64	808	1.85
ST JOHNS	27.4	12.8	2.84	9.48	454.71	843	2.11
SIMSBURY	63.9	15.9	1.34	5.71	840.39	834	2.07
THUNDER BAY	57.3	9.2	1.45	8.26	735.63	794	1.92
TORONTO	26.4	11.4	1.61	6.31	552.19	819	11.11
TROIS RIVIERES	44.8	19.4		10.21		795	
VANCOUVER	47.6	41.1	1.87	7.72	483.19	777	2.91
VICTORIA	57.4	9.4	3.15	11.29	467.21	783	2.47
WINDSOR	47.7	14.9	1.78	7.82	804.38	844	1.45

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URBAN CENTRE	SPSS/PC+	AVERAGE PRICE FOR A SINGLE DETACHED DUEL	CHANGE IN DWELLING STARTS 1976-1981	UNEMPLOY MENT RATE	YOUTH UNEMPLOY MENT RATE	CHANGE IN FEMALE PARTICIPATION RATE 1976	AGE STANDARDIZED MALE MORTALITY RATE	STANDARD IZED MALE HEART DISEASE RATE
WINNIPEG		\$58,866	-78 49	6 5	8 6	21 18	853 9	362 4
BARRIE		\$61,996		7 2	11 8	10 64	854 1	367 2
BRANTFORD		\$54,624	-64 78	7 1	13 2	13 28	916 1	388 9
CORNWALL		\$50,802		10 1	17 4	20 11	1007 9	462 1
DRUMMONDVILLE		\$42,160		13 2	22 5	16 67	935 4	444 4
FREDERICTON		\$48,513		8 1	14 9	16 41	802 2	315 1
GUELPH		\$64,437	287 41	6 2	9 4	13 53	828 8	411 5
KAMLOOPS		\$90,852		7 2	10 8	16 71	914 1	280 6
KELLOWNA		\$112,120		7 7	10 9	9 18	692 9	234 9
KINGSTON		\$59,529	-36 48	7 2	12 5	18 78	892 1	430 2
MONCTON		\$43,220	-80 85	10 4	18 2	17 51	836 1	338 6
NANAIMO		\$98,195		9 4	14 2	22 73	823 6	274 3
PETERBOROUGH		\$54,572	-7 64	7 1	12 3	13 02	970 6	427 4
PRINCE GEORGE		\$80,756		8 6	12 1	19 78	963 9	343 9
ST JEAN		\$48,605	-45 38	9 6	14 4	21 67	1002 9	499 1
SARNIA		\$63,081	-65 99	7 7	13 1	12 32	903 9	417 1
SAINT STE MARIE		\$57,796	41 82	2 2	13 1	23 41	1005 5	485 5
SHAWINIGAN		\$38,949	-73 33	17 4	30 1	25 96	1042 9	366 6
SHERBROOKE		\$44,765	-56 26	11 4	20 9	21 38	916 2	385 8
SYDNEY		\$35,160	-29 55	15 5	28 9	27 91	1163 9	554 9
CHARLOTTETOWN		\$51,170		9 9	15 9	38 16		
MEDICINE HAT		\$69,407		5 1	8 4	14 69		

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URBAN CENTRE	STANDARD IZED MALE TRAFFIC DEATH RATE	INCIDENC E OF LOW INCOME	RATIO OF SERVICE EMPLOYE NT TO OTHER EMP	HOSPITAL BEDS PER 100,000 POPULATI ON	POPULATI ON PER PHYSICIA N	INCOME DISTRIBUTI ON RATIO	RETAIL SALES PER CAPITA
CALGARY	48.8	10.4	1.54	8.89	739.08	798	6.96
CHICOUTIMI	66.1	18.5	1.59	7.29	711.43	802	2.58
EDMONTON	48.1	10.7	1.85	9.75	594.08	752	2.61
HALIFAX	45.4	12.8	3.34	9.19	431.25	814	2.22
HAMILTON	37.6	12.3	1.19	6.08	556.57	803	1.89
KITCHENER	41.7	10.7	1.08	5.09	779.95	803	2.63
LONDON	44.1	11.7	1.91				
MONTREAL	38.2	16.3	1.57	8.13	526.69	795	3.84
OSHAWA	45.9	9.2	1.07	4.86	694.67	759	1.31
OTTAWA-HULL	37.2	12.5	4.08	5.44	509.57	721	2.31
QUEBEC	57.6	15.1	3.29	15.57	394.57	824	2.28
REGINA	41.7	11.4	2.51	9.66	496.41	747	3.51
SAINT JOHN	56.6	14.6	1.63	8.85	609.88	791	1.75
SASKATOON	37.7	11.4	2.26	11.44	390.41	809	3.04
ST CATHARINES	48.3	13.8	1.18	5.64	749.64	828	1.85
ST JOHNS	27.4	12.8	2.84	9.48	454.71	843	2.11
SIMSBURY	63.9	15.9	1.34	5.71	810.39	834	2.07
THUNDER BAY	57.3	9.2	1.45	8.26	735.63	794	1.92
TORONTO	26.4	11.4	1.61	4.31	552.19	819	11.11
TROIS RIVIERES	44.8	19.6		10.21		795	
VANCOUVER	47.6	11.1	1.87	7.72	480.19	773	2.91
VICTORIA	57.4	9.4	3.15	11.29	442.21	757	2.47
WINDSOR	47.7	14.9	1.28	7.82	804.28	844	1.45

SPSS/PC+

URBAN CENTRE	STANDARD 17ED MALE TRAFFIC DEATH RATE	INCIDENC E OF LOW INCOME	RATIO OF SERVICE EMPLOYME NT TO OTHER EMP	HOSPITAL BEDS PER 100,000 POPULATI ON	POPULATI ON PER PHYSICIA N	INCOME DISTRIBUTI ON RATIO	RETAIL SALES PER CAPITA
WINNIPEG	35.2	14.1	1.86	7.11	522.18	843	2.14
BARRIE	73.5	10.2	1.51	9.07	795.73	813	2.41
BRANTFORD	51.8	11.6	.98	7.85	701.03	828	2.37
CORNWALL	54.3	17.1	1.31	9.72	741.74	873	2.46
DRUMMONDVILLE	92.6	16.1	1.19	12.41	1031.68	791	2.88
FREDERICTON	60.3	12.8	2.88	10.09	613.71	827	5.31
GUELPH	33.6	8.9	1.31	6.62	653.81	817	1.69
KAMICOOPS	96.9	9.8	1.74	8.42	500.01	781	3.19
KELOWNA	73.9	10.2	1.61	8.77	697.91	811	3.28
KINGSTON	34.1	11.9	2.55	11.31	325.73	844	1.69
MONCTON	55.1	14.7	2.03	9.48	723.19	739	3.35
NANAIMO	54.7	11.1	1.53	8.91	620.36	773	2.39
PETERBOROUGH	58.1	11.4	1.42	10.65	571.34	845	1.69
PRINCE GEORGE	90.1	11.1	1.35	6.04	726.44	767	1.69
ST JEAN	51.1	14.6	1.51	8.89	613.73	786	2.42
SARNIA	63.8	9.7	1.04				
SALUT STE MARIE	42.5	9.8	1.18	6.09	756.19	813	1.89
SHAWINIGAN	64.1	19.2	1.31	6.44	836.01	811	2.19
SHERRBROOKE	42.7	18.2	2.11	15.86	339.09	802	2.51
SYDNEY	56.1	17.7	1.51	7.71	754.22	832	2.04
CHARLOTTETOWN		11.6	2.52	12.63	494.49	842	2.83
MEDICINE HAT		9.9	1.32	9.41	1013.12	808	2.82

URBAN
CENTRE

URBAN CENTRE	POPULATION ON PER 10,000 POPULATION ON	RATIO OF MANAGEMENT TO SUPPORT EMPLOYMENT	POPULATION ON WITH LESS THAN GRADE 9 EDUCATION	POPULATION ON WITH UNIVERSITY DEGREE	URBAN CENTRE	CRIMINAL CODE OFFENCES PER 100,000 POPULATION	CRIMES OF VIOLENCE PER 100,000 POPULATION	PROPERTY CRIMES PER 100,000 POPULATION
CALGARY	59 27	45 18	8 08	13 18	1	3207 4	600 4	7295 0
CHICOUTIMI	13 52	37 13	21 11 ⁰	6 21	2	1210 3	464 1	5983 3
EDMONTON	65 71	40 29	10 79	11 53	3	621 7	1221 8	9832 5
HALIFAX	27 77	37 07	12 83	12 11	4	455 0	1106 7	8439 8
HAMILTON	54 21	36 81	17 38	9 7 88	5	1227 3	969 1	8453 1
KITCHENER	28 78	36 17	18 44	8 48	6	614 7	627 4	5775 0
LONDON	28 37	35 04	13 11	11 02	7	1095 4	833 4	6304 4
MONTREAL	282 83	37 96	23 69	9 09	8	1269 9	916 3	6943 9
OSHAWA	15 42	30 64	14 14	5 49	9			
OTTAWA-HULL	71 81	40 81	13 18	15 07	10	459 7	691 9	9887 4
QUEBEC	57 61	38 64	20 83	9 89	11	1066 6	639 1	8844 7
REGINA	16 43	38 34	13 99	9 58	12	2265 1	722 1	10168 9
SAINT-JOHN	11 41	34 26	19 66	6 71	13	909 3	959 3	4140 6
SASKATOON	15 42	38 98	13 64	11 27	14	2349 1	668 8	7773 0
ST CATHARINES	30 44	32 29	19 66	6 01	15	921 3	691 8	7108 6
ST JOHNS	15 48	38 69	18 46	8 43	16	1222 5	846 7	9100 6
SUDBURY	14 99	30 15	21 31	6 34	17	878 5	417 6	5339 3
THUNDER BAY	12 14	33 61	18 89	6 83	18	886 7	947 2	8908 8
TORONTO	299 91	39 55	16 21	11 61	19	1322 9	656 5	5381 7
TROIS RIVIERES	11 15	34 22	24 89	6 99	20	371 2	606 0	8234 8
VANCOUVER	126 81	36 85	11 87	10 38	21	1028 1	1692 7	9367 0
VICTORIA	23 35	32 81	9 31	10 58	22	891 2	1194 2	12070 0
WINDSOR	24 41	33 77	18 55	7 65	23	720 6	1107 3	8175 0

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URBAN CENTRE	POPULATI ON PER 10,000 POPULATI ON	RATIO OF MANAGEMENT TO SUPPORT EMPLOYE N	POPULATI ON WITH LESS THAN GRADE 9 EDUCAT N	POPULATI ON WITH UNIVERSI TY DEGREE	URBAN CENTRE	CRIMINAL CODE OFFENCES PER 100,000 POPUL	CRIMES OF VIOLENCE PER 100,000 POPULATI ON	PROPERTY CRIMES PER 100,000 POPULATI ON
WINNIPEG	58 48	34 96	16 07	9 57	24	367 2	548 5	7990 0
BARRIE	6 13	45 73	13 51	6 36	25	676 3	665 7	5892 1
BRANTFORD	8 83	42 62	19 01	5 29	26	879 4	919 1	9743 8
CORNWALL	5 34	34 37	22 26	4 47	27	486 9	645 6	8028 2
DRUMMONDVILLE	5 47	43 91	28 73	4 49	28	1650 8	454 2	6413 5
FREDERICTON	6 44	48 55	18 48	13 37	29	1053 0	351 7	5413 7
GUELPH	7 85	46 75	15 18	11 99	30	487 7	359 2	5252 7
KAMLOOPS	6 51	46 98	11 14	6 02	31	1203 0	1252 3	10304 6
KELOWNA	7 75	52 92	15 97	5 21	32	1398 1	996 3	10887 2
KINGSTON	11 51	36 08	13 32	11 53	33	857 8	392 1	7710 7
MONCTON	9 84	42 62	20 89	7 19	34	495 3	493 8	7186 1
NANAIMO			11 66	6 05	35	1548 0	1150 0	10462 0
PETERBOROUGH	8 57	40 31	15 15	7 25	36	1066 6	395 1	6000 0
PRINCE GEORGE	6 76	38 95	13 69	6 19	37	2343 8	1193 1	10449 3
ST JEAN	6 07	47 31	26 15	5 24	38	281 2	357 9	4468 7
SARNIA	8 41	42 46	12 72	8 38	39	779 1	1246 9	8146 5
SAULT STE MARIE	8 71	33 26	18 49	6 14	40	660 4	1000 0	5919 7
SHAWINIGAN	6 27	40 01	26 52	3 89	41	900 4	647 3	6253 1
SHERBROOKE	11 73	46 86	22 94	9 16	42	1505 9	365 7	5676 9
SYDNEY	8 75	38 61	21 42	4 91	43	765 6	762 5	5090 6
CHARLOTTETOWN	4 51	59 95	15 05	9 11	44	1358 8	489 2	6452 9
MEDECINE HAT	6 97	54 65	18 35	4 95	45	1711 8	440 4	7071 6

URBAN CENTRE	INDUSTRIAL WORKERS IN HIGH STRESS ESTABL	NUMBER OF AIR PASSENGERS	FAMILIES WITH LESS THAN \$10,000 ANNUAL INCOME	RATIO OF PROFESSIONALS TO POPULATION	ANNUAL HOURS OF SUNSHINE	ANNUAL DAYS OF PRECIPITATION	VALUE ADDED OF MANUFACTURING ACTIVITY PER
CALGARY	8 6	2487	9 22	716		113	48676
CHICOUTIMI	80 7		17 11	301		175	85711
EDMONTON	14 1	1574	9 73	641		120	59472
HAIFAX	7 1	1351	12 77	438		152	52396
HAMILTON	40 2		11 53	317		108	52229
KITCHENER	4		10 88	375		113	40527
LONDON	5	218	12 11	441		165	50924
MONTREAL	3 5	7026	14 23	404		163	47757
OSHAWA			9 13	233	2045	128	57482
OTTAWA-HULL	31 5	1726	11 19	499		152	54419
QUEBEC	9 5	650	12 71	197		164	54661
REGINA	8 8	554	10 88	331		114	56090
SAINT JOHN	25 1	288	15 58	258		149	67348
SASKATOON	4 9	488	12 61	455		103	50925
ST CATHARINES	22 9		13 73	206		116	50646
ST JOHN'S	5 4	385	15 27	632		175	42489
SIDNEY	88 4		13 41	226		155	42579
THUNDER BAY	56 3	379	9 93	425		141	65537
TORONTO	1 6	9706	10 49	611		134	47714
TROIS RIVIERES			19 45	266	1947	152	45175
VANCOUVER	4 6	4533	11 34	711		154	50610
VICTORIA	2 5	462	11 37	565		152	41228
WINDSOR	1 8	255	15 27	278		137	49119

URBAN CENTRE	SPSS/PC+	INDUSTRI AL WORKERS IN HIGH STRESS ESTABL	NUMBER OF AIR PASSENG ERS	FAMILIES WITH LESS THAN \$10,000 ANNUAL INCOME	RATIO OF PROFESSI ONALS TO POPULATI ON	ANNUAL HOURS OF SUNSHINE	ANNUAL DAYS OF PRECIPIT ATION	VALUE ADDED OF MANUFACT URING ACTIVITY
WINNIPEG	2 0		2145	12 44	479		121	40410
BARRIE				11 75	318	1900	140	53552
BRANTFORD				13 91	357	2035	121	48378
CORNWALL				19 62	487	1970	137	51956
DRUMMONDVILLE				18 42	305	1800	141	35705
FREDERICTON			214	14 77	548	1863	151	33644
GUÉLPH				10 69	375	1950	136	56925
KAMLOOPS				11 51	449	1860	77	60445
KELOUNA				16 89	573	1800	88	55209
KINGSTON				13 71	471	2113	130	61608
MONCTON			266	17 25	275	1918	152	39424
NANAIMO				15 17		1846	161	61937
PETERBOROUGH				13 31	393	1895	109	52439
PRINCE GEORGE			285	11 74	414	1865	162	97901
ST JEAN				16 26	242	1872	164	39230
SARNIA				11 69	311	1968	132	151536
SAULT STE MARIE				11 73	311	1999	163	
SHAWINIGAN				20 13	126	2020	145	59997
SHERBROOKE				17 85	406	1907	170	36623
SYDNEY			280	21 48	244	1824	179	38749
CHARLOTTETOWN				16 58	356			37038
MÉDECINE HAT				12 31	222			91107

URBAN CENTRE	SPSS/PC+	SUSPENDED PARTICULATE AVERAGE	SULFUR DIOXIDE CONTENT	EVALUATION OF MEDICAL CARE	GENERAL FEAR OF CRIME	EVALUATION OF PUBLIC TRANSPORTATION	EVALUATION OF RECREATIONAL FACILITIES	INDEX OF LINKING
CALGARY	117		8572	29.1	38	3.01	3.13	+ 73
CHICOUTIMI	65			33.1	- 43	4.18	3.58	14
EDMONTON	77		3724	28.2	73	2.71	2.89	- 54
HALIFAX	29		6200	27.4	41	3.25	3.43	21
HAMILTON	75		8554	27.5	37	2.96	2.99	- 48
KITCHENER	63		8069	28.2	- 31	2.92	2.91	31
LONDON	50		8447	26.6	- 89	2.92	3.25	22
MONTREAL	64		6497	26.5	24	2.99	2.85	- 13
OSHAWA	57		7881					
OTTAWA-HULL	64		8368	28.1	- 17	2.88	3.11	57
QUEBEC	42		8247	25.1	- 15	3.41	2.91	96
REGINA	50		3237	33.8	86	2.93	3.45	- 142
SAINT JOHN	58		4975	32.7	17	4.33	3.74	- 105
SASKATOON	63		3515	32.9	23	2.54	3.23	37
ST CATHARINES	57		8533	27.9	- 37	2.85	3.32	74
ST JOHNS	41		6457	25.5	- 42	3.48	3.61	25
SUDBURY	42		8359	32.1	- 31	12	3.31	- 17
THUNDER BAY	41		8634	33.1	19	2.91	3.26	- 43
TORONTO	74		7190	25.1	- 37	2.69	2.71	14
TROIS RIVIERES	80		7504					
VANCOUVER	48		7050	25.8	- 22	3.25	2.76	28
VICTORIA	52		4789	28.4	- 23	2.78	2.72	81
WINDSOR	67		8436	30.5	- 1A	3.5A	3.77	- 51
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URBAN CENTRE	SPSS/PC+	SUSPENDED PARTICULATE AVERAGE	SULFUR DIOXIDE CONTENT	EVALUATION OF MEDICAL CARE	GENERAL FEAR OF CRIME	EVALUATION OF PUBLIC TRANSPORTATION	EVALUATION OF RECREATIONAL FACILITIES	INDEX OF LIVING
WINNIPEG	55		4621	28.1	.05	2.95	2.88	- 22
BARRIE								
BRANTFORD								
CORNWALL	48		8627					
DRUMMONDVILLE								
FREDERICTON	38							
GUELPH	47		7465					
KAMLOOPS	81		6365					
KELOWNA								
KINGSTON	32		6807					
MONCTON	34							
NANAIMO								
PETERBOROUGH	40		7309					
PRINCE GEORGE	78							
ST. JEAN								
SARNIA	62		8649					
SAULT STE MARIE	94		7088					
SHAWINIGAN	106		7936					
SHERBROOKE								
SYDNEY	94		5083					
CHARLOTTETOWN	25		4382					
MEDICINE HAT								

STANDARD SCORES

URBAN
CENTRE

	ZSCORE POPULATION CHANGE 1976-1981	ZSCORE POPULATION DENSITY CHANGE 1976-	ZSCORE YOUTH DEPENDENCY RATIO	ZSCORE ELDER DEPENDENCY RATIO	ZSCORE POPULATION CHANGE 1971-1976
CALGARY	2 92926	77095	- 95970	-1 52411	1 05583
CHICOUTIMI	- 24984	78478	50020	-1 51081	- 78846
EDMONTON	1 74190	93657	- 36458	-1 31405	45361
HALIFAX	- 47132	74303	- 21890	- 76365	- 13606
HAMILTON	- 66050	70957	- 53506	19357	- 36189
KITCHENER	- 14526	80247	64898	- 25845	- 75477
LONDON	- 27445	77952	- 70244	14039	- 14860
MONTREAL	- 88813	66395	- 44014	- 33024	- 67554
OSHAWA	1 13438	1 03224	89695	- 86735	54144
OTTAWA-HULL	- 48209	74220	- 93180	- 72908	47871
QUEBEC	- 06682	81602	- 80782	- 62804	00195
REGINA	30538	88321	75747	- 14146	- 08587
SAINT JOHN	- 88351	67252	1 23791	45947	- 28661
SASKATOON	1 31741	53427	- 06702	07498	- 28661
ST CATHARINES	- 90505	66588	- 27159	76258	- 31170
ST JOHNS	- 03298	09741	2 11199	- 49510	08978
SUDBURY	-1 72482	51796	1 12942	-1 01625	-1 06448
THUNDER BAY	- 75586	69049	- 16001	38767	- 51244
TORONTO	04546	83648	-1 08368	- 33024	- 04823
TROIS RIVIERES	97904	- 33393	-1 16427	- 32492	- 92647
VANCOUVER	31307	88514	-1 62301	62964	- 03569
VICTORIA	04397	83593	-2 10655	3 09714	42852
WINDSOR	-1 12037	62717	41942	43761	-1 07702
WINNIPEG	- 85275	67556	- 54126	75727	- 34189
BARRIE	88368	- 24932	85976	71472	2 41154
BRANTFORD	- 00530	87072	58499	1 10293	- 62534

STANDARD SCORES

URBAN CENTRE	ZSCORE: POPULATION CHANGE 1976-1981	ZSCORE: POPULATION DENSITY CHANGE 1976-	ZSCORE: YOUTH DEPENDENCY RATIO	ZSCORE: ELDER DEPENDENCY RATIO	ZSCORE: POPULATION CHANGE 1971-1976
CORNWALL	- 91120	-1 44766	- 11971	89819	-1 27776
DRUMMONDVILLE	- 42364	- 60655	07866	- 10157	-1 45341
FREDERICTON	- 29599	-2 01005	72957	- 30365	- 02314
GUELPH	- 22831	- 58858	- 24990	04467	52889
KAMLOOPS	48380	01086	76367	-1 45497	2 08462
KELOWNA	1 86187	-1 56655	- 53816	2 30743	2 69938
KINGSTON	- 90505	-1 16342	- 77373	05531	- 29916
MONCTON	- 59436	-1 66222	40722	12976	29051
NANAIMO	1 81419	-1 86516	- 28399	36906	1 20639
PETERBOROUGH	- 74048	-1 45567	- 23130	1 29703	- 66300
PRINCE GEORGE	92829	97639	2 47154	-2 56109	1 67060
ST JEAN	20234	- 65688	- 73963	- 64931	- 16115
SARNIA	- 53592	73501	39487	- 28770	- 55008
SAULT STE MARIE	- 65281	- 59964	54360	- 68970	- 91392
SHAWINIGAN	-1 14652	-1 37964	-2 02906	10848	-1 84234
SHERBROOKE	- 09450	- 84047	- 16621	- 16805	- 12351
SYDNEY	-1 22496	60699	1 08913	92212	-1 36558
CHARLOTTETOWN	26847	-1 97051	1 38669	1 11356	03959
MEDECINE HAT	2 02029	-1 45706	1 09533	39565	1 46986

STANDARD SCORES

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URBAN CENTRE	ZSCORE - NET MIGRATION RATIO 1976-1981	ZSCORE - FAMILIES WITH NO CHILDREN	ZSCORE - FAMILIES WITH 2 OR MORE CHILDREN	ZSCORE - CHANGE IN LONE PARENT FAMILIES	ZSCORE - POPULATION LIVING IN PROVINCE	ZSCORE - 40+ SENIORS WITH NO FAMILIES
CALGARY	2 68305	2 62593	- 53676	43587	-1 89836	1 27651
CHICOUTIMI	- 61792	- 72249	1 99774	1 26590	1 60953	-2 44741
EDMONTON	1 11383	1 73689	- 12254	07323	-1 18506	1 07607
HALIFAX	- 50354	49474	19848	- 20147	05542	23565
HAMILTON	- 27077	- 02871	- 07594	-1 20541	- 41014	- 19422
KITCHENER	- 26475	01699	13376	- 26866	- 17950	- 27874
LONDON	- 29083	58198	- 69986	- 96430	- 09224	1 17025
MONTREAL	- 90487	1 20098	- 51864	- 43269	45244	94324
OSHAWA	1 23223	- 43168	77321	62164	- 09163	-1 38964
OTTAWA-HULL	08241	82293	- 04746	- 39020	- 53157	89494
QUEBEC	- 19652	1 54579	55316	- 16886	1 45210	21391
REGINA	08642	1 14919	12340	10090	113413	1 12920
SAINT JOHN	- 63197	- 82219	81981	27382	51366	- 17007
SASKATOON	1 01751	93510	- 26493	1 19871	- 02696	1 97928
ST CATHARINES	- 51357	-1 09223	- 19762	-1 32003	- 24057	- 48160
ST JOHNS	- 57177	-1 09638	2 68121	01098	1 15312	-1 94992
SUDBURY	-1 78379	-1 60322	1 68967	- 53743	39040	-1 09984
THUNDER BAY	- 30488	- 71418	- 00345	-1 78050	- 08553	13181
TORONTO	- 27879	68999	- 16655	- 43131	-1 17896	49447
TROIS RIVIERES	- 23866	54875	- 07076	67599	1 53326	- 21112
VANCOUVER	17471	1 27576	-1 17103	- 82599	-1 75985	1 86577
VICTORIA	67638	1 49594	-2 80720	- 76964	-1 81110	2 26666
WINDSOR	-1 14367	-1 07146	47112	-1 17675	01820	34915
WINNIPEG	- 94501	47411	- 67996	-1 33584	- 34987	1 47496
BARRIE	1 21216	- 81389	- 08371	77407	21101	-1 09535
BRANTFORD	07438	- 60617	- 39955	- 44751	10118	17007

STANDARD SCORES

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URBAN CENTRE	ZSCORE: NET MIGRATION RATIO 1976-1981	ZSCORE: FAMILIES WITH NO CHILDREN	ZSCORE: FAMILIES WITH 2 OR MORE CHILDREN	ZSCORE: CHANGE IN LONE PARENT FAMILIES	ZSCORE: POPULATION LIVING IN PROVINCE	ZSCORE: HOUSEHOLDS WITH NO FAMILIES
CORNWALL	- 72628	- 86374	- 05264	- 1 82694	48010	- 40432
DRUMMONDVILLE	- 49551	09177	11823	88745	1 55949	- 54922
FREDERICTON	- 28682	- 51477	13894	35386	36477	- 39949
GUELPH	- 33498	44073	- 06300	40423	- 09408	13905
KAMLOOPS	15465	- 19073	67483	47639	- 1 30344	- 27874
KELOUNA	2 28974	- 56878	- 1 91145	71848	- 2 20344	- 32704
KINGSTON	- 1 08347	06268	- 54970	1 09693	- 04343	39262
MONCTON	- 45137	- 57293	59717	2 68189	29644	- 76174
NANAIMO	2 28172	01283	- 1 40144	28667	- 1 19483	21874
PETERBOROUGH	- 45739	- 26136	- 63255	1 44673	65644	- 21354
PRINCE GEORGE	- 12428	57367	1 68708	1 47736	- 1 21374	- 77865
ST JEAN	1 11785	1 29653	- 32188	1 27282	1 34044	- 74725
SARNIA	- 46140	- 56047	107871	- 53546	09081	- 23044
SAULT STE MARIE	- 69819	- 1 35395	1 19778	- 87834	43678	- 97909
SHAWINIGAN	- 94099	- 14088	- 45133	- 04534	1 57597	- 81729
SHERBROOKE	- 45337	95587	- 06300	1 21353	1 33173	63895
SYDNEY	- 1 09551	- 2 55041	1 63530	- 1 15699	1 03352	- 1 39930
CHARLOTTETOWN	63223	- 72664	- 1 19692	- 1 45442	25067	- 02617
MEDECINE HAT	2 24158	- 37352	- 1 10890	1 05247	- 1 12954	69405

	TONGUE	POPULA	AND	PP	REPAI	1924
CALGARY	69884	77688	- 46653	1 13532	- 64563	- 71610
CHICOUTIMI	-1 28009	-1 94901	17871	-1 12425	87269	- 27707
EDMONTON	1 24959	1 00952	- 40899	90115	- 91706	- 72373
HALIFAX	- 94678	40324	- 44105	- 34310	- 87319	- 06311
HAMILTON	1 17507	06016	- 55859	00816	19606	30183
KITCHENER	1 13307	51839	- 61859	- 15087	- 16584	- 13443
LONDON	26726	05076	- 57914	14621	- 72216	13897
MONTREAL	43933	-1 37799	2 60186	- 72406	- 2 78550	- 09282
OSHAWA	25642	21760	- 57092	03087	62104	- 66816
OTTAWA-HULL	- 17988	09776	2 21307	- 10194	- 1 32967	- 70025
QUEBEC	-1 19067	-1 84562	98342	- 98444	- 1 56957	- 02150
REGINA	56670	93197	- 72134	11825	32355	- 70501
SAINT JOHN	-1 12021	- 14898	- 32679	- 68736	- 56064	1 23615
SASKATOON	79433	1 07297	- 62435	31223	- 39751	- 75256
ST CATHARINES	1 05854	38679	- 35063	- 36582	1 23104	73927
ST JOHNS	-1 19067	-1 38034	- 81915	- 94775	1 03227	- 24022
SUDBURY	29164	91552	1 89580	- 59824	23444	- 39476
THUNDER BAY	1 47316	1 29151	- 58325	- 23475	1 00622	87127
TORONTO	2 34845	- 42157	- 41968	31747	- 75804	- 24973
TROIS RIVIERES	-1 25028	-1 89731	74011	-1 11201	-1 21590	1 05309
VANCOUVER	1 49348	36800	- 52489	2 64169	- 47839	- 49817
VICTORIA	- 03896	26460	- 54297	2 06850	- 36050	04625
WINDSOR	1 04635	91552	- 14185	49144	78003	1 74195
WINNIPEG	1 57478	54894	- 34570	33320	- 43724	74591
BARRIE	- 48880	66173	- 63503	12524	1 31329	- 49817

STANDARD SCORES

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URBAN CENTRE	ZSCORE: POPULATION WITH MOTHER TONGUE	ZSCORE: RATIO OF MULTIPLE ORIGIN POPULA	ZSCORE: POPULATION SPEAKING ENGLISH AND	ZSCORE: POPULATION WITH NO RELIGIOUS PR	ZSCORE: DWELLINGS OWNED	ZSCORE: DWELLINGS IN NEED OF MAJOR REPA	ZSCORE: DWELLINGS BUILT BEFORE 1946
BRANTFORD	19409	- 00094	- 67038	- 13340	63061	- 18853	1 58444
CORNWALL	- 77334	42909	2 47364	- 87959	- 29744	1 00003	98771
DRUMMONDVILLE	-1 28416	-1 94196	56668	-1 13648	-1 03632	1 46090	21981
FREDERICTON	- 99149	- 29703	04979	- 20854	92534	1 14557	- 05597
GUELPH	42714	44554	- 53557	36640	- 11375	- 42502	18058
KAMLOOPS	19815	1 23041	- 67531	1 74625	80060	-1 06782	-1 80100
KELOWNA	97318	73928	- 68846	1 32754	1 19265	-1 55901	-1 65835
KINGSTON	- 78418	40559	- 36296	- 04602	- 36187	- 36438	36958
MONCTON	-1 18389	- 49912	1 98868	- 69086	84295	48459	31728
NANAIMO	- 11213	57714	- 64078	2 57179	1 10081	- 24310	- 94275
PETERBOROUGH	- 77334	- 00094	- 65887	- 21029	91300	- 13395	1 11371
PRINCE GEORGE	29029	1 16226	- 64900	2 16986	70327	- 58269	-2 29788
ST JEAN	-1 12292	-1 77982	1 62619	-1 05435	- 91980	63012	- 09782
SARNIA	- 01999	09541	- 47639	- 23825	57989	-1 03143	14848
SAULT STE MARIE	73065	1 31501	- 33830	- 41125	1 20636	- 39470	- 03101
SHAWINIGAN	-1 28551	-1 94196	49188	-1 10328	- 83897	2 38870	1 79365
SHERBROOKE	-1 14324	-1 70932	1 86538	- 87260	-1 95614	- 18246	- 22121
SYDNEY	-1 03620	- 25943	- 80107	-1 11201	1 88355	1 89866	2 82189
CHARLOTTETOWN	-1 17712	- 16308	- 58407	- 64717	16864	19958	78325
MEDECINE HAT	73334	72283	- 81504	28951	1 06791	- 77068	- 63606

STANDARD SCORES

URBAN CENTRE	750000 CHANGE IN THE COST OF A SINGLE	750000 URBAN CENTRE	750000 AVERAGE MONTHLY RENTAL COST	750000 AVERAGE MONTHLY HOUSING COST	750000 AVERAGE PRICE FOR A SINGLE UNIT	750000 CHANGE IN THE LINE STARTS 1974	750000 NEW HOME STARTS DATE	DATE
CALGARY	48612	-1 67505	2 82580	3 02873	8777	5533	49704	1974
CHICOUTIMI	06892	-1 59891	48681	32074	87447	57546	49704	1974
EDMONTON	35030	-1 52277	93849	2 04538	1 29993	5815	54856	1974
HALIFAX	93213	-1 44664	22303	88052	27394	27394	88937	1974
HAMILTON	-1 43752	-1 37050	17133	11608	33576	33576	69440	1974
KITCHENER	-84959	-1 29436	38822	02953	18516	79976	88937	1974
LONDON	-26661	-1 21872	08501	02508	07955	59181	48086	1974
MONTREAL	73806	-1 14208	46710	91692	05901	06780	30212	1974
OSHAWA	-38786	-1 06594	26247	80772	07779	22246	48086	1974
OTTAWA-HULL	-61281	-98980	73570	97153	08190	3485	44527	1974
QUEBEC	61415	-91366	46710	40730	55877	33459	58484	1974
REGINA	12649	-83753	55824	35269	27041	01402	1 33502	1974
SAINT JOHN	-31923	-76139	74315	46635	77814	34924	23094	1974
SASKATOON	55505	-68525	40049	49830	06299	17817	67322	1974
ST CATHARINES	-1 32352	-60911	64456	77576	45901	70075	44448	1974
ST JOHNS	62978	-53297	64456	26614	11586	1 30062	94274	1974
SUDBURY	-70432	-45683	72343	15693	49680	25873	05299	1974
THUNDER BAY	-60137	-38069	22303	53915	04625	56773	55204	1974
TORONTO	-39358	-30455	93288	1 37195	1 71894	37496	-1 26384	1974
TROIS RIVIERES	15737	-22842	-1 33468	73936	84634	50709	1 69013	1974
VANCOUVER	2 82595	-15228	1 85962	1 48115	3 84901	75301	-1 19266	1974
VICTORIA	2 20294	-07614	1 24836	60751	2 39550	1 25811	-55704	1974
WINDSOR	-21552	0 00	32907	28434	06368	77648	1 12069	1974
WINNIPEG	-1 14088	07614	04529	44815	33609	87371	-69440	1974
BARRIE		15228	77513	09788	2 00002		44527	1974
BRANTFORD	-1 65294	27842	-46710	42995	49339	-61482	-48086	1974

STANDARD SCORES

PAGE

75 SCORE:
YOUTH
UNEMPLOYMENT
T
RATE

75 SCORE:
UNEMPLOYMENT
T
RATE

75 SCORE:
CHANGE IN
DUELLING
STARTS
1974-

75 SCORE:
AVERAGE
PRICE FOR
A SINGLE
NETA

75 SCORE:
AVERAGE
MONTHLY
HOUSING
COST

75 SCORE:
AVERAGE
MONTHLY
RENTAL
COST

75 SCORE:
URBAN
CENTRE

75 SCORE:
CHANGE IN
THE COST
OF A
SINGLE

URBAN
CENTRE

CORNWALL	30455	- 52625	- 1 15798	- 63512	58684	48498
DRUMMONDVILLE	38069	- 1 94594	- 1 54020	- 95558	1 69013	1 30099
FREDERICTON	45683	- 17133	- 97597	- 72000	- 12496	08498
GUELPH	53297	- 13189	- 26614	- 12950	- 80117	- 79503
KAMLOOPS	60911	1 30752	1 28094	85002	- 44527	- 57103
KELOWNA	68525	71598	- 75756	1 63869	- 26732	- 55503
KINGSTON	76139	- 44738	- 13873	- 31150	- 44527	- 29903
MONCTON	83753	- 44738	- 93957	- 91628	69361	61298
NANAIMO	91366	1 05118	18889	1 12232	33771	- 02702
PETERBOROUGH	98980	- 62484	- 81217	- 49532	- 48086	- 33103
PRINCE GEORGE	92832	1 06594	1 89977	47564	05299	- 36303
ST JEAN	10133	1 14208	- 1 33468	- 71659	40889	00498
SARNIA	- 1 02269	1 21822	09788	- 17979	- 26732	- 20302
SAULT STE MARIE	- 39014	1 29436	- 55735	- 37576	- 44527	- 17102
SHAWINIGAN	- 34630	1 37050	- 2 02481	- 1 07465	3 18491	2 51700
SHERBROOKE	19359	1 44664	- 1 33468	- 85898	1 04951	1 04499
SYDNEY	166085	1 52277	- 1 21638	- 1 21516	2 50870	2 32500
CHARLOTTETOWN		1 59891	- 13189	- 62147	51566	24498
MEDICINE HAT	1 67505	89344	- 39354	05461	- 1 19266	- 95503

STANDARD SCORES

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URBAN CENTRE	ZSCORE: CHANGE IN FEMALE PARTICIPATION	ZSCORE: AGE STANDARDIZED MORTALITY	ZSCORE: STANDARDIZED D MALE HEART DISEASE	ZSCORE: STANDARDIZED D MALE TRAFFIC DEATH	ZSCORE: INCIDENCE OF LOW INCOME	ZSCORE: RATIO OF SERVICE EMPLOYMENT TO	ZSCORE: HOSPITAL BEDS PER 100,000 POPUL
CALGARY	1 23425	- 89705	- 1 29877	- 22431	- 82038	- 36868	- 00758
CHICOUTIMI	16966	1 21682	50690	85446	1 91546	- 29900	- 56550
EDMONTON	35764	- 93969	- 1 19972	- 26832	- 71905	02735	31561
HALIFAX	62192	03143	17628	- 43809	- 00976	2 13988	11503
HAMILTON	- 30680	- 87146	- 43944	- 94110	- 17864	- 85646	- 99889
KITCHENER	- 73672	- 1 09425	- 31630	- 67073	- 71905	- 1 00976	- 1 35348
LONDON	- 1 02893	- 55380	02369	- 51983	- 38129	14697	- 26463
MONTREAL	1 00532	52073	45336	- 89080	1 17240	- 32687	- 1 43586
OSHAWA		- 35339	- 03387	- 40665	- 1 22569	- 1 02370	- 1 22812
OTTAWA-HULL	- 22304	64545	71571	- 95368	- 11108	3 17118	2 40018
QUEBEC	1 56740	63052	18297	32901	76709	2 07020	28337
REGINA	- 23793	- 80537	- 1 15288	- 67073	- 48262	98315	- 00675
SAINT JOHN	46745	49941	79468	26613	59821	- 24325	99256
SASKATOON	- 06671	- 60070	- 1 35633	- 92224	- 48262	63474	- 1 15648
ST CATHARINES	- 1 21691	- 19562	12542	- 25575	32800	- 87040	21890
ST JOHNS	3 00049	79895	90578	- 1 56987	- 00976	1 44306	- 1 13141
SUDBURY	31669	1 25306	1 06640	72513	1 03729	- 64741	- 21807
THUNDER BAY	11755	1 45987	2 16533	31014	- 1 22569	- 69411	- 91651
TORONTO	- 42219	- 85121	- 43141	- 1 63274	- 48262	- 27113	48037
TROIS RIVIERES	88807	1 50464	43060	- 47581	2 28700		- 41148
VANCOUVER	- 05554	- 88106	- 86509	- 29976	- 58395	09122	86720
VICTORIA	- 72370	- 1 74664	- 1 88639	31643	- 1 15813	1 87509	- 37567
WINDSOR	33531	13697	68760	- 29347	69953	- 73103	- 62997
WINNIPEG	32786	41136	- 32567	- 1 07943	42933	07728	07705
BARRIE	- 1 43381	- 40923	- 26142	1 32874	- 88793	41049	- 34492
BRANTFORD	- 1 14246	05169	02904	- 03568	- 41507	- 1 14912	

STANDARD SCORES

URBAN CENTRE	ZSCORE: CHANGE IN FEMALE PARTICIPATI ON	ZSCORE: AGE STANDARDIZE D MALE MORTALITY	ZSCORE: STANDARDIZE D MALE HEART DISEASE	ZSCORE: STANDARDIZE D MALE TRAFFIC DEATH	ZSCORE: INCIDENCE OF LOW INCOME	ZSCORE: RATIO OF SFRVICE EMPLOYMENT TO	ZSCORE: HOSPITAL BEDS PER 100,000 POPUL	PAGE
CORNWALL	12872	1.03027	1.00884	12151	1.44260	-68922	30486	2
DRUMMONDVILLE	-51152	25743	77192	252968	1.10484	-85646	1.26835	
FREDERICTON	-55991	-1.16248	-95879	49877	-00976	1.49880	43739	
GUELPH	-1.09593	-87892	33155	-1.18003	-1.32701	-68922	-80547	
KAMLOOPS	-50408	03037	-1.42058	2.80005	-1.02303	-08995	-14076	
KELOWNA	-1.90554	-2.32761	-2.03229	1.35389	-88793	-27113	-03310	
KINGSTON	-1.11882	-20415	58185	-1.14859	-31374	1.03890	87436	
MONCTON	-1.28577	-80111	-64424	17181	63198	31420	21890	
NANAIMO	61634	-93436	-1.50491	14666	-58395	-38262	01474	
PETERBOROUGH	-1.19085	63265	54438	36044	-48262	-53592	63796	
PRINCE GEORGE	06171	56123	-57329	2.37249	-58395	-63368	-1.01321	
ST JEAN	41906	97877	1.50410	-07969	59821	-41049	00758	
SARNIA	-1.32113	-07836	40651	71884	-1.05681	-1.04551		
SAULT STE MARIE	74290	1.00469	1.32206	-62043	-1.02303	-87040	-99531	
SHAWINIGAN	1.21750	1.40337	-27213	73770	2.15189	-68922	-86994	
SHERBROOKE	36508	05808	-01245	-60786	1.81414	42570	2.50405	
SYDNEY	1.58042	2.69322	2.25100	23469	1.64526	-41049	-41506	
CHARLOTTETOWN	1.62695				-41507	99709	3.13801	
MEDECINE HAT	-88003				-1.02303	-67528	19383	

STANDARD SCORES

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URBAN CENTRE	ZSCORE: POPULATION PER PHYSICIAN	ZSCORE: INCOME DISTRIBUTION RATIO	ZSCORE: RETAIL SALES PER CAPITA	ZSCORE: POPULATION PER 10,000 POPULATION	ZSCORE: RATIO OF MANAGEMENT TO SUPPORT	ZSCORE: POPULATION WITH LESS THAN GRADE	ZSCORE: POPULATION WITH UNIVERSITY DEGR
CALGARY	65815	- 16783	2 53159	40180	81224	-1 91741	78652
CHICOUTIMI	48996	- 04551	- 11089	- 33920	- 43438	80421	- 71489
EDMONTON	- 22386	-1 57445	- 09279	50611	05497	-1 35137	1 19436
HALIFAX	-1 21433	32143	- 32808	- 10839	- 44367	- 92526	1 40251
HAMILTON	- 45203	- 01493	- 52717	31985	- 48393	02511	- 11556
KITCHENER	90676	- 01493	- 08073	- 09203	- 58304	24652	09977
LONDON				- 09867	- 75804	- 86678	1 01133
MONTREAL	- 63379	- 25956	64927	4 02273	- 30585	1 34310	31869
OSHAWA	38801	-1 36040	87709	- 30842	-1 43632	- 65164	- 97329
OTTAWA-HULL	- 73792	-2 52240	- 27379	60491	13550	- 85216	2 46481
QUEBEC	-1 43745	62722	- 29189	37492	- 20054	74573	60579
REGINA	- 81798	-1 72735	45018	- 29206	- 24700	- 68297	49454
SAINT JOHN	- 12775	- 38188	- 61164	- 37337	- 87883	50134	- 53545
SASKATOON	-1 46276	16854	16663	- 30847	- 14789	- 75608	1 10105
ST CATHARINES	72239	74954	- 55131	- 06515	-1 18390	50134	- 78667
ST JOHNS	-1 05946	1 20822	- 39445	- 30745	- 19280	25069	08183
SUDBURY	1 09192	93301	41858	- 31539	-1 51530	84598	- 66824
THUNDER BAY	63717	- 29014	- 50908	- 36155	- 97948	34051	- 49239
TORONTO	- 47867	47433	5 03531	4 29937	- 05962	- 21927	1 22307
TROIS RIVIERES		- 25956		- 37758	- 88502	1 59375	- 43497
VANCOUVER	- 91664	- 93230	08820	1 49573	- 47774	-1 12578	78165
VICTORIA	-1 14767	-1 42154	- 17726	- 17998	-1 10337	-1 62050	85342
WINDSOR	1 05476	1 29995	- 79263	- 15957	- 95471	26949	- 19810
WINNIPEG	- 66172	1 20822	- 37635	38901	- 77042	- 24851	49095
BARRIE	1 00275	29085	- 21346	- 45889	89741	- 78323	- 66106
BRANTFORD	42670	74954	- 23759	41516	41580	34558	-1 04507

URBAN CENTRE	ZSCORE: POPULATION PER PHYSICIAN	ZSCORE: INCOME DISTRIBUTION RATIO	ZSCORE: RETAIL SALES PER CAPITA	ZSCORE: POPULATION PER 10,000 POPULATION	ZSCORE: RATIO OF MANAGEMENT TO SUPPORT	ZSCORE: POPULATION WITH LESS THAN GRADE	ZSCORE: POPULATION WITH UNIVERSITY DEGR
CORNWALL	67433	2.12558	18329	- 47168	- 86179	1 04441	-1 33935
DRUMMONDVILLE	2 43800	- 38188	07010	- 46958	61557	2 39583	-1 33217
FREDERICTON	- 10446	71896	1 53613	- 45387	1 33411	25487	1 85471
GUELPH	13947	41317	- 64784	- 43103	1 05537	- 43441	1 35945
KAMLOOPS	- 79608	- 68767	25712	- 45273	1 09098	-1 27826	- 78308
KELOWNA	40772	22970	31142	- 43265	2 01085	- 27984	-1 07378
KINGSTON	-1 85420	1 23880	- 64784	- 37175	- 59698	- 82292	1 19436
MONCTON	56150	-1 97198	35365	- 39880	41580	75826	- 36319
NANAIMO	- 06400	- 93230	- 22552	-	-	-1 16965	- 77232
PETERBOROUGH	- 36219	1 26938	- 64784	- 41937	05807	- 44068	- 34166
PRINCE GEORGE	58127	-1 11577	- 64784	- 46868	- 15254	- 74563	- 72207
ST JEAN	- 10738	- 53477	- 20742	- 45986	1 14209	1 85693	-1 06301
SARNIA				- 42194	39102	- 94406	06388
SAULT STE MARIE	76223	29085	- 52717	- 41710	-1 03368	25696	- 74002
SHAWINIGAN	1 24776	22970	- 34618	- 45662	01161	1 93422	-1 54750
SHERBROOKE	-1 77493	- 04551	- 15312	- 36819	1 07240	1 18645	34381
SYDNEY	75025	87185	- 42461	- 41645	- 20519	86896	-1 18144
CHARLOTTETOWN	- 82965	1 17764	03993	- 48513	3 09951	- 46156	32587
MEDECINE HAT	2 32534	04622	03390	- 47768	2 27875	22772	-1 16709

STANDARD SCORES

URBAN
CENTRE

	ZSCORE: CRIMINAL CODE OFFENCES PER 100.	ZSCORE: CRIMES OF VIOLENCE PER 100,000	ZSCORE: PROPERTY CRIMES PER 100,000 POP	ZSCORE: INDUSTRIAL WORKERS IN HIGH STRE	ZSCORE: NUMBER OF AIR PASSENGERS	ZSCORE: FAMILIES WITH LESS THAN \$10,000	PAGE	ZSCORE: RATIO OF PROFESSIONALS LS TO POPUL
CALGARY	3 12212	- 56809	- 18541	- 40966	32310	- 1 45425	2	41454
CHICAGO	12183	- 1 00893	- 88203	2 40090		1 07431	-	61171
EDMONTON	- 76235	1 44171	1 16221	- 19526	- 04227	- 1 29080		40919
HALIFAX	- 71233	1 06944	42257	- 46813	- 13151	- 31656		38731
HAMILTON	14736	62440	42963	82215				49504
KITCHENER	- 77287	- 48077	- 99266	- 72931		- 71395		- 07209
LONDON	- 05077	18550	- 71150	- 72541	- 58491	- 92226		40919
MONTREAL	21136	45363	- 37187	- 60846	2 13951	15134		13938
OSHAWA								
OTTAWA-HULL	- 1 00570	- 27215	1 19136	48301	01856	- 1 48309	- 1	10758
QUEBEC	- 09404	- 44292	63761	- 37458	- 41203	- 82291		83214
REGINA	1 70632	- 17448	1 34086	- 40186	- 45045	- 33579	- 1	37010
SAINT JOHN	- 33033	59270	- 1 86066	23353	- 55690	- 92226	-	39295
SASKATOON	1 83250	- 34687	06845	- 55389	- 47686	58398	-	92528
ST CATHARINES	- 31230	- 27248	- 28441	14777		- 36783		51128
ST JOHNS	14015	22852	77351	- 53440	- 51808	- 00890	- 1	30447
SUDBURY	- 37659	- 1 15932	- 1 22405	2 70106		48463	1	80200
THUNDER BAY	- 36428	61825	67165	1 44975	- 52048	- 1 1145	- 1	15863
TORONTO	29097	- 38665	- 1 20153	- 68253	3 21199	- 1 22671		29252
TROIS RIVIERES	- 1 13865	- 54998	31370			- 1 04724	1	64886
VANCOUVER	2 85248	2 96475	91499	- 56558		1 82422	-	86694
VICTORIA	- 35301	1 35244	2 35050	- 64745	1 14184	- 77484	2	37808
WINDSOR	- 61379	1 07138	28194	- 67471	- 48727	- 76522	1	31342
WINNIPEG	- 1 14466	- 73595	18369	- 44494	- 57010	44861	-	77943
BARRIE	- 75544	- 35689	- 93047		18474	- 47737		68629
						- 44744	-	48775

STANDARD SCORES

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URBAN CENTRE	ZSCORE: CRIMINAL CODE - OFFENCES PER 100	ZSCORE: CRIMES OF VIOLENCE PER 100,000	ZSCORE: PROPERTY CRIMES PER 100,000 POP	ZSCORE: INDUSTRIAL WORKERS IN HIGH STRE	ZSCORE: NUMBER OF AIR PASSENGERS	ZSCORE: FAMILIES WITH LFS THAN \$10,000	ZSCORE: RATIO OF PROFESSIONALS TO POPUL
BRANTFORD	- 37524	46268	1 11810		04878	- 20335	
CORNWALL	- 96485	- 42190	20398		1 87870	74443	
DRUMMONDVILLE	78353	-4 04095	- 65356		1 49413	- 58255	
FREDERICTON	- 11447	-1 37247	-1 18454		32439	1 18945	
GUELPH	- 96364	-1 34821	-1 27004		- 98315	- 07209	
KAMLOOPS	11086	1 54036	1 41293		- 72036	46753	
KELOWNA	40393	71237	1 72234		1 00380	1 00715	
KINGSTON	- 40769	-1 24180	03536		- 01531	62796	
MONCTON	- 95223	- 91287	- 24325		1 11917	- 80131	
NANAIMO	62911	1 20949	1 49652		45258		
PETERBOROUGH	- 09404	-1 23210	- 87316		- 14350	05917	
PRINCE GEORGE	1 82454	1 34888	1 48978		- 64665	19043	
ST JEAN	-1 27384	-1 35241	- 62424		80190	-1 84195	
SARNIA	- 52591	1 52289	26680		- 66267	- 53879	
SAULT STE MARIE	- 70422	72434	- 91581		- 64985	- 53879	
SHAWINIGAN	34370	- 41640	- 73875		2 04214	-1 88785	
SHERBROOKE	56587	-1 32719	-1 04475		1 31146	15396	
SYDNEY	- 54619	- 04381	-1 35613		2 47478	-1 02737	
CHARLOTTETOWN	34490	- 28412	- 63264		90445	21064	
MEDECINE HAT	96530	- 37403	- 30406		- 46398	-1 18780	

STANDARD SCORES

PAGE 1

URBAN CENTRE	ZSCORE: ANNUAL HOURS OF SUNSHINE	ZSCORE: ANNUAL DAYS OF PRECIPITATION	ZSCORE: VALUE ADDED OF MANUFACTURING AC	ZSCORE: SUSPENDED PARTICULATE AVERAGE	ZSCORE: SULFUR DIOXIDE CONTENT
CALGARY	-1 11814	-1 11814	- 31133	2 68106	98336
CHICOUTIMI	1 46278	1 46278	1 52778	24723	
EDMONTON	- 82675	- 82675	22485	82427	-1 96771
HALIFAX	50534	50534	- 12651	-1 40389	- 46052
HAMILTON	-1 32628	-1 32628	- 13680	73143	97240
KITCHENER	-1 11814	-1 11814	- 71588	17439	67717
LONDON	1 04650	1 04650	- 19960	- 42907	90727
MONTREAL	94325	94325	- 35686	22081	- 27973
OSHAWA	1 42509	- 49373	12604	- 10413	56273
OTTAWA-HULL	50534	50534	- 02606	- 70759	85979
QUEBEC	1 00488	1 00488	- 01404	- 80043	78553
REGINA	-1 07652	-1 07652	05692	- 42907	-2 26416
SAINT JOHN	38046	38046	61594	- 05771	-1 20621
SASKATOON	-1 53442	-1 53442	- 19955	17439	-2 09494
ST CATHARINES	- 99326	- 99326	- 21341	- 10413	95962
ST JOHNS	1 46278	1 46278	- 61845	- 84685	- 30408
SUDBURY	63023	63023	- 61398	- 80043	85370
THUNDER BAY	04744	04744	52602	- 84685	1 02110
TORONTO	- 24396	- 24396	- 35900	68501	14211
TROIS RIVIERES	27631	50534	- 48508	96353	33325
VANCOUVER	58860	58860	- 21520	- 52191	05689
VICTORIA	50534	50534	- 68107	- 33623	-1 31943
WINDSOR	- 11907	- 11907	- 28923	36007	90057
WINNIPEG	- 78512	- 78512	- 72169	- 19497	- 20425
BARRIE	- 27464	00581	- 06911		

STANDARD SCORES

PAGE 2

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URBAN CENTRE	ZSCORE: ANNUAL HOURS OF SUNSHINE	ZSCORE: ANNUAL DAYS OF PRECIPITATI ON	ZSCORE: VALUE ADDED OF MANUFACTURI NG AC	ZSCORE: SUSPENDED PARTICULATE AVERAGE	ZSCORE: SULFUR DIOXIDE CONTENT
BRANTFORD	1 30787	- 78512	- 32603		
CORNWALL	54592	- 11907	- 14836	- 52191	1 01380
DRUMMONDVILLE	-1 44686	04744	- 95532		
FREDERICTON	- 70836	46371	-1 05766	- 98611	
GUELPH	31148	- 16070	09838	- 56833	30951
KAMLOOPS	- 74352	-2 61674	27317	1 00995	- 36009
KELOWNA	-1 44686	-2 15884	01317		
KINGSTON	2 22220	- 41047	33092	-1 26463	- 09103
MONCTON	- 06363	50534	- 77065	-1 17179	
NANAIMO	- 90764	87999	34726		
PETERBOROUGH	- 33325	-1 28465	- 12438	- 89327	21455
PRINCE GEORGE	- 68491	92162	2 13308	87069	
ST JEAN	- 60286	1 00488	- 78028		
SARNIA	52248	- 32721	4 79638	12797	1 03023
SAULT STE MARIE	88587	96325		1 61341	08002
SHAWINIGAN	1 13203	21395	25092	2 17045	59621
SHERBROOKE	- 25119	1 25464	- 90973		
SYDNEY	-1 16552	1 62929	- 80417	1 70625	-1 14046
CHARLOTTETOWN			- 88913	-1 58957	-1 56718
MEDECINE HAT			1 79572		

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