LIVABILITY AND QUALITY OF LIFE INDEXES IN PLANNING FOR SUSTAINABLE COMMUNITIES

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Abstract

This thesis examines issues surrounding the use of Livability and Quality of Life Indicators in a sustainable planning process. Planning literature is rife with references to quality of life and livability, as is other literature dealing with the urban environment. There are numerous existing indexes purporting to measure livability or quality of life, but few do so with any real sense of theoretical rigour or clarity of purpose.

An examination of the relevant terms follows, and workable definitions are proposed. An examination of existing indexes highlights many of the potential issues which must be addressed in the development of an index. Finally, a planning framework within which community quality of life and regional livability indexes could be effectively employed will be discussed.

Despite the difficulties, there is much potential for the use of quality of life and livability indexes in planning, in terms of both information gathering and equitable information dissemination. Ultimately, however, the true value of an index-centred process might lie in the social learning involved in its development and use.
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1.0 Introduction

The purpose of this thesis is to examine the issues surrounding the use of Livability and Quality of Life Indicators in planning, and in particular, in a planning process designed to lead us to a more sustainable community. The planning literature is rife with references to quality of life and livability, as is other literature dealing with the urban environment. Such frequently used, but rarely defined, terms demand closer scrutiny. We need adequate, accepted definitions for terms so that we might establish their relevance to planning debates. The same could be said for indexes and indicators - while there are numerous existing indexes purporting to measure livability and/or quality of life and/or some aspect thereof, few do so with any real sense of theoretical rigour or clarity of purpose.

There are a number of major stumbling blocks on the road to achieving a workable index. First, there is a lack of agreement (or, in too many cases, concern) over the meanings of terms such as "quality of life," "livability," and "sustainable community." This thesis led to the development of definitions for these terms, and led to distinctions being made between terms which are presently often used interchangeably.

The literature review also uncovered a number of potential difficulties and theoretical problems pertaining to the use of indicators and indexes. These included concerns regarding scale; scope and organization; type of indicators to use (subjective versus objective); public involvement; goals for and purposes of
an index; and the relationship between community and individual quality of life. These issues are more fully explored in Chapter 3. Unfortunately, it is entirely possible that many of these concerns might be unanswerable—we may only learn what constitutes a good index by a method of trial and error. Still, planners must be aware of the potential problems and possibilities involved before they start devising the plan of action.

There are many existing indexes devised to measure quality of life and livability. A number of these indexes are examined in Chapter 4 of this thesis to gain an understanding of the state of the art and to discover ways in which planners might use them in the development of a more effective framework. These include indexes applied to the city, region, national, and international scales; ones which "rate" cities on livability; and ones which examine either individual or community quality of life.

Despite the possible difficulties, there is much potential for the use of quality of life and livability indexes in planning, especially in processes designed to promote sustainability of urban environments. A comprehensive index can serve a myriad of purposes, such as:

. the provision of a holistic set of baseline data on the region or community as a system;

. a means to measure progress towards stated community goals; and

. a way to evaluate and monitor projects and proposals.
These are vital tools in a progressive planning process. Ultimately, however, the true value of an index might lie as much in the process of developing and using it as in the information it would glean. A properly designed framework, within which quality of life and livability indexes would be central, would provide the means for pro-active, meaningful public involvement in decision-making. It would assist in making information accessible to all, and it would force people to recognize and be responsible for the consequences of their actions.

Naturally, there is the potential for misuse of an index-centered procedure. For this reason, we must understand the potential of the process, and devise a planning and decision-making framework within which people can improve their communities and global sustainability. Such a framework is proposed and discussed in Chapter 5 of this thesis, and is centered on:

1. the need for accurate and accessible regional and global environmental and livability information;
2. a corresponding need for local community quality of life information; and
3. an effective means for information to flow between levels and to/from individuals.

An effective quality of life / livability measurement process would involve not one, but two complimentary-yet-different levels of indicators. It might seem strange to advocate two indexes when it is so difficult to devise even one adequate index. Nonetheless, having two indexes would solve many of the problems inherent in
existing systems, and provide the means for truly effective
decision-making on issues at the scale at which it is most
appropriate for them to be dealt with. These issues will be fully
explored in Chapter 5. It is important, however, to remember that
this is not a framework designed to provide neat, packaged answers.
Rather, it will point out areas of concern, help in the allocation
of resources, and guide the community towards the realization of
its goals, particularly those related to sustainability and equity.
Also, it is not a "one-framework-fits-all" proposal. The framework
described could serve as a point of departure in devising a
sustainable planning process. Each region and each community must
design a system which it finds useful and pertinent for itself.
2.0 Definition and Explanation of Terms

2.1 Rationale and Methodology

To authors examining urban quality of life, livability and sustainable communities, the general lack of clear definitions is of major concern. Terms such as these are frequently used without adequate definition or context. As a result, the terms are allowed to imply virtually whatever the author, or the reader, wants them to and consensus is impossible. This confusion is compounded by the fact that many of the terms have meanings which have changed somewhat over time. Others are taken to have generally understood meanings, so are allowed to mean all things to all people:

One difficulty arises because the concept [of quality of life] is intuitively familiar and therefore appears undeserving of close definition: everyone believes he knows when he is better or worse off. (McDowell & Newell, 1987, p.206).

Therefore, a brief definition of terms central to the discussion of quality of life / livability indicators is necessary before proceeding. In some cases, distinctions will be made between terms which are often used interchangeably. This will be done to avoid the confusion which exists in the existing literature.

2.2 Indicators

Everyone, individually and collectively, requires good, accessible environmental information on which to base ... decisions. But, in today's world of information overload, the need is for authoritative, easy-to-use indicators by which to measure our environmental performance and progress towards sustainable development." (Honourable Robert de Cotre, then Federal Minister of the Environment, in Canada, 1991, p.iii).
Individual indicators are simply variables - the things to be measured. They can be either a summary measure, or an ongoing measure used as a tool for monitoring change. Ideally, they provide relevant and accurate data about a given situation, or factors related to that situation. Indicators are, in fact, a part of everyday life - temperature and wind speed are indicators of climatic conditions; speedometers indicator how fast a vehicle is travelling. Some of government's most important tools in policy-making are indexes or individual indicators - the GNP and the plethora of opinion polls are examples. Opinion polls are, rightly or wrongly, an example of governments using subjective data in deciding policy. The problem is that they are not placed into any context - they measure the reactions of people to very specific issues or events. The GNP is also a problematic measure because it takes into account only a very select set of economic indicators, and discounts such important considerations as environmental quality, self-sufficiency levels, and personal sense of well-being. Another ironic aspect of GNP is that money spent to counter damage caused by environmental degradation is actually considered positive economic activity. In spite of its shortcomings, it is a prime motivator behind federal government decision-making.

In an era of rapid technological change, globalized economies, limited governmental resources, mega-cities with mega-problems, and a potential (if not actual) ecological crisis, the need for
accurate and accessible information on the environment - including the urban environment - is greater than ever:

Anecdotal evidence of environmental degradation, however persuasive, is simply not good enough to meet our needs. We must have reliable information about the current state of the environment, the factors that endanger it, and the steps that must be taken, either to heal damage or to prevent it from occurring in the first place. We can then make appropriate future commitments of time, energy, and resources to meet the environmental challenges we face. (Canada, 1991, p.1).

Different authors have put forward a number of criteria which they feel indicators must meet if they are to be effective. These include reliability, validity, sensitivity to change, ease of administration and scoring, the existence of normative data, and the applicability of the measure to heterogeneous samples (Herbert & Milsum, 1990). Unfortunately, for most existing examples of indexes:

The choice is often made on the basis of what statistics are available, and any weakness in concept (e.g., do divorce rates indicate social instability or enlightened society?) or validity (because of data-collection problems, many available statistics are not very accurate or reliable) are admitted and subsequently ignored as much as possible. (Cherniak, 1976, p.6).

In other words, indexes often use indicators which collect data that is convenient, not necessarily what is needed.

There is general agreement in the literature on some qualities which all good indicators should possess. They should, of course, measure data relevant to the issue at hand. They should be designed to use data that is already available whenever possible, or is at least measurable / attainable - it should be feasible. The indicator should also be selective - providing information not
furnished by other indicators in the index. The indicator must be **easily understood** by the public, both in terms of content and purpose. The World Health Organization adds that indicators (in this case, specifically for health related issues) should be **scientifically respectable, valid** (measure what they are supposed to), and **reliable** (giving constant results under similar circumstances). They warn, however, that few indicators can be expected to actually achieve all of these criteria (WHO, 1981, p.12).

Indicators can measure any number of types of data - social, physical, physiological, psychological, environmental, economic, health status, quality of life, etc. Problems arise, however, in the lack of agreement over what constitutes a good indicator for measuring concepts such as "quality of life" or "livability". There is a poor understanding of which variables have an affect on quality of life and livability, as well as how this affect is manifest. Nor is there agreement on how these indicators can best be congregated into an index:

At present, we can relate subjective quality of life to many variables, but the nature of these relationships is not well understood and an integrated framework to organize the findings is lacking. (Cheng, 1988, p.129).

It follows that who decides which indicators to use and how they are to be used is of major concern. Specific indicators could be selected to further the political or economic interests of the few in the guise of social management. Likewise, sets of indicators could be manipulated to **support** the actions that they are supposed to **evaluate**. For this reason, it is vital that the
development and administration of an index be totally open to and understood by the public and not controlled by any particular group.

Hayes and Willms (1990) identify five additional issues around which concerns about healthy community indicators coalesce:

... the lack of guidance offered to community participants as to where to begin their search for indicators and how to proceed; a concern about inadequate expertise among lay community members to design a research strategy to identify indicators; a concern about gathering data; a concern about inadequate resources to mount an evaluation; and a concern about what the results of an analysis would be used for or against. (p.162).

These issues are relevant to any community-based indicator process, and underline the necessity that community input be efficient and effective. Otherwise, public participation, which is a major goal of the process, could become unproductive, or even counter-productive. Vital components of planning must be to ensure the availability of skills and information to community groups, as well as the provision of a framework within which participation is known to be proactive and effective.

There are, however, basic data collection requirements in which public input might not be feasible. There are many indicators vital to sustainable planning which would fall outside the realm of the community to adequately measure, or would supply required basic information which all communities must have access to. This basic regional environmental information, as well as broad ground-rules which the public uses in informed decision-making and priority setting, must be provided.
2.3 Indexes

An index is a framework or a relational tool in which a composite of indicators is organized and compiled into a useful form, often for comparison with similar data compiled at another time or in another place. Its main advantage over the use of indicators individually is that an index facilitates a broader examination of secondary cause-and-effects. For example, if indicator 'A' goes up, what effect does this have on indicators 'B' and 'C', and what effect should this, in turn, have on decision-making?

An index can take many forms, the most common one being "Ranking Indexes" (see Section 4.2) in which various indicators are compiled into a list, assigned ultimate values and, sometimes, weights leading to an overall ranking of the situation as compared to other places or time periods. An index could, however, also take the form of a matrix, or a looser collection of indicators in which comparison is possible, but without assigned values.

Initiating an index is very difficult and time consuming if done correctly. The researcher must be sure of exactly what is being measured and why, as well as the context and purpose of the study. This might sound like a fairly straight-forward, easy task, but it appears that this is not the case, especially when attempting to measure nebulous concepts such as "quality of life" or "livability". Many important questions seem to go unasked, or at least unanswered.
What is the purpose of the index? It can be designed to simply assess the situation, to instigate action, or both (in which case the index might measure roughly the same data, but be administered entirely differently). It can, of course, also be designed as a tool to placate the public and give an impression of scientific rigour and public participation in a process in which the results were pre-determined.

What is to be the scale or scope of the index? It can be designed to be all inclusive, or try to measure only a more easily manageable section of possible variables. For a topic this broad, the scope could be so large and the number of variables so great that the index becomes unwieldy, expensive, and virtually meaningless in its excess. On the other hand, anything less could be incomplete, may lead to not recognizing secondary effects of activities being monitored and result in important gaps in information or a lack of knowledge about the systems involved:

It is necessary to understand, to the extent possible, specific cause and effect relationships, but intelligent planning for a better environment requires a consideration of the whole. (Purdom, 1980, p.628).

A consideration of the whole would not be possible if the whole system is not included in the study.

What use will the index have? An index can have a multitude of uses, depending on the needs of the research. In a well designed program, an index can, at the same time, be used to collect data, measure progress towards desired goals, evaluate proposals, monitor change, involve the public, and make commonly held objectives tangible. These are all strong arguments for the
development of an index - arguments which fit in very well with the objectives of a sustainable community. However, creating an index is a daunting task. A tremendous input of human and financial resources would be required to compose the index and regularly compile and analyze the data. There will also be concerns regarding who administers the index, how the data is collected, and how information is analyzed.

The end result must be usable by the public - indexes can be designed to be unbelievably technical and decidedly user unfriendly (e.g. Clark, 1988). Also, Cherniak (1976) describes a system for measuring livability which by-passes the public altogether:

For each area of concern ... a person familiar with the issues could make a brief report on that area of concern, quoting such facts and figures as are pertinent, making such qualifications as are necessary, and attempting to judge whether conditions in the area of concern had improved, become worse, or stayed about the same. (p.15)

This brings us to perhaps the most difficult question of all: the determination of which indicators to use, what data to collect, and how to collect it. These issues will be discussed in greater depth in Chapter 3.

2.4 Community and Region

The Community

Else (1978) points out that a main problem in adequately measuring community needs is the lack of a clear understanding of what a community is. "Community" in Vancouver is most often used in relation to largely geographically defined neighbourhoods or specific areas such as Strathcona or Kerrisdale. The City, for
example, has defined a number of community planning areas. The picture is complicated, however, with the addition of other forms of community, which are often of greater importance to individuals than the neighbourhood in which they live. For example, the university community might be of more importance to a student living in suburban Burnaby than where he lives; likewise a person's ethnic community might be more important than the one in which she lives or works or shops.

McMillan and Chavis (1986) propose a definition of a sense of community with four basic elements:

1. **Membership** - a feeling of belonging or shared personal relationships;
2. **Influence** - a sense of making a difference to the group, and of the group mattering to the individual;
3. **Integration and Fulfillment of Needs**; and
4. **Shared Emotional Connection** - a sharing of history, common places, time together, and experiences. (p.9)

A community, therefore, is any organization of individuals which feel a sense of belonging, a sense of mattering, and a sense of shared history and interests.

Nairne (1991) identifies four different types of community - territorial, social, economic, and cultural. The geographical extent, levels of organization, and populations of different communities will vary significantly. All, however, are important to individual sense of quality of life, and all have relevance to planning, to the measurement of quality of life, and implementation of policies:
Any comprehensive effort to measure the impact of social change upon individuals and households should include social indicators at the local community level. It is at this level at which many of the interactions between people and programs occur and at which the human meaning of change is most observable. (Hemple & Tucker, 1979, p.402).

Pacione (1990b) adds that, while modern social networks often extend well beyond the traditional neighbourhood level, the local community remains an important entity for many residents, including children, the elderly, lower income people, and home-workers. With an aging population and an increase in home based workers, the neighbourhood could regain its importance as an area for personal interaction.

The Region

If there is any scale at which ecological consciousness can be developed, at which citizens can see themselves as being the cause for the environmental effect, it is at the regional level. (Sale, 1985, p.54).

It is at the regional level, a scale larger than the community, that many sustainability issues are most easily and effectively confronted. Seelig and Artibise (1990) define a region as a geographical area which reflects ecological and economic reality. The region must also, as much as possible, reflect the perceptual boundaries of residents, thus reinforcing a sense of belonging and commitment (Delbrouk and Lawson, 1990). The region is, therefore, a wedding of geographical / ecological terrain to terrain of consciousness (Aberley, 1985).

This is a concept of region which is very similar to that of Bioregionalism:
a territorially oriented perception and practice based on the capability of a bounded physical environment to sustain both its native ecosystem and a level of human activity. (Aberley, 1985, p.ii).

The relevance of bioregionalism to urban planning has not been totally explored, and it is beyond the scope of this thesis to do so. There are, however, elements of bioregionalism which reflect directly on sustainable planning in the urban environment. For example, while it might seem impossible for an urban area to live totally within the capabilities of the region in which it exists, it is important that urban environments recognize current levels of self-sufficiency and work towards existing within their own means. This will involve a detailed analysis of the capacity of the region to support life, the levels and effects of human activity, the amounts of resources imported into and wastes exported out of the region, and options designed to improve self-reliance. The region, therefore, is the level at which the long term viability and broad scale operation of the urban area is examined.

2.5 Quality of Life and Livability

In the past, quality of life has been perceived in a variety of ways. According to Dillman & Beck (1986), up until the early 1900, quality of life in urban environments was defined by neighbourhood ethnic makeup and industrial orientation. By the middle of the twentieth century, however, the influence of the neighbourhood was supplanted by larger scale factors such as the automobile, the telephone, and the television. People had a much
broader picture, and were able to experience and compare their quality of life with that of people in other places. Quality of life became synonymous with economic well-being, as measured by the GNP and individual spending power.

In the 1960's and 1970's, however, researchers saw worsening social indicators (suicide rates, drug use, distrust of politicians, etc.) during times of unprecedented economic growth (Campbell, 1981). They realized that quality of life must also depend on variables other than economic well-being. In fact, many researchers began to question whether perceived quality of life could depend less on external factors such as GNP, housing, and environmental aesthetics, and more on personal experiences such as sense of achievement, freedom, and friendship. (Andrews & Withey, 1976).

One definition of quality of life frequently cited in the literature is "the perceived discrepancy between aspirations and achievement" (Campbell, et al, 1976b, p.8). This implies that quality of life is a level of well-being which is equally contingent on actual state of being and desired state of being. This definition helps to explain the discrepancy between 'economic' and 'social' quality of life indicators, as in the 1970's:

A positive change in the objective opportunities available in the environment, when not perceived as personally obtainable by individuals in that setting, may not lead to active coping behaviors, and thus to an improved quality of life. On the other hand, increasing an individual's subjective expectations of success, when the objective opportunity of his/her environment remain extremely low, may lead to frustration, failure, or other negative outcomes. (Knapp, 1987, p.281).
People's aspirations rose throughout the 1960's and 1970's at a faster rate than achievements in well-being, leading to a substantial discrepancy between the two, causing frustration and dissatisfaction. If this is true, then it appears that, to achieve a happy population satisfied with their quality of life, policy-makers must ensure that people have either low aspirations or effective means of achieving them.

There is much debate over whether quality of life is a property of the environment, a property of a person reacting to the environment, or an interaction between the two (Eyles, 1990). Indexes, such as GNP, which claim to measure some form of quality of life through strictly objective measures of environmental conditions would support the first view: that quality of life is a property of the environment (Boyer & Savageau, 1985; Findlay, et al, 1988 are examples). Many other researchers feel that "[q]uality of life has no meaning apart from the experience of individuals." (Taylor & Bogdan, 1990, p.7). As such, it can only be understood and studied as a result of people's subjective experiences to external forces, not the forces themselves. Liu tends to agree with this, stating that:

> quality of life for any individual is interdependent via the following three mechanisms: the interpersonal capability of the individual, the interpersonal relations with other individuals, and the political system or society in which they all live as members. (Liu, 1977, p.228).

In other words, quality of life is an individual construct, but is partly the result of societal influences and the ability of the individual to deal with them.
In the literature, the term quality of life is used with equal frequency to refer to individuals and to communities. Many researchers make a clear distinction between individual quality of life and community quality of life or quality of environment (Bubolz, 1990; Shin, 1980; Shye, 1989; Milbrath, 1982; Myers, 1987). There also seems to be some consensus that there is a relationship between the two, but what this relationship actually entails is less clear. Shin (1980) tends to minimize the relationship, stating that community life is a collective phenomenon conceptually distinct from individual life. Milbrath believes that the relationship is a stronger one:

[T]here are interactive effects between individual experiences of quality of life and community experiences of quality of life. Personal experiences of quality of life are always embedded in and affected by community structures and processes. (Milbrath, 1982, p.137).

Myers agrees, stating that

A community's quality of life is constructed of the shared characteristics residents experience in places (for example, air and water quality, traffic, or recreational opportunities) and the subjective evaluations residents make of those conditions. (Myers, 1987, p.108).

Therefore, community quality of life, like individual quality of life, depends on much more than economic factors, and this is borne out in many recent surveys and studies (Liu, 1977; Findlay, et al, 1988b; MacNeill, 1989). Rather, it is a product of the physical and social environment, and the collective reactions of people - and their ability to react - to the environment. To measure community quality of life requires the measurement of both the objective characteristics of the environment and the combined
subjective experiences of the people - "we must consider both the city on the ground and the city in the mind." (Pacione, 1990, p.95).

This, of course, has significant bearing on how one chooses to measure quality of life, and leads to many conceptual difficulties in the preparation of a single index to be used in the planning process. For example, many of the environmental determinants of a livable city (such as air and water supply and quality and the availability of undeveloped areas) have relatively well established minimum standards and are outside the scope of neighbourhoods actions. However, any accumulation of individual subjective quality of life assessments beyond the neighbourhood level would inevitably prove to be at best hopelessly general and at worst counter-productive.

Community quality of life is often referred to as livability. Both terms are frequently used, for example, in both GVRD and City of Vancouver documents. Quality of life and livability, however, have very different meanings, and their inter-changeable usage only serves to confuse the issue further. Therefore, for this paper, a distinction will be made between the two. The term "Quality of Life" will be used to refer to individual perceptions of well-being, while the term "Livability" will be used to refer to the more objective conditions of the environment within which the individual lives. There is some basis for this distinction in the existing literature. Social indicators, designed primarily to measure individual perceptions of well-being, are predominantly
said to be measuring individual quality of life; whereas planning literature examining environmental conditions (physical or otherwise) often refers to livability¹.

Planners, therefore, must deal with two separate but interrelated issues. The first is livability, defined as the availability of, and accessibility to, opportunities for both individual quality of life (Blumenfeld, 1969) and environmental viability - how suitable the city is for living. The information required to gauge livability would have to be broader in scope and more objective in nature. The second is quality of life, which refers to how individuals and communities utilize resources and opportunities to maximize well-being. It involves an examination of how individuals and localized communities perceive their situation, and how they wish to prioritize resources and energy to provide an improved quality of life. According to Myers,

Treating quality of life as a local experience is justified on four grounds. First, people are likely to gravitate toward places they prefer, and with time they may develop further attachment to local attributes. Second, people presumably judge their quality of life more by changes over time than by comparisons with other places. Third, local government decision making and political debates about quality of life focus on changes within the boundaries of the community. Finally, research findings acquire greater local credibility if they are grounded in local opinion. (1987, p.112).

A planning framework for measuring both livability and quality of life will be further discussed in Chapter 5.

¹ It must be noted, however, that this is a generalization, and not the result of a complete and systematic review of all uses of these terms.
2.6 Sustainability

Sustainable development is positive socioeconomic change that does not undermine the ecological and social systems upon which communities and societies are dependent. Its successful implementation requires integrated policy, planning, and social learning processes; its political viability depends on the full support of the people it affects through their governments, their social institutions, and their private activities. (Rees, 1988, p.3).

Sustainable development is a term that has been used, and abused, much over the last few years. Like many terms relevant to this discussion, it is one with a plethora of meanings, and can even be used to justify the status quo with relatively minor technological changes:

Currently, many people believe sustainable development is business as usual with the addition of a treatment plant. This concept needs to be expanded to include the principles of maintaining ecological integrity, providing for social self-determination, and achieving greater social equity. (Collett, 1990, p.16).

Sustainable development, by this definition, implies an entirely new mind-set, a new way of understanding our place in nature, and a new way of treating the world around us.

Sustainable Communities

Achieving some level of global sustainability is, according to MacNeill (1989):

largely an urban challenge, given the dominant place of urban areas in population distribution, in the production and consumption of goods and services which impact on interdependent economic and ecological systems, and in the governance at all levels. (p.1).

First and foremost, a sustainable community is one which recognizes its place in nature and knows its ecological capacity and limits:
Redeveloping our communities for sustainability means closing the loop between 'input' (energy and materials) and 'output' (pollution and wastes). Developing sustainably requires that our social and economic living patterns do not bankrupt the resource systems upon which we depend. (Rees & Roseland, 1991, p.9)

A sustainable community works towards being as self-sufficient and self-reliant as possible, but self-reliance does not mean a form of isolationism. Contact with other communities, in the form of knowledge or trade, will always be essential. Rather:

Sustainable communities ... aim for a balance between local and regional integrity and trade on a global basis. (Van der Ryn & Calthorpe, 1986, p.X).

In addition, sustainable communities stress the need for citizen involvement in decision-making and monitoring of change based on ecological and social criteria. Equity, the provision of basic needs, opportunity, and other social considerations are fundamental to any definition of a sustainable community (MacNeill, 1989). In other words, both the physical design and the social design of the community must change to ones enabling sustainability.

Unfortunately, sustainability is not easy to measure or quantify, as it depends on both large and small scale conditions, localized perceptions, and because it is as much a "process" as it is an "outcome". As such, it might be best measured by:

1. examining the present condition against stated objectives or against "bottom line" standards below which we agree that we can not allow the environment to deteriorate. This would include examining issues at regional and global levels, scales at which systematic environmental information can be effectively gathered; and
2. examining perceptions of residents about the condition in which they find themselves and their communities, as compared to the past, to future aspirations, and to the region as a whole.

Should urban planners be concerned with issues of sustainability? All of the evidence indicates that we should, for two main reasons. First, cities are primary players in the global ecological crisis we are now facing. Cities are major producers of waste and pollution, and major consumers of energy, materials, and non-renewable resources:

Preservation of the biosphere by maintaining and restoring the ecological balance of nature is the most basic criterion for the urban environment, as indeed of any environment for human life. (Blumenfeld, 1969, p.152).

Cities have long ignored their relationships with the surrounding countryside, and the planet as a whole. Concepts such as Bioregionalism and Appropriated Carrying Capacity attempt to define the levels of resources available to and used by individual regions (Wackernagel, 1991). Essentially:

[c]ities aren't sustainable because they have become increasingly dependent on distant, rapidly shrinking sources for the basic essentials of food, water, energy and materials. At the same time, they have severely damaged the health of the local systems upon which any sensible notion of sustainability must ultimately depend. ... There isn't a single realistic plan in operation to ecologically redirect and thereby advance the quality of life for any sizable urban area in North America. (Berg, 1989, p.xii).
To do anything even approaching this, a new form of planning, and a new way of thinking, is required. Much of this must arise from local actions and initiatives.

The second reason for a shift towards more sustainable planning is that we need a more holistic way in which to comprehend and plan the city. Planners have tended to focus on individual elements of livability, but have had neither the means nor the mandate to systematically measure comprehensive community quality of life (Myers, 1988). This leads us to believe that we can "have our cake and eat it too" - we ignore the real and potential negative effects and side-effects of what we do. Already, many, if not most, urban areas fail to provide many of the basic elements of the good life, such as a healthy environment, safety, equity, and a reasonably secure future. Further,

[t]he real risk is that if the region fails to put its house in order, the very qualities that have made it great -- its superb natural environment, its civilized quality of life, its vibrant economy -- could erode away. (Hall, 1990, p.36).

Peter Hall was talking about San Francisco, but his points apply equally well to the Vancouver region.

2.7 Chapter Conclusions

In this chapter, working definitions of the relevant terms were put forward. If we are to discuss issues of livability and quality of life, and how indicators and indexes can be used in the advancement of sustainable practices, clear understandings are required.
Quality of life refers to a more subjective, personal experience of the immediate environment. Individual quality of life, while somewhat dependent on the environment, is largely the product of the individual's beliefs, perceptions, and ability to cope. As such, it essentially falls outside the direct sphere of the planner. Community quality of life refers to some form of collectively accepted subjective experience. While there will be an objective element to community quality of life measurement, effective subjective indicators and ways to input this data into decision-making and resource allocation must be created.

Livability was defined as a more objective measure of the ability of the urban area to promote or enhance individual quality of life. Livability, therefore, refers to the larger scale physical and social construction of the city, and whether the facilities or opportunities for individuals and communities to maximize well-being are available. As such, the task of a livability indicator/index is to measure these opportunities, or the constraints upon them, to point out areas where needs are not being adequately met, areas requiring an input of resources, and areas which are working satisfactorily. A livability index should provide the necessary baseline environmental, ecological, and social data required to effectively monitor the urban area, as well as provide the information used in more local– and more global– decision-making.
3.0 Issues Surrounding the Use of Indicators and Indexes

3.1 Rationale and Methodology

A "Quality of Life" index could justifiably encompass virtually everything that there is to measure, including an evaluation of any number of physical, mental, social, environmental, and economic criteria, as well as perceptions people have about them. A broad index encompassing all of these criteria, however, would be impossible to manage or use. Therefore, as discussed in Chapter 2, an index must exist within a defined framework complete with stated goals and values for the community and for the index. It must have a defined scope and purpose, but it must also be adaptable and capable of reacting to changes within the community.

The literature search revealed that there are a number of potential problems central to the ultimate success of an index. To avoid these, questions relating to the use of the index, its scale and its scope, and the kind of indicators to utilize must be asked prior to index formulation. This section will examine these issues, and relate the theoretical discussion back to the definitions of livability, quality of life, and sustainability discussed in Chapter 2. This chapter will also lay the groundwork for the discussion of various existing indexes in Chapter 4, and of a planning framework, including the use of inter-related indexes at the regional and local community levels, in Chapter 5.
3.2 Goals and Uses For An Index

A properly designed index can simultaneously serve many functions. It can:

- collect necessary baseline data;
- assess progress (or lack thereof) towards the achievement of stated goals or objectives;
- illuminate public concerns, especially those of groups with little power or influence in the community;
- evaluate proposals and policy options (in terms of both outputs and impacts), and thereby assist in decision-making and resource allocation;
- provide an early warning system for faster recognition of potential problems;
- monitor for both direct and indirect effects of change;
- involve the public in both evaluating and monitoring their environment, as well as provide a means by which required information is made available;
- facilitate social learning and community interaction;
- compare the current situation against an anticipated situation, past conditions, and, possibly, with that of other communities; and
- make community goals and values more tangible by making the alternatives and the results of various options more apparent.

In other words, an index can do much more than simply measure and collect data about things. More specific to a planning process
designed to examine livability issues and augment sustainable practices, an index can foster:

1. proactive, rather than reactive planning and decision-making. Rather than the prevailing system of emergency stop-gap decision-making to ease the symptoms of problems,

   [it would be better to have programs which would aim to ameliorate causes and which are soundly planned, based on current and adequate data, so they could be truly effective. (Colley, 1975, p.93);

2. ecologically and socially sound decision-making, by making the existing situation more understandable, needs more apparent, and consequences of actions more evident;

3. equity within the community by making information about its status accessible to everyone and by translating knowledge into terms which are usable by the community;

4. identification of service, amenity, and other inequities within the community;

5. public participation and social learning, by making people think about and understand their own situation, their community, and the consequences of alternative actions;

6. community self-reliance by monitoring the import and export of resources and wastes;

7. a more well-rounded role for decision-makers themselves, by including them in the information gathering and impact assessment phases of policies or projects:

   ... architects and planners are only rarely involved in empirical research, which can mean that urban plans and designs are neither tested in advance nor adequately evaluated after implementation. (Pacioni, 1990a, p.13).
8. a fuller understanding of the relationships between the many variables that affect the community through a more comprehensive, holistic approach to information gathering and decision-making; and

9. ongoing monitoring of both specific projects and the environment of the community as a whole.

Few existing indexes have purpose statements which recognize their potential uses. Most are designed as either theoretical exercises with no intended purpose other than the act of doing them, or as relatively specific exercises designed to quantify one aspect of the environment. In particular, few recognize the public participation and social learning potential of a set of indicators. This is largely due to the fact that very few existing indexes were designed as part of an overall planning framework in which such important secondary benefits would be realized and encourage.

Of utmost importance is that the index be usable. This may seem like an obvious point, but many of the indexes studied seem to have no purpose or intended use, and therefore measure data in an ad hoc fashion. For example, one of the studies reported as one of its "findings" that:

The unemployment variable was highly correlated only to hospital beds. The direction of causation is unknown, so either a high proportion of beds leads to high unemployment or vise versa or there is no behavioral causation. (Sinden, 1982, p.415).

It is difficult to understand the usefulness of this - it is a result for the sake of needing to find a result. The developers
of the index must have a clearly stated purpose. They must also understand who the end user of the information will be, or the index runs the risk of lacking focus and organization:

[T]he crucial determinant of utilization is the extent to which an evaluation study addresses the informational needs of a specific decision maker confronting or anticipating a specific decision. (Connolly & Parker, 1980, p.131).

An index can be designed to have different purposes. It can either monitor change (assessment oriented) or manage change (action oriented). To identify the index purpose, it is necessary to first determine how the index is to be used in decision-making. The general consensus among writers who approach this topic is that an index serves more effectively as a means of raising awareness and allocating resources, rather than as a management tool (Pearson, 1971; Liu, 1977; Ferris, 1988). Indicators do not tell us how to solve problems; they merely show us where problems exist (Liu, 1977). They should act like a thermometer, which reveals a sick person's temperature, but cannot prescribe the cure (Pearson, 1971). Action oriented indicators, while being possibly more appealing to politicians, fail to examine tertiary effects of actions, and lead to single purpose solutions that are grossly oversimplified (Pearson, 1971). A comprehensive assessment-type index would provide the background data necessary for decision-makers and the public to make sound policy, program and resource allocation judgments.
3.3 Scale

At what level should indexes be applied? What are the correlations between individual, neighbourhood, community, city, regional, national, and global appraisals of quality of life?

Scale can refer to three elements. The first is the size of the index itself, and is discussed in Section 3.5. The second is whether the index should centre on the perceptions of individuals or on the community as a whole. The relationship between individual and community quality of life is especially pivotal to subjectively derived quality of life indexes.

The third element refers to the geographical or population size of the study. The term "region" can refer to a political, economic, or a ecological set of boundaries. Likewise, community can suggest many different social, economic, cultural, or geographical constructs. Paradoxically, the community or neighbourhood level is the one at which the needs and preferences of citizens are most immediate; yet is the level which often has the least economic or political power required to turn desires into actions. When citizens feel that they have lost control over the future of their community, actions become reactive rather than proactive, and NIMBYism becomes an impediment to the livability of the city or region as a whole (Nairne, 1991).

Scale will greatly influence the choice of appropriate and meaningful indicators. Some indicators might be most effectively utilized at the regional, national, or even global scale, but have little meaning at the community level. Likewise, other more
subjective indicators are entirely appropriate to the local community level, to which people relate most personally.

**Individual versus Community**

Most of the literature addressing questions of scale focus on the relationship between individual and community quality of life. There appears to be some general agreement that individual quality of life is best evaluated using subjective indicators, but whether or how this information can be translated into an evaluation of a community's quality of life is still open to discussion:

In the area of economic indicators, it is relatively easy to move from an individual's average weekly earnings to the average weekly earnings of all employed people in a variety of categories. It is a much more difficult matter to collect data on the 'average' response to environment of all people in the community and how this varies according to time and other variables. (Blau, 1977, p.471).

There is some agreement that a close, iterative relationship exists between individual satisfaction and satisfaction with community. There is, however, no agreement on whether indicators of individual satisfaction can be used to assess over-all community quality of life. Many authors imply that this is, in fact, possible, but on closer examination, it becomes apparent that they are not discussing a "community quality of life", but instead an "individual perception of community quality of life" (for example: Shin, 1980; Milbrath, 1982; and Hughey & Wood, 1987).

Myers (1988) argues that measuring personal well-being is actually counter-productive in community decision-making:
Research on personal well-being diverts emphasis from community level factors to personal factors. The resulting measurements - while accurate - provide a less useful guide for community level decisions. ... In essence, community level considerations are drowned out. The individual focus is inconsistent with the needs of planners and local leaders who must make decisions about community level resources." (Myers, 1988, p.155).

As an example, he cites the differences in two surveys conducted in Austin, Texas (Myers, 1988). One inquired about "Austin's quality of life", while the other inquired about "your quality of life". The first study found an 85% consensus on the importance of 6 community factors such as traffic and water quality. This would certainly provide a framework for consensual decision-making. The latter study, however, concluded that everyone's quality of life was different, leading to the conclusion that the quality of life concept should be excluded from community debates concerning future planning decisions. In addition, the former found a perception of a decreasing quality of life, while the latter found the opposite. The point that Myers is making is that these are two very distinct questions which can not be used interchangeably.

This also raises the question of whether planners should even be concerned with "quality of life". If it is of necessity an individual construct, does it have any relevance to the planning process? Community planners can not be guided solely by individual perceptions of quality of life. This would lead to, at best, mass confusion with a multitude of conflicting perceptions within the community. At worst, it would lead to a domination of decision-making by those with a voice sufficiently powerful to be heard.
There are, however, innumerable examples of planning procedures carried out to improve the quality of life of others but which actually replaced one situation with a worse one. Clearly, planners do require a strong sense of what the community's residents value about their neighbourhood, and an understanding of how various parts of communities rate their own quality of life:

Without a clear understanding of what the community wishes to become, the actions of government decision makers, staff or elected, may not reflect or reach for what it is that a community values. (Daniel Janczewski in Vancouver, 1980, p.2).

Therefore, it is essential that there be a clearly understand distinction between individual quality of life and community quality of life. Although there is a great deal of reciprocal interaction between the two components, the former refers to the individuals own ability to cope with the stress of living in an urban environment and the latter refers to the degree to which the immediate environment allows the individual to exercise choice and to use their abilities.

Geographical Scale

There are many levels at which indexes could, and perhaps should, be conducted. For the purposes of this study, the geographical levels examined will be the community or neighbourhood, the regional, and the planetary scales. A clear definition of what constitutes a "region" as opposed to a "community" is difficult to establish. For example, in our area, is the Lower Mainland a community? Is Greater Vancouver a
community? Is Vancouver? The West End? My block? In addition, there are numerous additional social and cultural communities within and crossing over geographical boundaries.

The need for a regional view is frequently expressed in the planning literature (Mumford, 1961; Mantell, 1987; Berg, 1989). The region represents a more realistic scale at which to survey broader environmental concerns, such as transportation, pollution, waste disposal, and ecological diversity. In essence, it represents a compromise between the local level in which people can act and the global level at which many environmental problems exist. Likewise, the need for a local, community scale is often cited (Milbrath, 1987; Pacioni, 1990), as this is the level at which people have the maximum knowledge of and sense of belonging to their environment.

Geographical scale will greatly affect the choice of indicators and the values placed upon them. For example, food banks might be regarded as a positive indicator (of community organization and caring) at the local level, but as a negative indicator (of a failure of social programs to provide basic needs) at the provincial level. The computer will help to solve some of the problems associated with conflicting processes and requirements at different scales, making the sorting of data by any form of sub-group possible. Others would be resolved by making the index a hierarchical one with information from different levels feeding into lower and higher ones. For example, a neighbourhood could not effectively measure levels of ozone depletion, but such
information, as supplied by a global index, does affect decision-making at the local level. Likewise, information on user-satisfaction with local services can not be meaningfully assessed at the regional level, but would affect regional resource-allocation decisions.

3.4 Subjective vs. Objective Indicators

The terms "objective" and "subjective" crop up in most discussions concerning indicators. This is especially true when trying to evaluate indicators for quality of life / livability issues:

There is little doubt but that the central issue confronting any examination of a person's perceived quality of life involves the relationship between subjective and objective well-being. (Schalock, 1990, p.141).

Objective criteria measure hard data about issues. Crime rates, pollution levels, housing prices, and number of hospitals per 100,000 people in a region are all examples of objective indicators. Subjective criteria evaluate our perceptions about issues. Feelings of safety, level of personal environmental awareness, and health care perceptions are all examples of subjective criteria. Some studies, such as the measurement of the levels of toxins in a water way, are able to employ entirely objective criteria. Using objective criteria, however, does not make the study any less value laden - decisions regarding the choice, collection, interpretation, and presentation of data still exist.
The use of subjective versus objective data in Livability and Quality of Life indexes, however, is not a resolved issue. Many such indexes use entirely, or nearly entirely, objective criteria (Coughlin, 1973; World Bank, 1988; Artibise, 1990; and U.N., 1991 are examples). The advantages are obvious: the data is relatively easy to obtain (and is often already being collected by someone else); such indexes are faster to initiate and would probably be somewhat less controversial; comparisons with other areas would be possible; methods used are seen as being more scientifically sound; and the information is easily organized and codified.

Other authors argue that objective indicators are not valid ones, especially for appraising quality of life (Atkinson, 1982; Vreugdenhel & Rigby, 1987; Schalock, 1990; Turnbull, 1990). For example:

[If] we believe, as I assume most psychologists do, that the quality of life lies in the experience of life, then these [objective indicators] are surrogate indicators. They describe the conditions of life that might be assumed to influence life experience, but they do not assess that experience directly. (Campbell, 1976a, p.118).

and

The practice of using these indirect [objective] variables as indicators of quality of life ... seems to us inadequate and capable of leading to errors in the planning and implementation of social policy. (Shye, 1989, p.350).

It must also be remembered that objective indicators are not at free of bias or misuse:

... objective measures are often not as well standardised as the subjective measures; objectivity does not automatically mean that measures are reliable and valid. (Williams & Wood-Dauphinee, 1989, p.68).
For example, two of the quality of life rating scales, the Artibise Index (1990) and the Toronto Star Index (1990), use "number of homeless people" as an indicator. Presumably, researchers obtain this information from other sources, and the results could vary accordingly. Two potential sources for homelessness numbers are a city planning agency and a non-profit housing coalition, and they could have very different agendas, means of counting, and definitions of 'homelessness'. This does not negate the usefulness of the resulting information, but does point out the need to carefully examine where it came from.

The problem of bias or misuse is not limited to objective indicators. Anderson, et al (1984) point out that subjective responses to questions can be biased by factors outside the direct scope of the question, such as the wording of the question, the method by which the question is administered (for example, by phone or in person), or by how the researcher interprets and collates the responses. Finally, Bubolz, et al (1980) comment that subjective responses to questions relating to overall sense of well-being can be influenced by the respondent's sense of the ideal, or by defensive mechanisms (p. 133).

In a comprehensive planning process, it seems likely that a mixture of subjective and objective indicators will be required. Pierce and Bell (1986) point out that objective indexes neglect data measuring "higher order" aspects of satisfaction (such as self-actualization) in favour of data from governmental and census publications. Indexes employing only subjective indicators,
however, often omit the assessment of more basic needs, "presuming that expressions of personal happiness mean that physical, aesthetic, and self-actualization desires are all being fulfilled" (p.38).

Pierce and Bell go on to question the value of using only either objective or subjective indicators since they measure different (and equally important) aspects of human needs. This, in turn raises additional questions. Can the data from both kinds of indicators be compiled into one index? If the index is intended to guide policy, should policy be made on the basis of hard facts or on people's subjective perceptions, especially when studies have shown that the association between objective and subjective indicators is often weak (McDowell & Newell, 1987)?

These are questions of major concern to Andrews and Withey (1976). In their highly regarded book Social Indicators of Well Being: Americans' Perceptions of Life Quality, they state that "objective / subjective" is a classification for indicators which is neither clear nor useful. Rather, they state that of greater importance is the level of agreement on how to characterize a given phenomenon, the degree to which the same results are obtainable by co-observers, and the extent to which different people can take similar action towards a phenomenon. This seems to be a practical approach in a process requiring both kinds of indicators. Objective indicators of environmental conditions would provide the means to assess the physical characteristics of the area and provide a yardstick of sustainability. Subjective measures, on the
other hand, would provide information on perceived quality of life, thereby assisting in priority setting and resource allocation. To overcome some of the problems inherent in the attempt to combine the two types of indicators, it would be best to recognize that they are most useful when assessing different kinds of data at largely different scales.

3.5 Scope and Choice of Indicators

The quest is for a limited yet comprehensive set of coherent and significant indicators, which can be monitored over time, and which can be disaggregated to the level of the relevant social unit. (Andrews & Withey, 1976, p.4).

A single index must be two potentially contradictory things in terms of scope at the same time. It must be limited enough to be understandable, usable, and affordable. On the other hand, it must be sufficiently comprehensive so that important factors and relationships are not excluded. It must also be constructed to recognize diversity and not simply include "middle class" values (Johnston, 1977).

Most existing examples of quality of life indexes simply include data that is easily available and, actually, this is not a bad place to start. It is best not to wait for the perfect index before commencing with data collection, as the perfect index will never be devised:

In a world where knowledge is inevitably incomplete, the continuing utility of such a post hoc evaluation should not be ignored. (Clark, 1973, p.4).
However, a more comprehensive and systematic approach to data collection will require a clear theoretical model (Cheng, 1988). This theoretical model, in turn, must be part of a larger framework in which the need for and limits of data collection are implicit. The model would help determinate how the indicators are to be chosen (by experts, by public opinion polls, etc.) as well as what sort of indicators are to be used. The criteria for the selection of good indicators has been discussed previously in this report, but there are different kinds of indicators designed to measure slightly different forms of data:

1. As previously discussed, subjective or objective indicators can be used, measuring perceptions or actual numerical values.

2. Indicators can be chosen to consider positive factors rather than the usual negative ones (Zautra & Reich, 1981) —"level of well-being" instead of "level of sickness". At the community scale, for example, this could mean devising indicators to assess the possibilities of social interaction (a positive attribute of communal life) rather than isolation (a negative attribute).

3. Indicators can indicate a level of attainment and / or point out variability within the community. This use of maximum and minimum values, rather than simple averages, would be invaluable in assessing equity within the community.

4. Indicators can measure either normative data or trends. Normative data reveal the absolute level of an indicator and are often used in ranking / comparison indexes. Trends, on
the other hand, indicate the change in an indicator over time. This can lead to an index such as Johnston's (1988) which does not directly measure quality of life, but does measure the change in quality of life – whether it is improving, static, or deteriorating.

5. Finally, the availability or potentiality of an indicator can be measured, rather than its actual use. For example, available green space can be surveyed instead of actual use of green space. This is especially important for a community quality of life index, where possibilities for use of a resource are as important as individual responses to these possibilities.

3.6 Ranking / Weighting of Data

The organization and interpretation of indicator output is also of concern. Many indexes attempt to prioritize the indicators by assigning standardized numerical values or quotients. For example, an indicator or category could, based on the measured data, have an overall rating of 77 out of 100 with 100 being theoretical perfection. Often different weights are given to indicators to reflect their relative importance to the people or to the achievement of the desired goal. While this valuation step for indicators makes index development more value-laden and potentially open to misuse, there are advantages:

1. It results in a standardized number which allows comparison between indicators or categories of indicators. For example, it
is difficult to directly compare the results of water quality tests to traffic flow patterns, but comparisons such as this must be made in effective priority setting and resource allocation. The valuation system could tell us that water quality is declining at a faster rate than ease of movement. This would indicate that water quality needs attention and resources.

2. It translates technical information into a form which is more easily comprehended by everyone. For example, lists of water oxidation levels, clarity, and water-born coliform counts are simply not as immediately graspable as "a water quality value of 77, compared to 83 last year". A simple numerical value, however, disclose the entire story - "a drop of six points in water quality" does not tell us which aspects declined, or why they declined. The actual test results must be available to anyone who wishes to see and use them, and should be in forms which the average person can comprehend. For many purposes, however, such as in priority-setting, a more general rating is adequate or preferable.

3. Translation of the indicator data into standardized numerical values could provide results which relate more directly to regional goals. While these goals can only be established by the community itself, it is likely that they will include statements such as "to improve water quality" rather than "to increase water clarity and decrease coliform counts."

4. It will make for an easier comparison of indicators for which less is better (energy consumption, for example) and ones for which more is better (food production).
5. It will allow at least some forms of inter-regional comparison to occur.

A ranking and/or weighting process for indicators, therefore, has many merits, provided that public input is incorporated. Perhaps this would follow the procedure used by Findlay, et al (1988) in which residents helped to prioritize, or weight, the indicators.

3.7 Public Involvement

A Sustainable Communities project is one which, by definition, promotes public involvement in the process:

sustainable planning involves people in the choices that determine the ecological functioning of their region and this brings home the effects of people's actions in their environment. (Berg, 1989, p.16).

This involvement by citizens in decision-making takes many forms, and, according to Pacioni (1990), can be operationalized through a decentralization of resource allocation strategies and service system management, a deprofessionalizing of bureaucracies, and a demystification of planning and investment decisions. This would require a devolution of control and power down to more localized, grassroots levels. A more "bottom up" and co-operative approach to planning is a basic tenant of a sustainable society (Gardner & Roseland, 1989; Rees, 1988).

An index would be instrumental in fostering different levels of public involvement in the planning process:

1. Social learning through the involvement of everyone in goal setting, indicator selection, data collection, and decision-making
processes. For the process to work, it is vital that the public inform themselves on all aspects of their environment:

It could be argued that, at the moment, information on residents' preferences would be of little value ... because taxpayers have little knowledge of the cost of service provision, the alternative levels of services that are feasible, and the property tax implications of alternative levels of service provision (Smit & Joseph, 1983, p.5), not to mention little knowledge of their environment, sustainability, etc. For this vitally important education to occur, the approach must be open to all and must be easily understood.

2. Community self-control and decision-making confidence:

In a healthy community: people try to understand systemic problems rather than seeking scapegoats; people take responsible risks because they have in place monitoring systems to limit damage if things go wrong and they trust others to support them in their reasonable risks; and people conduct dialogues to analyze each other's mistakes in an atmosphere of trust. (Boothroyd & Eberle, 1990, p.12).

A heightened role in the planning process involves a higher level of responsiveness to community needs, but also implies greater personal responsibility in decision-making.

3. A sense of belonging; a sense of being "of" a community (Turnbull & Brunk, 1990, p.198):

a feeling that members matter to one another and to the group, and a shared faith that member's needs will be met through their commitment to be together. (McMillan & Chavis, 1986, p.9).

It does this by identifying member's needs and providing a vehicle for needs to be expressed as well as by, in effect, forcing people to work together towards commonly held goals and values.
4. Community empowerment by shifting the onus for evaluating and monitoring quality of life back into local control:

"City government can facilitate empowerment by enabling citizens to increase control over their lives and the conditions that affect their health. ... Empowerment has two prerequisites; the availability of information and the power to make choices based on that information. It is therefore important that information be provided to communities in a manner that is accessible and understandable... (Toronto, 1988, p.83).

The index is, in effect, the feedback mechanism supplying the information necessary for citizens to adapt to changing circumstances.

At the same time, however, there are potential problems with public involvement in the index. With so many voices to be heard, the entire process could become paralyzed or dominated by a tyranny of either the majority (at the expense of others inside or outside the community) or of the most vocal. Also, if the index is not tied in with larger levels of concern, decisions could be made to better the community at the expense of its neighbours, the region, or of the planet as a whole. These, however, are problems associated with any procedure involving the public; not ones specific to the use of a livability or quality of life index, and are ones which are certainly not foreign to present planning processes. Once again, education, involvement, social learning and equity of information and influence within a defined framework will help to alleviate these problems.
3.8 Values and Ethics

It is impossible to assess the quality of life in a community - either objectively or subjectively - without grounding that assessment in value decisions. Those decisions, whether made by the researcher or the respondents, may accurately reflect the prevailing values of the community or may severely distort them. (Olsen, et al, 1985, p.328)

Value judgments will enter into virtually every stage of an index process - in the selection of indicators, in the weighting, compilation, and interpretation of results, and in the application of results to address perceived needs. Values are in a dynamic equilibrium, even in a stable society, and we are rarely even aware of our basic cultural values (Hayden, 1977). For this reason, a statement of community values is necessary. Many authors warn us of the dangers of a misuse of indicators (Springer, 1970; Francis, 1975; Blau, 1977). The basic concern is that indicators can be manipulated, not to further equality, but to further concentrate power in the hands of a few individuals or groups:

One face of power is the power to define, and we might profitably carry our examination to the category of urban liveability itself. Who has the power to define this category? Whose interests does it serve? (Ley, 1990, p.32).

The main way to guard against this from happening is to ensure that the strategy be truly public from start to finish. Effective means of consulting with all affected groups must be in place. Citizens must know that they have an effective voice in decision-making. For example, Francis (1975) describes an impact assessment in which the process was used by the vested interests as an advocacy tool for their project, resulting in the exclusion of
community concerns and desires and a rejection of the proposal. This is in spite of the fact that the project involved building a facility normally considered an asset - a public library:

The main point which emerges ... is that more comprehensive or higher budgeted impact statements are not what is needed. The failure of the Kennedy Library EIS was not in its lack of detail, but in its use as a political tool for project justification ... To build credibility and faith with the public, future impact assessment efforts must represent the values and concerns of all groups involved. (Francis, 1975, p.398).

3.9 Chapter Summary

There are a number of concerns regarding the type of indicators to use in a livability or quality of life index. Principally, these involve making basic choices about the indicator or index itself - its intended purpose, scope and scale, the types of indicators which would most effectively be used, and the levels and effectiveness of public involvement. These are important questions to consider prior to the establishment of an index. It must also be remembered that perfect solutions might not exist for all of the potential problems. The decision must be made whether an imperfect but useful index is preferable to none at all. While we must be cognizant of the theoretical and practical difficulties, the benefits must also be recognized. At some point, we must simply plunge in and start. Recognizing that there are different scales of indexes with different scopes and types of indicators will alleviate many of the problems. Learning from existing examples of indexes will also help in producing a workable process.
4.0 Examples of Indexes in Planning

4.1 Rationale and Methodology

There are many examples of indexes, albeit unclearly defined, designed to measure quality of life / livability. A literature search, in conjunction with select interviews, revealed that the number of existing indexes and their methodologies for design and implementation are virtually endless. This chapter will briefly outline the main characteristics of some of the more interesting ones, and will highlight specific issues.

Indexes examined include ones designed to measure livability at the global, regional, city, and community levels; indexes which use objective indicators and ones which use subjective indicators; and approaches taken in three specific locations - Toronto, Seattle, and Greater Vancouver. The examples raised important issues and have elements which could ultimately be incorporated into indexes designed to measure levels of sustainability in the Lower Mainland of British Columbia.

4.2 Livability Ranking Indicators

Perhaps the most widely publicized indicators are those which purport to "rank" cities on some aspect or on overall livability. "Toronto Most Livable City, Survey Finds" (Toronto Star, 1990), "Montreal Tops List of Most Livable Cities" (Globe and Mail, 1990) and "Calgary #1 in Canada for Livability" (Calgary Herald, 1990) are examples of stories resulting from such quality of life
measures. The Toronto Star index was developed and conducted by the paper itself, while the Globe and Mail index was conducted by the Population Crisis Committee (PCC) in Washington, D.C. Both use entirely objective criteria (although the Star article does not state all of its indicators), and neither discuss how the decision was made to choose these particular indicators as measures of overall livability. In both cases, the selection of indicators seems arbitrary and based on the availability of existing data rather than on suitability. A full listing of indicators used in indexes discussed in this section is given in Appendix A.

There is surprisingly little overlap in the indicators used - only murder rates and air quality appear in both. A main reason for this discrepancy is their difference in scope. The PCC index was designed to measure 100 very different cities around the world, while the Star survey measured eight similar cities in the U.S. and Canada. This raises the concern over the adaptability and universal applicability of indexes. While there may be many structural similarities between Toronto and Montreal, there are many important local differences in decision-making, perceptions, and urban landscape which a universal index would ignore. Obviously, there are even fewer similarities between Toronto and Atlanta, and fewer still between Calgary and Calcutta. While there are a number of general broad concerns which must be evaluated for all cities - effectiveness of transportation systems, health care, employment rates, for example - how these would be interpreted and measured, and their relative importance to the city's residents
would vary greatly. Indexes, it must be remembered, are always biased by the values and lifestyles of the people who devise them:

The interesting thing about these attempts to rank cities in terms of preference is that ... they often reveal more about the people making the judgments than they do about the places being judged. (Friedman, 1989, p.259).

Biases would be increasingly noticeable as an index is applied to more diverse cities.

One of the most widely publicized indexes is the Boyer and Savageau *Places Rated Almanac: Your Guide to Finding the Best Places to Live in America*, with the 1989 edition the most recent. It places Seattle at the top of the American metropolitan area livability heap and Pine Bluff, Arkansas at the bottom. The authors claim to rate and rank 330 metropolitan areas on 9 factors which, in their opinion, greatly influence the quality of place - cost of living, job outlook, crime, health care, transportation, education, the arts, recreation, and climate. Within each category, they studied numerical data on a number of different criteria, but, as with other ranking systems, with no explanation as to why these data or subject groupings were chosen over others.

The authors justify their study by asserting that existing state-wide quality of life studies tend to hide local realities. While this is undoubtedly the truth, they themselves use metropolitan areas as large as Los Angeles and ignore the differences in quality of life between, for example, Watts and Beverly Hills. They also, incidentally, have a decidedly "suburban" bias, describing inner cities as old, troubled, and
depressed, while extolling the virtues of new suburbs with their
sleek new malls, office parks, factories and choice neighbourhcods
(p.2). Moreover, the study makes no attempt to measure perceptions
of quality of life.

The index is easily disaggregated in order to measure rankings
under all nine groupings of indicators, but the basic purpose is
to arrive at an over-all, comparative ranking. Myers (1987)
soundly criticizes indexes such as Boyer and Savageau's because
subjective data is neglected; indicator selection and weighting is
biased but presented in the guise of objectivity; comparative data
is rarely available; and scant attention is paid to unique local
features. Myers goes on to state that:

The fundamental weakness is that emphasis on comparisons
among many places leads to a focus on a few available,
common denominators, ignoring unique local attractions
and ignoring residents' perceptions of quality of life.
Without close attention to how residents perceive their
community's quality of life, we may not come close to

Therefore, while it is an impressive list of easily understood
facts and figures, and may be of some limited use to an individual
with the choice of moving to either Seattle or Pine Bluff, there
are problems with its value judgments, scale of study, and choice
of indicators.

Two of the more comprehensive sets of indicators found were
the Artibise Livability Index for Regional Planning (1990) and the
Findlay, et al, Quality of Life in British Cities (1988) indexes
(see Appendix A for a listing of indicators).
The Artibise index is intended to serve primarily as an initial tool for discussion, but it does provide ten index categories using some 44 indicators for measuring livability at a regional scale. The categories are ranked with equal weighting (each category out of 100) for a point total of 1,000. The composition of an actual index for a region would be based on pre-determined regional policy goals and ultimately used to assist in augmenting public understanding of the planning process, in allocating resources, and measuring progress and the relative success of policies. All of the indicators suggested could be measured objectively, with the possible exception of "quality of urban design/form" and "views." It should be noted that this index was designed to be used as part of a larger planning procedure; it is a tool to assist in decision-making within a framework with explicit goals and objectives. It should also be noted that the index does not attempt to measure perceived quality of life, but instead measures the factors affecting quality of life.

The Findlay et al Quality of Life in British Cities Index (1988a & 1988b) takes a somewhat different approach. Although the authors felt that "in a specific cultural context, there are sufficient elements of quality of life held in common by the population for the concept to be useful" (Findlay et al, 1988a, p.96), they found little agreement in the literature regarding the selection of indicators for use. To address this problem, the authors conducted a national opinion survey in which people were asked to "rate dimensions of quality of life in terms of their
degree of importance in influencing their choice of where to live" (1988a, p.98). The people for whom the quality of life index was being conducted chose the indicators themselves. The authors then devised surrogate variables to measure the chosen dimensions of quality of life - a form of "objectifying" subjective input. They were also able to use the opinion survey to devise weightings for different variables. Finally, the data was collated into a ranking list of 38 British cities (Edinburgh came out on top). It is interesting to note that they found that economic conditions were not as important in the survey as previously expected. Only one of the top ten variables, cost of living, is a strictly economic one. Had a survey to measure people's perceptions not been conducted, it appears that economic matters would have played a much more important role in the index. The survey also made it possible to gauge the importance of different variables for different groups of people. Although it makes use of objective indicators, it also uses dimensions and weightings chosen by the intended respondents, so it does not fall victim to all of Myers criticisms of comparative ranking indexes. It would be interesting to apply the Boyer and Savageau index to the cities studied by Findlay to see what the differences in outcome would be.

These sets of indicators highlight many of the problems which a livability index must address, such as the determination of variables to use, making the index comparable to other indexes, and the question of scope. There are similarities - all use entirely or substantively objective indicators for measurement and all take
a regional or city wide approach to scale. There is some consensus on the choice of categories for study: indicators measuring air and water quality; transportation; housing; health; economy; education; recreation; safety; and employment appear in at least three of the four indexes. However, only the Artibise Index makes any mention of using indexes in decision-making programs to improve the livability of the area.

4.3 WHO Health for All Indicators

In this document (WHO, 1981), the World Health Organization compiled a list of indicators designed to measure progress towards achieving health objectives. These indicators are grouped into the following four main categories: "health policy indicators, social and economic indicators, indicators of the provision of health care, and indicators of health status, including quality of life" (p.7).

Of special interest is that this index attempts to input the disparities between highest and lowest (the internal range) levels of variables. This is often of greater concern than a national average, as this indicates the level of equity. Since equity is often cited as a necessary aspect of sustainability and livability, a procedure such as this is a necessary inclusion into any index designed to measure them.

For the most part, WHO indicators are all objective. There are some indicators under the Health Policy heading which appear to require more subjective measurement - "political committment"
and "community involvement," for example. The authors do not, however, detail how to combine these potentially subjective measurements into an otherwise objective index.

4.4 Subjective Indexes

The indexes discussed previously use entirely, or nearly so, objective indicators in measuring livability. They focus on providing information on environmental conditions - physical, social, economic - which contribute to the orderly and responsible working of a city. This data, in turn, will lead to more effective decision-making and an improved quality of life for all. They have also all taken a broad scale approach, using city, region, or nation wide data.

Many other indexes use entirely subjectively based information in the formation of a quality of life index. Data is usually derived from a lengthy questionnaire or interview. This information can be used to measure the response of citizens to a number of pre-determined quality of life indicators, but often the information is first used to ascertain the most significant indicators themselves, and the relative importance of each.

Many subjectively derived indexes are designed to measure perceptions of personal well-being; they centre largely on the individual's own internal ability to cope with environmental stress. While these are obviously important studies, they, and the information they produce, generally fall outside the scope of planners. They can, in fact, provide information which is counter-
productive to community planning (Myers, 1988) by focussing attention away from issues which planners and decision-makers can influence.

Other indexes using subjective indicators are designed to measure perceptions of community satisfaction - how well people believe the locale provides the means for them to achieve a better quality of life. A well designed set of indicators providing this information would be of great value in the planning process designed to foster sustainable ideals. It would assist in assessing levels of community satisfaction, the success of both regional and community goal achievement, and degree of inequity of contentment within the region. It would also help in the understanding of what different locales, in fact, perceive themselves as being, and could foster constructive interaction both within and among communities. Four studies were singled out to examine their methods, their results, and their relevance to a sustainable planning process.

Two of the studies took a relatively general approach. Flanagan (1978) asked some 6,500 people only two questions:

What did you do or what happened that was [especially] satisfying to you?
What did you want to do or have that you could not do or have? (Flanagan, 1978, p.138)

These questions led to the development of a set of 15 critical incidents (see Appendix B.1) that included the responses of virtually all 6,500 participants. Flanagan was then able to measure the importance of these 15 variables by asking another group of people to rate their importance to their quality of life.
A general approach such as this led to some variables which are very individual in nature (health; having and rearing children, for example). Most, however, relate to how the individual reacts with the community / neighbours.

The study conducted by Bubolz, et al (1980) used an interview of one to four hours in length involving both specific and open-ended questions regarding individual quality of life and community satisfaction perceptions. This led to a scale of 21 life concerns (Appendix B.2), some of which related to individual quality of life and others to community quality of life. They found that people who were generally satisfied with their personal overall quality of life (POQL) were also satisfied with their community:

The fact that community satisfaction and POQL were highly correlated lends support to the significance of the near environment in evaluation of quality of life. This environment, physical as well as sociocultural and human behavioral, provides the basis for satisfaction of important needs and wants and for meaningful interactions with significant others. (Bubolz et al, 1980, p.129).

They also found that the correlation between POQL and national government satisfaction was much lower. Finally, in spite of their own lengthy study, they agreed with Andrews & Withey (1976) that a small number of concerns spread over a limited range can, in fact, accurately predict perceptions of well-being.

A study conducted by Widgery (1982) supports the view that community satisfaction indicators and city or region-wide ones can be very different. This study used a 240 item questionnaire designed to measure:

- satisfaction with aspects of community life;
- degree of knowledge of the locale;
optimism about the future of the neighbourhood and the city;
perceived power to influence community institutions;
motivation to help solve neighbourhood problems;
commitment to the community;
degree of activity in the neighbourhood and city;
degree of affiliation and membership in local organizations;
amount of support for civic institutions;
trust and confidence in community institutions;
opinions regarding life in the neighbourhood and the city;
identification of neighbourhood and city-wide problems;
and
demographic data.

Widgery found that the variables which were the most important predictors of satisfaction with the city were: government and political systems; satisfaction with family and friends; satisfaction with aesthetics; age and years in community; and degree of optimism. Less important, but significant, were: climate; race relations; and degree of affiliation and membership in organizations. On the other hand, they found that the variables which were significant predictors of satisfaction with the neighbourhood were: satisfaction with neighbours; satisfaction with the home; satisfaction with aesthetics; government and community services; and security. Only one - aesthetics - appears on both lists.

The list of items for measuring satisfaction is also important. It centres very much on the potential for the individual to interact and meaningfully affect the social nature of the neighbourhood. For example, it does not measure the number of community organizations, but does attempt to measure levels of involvement.
Bardo & Hughey (1982) support this approach, stating that:

The individual sense of satisfaction with the community ... is a consequence of the community's adequacy at meeting his or her needs and desires. ... [M]anifestations of needs and desires are socially defined and reified through culture, subculture, learning, socialization, and interactions with significant others. Conceptions of community are thus learned, shared, and modified with time and concomitant changes in expectations. (p.152).

Thus, if we are trying to foster a new, more sustainable way of living, a change in perceptions will be most immediate to people at the local level. Even though many of the problems are regional in scope, they will be "brought home" to people at the community level.

Hughey and Bardo's method of study was to ask a 54 point questionnaire to residents of two medium sized towns. Responses were analyzed to reveal eight factors which were related to community satisfaction:

- degree of alienation;
- hominess and belonging;
- political and other institutional responsibility;
- levels of excitement/dullness;
- peacefulness and courtesy;
- quality of the physical environment;
- individual/parental responsibilities; and
- peer criticisms.

The usefulness of these results, however, is minimized, as they do not define what they mean by "community." It seems to refer to the city as a whole, but this is not made clear. Of importance, however, is their finding that, despite general participant comprehension of the community satisfaction concept, the domain and the structure of the concept varied significantly cross-culturally.
In summary, these studies demonstrate the difference between community and city/regional perceptions of quality of life. They illustrate that a sense of belonging to, interaction with, and control over the immediate environment is central to the question of community quality of life. This implies that, especially at the local level, the nature of the process is as important as the results themselves. For it to be successful, the procedure must incorporate the needs and energies of citizens.

4.5 Toronto

The next two sections of this report will discuss recent initiatives launched by two other cities in North America - Toronto and Seattle. Both cities are seen as having a high level of livability, and both are planning to ensure that this remains the case. This report, however, will not present an exhaustive examination of all initiatives by these two cities. Rather, it will examine two programs related to the achievement of a more sustainable city.

The Greater Toronto Area Urban Structure Concepts Study (1990) is a program designed by the Greater Toronto Co-ordinating Committee to examine the implications of different methods of growth management in the area. Specifically, it examines, in considerable detail, three general urban structure concepts:

. Spread - continuation of the existing patterns in urban growth;
. Central - an intensification of development occurring within the central, already built-up parts of the Greater Toronto Area (GTA);
. Nodal - growth occurring primarily in and directly around existing communities in a compact form; a compromise between Spread and Central.
The purpose of the study is mainly to examine the monetary costs of these three options, leading to more informed planning and decision-making regarding land use and development practices. In addition, the study compares the implications of the three concepts against sustainability and livability goals and objectives for the area. These basic urban objectives include:

- efficient, pleasant, diverse urban ambience;
- continued opportunity for economic growth;
- efficient, reliable, convenient, and environmentally benign transportation;
- cost-effective hard services;
- environmental quality maintenance - green space, water resources, natural areas;
- effectiveness / efficiency of human resources; and
- positive impacts on adjacent hinterlands.

The Committee developed a set of 8 criteria with 42 variables (indicators) against which to measure each option. A five point scale is used, and all of the indicators are worded such that higher is better. These indicators are listed in Appendix C.

There are many interesting aspects to this study. It points out the value of indicators in planning, especially in examining the implications of various alternatives. It also points out the value of congregating indicators into categories and an overall index to better measure systematic ramifications of various choices. The indicators, however, are not being used to make decisions or to define objectives. The objectives against which the indicators are compared were set in advance. The information supplied in the index provides information about options, but does not decide between them. Therefore, the index has been placed within the planning context, and its purpose clearly stated.
The index also raises some questions. Primarily, the report does not detail exactly who is involved at different stages. It appears to be largely "expert" controlled with little public input. Public input in the choice of indicators and in the assignment of rankings, possibly using a technique similar to that employed by Findlay et al (1988), would be desirable, but it could be argued that at this scale and for this information-provision purpose, a system in which groups of experts make judgement calls using both quantitative and qualitative input is not unreasonable.

What is to be done with this information is of greater concern. If it is to be used by these same experts to lay out a planning policy for Greater Toronto with no public input, then this process is little better than the present one. If the information is to be used to provide planners, politicians, and the public with greater access to understandable information so that they might, together, work towards sustainable development, then the process has value indeed.

Finally, the report raises the question of adding individual indicator ratings into a cumulative, overall assessment. This index does not have one, because of an overlap in many of the measures and because of a lack of weighting of each measure. Each indicator is given equal priority, even though they are not of equal importance. Presumably, this was done to make the index easier and faster to initiate, and because the assignment of weights would be a procedure too value-laden for the experts to consider. Of course, the assignment of ranking, and, in fact, the
choice of indicators is equally value-laden. This omission, which the authors of the study admit, does limit the usefulness of the final results.

4.6 Seattle

In late 1990, the Seattle Environmental Priorities Project (SEPP) was initiated by the City of Seattle Office for Long Range Planning. Its purpose is:

- to develop an integrated environmental action plan for the City that will highlight the City's environmental priorities and lays out holistic, workable strategies for action. (Seattle, 1991, p.vii).

Specifically, SEPP identified five key issues:

- the need for improved cohesion and co-ordination among federal, state, and local environmental agencies;
- the need to set clear environmental priorities in light of budgetary constraints;
- a concern about growth in the region and its impact on the environment;
- the need to adjust to changing environmental challenges - a need for new thinking; and
- a concern about the City's increasing role in implementing and paying for environmental protection.

A four step methodology has been identified in the development and implementation of the SEPP. Step one involves the identification, analysis, and comparison of environmental risks and opportunities. A strong technical foundation will be established to assist in priority setting and strategic development. Towards this end, a 30 member Technical Advisory Committee (TAC) was established by the mayor. The first task of the TAC was to identify the environmental issues to be evaluated and compared. Unlike other techniques which seek to identify what the general
problems are, "the TAC focuses primarily on major sources of environmental degradation so that their work would help policymakers target action most effectively" (p.ix). They identified eleven issues in the category of Air Issues; thirteen issues in the category of Water Issues; six in the category of Land Issues; and nine in the category of Cross-Media (mainly hazardous waste) Issues - a total of 39 issues in four categories (see Appendix D for a complete listing). Each issue was then rated high to low against three questions:

. What is the relative magnitude of the problem in terms of the risk it poses to human health, the environment, and to quality of life?

. What is the degree of need for action on the problem, given the risks it poses and the adequacy of present efforts to reduce the risks? and

. What is the City's ability to solve this problem?

Many points were considered in assessing the relative risks of issues. Issues with widespread human exposure and ones which resulted in irreversible consequences were given higher rankings. Issues over which the City had little or no control, ones being addressed by other studies, and global issues were not considered at all. Despite this project-orientation, and the omission of important issues, the TAC feels that it is important to recognize the interconnections of risks when creating solutions:

Failure to recognize these relationships can lead to actions that merely shift risks from one location or time frame to another, rather than meaningfully and permanently reducing them. (p.xiii).

The TAC also recognized that risks are not always equally distributed across the city or among socio-economic groups, that
the quality and quantity of accessible information is generally limited, and that there are probable discrepancies between how citizens and environmental professionals perceive risks. One of the purposes of the project, it is felt, is to highlight these difficulties so that solutions might be found.

Finally, the TAC took the risk assessments for each issue and formed an Overall Priority for Action Ranking, combining relative risk, the need for further action, and the ability of the City to exert influence. All of this information - the ranking, prioritization, and the background environmental data - is to be passed on to the Policy Advisory Committee (PAC), a forty member panel composed of experts, decision-makers, planners, and civic leaders. They will initiate Step Two - the identification of action priorities. This will be based on the information from the TAC, but will also include broad-based dialogue amongst themselves and, presumably, other environmental decision-makers and community leaders. They will select a manageable number of environmental action priorities - a feasible list of issues. At present, the SEPP is somewhere between Steps One and Two. Later, in Step Three, the PAC will develop an environmental action plan including integrated strategies and responses to the priority issues identified in Step Two. This is to include the evaluation of the many roles that the City itself can play - as leader, as educator, as advocate, as regulator, and as catalyst. The final step of the process is implementation.
This is a very interesting study for a number of reasons. First, this is a procedure in which the objective is to ACT rather than one designed to simply provide information for some unspecified later use. Second, the strategy uses, it seems, entirely expert input and has little if any capacity for widespread public involvement or input. Considering how closely the approach is tied to political priorization and decision-making, this seems surprising. It might be expected that public participation will be given more of a chance in later stages, but it will be interesting to gauge levels of commitment by the public to what could be fairly major lifestyle change recommendations. In addition, the "regional inventory" phase which most studies say is necessary is more or less skipped over. In fact, much of this information is considered in the choice and ranking of issues, and perhaps this information is already easily accessible in Seattle.

There is, however, another citizen group in Seattle called Sustainable Seattle which has, as its initial task, the formation of a set of indicators which will measure the area's sustainability. An interview with Richard Conlin of the Task force on Indicators revealed that they will use mainly objective measurements, and will attempt to use existing data whenever possible. They hope to have a preliminary set of indicators ready for early 1992, with a final set ready within a year after that date. It will possibly include an overall ranking, but its main purposes are to generate a small set of composite measurements on the state of sustainability, to provide a detailed set of
indicators for each composite measurement, and to generate a system by which this information is regularly given to the public at large.

The difference in tactics regarding indicators between SEPP and Sustainable Seattle appears to be largely due to intended purpose. SEPP is highly action oriented, while Sustainable Seattle sees itself in an educational role, providing information to the public and to decision-makers that will clarify and promote sustainable practices. SEPP runs the risk of making decisions based on partial or incomplete information, a risk heightened by the fact that the TAC is not examining all issues which could be relevant to the problems being examined. On the other hand, they are correct to feel that the time for action is NOW; that there is much information out there, and it is not being used to any constructive purpose. Perhaps the two groups will eventually work together, each filling a niche for which it is well suited.

4.7 G.V.R.D.

Documented use of terms such as livability and quality of life by the G.V.R.D. dates back to at least 1971 with a report entitled Livability Indicators prepared for the Greater Vancouver Regional District (GVRD) by Norman Pearson. Subsequent reports, plans, and proposals, such as the 1972 Report on Livability, the 1975 planning document The Livable Region 1976-1986, the 1981 Plan for the Lower Mainland of British Columbia, and the recent Choosing Our Future series, are rife with references to livability and quality of life.
They do not, however, adequately explain how and by what means these terms have been defined. As early as 1976, Cherniak laments that

"...livability became a concept more defined by the implicit assumptions and activities of the Livable Region Plan, and apparently less by any process of structured thought. (Cherniak, 1976, p.24)."

In terms of livability indexes, there is little mention in any early GVRD documents. The 1975 plan does note the lack of overall regional planning and effective monitoring of land use (p.11) and calls for a description of what living conditions are expected to resemble under rapid urban growth conditions, but there is little discussion regarding how these studies are to be conducted and used. The 1981 plan (p.13) calls for a cooperative strategy to "enhance the region's quality of life and protect its natural environment", but while the development of the strategy itself is subject to evaluation, the recommendations do not include any form of inventory, index, or evaluation mechanisms. Recommended policies are put forward to help us improve the quality of life of the region without any real discussion of what that desired quality of life is.

The most recent document is the 1990 Creating Our Future - Steps to a More Livable Region report. Public consultation and the preparation of a number of background reports by committees of experts and consultants were instrumental in the production of this series of reports. The report stresses that Lower Mainland residents will have to make choices, define values, and generate appropriate action if we want to maintain a livable region, but the
report is short on ways for this to happen. One of the 54 recommended steps is, in fact, an index. Step number 10 recommends that we:

Develop an index incorporating air and water quality measures to provide a benchmark against which to evaluate the effectiveness of actions with January 1, 1991 as the benchmark. (GVRD, 1990, p.9).

They do not, however, translate the need for ecological monitoring to other issues. There is no related call to monitor overall quality of life. For the most part, the report recommends further consultation and information gathering and recommends areas in which other jurisdictions can act.

This lack of direct action is not surprising, given the lack of an effective jurisdictional base at the regional level. In British Columbia, land use planning powers have been delegated by the provincial government to the municipal / town / village / City of Vancouver level, which has the power to prepare and adopt official community plans, to adopt by-laws, regulate zoning, and approve subdivision of land. The regional district level since 1983 has had no regulatory land use planning authority. Any land use planning has been done only with the voluntary co-operation of municipalities and on a non-binding basis (Reeve, 1989; Colnett, 1990). While there will obviously be concern over a regional body capable of over-ruling municipalities on development issues, a stronger jurisdictional base for regional planning is a requirement if we are to seriously address sustainability issues.
4.8 Chapter Summary

The many indexes and approaches discussed in this section underline the need for a co-ordinated planning approach in the generation of indexes for sustainability. There are no truly comprehensive regional livability indexes in practice. Nor are there any comprehensive community quality of life index programs. While there are many examples upon which to build, there are no precedents for the necessary procedure. Consequently, planners must be very conscious of the many issues which must be taken into account - issues of scope, scale, intent, and purpose which all affect the choice of indicators, and the ultimate success of the approach.

They also point out the need for:

1. effective regional authorities which can gather information, make recommendations, and act upon them; and
2. effective public input, especially at the community quality of life index level, to ensure that the index reflects their needs and concerns and to ensure that people feel involved.

Since the Regional Livability index will be logistically easier to create and implement, it would be wise to concentrate some effort at this level in the initial stages of process formation, just as both Toronto and Seattle did. In fact, elements of the indexes discussed, notably those of Findlay, Artibise, and Toronto, could form the backbone of a regional index. The community quality of life index, however, will be more difficult to define. While elements of procedures employed by other communities might be used, the index itself must be a home-grown affair, responding specifically to local concerns.
5.0 A Planning Framework for Indexes

5.1 Rationale

As we have seen in Chapters 3 and 4, there are many methodological problems with the present role of indexes in planning. Few indexes are actually utilized in planning, but the use of individual indicators is much more prevalent. For example, planning departments employ a wide variety of social indicators, traffic flow measures, and rates of land development. This information, however, is rarely placed into a broader planning context in which problems can be addressed in an integrated manner considering broad scale, long term, and secondary effects. In this chapter, indexes will be placed within a sustainable planning framework which allows for their effective utilization in decision-making and resource allocation.

As discussed in Chapter 3, many of the potential problems with using indexes in planning relate to scale of study and type of indicators. Not all indicators can adequately measure data at all scales. As scale increases, it is more difficult to measure subjective perceptions in a meaningful way. Likewise, as scale decreases, it becomes less meaningful to measure broad scale objective environmental concerns which are regional in scope.

Section 5.2 develops the idea of a Regional Livability Index. The advantages of a regional-scale, objective index designed to provide information on broad issues affecting the urban area as a whole are discussed, as are its organization, objectives, and ties
Section 5.3 comprises a similar examination of a Community Quality of Life Index using largely subjective input, plus information from the regional scale index, to ensure widespread citizen participation in and satisfaction with the strategy. Finally, a sustainable planning framework within which these indexes could efficiently operate is drafted. The many advantages, along with the possible disadvantages, to the proposed framework are discussed. A brief discussion of impediments to the implementation of the framework rounds out the chapter.

The Lower Mainland of British Columbia will be cited to provide examples or explanations of the concepts, but this framework is not designed as a blueprint for a Lower Mainland political and planning reorganization. Rather, this is a discussion of a general framework, the details of which depend on the place of implementation and the goals and aspirations of the population.

5.2 A Regional Livability Index

As discussed earlier, many environmental, ecological, and social issues require a broad scope for adequate measurement. A regionally based index with indicators assessing objectively derived variables provides the environmental data needed for a sustainable planning approach. In effect, it would provide a baseline set of regularly updated data on urban environmental conditions for use in decision making and resource allocation.
An appropriate local application for this index would encompass the Greater Vancouver, Central Fraser Valley, Fraser-Cheatam, Dewdney-Alouette, Squamish-Lillooet, and possibly the Sunshine Coast Regional Districts. This area corresponds somewhat to the "true economic" area defined by Seelig and Artibise in From Desolation to Hope (1990); however, the planning region should include the entire districts, not just the populated areas. This area could also be considered a reasonable compromise between a truly ecologically-based region, and one which is politically defined. The study area is large, but already possesses an "identity" of sorts and a common set of concerns.

An administrative organization, probably composed of members of regional and/or municipal and city governments, experts and technicians, and civic leaders would be required to oversee the formation and implementation of the index and the translation of goals and information into action. The regional district should, with public consultation, adopt a regional "mission Statement" and a "long-range strategic plan", and have the authority to address issues of regional significance (UDI, 1991, p.2). It is vital that this organization have the ability to affect decision-making at both higher and lower levels of government.

Indicators to be used in a Regional Livability Index would include those which are designed to measure the urban environment itself. Relevant indexes discussed in Chapter 3 would include the Findlay, et al Index (1988), the Artibise Index (1990), and the Greater Toronto Area Urban Structure Concepts Index (1990). Common
categories for indicators include evaluations of ecological integrity; mobility; housing availability and costs; health care; economic conditions / cost of living; employment opportunities; educational opportunities; recreational / cultural facilities; equity; safety; urban form / green space; and social systems. While there are many indicators which would be used in indexes devised for virtually any area, the exact indicators will vary with the priorities of the citizens, conditions of the place, and the availability of data.

Because much of the pertinent information is already being collected, or is at least measurable, the Regional Livability Index could be generated and implemented relatively quickly. Development could be roughly based on the following procedure:

1. Establishment of a Regional Authority to organize and administer the Index. This body would oversee and ensure public involvement and would co-ordinate the overall development and implementation of the Index. The Authority could immediately begin the task of collating basic regional environmental data which is already being collected but not organized. A transfer of some regional planning powers to this body would be required to ensure the effectiveness of the index and the achievement of regional goals.

2. Consultation with other centres, such as Toronto and Seattle, which are examining similar issues and instituting similar actions.

3. Establishment of an education process in which information on the region and on basic sustainability goals and objectives is made
available to the public. This would include use of the media, round-table discussions, and existing community organizations.

4. Determination of regional goals and objectives based on public input and sustainable criteria such as ecological integrity, equity, and self-reliance.

5. Consultation with ecological, social, and urban experts as well as the public in the final choice of indicators and their organization into some form of index. Ranking/weighting systems will also be organized in consultation with citizens.

6. Formation of the baseline data Index, the collection of data, and the development of information distribution/publicity systems.

7. Co-ordination with other organizations to ensure a flow of information to and from higher (global) and lower (community) levels of information gathering, as well as with neighbouring regions.

8. As the Index matures and information becomes more complete, information regarding the long-term sustainability of the region will be compiled. This will include assessing the region's material/energy use and waste production against the ability of the Region to support these activities, leading to a measure of self-sufficiency and self-reliance levels. This will, in turn, input into equations of global sustainability and carrying capacity.

It is vital that everyone in the Region understand why this information is being collected and how it is being utilized.
Public involvement in the collection, interpretation, and dissemination of this data would be beneficial, but the information at the very least must be both accessible to and understandable by everyone. Public involvement will also be necessary to ensure that the Index continues to consider data of relevance and importance to the region.

It is important to remember, however, that the purpose of the Index is to provide region-wide environmental data. It should not be designed to gauge the subjective perceptions of citizens. Rather, its basic environmental information will enable citizens to make more informed decisions about priorities, the allocation of resources, and the achievement of a more sustainable city.

To recap, the advantages of a Regional Livability Index in a sustainable planning agenda are many:

1. The Livability Index would be relatively easy to initiate.
2. It would have value to politicians, who want accurate information that has meaning to voters; to planners, who require accurate information to do their jobs; and to the people, who deserve accurate information.
3. It would provide a baseline set of data against which to survey change. A preliminary "state of the environment" report is vital for monitoring progress towards the achievement of goals.
4. It would provide a background set of information, available in advance of any decision making. This would be a valuable tool in the allocation of scarce resources, ensuring that effort and tax dollars are used to maximum effect.
5. It would increase equitable access to information which is understandable and as complete as possible.
6. It would be an important social learning tool, in which people learn both from the data generated and from the process of measurement.
7. It would provide a regularly updated set of data on urban environmental conditions against which to judge and monitor individual projects and proposals.
8. It would provide the means for ongoing, comprehensive monitoring of the environment.
9. It could highlight discrepancies in environmental quality, opportunities, social services, etc. within the Region.
10. It would measure and publicize information regarding the cumulative effects of gradual change. Small scale effects can go unnoticed until it is too late to easily deal with them. This would also assist in the assessment of individual projects or proposal options by more effectively inputting systemic data into their evaluation and monitoring.
11. It would provide an effective tool through which global concerns are translated into regional or community action programs. The Index would also assess the level of self-sufficiency of the Region, ultimately feeding into measures of Regional and Global carrying capacity leading to living within the ecological constraints of the biosphere.
5.3 A Community Quality of Life Index

While many issues are properly dealt with at the regional level, others are more appropriately addressed at the local level. As discussed earlier, this is the level at which citizens often have the most intimate knowledge of their environment and the greatest level of perceived influence. Here, knowledge is most effectively translated into action which might address local, regional, or even global concerns. This is also the level at which frustrations over a lack of input into or control over the planning process can lead to forms of NIMBYism and attempts to "stop the clock" and avoid change.

The choice of indicators at this smaller scale could prove to be far more difficult than for the Regional Livability Index. Some objective indicators of local environments might be required to augment information obtained from the regional index. The main rationale for local measurement, however, is to obtain the subjective interpretations of people about community quality of life and how the public prioritize options and resource allocations. A local index would also include data regarding levels of citizen knowledge of and participation in community activities, the possibilities for interaction, optimism about the future, and commitment to the community (Widgery, 1982). The actual questions would have to be developed by experts in conjunction with the citizens themselves. This will not be an easy process, or, rather, set of processes as different types of communities will require different approaches.
Organizing this information into indexes will also be problematic. Likely, the information will be gathered in ways which involve evaluating perceptions, such as asking people to rate an issue on a preference or importance scale. The information is often then presented either in percentage terms - "X% of people are satisfied with the issue", or in ratios - "the cumulative rating for issue "Y" is 3.5 on a scale of 1 to 5". Information presented in these terms is relatively easy to publicize and to compare over time.

It would also be possible to collect some of this information in ways which do not involve indicators or indexes at all. Andrews and Withey (1976) have shown that the required information can often be obtained with only a very limited set of indicators. In addition, Boothroyd & Eberle (1990) point out that many of the advantages of public involvement would be achieved to an equal or greater degree through a mechanism of free-flowing discussions. A Community Quality of Life Index, however, is only a part of the process, designed to provide more systematic measurement of subjective well-being information for planning. The index must be augmented by a much greater level of consultation and dialogue than at present. The development of indicators would, indeed, be difficult and time consuming, but it would provide a more comparable, and possibly more truly representative, set of data.

The formation of a Community Quality of Life Index, because of its difficulty and its relative lack of adequate precedent, will require the input of experts along with extensive public
consultation, and will be a more lengthy and potentially controversial procedure than that for the Regional Livability Scale. Therefore, the two will likely not be implemented at the same time (the Livability Index being developed first). It will also be even more adaptive, as communities organize and grow over time. The steps required in its production would vary with the place and the level of organization, but could include the following:

1. Identification of communities. The Regional Livability Index could, in fact, assist in this, but the definition of communities will be largely conducted through the examinations of existing political boundaries and consultation with community leaders to identify social and cultural communities.

2. Consultation between planners / experts and the community / community leaders to initiate effective communication processes. This will include the distribution of information regarding regional sustainability imperatives.

3. Development, by the community, of a statement of goals and aspirations.

4. Formulation of indicators to adequately measure both locally originated and regionally inspired concerns for which subjective information is necessary;

5. Co-ordination with regional data gathering mechanisms to ensure that regional goals are not buried beneath community wishes. Co-ordination also with other relevant communities.
6. Ongoing consultation with and information distribution to the community.

Obviously, citizen involvement is at the core. This is the level at which individual interest is turned into involvement and subsequently into action. It is important to note, however, that there must be a degree of expert input into the indicator formulation and application procedures. The purpose of this index is not just to gauge citizen quality of life perceptions, but also perceptions about specific options and priorities for allocation of resources.

In summary, the advantages of a Community Quality of Life Index, are many:
1. A Community Quality of Life Index would provide politicians with a more complete and systematic picture of the wants of various communities within their jurisdiction.
2. It would provide a baseline set of subjective information against which to measure change and with which to ensure that community and regional goals and aspirations remain current and valid.
3. It would provide an opportunity for citizens to participate pro-actively in planning issues, leading to decreased disenfranchisement and, hopefully, a reduced NIMBY problem.
4. It would improve both long range and project specific planning by incorporating local issues at an early stage.
5. It would allow a comparison over time of how citizens view their community and how they feel it changes.
6. It would provide a means through which regional concerns can be measured against local community perceptions.

7. Defining and "officially recognizing" different types of communities, especially non-geographical ones, would lead to a greater increased sense of belonging to and interaction within the community, as well as a clearer understanding of other communities' needs.

5.4 A Planning Process Framework

The combination of a Regional Livability Index and a Community Quality of Life Index will not, unfortunately, solve our problems. In fact, they are not even designed to solve problems, only to identify them and help us in prioritization and decision-making. For an index to serve as an effective planning tool, it must be incorporated into an effective planning organization designed to further the aims of sustainability. This section will present the outline of such a framework, in terms which are broad in nature, as the specifics of any framework would depend on the particular circumstances of the area in question. The framework is centred on a multi-level approach to planning which includes extensive information gathering, consultation, interactive decision-making, and monitoring. All of these steps require, or are augmented by, the Regional Livability and the Community Quality of Life Indexes described in the previous sections.
An organizational framework showing the relationships between regional and community levels is shown in Figure 1. Of particular significance is that citizens - the people for whom the system is intended to serve - are involved throughout. The entire procedure is designed to help them decide what their objectives are, what the environment offers in terms of meeting or hindering those objectives, what alternatives are available, and what course of action is best able to suit their needs.

The end result is a plan of action at both the community and regional levels. These strategies will be highly interactive, and will input data from the Indexes, and from global and neighbouring community concerns. This data will be filtered through the statements of goals and objectives to assess priorities and establish areas of concern. The course of action itself will depend on the issue at hand, and will be implemented at the appropriate level - community, city/municipality, or region.

Figure 2 shows the basic elements in the sustainable planning framework. The process is a highly interactive one, with all levels in constant consultation. It is a framework designed to rationalize the information gathering and distribution mechanisms, to make decision-making more effective and responsive to ecological constraints, and to ensure on-going, systematic monitoring. A brief description of each element follows.

Public involvement, as stated earlier, is of primary consideration. Involvement occurs throughout, and is proactive, rather than reactive in nature.
Figure 1 -
An organizational framework for the relationship between regional and community levels:

source: the author
Self-Concept statements include the drafting of both regional and community level declarations of aspirations, goals, and objectives. In many cases, this will be difficult and possibly even divisive, but it is necessary. The data measurements would be useless assessed against these goals and objectives. These statements would be broad in nature, but specific enough that they have real meaning in decision-making processes.

Measurement stage includes both the Regional Livability Index described in Section 5.2 and the Community Quality of Life Index described in Section 5.3. Environmental evaluation will ensure the provision of baseline data on the physical, social, economic, and ecological characteristics of the region. It will also provide the equally important information on public perceptions of their environment and their quality of life. Public participation at this stage would result in important educational benefits as people learn from the process of deriving data about their locale. As time progresses, this evaluation data will be used to measure progress towards sustainability, and to assess the options surrounding possible changes within the region.

The two processes together point out where there is a Need For Change. The goals and objectives describe where the region / community wants to go; the information from the evaluation will detail where change is necessary and help the people to decide which of the alternative paths available to them is likely to produce the most beneficial results. Information and stresses from outside the region -External Influences- will also be added to the
Figure 2. - Flow chart for the general decision-making framework:

equation to ensure a true representation of conditions and a consideration of global concerns.

There will be a number of Coping Mechanisms available to assist in both the definition of a need for change and in the resulting decision-making. These coping mechanisms would include the Indexes and the Goal Statements themselves, as they provide a tangible set of ground-rules and standards against which to measure any potential change. The framework also incorporates the input of informed and aware planners, politicians, and the public - there is a higher and more equitable distribution of information. The people also live with the knowledge that they have in place an effective evaluation and monitoring system, leading to greater confidence in decision-making.

The Decision-Making processes, therefore, are built right into the system and include both project-specific and generic-environmental ones. Since the "ground-rules" for the region/community are included in the self-concept statements, much of the decision-making will involve the setting of priorities among competing needs and the allocation of resources. The community must be able to:

- Identify driving forces and develop future scenarios;
- Develop alternatives for achieving sustainable community goals;
- Estimate tradeoffs among alternatives; (and)
- Implement chosen alternative and identify policy and institutional gaps. (British Round Table on the Environment, 1991, p.9).

As in the Seattle program (Section 4.6), relative risks of various, dissimilar problems must be assessed, including human health risks, ecological risks, and quality of life risks (Seattle, 1991). These
risks must then be compared against the goals and objectives, as well as against the need for action, the consequences of (in)action, and the capacity for effective action given available resources.

The result will be a plan of Action, which will include both long and short term considerations. There will be both Regional and Community Action Plans, but they would be highly interdependent. The entire strategy is designed to provide an environment in which action can effectively be taken towards addressing issues of sustainability and improving the well-being of residents without compromising the needs of neighbouring communities and future generations.

Finally, any action taken will be subject to On-going Monitoring of a systemic nature. The environment as a whole, through the two indexes, will undergo constant or periodic monitoring to ensure that actions have the desired effects, to recognize potential problems before they become unsolvable, and to measure progress towards the sustainable goals and objectives established by the residents. Information feeds back into need identification and decision-making, as well as into global standards of sustainability.

This is not intended to be a passive strategy. The indexes, to be useful, must be part of a planning framework leading to an examination of alternative courses for development or change. The indexes will not make the decisions for us, but enable easier and more knowledgeable decision-making by us.
5.5 Chapter Summary

In an urban context, the general aim of the planner is "to ensure the orderly development of urban areas for the benefit of the city's residents" (Syme, 1989, p.2). While there are a number of specific roles that a planner can assume - technician, mobilizer, mediator, or advocate (Alexander, 1986) - the practice of planning itself is

concerned with making decisions and informing actions in ways that are socially rational. ... Where planning is used, it is meant to serve a public or general purpose. (Friedmann, 1987, p.47).

Planning for sustainable development is as concerned with the process of planning as with its outcome. The role of the planner is not only to research, analyze, and synthesize information (Simonds, 1978), but also to mobilize widespread involvement in and support behind desired methods and outcomes by providing adequate dissemination of information. The role also includes mediating between the many competing interests within and between communities and the region. The planner may even be considered an active advocate of sustainable practices.

In essence, then, the planner has to assume aspects of all four of Alexander's roles. As this happens, the job becomes increasingly complex and subjective in nature. Why, then, would planners want to subject themselves to this? The short answer is that somebody must. Present practices of planning and development have not led to cities which even attempt to live within their means or provide all of the basic needs for all residents. Something is not working. Planners must be willing to look at the
basic problems, and be willing to guide society to a more sustainable way of living. In addition, society itself appears to be undergoing a value shift:

... a change in emphasis from material well-being to quality of life and the empowerment of the individual in shaping our collective future. Quality of life through empowerment of the individual ... implies incremental and ad hoc change as individuals exercise their responsibility by free association with others in building a community. (Weiler, 1992, p.35).

Planners must be willing and able to accept the new challenges implied in this. To make the job somewhat easier, the planner, as with all affected groups, requires information which is as complete and relevant as possible, as well as a framework in which initiatives towards sustainability are encouraged. The process also helps in that it involves some devolution of responsibility back to the people who are most affected by decisions.

There are, of course, many impediments to the implementation of this form of sustainable planning approach. A principle impediment is the present system itself. The existing power structure is not conducive to this type of process, and fundamental changes to the present way of doing things is required. For example, as stated earlier, there is no effective regional authority at which to implement the Livability Index. Even at the municipal level, powers are limited, are granted by the provincial government (Colnett, 1990), and have, in the past, not been taken advantage of by the municipalities to promote sustainable practices (Bailey, 1988). Planning and decision-making authorities have not been noted for adopting long-term, holistic principles (Bailey, 1988). This is because:
there has not been sufficient pressure to do so by the populations they serve;

the lack of clear, universally accepted definitions allows virtually anything to be labelled as a "sustainable proposal";

the multitude of government departments with distinct areas of responsibility tends to work against holistic, adaptive decision-making (Colnett, 1990); and

there is a lack of precedent - "policy-makers at municipal and regional levels of government have few directions to follow if they want to get on the sustainable development bandwagon" (Colnett, 1990, p.1).

Before we can expect these structural changes to occur, however, we need an entirely new mind-set, one in which people accept and, in fact, demand that sustainable principles be followed. People need to be made aware of the situation and of the possible ramifications of continuing with current practices. In this regard, an index would be invaluable in providing basic information on the state of the environment in ways which planners can utilize and people can understand.

This brings us to a second problem, the possibility that the process could be co-opted and misused. While this is a possibility, it can be minimized by ensuring informed, pro-active public involvement (and scrutiny) throughout. We also must ask ourselves how effective the existing development procedure is in involving and meeting the needs of the majority. We should learn
from the shortcomings of the present method, and use this information to devise a better one; one in which people are involved in and responsible for their community's future health.

This, in turn, leads to a third problem - do people want to take on this responsibility? The present system is basically a passive one in which people are, occasionally, allowed to participate on a reactive basis. While this, in itself, is problematic and can be frustrating to people, will they be amenable to taking on additional responsibility? A sustainable strategy is centred on the resolution and ability of people to take an active role, so for it to work, ways must be found for this to be easily and effectively accomplished. The process described will help, and it is likely that once residents get a hint of control and of success in realizing their goals that they will be even more willing to participate. However, at first, this could be a major hurdle to overcome, so an incremental approach to implementation would be appropriate. We must be willing and able to institute portions of the scheme, such as the implementation of a basic Regional Livability Index, prior to the formation of the whole package. This can lead to a snow-ball effect, making more difficult or potentially controversial aspects of the framework easier to justify and easier to take.

It is important to understand the potential problems, but it is also important to not get overly disconcerted by them. We must also remember that the need for a change is great and that the potential advantages are many:
The strategy described would lead to a much needed holistic approach to planning and the recognition of larger scale, long-term, and cumulative aspects to growth and development;

It would provide a clearer recognition of ecological constraints, social considerations, and inequities within the community;

It would provide an effective and understandable project / policy evaluation and monitoring method;

It would lead to a clear set of goals and practices, providing increased resident involvement and control;

The process recognizes the public as the end-users of regional and community planning and decision-making. At the same time, it provides planners, politicians, and other community leaders with the data which they need to make informed decisions;

It will make trade-offs, in terms of development, growth, and resource allocation, explicit and at the centre of decision-making. Everyone will better understand the implications of various proposals or practices;

The ongoing monitoring of the environment will provide an effective scanning method, leading to the identification of possible problems before they become unmanageable; and

Comparisons over time in terms of progress towards stated sustainable goals will be possible. It will also
facilitate the sharing of knowledge and, possibly, a comparison of progress between communities.
6.0 Conclusions

An index can serve many important functions in a sustainable planning procedure. Obvious benefits include the ability to measure and evaluate the state of the community and to monitor change over time. Other, less obvious, benefits, however, might be of even greater value - the ability of an index to involve citizens in the planning and decision making processes in their own communities, and the ability to more equitably share information, and therefore power, within the community.

It is important that an index, or any data gathering technique, not be allowed to simply accumulate scattered information on charts that collect dust on the shelf. There must be a stated purpose and the means to achieve that purpose, plus a planning and decision-making framework within which the data from the index is kept current, useful, and effective. Even with a good planning framework, however, there will be difficulties. The main problem is the comprehensive nature of the index itself. There will be problems with defining what the index is intended to measure and then choosing adequate indicators. Even this problem, however, has a silver lining in that the process will further community self-understanding and serve to, eventually, create meaningful dialogue and bonds among community members.

A number of the potential problems with an index-centred process would be alleviated by the use of two separate yet complementary indexes. The framework described in this thesis, in
which there is both a Community Quality of Life Index and a Regional Livability Index, would enable effective measurement of data using indicators at the scale and of the type which is most appropriate. The difference between the subjective assessment of community quality of life and the more objective measurement of regional livability is recognized, and used to help define the process itself. The framework also provides for the inclusion of ongoing input from the public and from global levels of measurement. The end result is an adaptive yet defined action plan which will address issues of local development, regional sustainability, and global carrying capacity.

Much more directed study must be conducted on issues such as the use of subjective and objective indicators and the appropriate levels for the measurement of various kinds of data. In addition, there is a need for much more research examining the relationship between the urban environment and its geographical / ecological sphere of influence - urban bioregionalism. The establishment of a measure for urban regional carrying capacity will greatly enhance our ability to achieve sustainability. This need for research, however, should not stop the process. Much of the theoretical background might only be understandable after the process is under way. In addition, the creation of a base set of data against which to measure change will be of prime concern. The sooner we get started, the more complete this base will be and the sooner we can explore the more difficult and controversial aspects to index development and sustainable planning initiation.
There are also many structural impediments to the full development of a process such as this. While the potential does exist, there is at present a lack of an effective decision-making power base at the both community and regional scales. These shifts in responsibility and accountability will undoubtedly only occur in an incremental manner.

Finally, a set of criteria by which to judge the usefulness and effectiveness of indexes must also be developed. Any index centered process must:
1. contain indicators which are relevant, measurable, understandable, and sensitive to change. They must be comprehensive without being redundant;
2. be adaptable to change. While elements of an index will undoubtedly remain over time, the index must be able to adapt to new conditions within the community, to new values, and to theoretical and methodological improvements;
3. be open, accessible, understandable, and usable by the public, politicians, and planners;
4. be holistic in nature, encompassing the wide variety of factors which influence sustainability, livability and quality of life;
5. be effective, with the ability and the authority to meaningfully affect decision-making and resource allocation; and
6. be do-able!
Appendices

Appendix A - Indicators Used in Livability Rating Scales

A.1 Population Crisis Committee Index (Globe & Mail, 1990)

This index rated 100 cities around the world to determine overall livability, with the premise that population growth leads to a decrease in livability. The Population Crisis Committee is described in the article as a research organization based in Washington, D.C.

Indicators used were:

- murder rates
- food costs
- living space
- access to clean water and to electricity
- access to a telephone
- education levels
- infant mortality
- air quality
- noise pollution
- traffic congestion.
A.2 Toronto Star Index (1990)

This index was devised for the Toronto Star and reported on June 9, 1990. It compared Toronto, Pittsburgh, Montreal, Atlanta, Boston, Dallas, Philadelphia, and Washington, D.C. These cities were chosen because they are all of similar size and nature.

The article stated only 15 of 20 indicators used. It did not state why these particular indicators were chosen, or how the data was collated and weighted. Indicators used were:

- household income
- murder rates
- number of homeless people
- commuting times
- housing prices
- suicide rates
- transit use
- transit costs
- projected job creation
- education levels
- transit crime
- people per hospital bed
- average ticket costs for rock concerts
- average ticket costs for baseball games
- air pollution levels
- plus 5 other unstated indicators.
A.3 Places Rated Almanac Index (Boyer & Savageau, 1989)

This study included 330 U.S. metropolitan areas, ranging in population from under 100,000 to over seven million people. It was devised to help people decide, given a choice, where to move to.

Indicators, grouped under 9 subheadings, were:

1. Cost of Living: household income; taxes; college tuition; food, housing, health care, and transportation costs.
3. Crime: violent and property crime rates; crime trends; drunk driving and handgun regulations; personal safety.
4. Health Care / Environment: family practitioners; medical specialists and surgeons; general hospitals; air quality; toxic dumps; acid rain; nuclear power plants.
5. Transportation: commuting times; mass transit; interstate highways; airline flights; train departures.
6. Education: college enrollment; CMSA access; K -12 schools.
7. The Arts: fine arts broadcasting; public libraries; art museums and galleries; lively arts calendars; access.
8. Recreation: restaurants; public golf courses; bowling lanes; zoos; aquariums; theme parks; auto racing; professional sports; NCAA football / basketball; coastlines and inland waterways; forests, parks and wildlife areas.
9. Climate: hot / cold months; temperature variations; heating / cooling degree days; freezing days; 0 and 90 degree days.
A.4 Artibise Livability Index (Artibise, 1990)

This index for measuring regional livability was devised to "be a tool for allocating resources, assessing the relative success of various policies, and the need for additional investment." (Artibise, 1990, p.2). It lists 10 general categories, each with a weighting of 100, and each with a number of equally weighted indicators, including:

1. Air & Water Quality: air quality; water quality
2. Mobility: cost; travel times (auto/transit); public transit; availability; public transit use; work to residence relation.
3. Housing: availability; choice; quality; affordability.
4. Health & Health Care: state of health; health care (access, cost, quality).
5. Economy: unemployment rate; job creation rate; new business creation rate; trade figures; gross regional product; diversity of economy; average income; measure of social/human capital; measure of natural capital; measure of physical capital.
6. Education: participation rates; cost; quality; variety.
7. Recreation and Cultural Facilities: variety; quality; cost; vitality; accessibility.
8. Equity and Safety: Gender, ethnic, and handicapped participation rates; crime levels, safety considerations.
9. Physical Environment: quality of urban design/form; views; quality of green space; amount of green space; noise pollution.
10. Social Systems: poverty rates; homeless rates; welfare rates; support systems.

For this index, the authors conducted a national opinion survey in Britain to determine which dimensions of quality of life to use and what weighting to give each. Surrogate indicators were developed for each of the 20 dimensions. They were then applied to 38 cities and the results weighted. Dimensions and Indicators used were (in order of weighting):

3. Health Service Provision: # of available hospital beds / population;
   # of general practitioners / head of population
   ratio of elderly day centre places / population over 65.
4. Pollution: concentration of SO\textsubscript{2} in the air;
   % total area of spoilt or derelict land.
5. Regional Cost of Living: shopping basket costs;
   avg. household heating costs - electricity;
   avg water rates bill / household;
6. Shopping Facilities: Number of superstores / population;
   diversity index of higher-order outlets.
7. Social Harmony: people of ethnic origin arrested as a % of total arrests.
8. Cost of Owner Occupied Houses: avg. costs of 1 & 2 b.r. flats;
   avg. cost of 3 & 4 bedroom houses.

11. Employment Prospects: mobility index of jobs;
diversity index of employment sectors;
% change in employment levels.


13. Levels of employment: % change in unemployment;
% economically active population unemployed;
% economically active population unemployed >1 year.


15. Climate: avg. annual temperature and temperature range;
avg. # of sunshine hours; # wet days / annum.

16. Travel to Work Time: distance by rail in 1/2 hour;
length of motorway in city region / population driving;
% population walking to work;
% resident population working within the city region.

17. Access to Leisure Facilities: # social clubs / population;
# youth clubs / population <19 yrs.;
ratio of orchestras/museums/art galleries to population;
ratio of cinemas/theatres to population.

18. Quality of Council Housing: % lacking bath;
% lacking / sharing internal toilet;
% houses with only 1 or 2 rooms.


Appendix B - Subjective Community Quality of Life Indexes

B.1 Flanagan Index (1978).

Fifteen critical quality of life components distilled from the responses of 6,500 people:

A) Physical and Material Well-Being:
   1. material well-being and financial security
   2. health and personal safety

B) Relations With Other People:
   3. relations with significant others
   4. having and raising children
   5. relations with parents, siblings, and other family
   6. relations with friends

C) Social, Community, and Civic Activities:
   7. activities related to helping or encouraging other people
   8. activities related to helping local or national governments

D) Personal Development and Fulfillment:
   9. intellectual development
   10. personal understanding and planning
   11. occupation
   12. creativity and personal expressions

E) Recreation:
   13. socializing
   14. passive and observational activities
   15. active and participatory activities.

Items derived from a Degree of Satisfaction with Life Concerns study (in order of importance):

- family life
- religious faith
- food
- work
- safety
- sleep
- independence
- friends
- house of apartment
- accomplishments
- natural environment
- beauty
- clothing
- spare time activities
- transportation
- fun
- interesting life
- health
- developing self
- financial security
- national government
Appendix C - Greater Toronto Urban Structure Concepts Study

URBAN STRUCTURE:

Amenities and Diversity:
1. has a low impact on existing community character - size and density.
2. helps to provide a diversity of community sizes.
3. helps to provide community diversity in terms of the types and mix of housing, employment, human services, and recreation.

Integration and Efficiency:
4. compact development in and adjacent to established urban communities builds on and has high utilization of existing urban infrastructure and helps protect rural areas.
5. provides a high regional and local balance of people to jobs, by type, to reduce commuting distances.

ECONOMIC IMPETUS:

Economic Growth Opportunities:
6. has a low risk of land price increases, which might result from government legislation, thereby moderating the risk of price increases for housing and economic activity by maintaining a high rate of delivery of serviced land.
7. has low per capita land development costs, thereby contributing to economic efficiency.

Impact on Agriculture:
8. has low encroachment on Class 1, 2, and 3 agricultural land.

Impact on Natural Resources:
9. has low impact on forest resources in the GTA.
10. has low impact on mineral resources in the GTA.

TRANSPORTATION:

Choice of Modes and Service Levels:
11. provides high transit accessibility and level of service.
12. provides high road accessibility and level of service.
13. provides high effectiveness of external (intercity) connections and access to intercity terminals.
14. provides high accessibility for the urban population to reach rural and vacation areas.

Transportation Efficiency/Costs:
15. has low average trip times, distances and costs.
16. a high proportion of each region's work trips remain in the region.
17. has high transit efficiency and cost recovery from the fare box.
18. urban structure reduces pressures for continuing growth of road traffic congestion.
19. has reduced requirements for school busing.
20. allows more opportunity to provide transit services for mobility-handicapped persons.
21. required transpiration improvements have a low capital cost.
22. the resulting transportation system has a low operating cost.
HARD SERVICES:
Trunk Water and Sanitary Sewage Systems:
23. has low capital cost to expand trunk water and sewerage systems.
Solid Waste Management:
24. has low costs to provide and operate solid waste disposal systems.

Land Development and Redevelopment:
25. has low capital costs for land development and redevelopment and local hard services, including site preparation, water/sewer services, roads, sidewalks, street lighting and electric power utilities.

GREENING/ENVIRONMENT:

Greening:
26. has high compatibility with the regional "greenlands" concept.
27. has high available amount of passive open space.
28. has high ease of disposal of contaminated soils.
29. has high potential for cleanup of contaminated soils.

Sustainable Development:
30. has high potential for improving the quality of storm water drainage.
31. results in reduced degradation of atmospheric quality (as measured by relatively low transportation emissions).
32. has low level of transportation energy consumption.

HUMAN SERVICES:

Level of Service, Accessibility, Efficiency and Capital Costs
33. has high effectiveness/efficiency of health services.
34. has high effectiveness of education services.
35. has high effectiveness/efficiency of cultural and recreational services.
36. has high effectiveness/efficiency of social services.
37. has high effectiveness/efficiency of protection services.

EXTERNAL IMPACTS:

Nature and Extent of Impacts on Adjacent Hinterland:
38. produces low pressure for overspill urban development.
39. results in low growth of GTA-oriented road commuting traffic.

CRITERION & OVERALL INFRASTRUCTURE COSTS

Capital Costs:
40. has low overall transportation, hard services, greening/environment, and human services capital costs.
Operating Costs:
41. has low operating costs.
42. has positive human services operating cost implications.
## Team Ranking of Environmental Risks:

### AIR ISSUES:

<table>
<thead>
<tr>
<th>Issues</th>
<th>Relative Risk</th>
<th>Need For Further Action</th>
<th>City's Ability to Priority Influence</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transp'n Sources</td>
<td>high</td>
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<td>high</td>
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<tr>
<td>Wood Burning</td>
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<td>Env'tal Tobacco Smoke</td>
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<td>Other Indoor Air Poll'n</td>
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<tr>
<td>Noise Pollution</td>
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<td>Fugitive Dust</td>
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<tr>
<td>Gas Stations</td>
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<tr>
<td>Indust'l Point Sources</td>
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<tr>
<td>Centralia Power Plant</td>
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<tr>
<td>Yard Burning</td>
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<tr>
<td>Other Non-point source</td>
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### WATER ISSUES:

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<tr>
<td>Contaminated Sediments</td>
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<td>Sewer Overflows</td>
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<td>Stormwater Discharges</td>
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<tr>
<td>Indust'l Discharges</td>
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<td>Accidental Spills</td>
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<td>Boater Discharges</td>
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### LAND ISSUES:

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<td>Greenbelt/Natural Areas</td>
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<td>Open Space (Dist'n/Access)</td>
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### CROSS-MEDIA_ISSUES:

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<td>By Households</td>
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Bibliography


