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MEASURING THE SUSTAINABILITY OF NATIONS: THE GENUINE PROGRESS INDICATOR SYSTEM OF SUSTAINABLE WELL- BEING ACCOUNTS

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ABSTRACT

Current national income accounting systems and measures of progress, like the Gross Domestic Product (GDP), fail to measure the real “economic” state and real “wealth” of nations. While GDP may be an excellent measure of the cash flowing (*chrematistic*) in societies it is actually a poor “economic” measure. The word “economic” comes from the Greek *oikonomia*, meaning the stewardship or management of the household; the word “wealth” comes from the Old English meaning the condition (*th*) of well-being (*weal*).” If we are to measure genuine “economic conditions” then new tools (beyond monitoring cash flow) are required in order to achieve both the spirit of sustainable development (SD) that is to improve or sustain the conditions of well-being.

The Genuine Progress Indicator (GPI) System of Sustainable Well-being Accounts was developed by researchers at the Pembina Institute for Appropriate Development as a new tool for measuring and monitoring the “condition” of natural, social, human and produced capital of nations. The model attempts to combine the best of several models for measuring well-being and SD including: the UN’s Human Development Index, the ISEW/GPI, the World Bank’s total wealth (genuine savings) accounting, natural resource accounting models, ecological footprinting, and indices of quality of life (Miringoff’s Index for Social Health).

Applied for the first time to the province of Alberta, the Alberta GPI Accounts provide a kind of full “health and wellness” diagnosis of the province using 51 measures of Alberta’s economic, social, human health and environmental condition from 1961 to 1999. The accounts track the physical, qualitative and monetary (full costs or benefits) of total capital in an integrated total well-being accounting framework. Like the U.S. GPI, developed by Cliff Cobb for Redefining Progress (Oakland, CA), and its predecessor, the Index for Sustainable Economic Welfare (ISEW) (see Daly and Cobb, *For the Common Good*, 1989), the Alberta GPI accounts include a GPI “net sustainable income statement” which makes adjustments to the GDP for the value of unpaid work, regrettable social, human and environmental costs (expenditures), and the depreciation costs of natural capital depletion and environmental degradation.

This paper explores the GPI Well-being Accounting model, in terms of its strengths, weaknesses, and opportunities for measuring the sustainability of the real wealth of nations. The paper also explores GPI accounting as a fiscal policy tool and for guiding sustainable “development.”

KEYWORDS: Genuine Progress Indicators; Gross Domestic Product; Social, Human, and Natural Capital; Sustainable Economic Welfare.

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1. INTRODUCTION

In August of 1999 at the Third Biannual Canadian Society for Ecological Economics conference I presented the results of the U.S. GPI analysis in a paper titled “Misplaced Concreteness: Measuring Genuine Progress and the Nature of Money” (Anielski, 1999). That paper provided the theoretical foundations upon which a fully integrated set of economic, societal and environmental well-being accounts (The Genuine Progress Indicators System of Sustainable Well-being Accounts) were constructed and applied for the first time to Alberta, Canada. The Alberta GPI accounts represent a major advancement in developing a new sustainability accounting architecture that I envision would replace the current United Nations System of National Accounts. After reviewing our initial GPI accounting blueprint John Cobb Jr. (original architect of the Index for Sustainable Economic Welfare (ISEW) with Herman Daly and Clifford Cobb) remarked, “*I am amazed and delighted at the thoroughness and thoughtfulness of your work. It goes far beyond what I even dared envision when I first decided it was worthwhile to try to construct a [ISEW] indicator.*”² We feel that the application of this GPI accounting framework to Alberta provides significant hope of developing a total well-being (wealth) accounting system applicable at any societal or geographic scale.

For more than 50 years economists have been measuring the economic well-being of nations using a System of National Accounts (SNA) and a broad measure called the Gross Domestic Product (GDP). However, the SNA and GDP measure well-being through a most myopic lens; the more money changing hands for goods and services produced and sold in the market the more it is assumed our economic well-being rises. This very narrow measurement system is fundamentally flawed. First, it does accord with the letter and meaning of the words “economic” and “wealth.” Second, it fails to measure the physical realities or conditions that common sense would argue contributes to our genuine well-being – our physical, mental, spiritual health, the social cohesion of our households and communities, and the integrity of the natural environment.

Measuring the health of a nation using a measure such as the GDP is like a doctor taking the blood pressure reading of a patient as the primary indicator of good health. In the language of economics, the GDP rises (that is, the more money changing hands), is automatically assumed to be good for everyone. But is it?

How should we measure the genuine well-being of our communities and nations if not according to the monetary expressions of what we produce and consume? This is the fundamental challenge addressed in our attempt to construct an alternative accounting system (the Genuine Progress Indicator (GPI) System of Sustainable Well-being Accounts) that begins to measure the genuine physical conditions of life.

2. WHAT’S WRONG WITH GDP?

The problem with the GDP and money-based measures of progress is that they fail to measure those things that really matter in our lives. According to the GDP, the more we spend, consume and produce the more the GDP rises. Such a meter of economic progress is fundamentally flawed because it makes no distinction between production that contributes to genuine improved well-being and activities that degrade our personal, community and environmental conditions.

Robert Kennedy (1968) identified the basic flaws in the GDP and the SNA when he noted: “*It [the Gross Domestic Product or GNP] measures everything except that which makes life worthwhile*”¹--like the quality of our time spent at work, play and volunteering or the health of our bodies and the environment. Kennedy was really calling for a new system of accounting for well-being that accorded with the physical realities of our lives.

So why, after more than 50 years of the GDP, do we continue to use an outdated and counter-intuitive accounting system that seems only able to add and not subtract? How can we better measure genuine well-being and the real things that make life worthwhile?

² Based on personal email communication with John Cobb Jr. in August 2000.

Simon Kuznets, one of the early pioneers of the SNA and the GDP in the U.S. in the 1940s warned the U.S. Congress: “*The welfare of a nation can scarcely be inferred from a measurement of national income as defined (by the GDP)Goals for more growth should specify of what and for what.*”² Kuznets (1965) recommended going beyond the GDP by constructing a single “yardstick” that would more holistically account for the economic and social dimensions that currently do not enter the GDP figures and national accounts.³

Economist John Kenneth Galbraith (1999) observed that the most important “*unfinished business*” issues for economics include: the shortcomings of GNP/GDP as an economic measure; economic instability (cycles of boom and bust), and poverty and income inequality.⁴ Galbraith remarked that “*there is a major flaw in measuring the quality and achievement of life by the total of economic production – (GNP/GDP) –the total of everything we produce and everything we do for money.*” He echoes the words of Simon Kuznets, noting that measures such as GNP override and obscure deeper and more important aspects of economic life, failing to “take sufficient account of the value and enjoyment of what is produced.”

Most recently Canada’s Finance Minister Paul Martin has called for “new ideas and test[ing] of old assumptions” about how to measure economic progress (i.e. beyond GDP) that would encompass a wider range of environmental and sustainable development indicators, as well as social and human health indicators.⁵

3. THE GENESIS OF GENUINE PROGRESS INDICATORS

A new movement is taking shape in Canada and in other countries to finally address the longstanding challenges posed by Simon Kuznets. Our efforts in developing the Genuine Progress Indicator (GPI) accounting system recognize the important contribution that the SNA and GDP accounting have made toward measuring economic progress since World War II. However, we believe a new 21st Century accounting system is needed – one that moves beyond money expressions of wealth and closer to measuring “that which makes life worthwhile.”

The Alberta GPI Accounts project represents a significant first step towards such a holistic and integrated system for measuring well-being and sustainability. The project has two major parts: 1) a conceptual accounting “blueprint” for measuring sustainability and well-being, and 2) a set of accounts that reveals the physical and monetary values of human, social, natural, and produced capital or wealth. This requires a comprehensive set of “books” or accounts to track the physical conditions of genuine well-being and hence genuine progress. The GPI Accounts give citizens a “big picture” perspective on the genuine state of their well-being, in accordance with their values and life experiences. My vision and that of the Pembina Institute is that the GPI accounting system will be provide a practical tool towards achieving the vision Simon Kuznets for a comprehensive, practical and policy-relevant accounting system for measuring total well-being according to the physical realities of living.

4. REDEFINING ECONOMICS AND PROGRESS

In the art of economics it is critical to understand the origins of the language we use. The word “economy” comes from the Greek *oikonomia* meaning “the management of the household” (*oikos*). Economics should thus be concerned with the quality of the lives of families and households. Aristotle made a clear distinction between *oikonomia* and *chrematistics* -- the science of the wealth of nations, as expressed in terms of money.⁶ The word “wealth” comes from the Old-English “weal,” meaning “the condition of well-being.”

In principle, *economists* should be concerned with measuring the conditions of the well-being of the households of a community or nation as well as the conditions of the natural environment that contribute to human well-being. It may be that modern-day economics is out of touch with the physical conditions of well-being and too focused on money values.

The GPI accounting model also provides a means of truly accounting for “sustainable development” by explicitly measuring the physical conditions of all living and produced capital. GPI accounts paint an

important portrait of these conditions, both past and present, and thus are useful for asking, “what are the well-being prospects of our children and grandchildren?”

5. WHAT IS GPI ACCOUNTING?

The Genuine Progress Indicators System of Sustainable Well-being Accounting is a new blueprint for measuring and managing the total wealth of communities and nations. It was applied for the first time to the province of Alberta, Canada in the report *Sustainability Trends 2000*.

GPI accounting yields a comprehensive assessment of the total well-being of a society, its economy, and the natural environment. It considers the physical conditions of well-being that contribute to a high quality of life and a sustainable lifestyle. Raw time-series data from government, statistical agencies and other reputable sources are used to construct the accounts. These include conditions of personal health, social cohesion, intellectual capital, economic prosperity, and the sustainability of natural capital and the health of the environment.

GPI accounts are developed along the lines of traditional accounting standards and represent a synthesis of many existing measurement systems. Their innovation stems from providing a more holistic and integrated accounting of the physical, qualitative and monetary dimensions of all living and produced capital.³

6. ALTERNATIVE FRAMEWORKS FOR MEASURING WELL-BEING

Various alternative systems have been developed for measuring well-being, many of which were reviewed thoroughly in developing the GPI well-being accounting system.

The SNA and the GDP originated in the early days of World War II. In 1939, as a basis for helping Britain finance the war, John Maynard Keynes and Richard Stone began developing a national accounting system to measure activity in the British economy. About the same time, U.S. statistician and economist Simon Kuznets began a parallel development of the U.S. System of National Accounts (SNA).

Kuznets became one of the principal architects of the U.S. and United Nations SNA, which are used by virtually every nation to measure economic activity and well-being. The GDP (or GNP – gross national product) arises from the SNA; it is used to compare the economic performance of nations and is the basis for the monetary policies of the World Bank and IMF (International Monetary Fund).

Measuring the total economic activity of nations (expressed in terms of money) is useful for tracking goods and services trading in an economy and between nations or communities. But the SNA and GNP/GDP were never meant as holistic measuring instruments for tracking the physical conditions of the well-being of nations.

In the 1960s, social indicators began to emerge to measure quality of life. In the 1970s, concerns about environmental degradation led to the establishment of environment ministries, environmental research and environmental indicators and reporting. Then in 1987, the Brundtland Commission popularized the term *sustainable development*: “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.”

Sustainable development was a call for a more holistic and integrated approach to measuring and managing economic, social and environmental factors in decision-making processes. However, these two words have probably created more confusion than clear answers to how to manage now and for the sustained well-being of future generations. Part of the reason, we suggest, is that “economic growth” remains the dominant voice. Pursuit of goals for more GDP growth, more trade, competitive advantage and more monetary wealth is fundamentally at odds with the notion of sustaining or improving the conditions of living capital. In a world focused on the pursuit of monetary objectives and on measuring prosperity, is it any wonder that the words “sustainable” and “development” are problematic?

³ “Living” capital refers to people, society, and nature. “Produced” (or “manufactured”) capital refers to financial wealth and infrastructure.

After more than 13 years of debate about how to live with “sustainable development,” we still lack a conceptual and practical analytical framework for managing living and produced capital with a view to its physical conditions. This is partly because we are fixated on monetary expressions of what we falsely call “wealth.” We need a new accounting framework for managing the real physical or qualitative conditions of wealth in its original context – the conditions of well-being. Such an accounting system must be fundamentally rooted in experiential science and the physical, oral and spiritual knowledge of those things that contribute to genuine well-being and genuine qualitative “development.”

This is no easy task given the inertia of a money-based accounting system. Any system that attempts to holistically measure the physical realities of life is bound to be complex and messy since there are no common “measuring sticks” (like money) to compare one form of living capital with another. Certainly, Kuznets and Keynes must have understood the difficulty of establishing a system of accounts for measuring the true well-being of human, social, natural, produced and financial capital. It was far easier to track the money changing hands in a marketplace than to measure the genuine conditions of living.

But with the advancement of computers and a plethora of data, it is now possible to begin designing a holistic accounting system to integrate the complex factors that we know contribute to overall societal and environmental well-being. To do this right means integrating data and value systems across many disciplines and is a daunting and humbling task.

7. BENCHMARKS OF WELL-BEING MEASUREMENT

Our GPI accounting project built on the results of previous pioneering efforts to measure quality of life and sustainable development. According to economic policy think-tank Redefining Progress in San Francisco, there are now over 300 initiatives in North America involving indicators of quality of life, economic well-being, sustainable development, and government performance at the national, regional and community level.

We observed that what has been lacking to date, is a pragmatic framework that unifies and synthesizes many perspectives into a holistic, systems-based accounting framework for measuring total well-being. The GPI accounting system attempts to present such a framework within which many lay and professional perspectives on quality of life and well-being can be examined and assessed--from a physical, societal or environmental well-being perspective as well as from a financial or economic perspective. The GPI framework presented in our work was an effort to take the best of many existing frameworks while relying on existing data to construct the accounts.

In developing the GPI accounting system, we considered a number of exemplary measurement and indicator frameworks listed below. Our inventory is by no means exhaustive. What we sought was an organic process by which improvements could be made over time to the GPI framework through application, experimentation and further research. Our goal is to improve the elegance and practicality of the GPI accounting tool.

The **Alberta Government’s *Measuring Up*** government performance measurement system tracks 24 or more key performance indicators clustered according to three themes of people (human health), prosperity (economic) and preservation (environment, social) to measure the outcomes against predefined performance targets. Many of the indicators used in the Alberta GPI Accounting framework were drawn from the *Measuring Up* report as well as from other Alberta Government ministry measures, although attempts were made to create longitudinal data sets that extended back to 1961. While the Government’s choice of indicators may align with political mandates and ideologies, they do not necessarily encompass all the measures that citizens in a pluralistic society might consider important for defining well-being. A key issue in constructing a set of indicators of well-being is to engage citizens in a dialogue about what they consider important to their well-being and quality of life and then establish and align indicators with these values.

The **U.S. Genuine Progress Indicator (GPI)** and the **Index of Sustainable Economic Welfare (ISEW)**⁷ were used to construct the Alberta GPI Income statement. This allowed us to derive a net sustainable income line for assessing the full costs and benefits associated with the use of human, social, produced and

environmental capital. The ISEW first appeared in the book *For the Common Good* (1989) by Herman Daly and John Cobb Jr. and was developed by Clifford Cobb. The ISEW is an attempt to derive a sustainable economic welfare measure by:

- Starting with the GDP (gross income or expenditures),
- Then adjusting for unaccounted benefits (such as unpaid work including housework, parenting, volunteerism; the value of services from household and public infrastructure, and; the value of spending on health and education) and
- Deducting various regrettable costs or depreciation costs including social costs (such as the cost of crime and income inequality) and environmental costs (such as nonrenewable energy depletion, environmental degradation, air quality and water quality degradation, agriculture losses, loss of wetlands and old growth forest losses).

The **U.S. Genuine Progress Indicator (GPI)** was developed by Clifford Cobb for Redefining Progress, a San Francisco-based economic think-tank. It was released in 1995 as a modification of the original ISEW framework. The U.S. GPI has been updated three times since 1995, the most recent being December 2000 (see www.rprogress.org). The ISEW and GPI frameworks have been replicated by researchers in several countries including Canada (Messinger, 1997) and Australia (Hamilton, 2000).

The **Australian GPI** (Hamilton, 2000) represents a slightly modified and improved methodological version of the original U.S. GPI (the methodology of which has not been modified since 1995). It adopts some new valuation methods and includes estimates of the value of education, health spending and the cost of gambling and advertising. Many of the full cost-benefit valuation methods used in the U.S. and Australian work have been adopted and modified for the Alberta GPI Income Statement to derive a made-in-Alberta “GPI” bottom line.

The **Nova Scotia GPI** (Colman et. al. of GPI Atlantic (www.gpiatlantic.org) initiative involves the construction of roughly 20 individual genuine progress indicators to account for sustainable development in Nova Scotia. The 20 GPI accounts cover aspects of economic, social and environmental well-being. The GPI Atlantic initiative avoids indexing or aggregation of measures into a single composite index or monetary bottom line (like the U.S. and Australian GPI). However, the basic approach to measuring, in part, mimics the original U.S. GPI model whereby attempts are made to impute the full monetary benefits and costs associated with human, social and natural capital that currently contributes (or is left out of) the GDP figures. Components that are unique to the Nova Scotia GPI include time-use accounts, ecological footprint analysis and transportation accounts. The GPI Atlantic research and development of GPI accounts is vital for advancing sound and rigorous methods that can be replicated elsewhere. Colman’s work is inspirational and vast in its scope. He takes a collaborative approach, engaging many experts, researchers, national statistical agencies and other agents in constructing the accounts. Some of the methods used to develop the Alberta GPI accounts were inspired by the work of Colman and his team.

The **Dashboard of Sustainability**, developed by the International Institute for Sustainable Development (IISD), is a set of aggregates of various indicators. Each of the three broad clusters – economic, environmental and social – is represented as values or indices or dials on a “dashboard.” The concept of a dashboard of instruments for presenting sustainability indicators helped to inspire the Alberta GPI framework and the GPI Sustainability Circles.

The **Human Development Index (HDI)** developed by the United Nations Development Program, is an aggregate index of human well-being using three primary measures, all with equal weighting. These include standard of living (measured by GDP per capita and income above the poverty line), educational attainment (measured by adult literacy and years of schooling), and longevity (life expectancy). The methods used for indexing and aggregating variables with different reporting standards were used, in part, as the basis for indexing Alberta’s GPI Account variables for the construction of longitudinal trend indicators and in creating aggregate GPI Sustainability Circles and composite indices. The HDI is an important benchmark for measuring quality of life since it provides a method for combining otherwise incomparable variables of physical and economic well-being. Its key limitation is that it only comprises three variables in defining human well-being. The Alberta GPI expanded the UN HDI accounting system to some 51 variables of human, social, and environmental “development” or well-being.

The Index of Social Health (ISH), developed by Marc Mirginoff of Fordham University, is a composite index of 17 socio-economic indicators. Similar to the UN HDI, it indexes raw data and then aggregates indicators to create a composite index. Indexing involves establishing benchmarks of performance that are deemed optimal or ideal conditions of human and social well-being, then converting the raw data set to an index using a scoring system from 1 to 10. A similar approach was used in constructing the Alberta GPI composite indices for economic, social and environmental well-being. Human Resources Development Canada (1997) has also experimented with the ISH, using it to estimate provincial ISHs and a national average. The ISH framework also helped shape the **Edmonton Social Health Index** developed in 1998 by Mark Anielski for the Edmonton Social Planning Council.

As well, we acknowledge the important work of Lars Osberg and Andrew Sharpe (Centre for the Study of Living Standards) in developing the **Index of Economic Well-Being (IEWB)** for Canada, the U.S. and other OECD nations. The IEWB combines the strengths of aggregation of indicators, like the ISH, as well as drawing heavily on traditional economic variables.

The Calvert-Henderson Quality of Life Indicators⁸ were developed for the U.S. by economist Hazel Henderson and the Calvert Group (a U.S. asset management firm specializing in social responsibility investing). This represented the first national, comprehensive assessment of the quality of life indicators in the United States taking a systems approach. The Calvert-Henderson model, which uses a “pie” analogy to show the composite of quality of life indicators inspired construction of the Alberta GPI Sustainability Circles.

Statistics Canada’s System of Environmental and Resource Accounts is a system of natural capital and environmental stock, flow and monetary accounts for natural capital and environmental assets. It was the basis for developing the Alberta GPI Accounts for nonrenewable energy, forests, agriculture, fish and wildlife, air (including greenhouse gas emissions), water, parks and wilderness, toxic and landfill waste, wetlands and peatlands, carbon, and ecosystem health accounts. Original work by Anielski (1992, 1995, 1999) to construct resource accounts for forests, oil and gas, and carbon for Alberta was also used. In addition, the **World Bank’s Total Wealth of Nations (*Expanding the Measure of Wealth: Indicators of Environmentally Sustainable Development, 1997*)** -- an attempt to construct monetary measures of produced, natural and human capital -- provided a basis for constructing a total wealth accounting framework for the Alberta GPI Accounts.

The **Ecological Footprint (EF)**, developed by Mathis Wackernagel and Bill Rees (1996), is an accounting tool that calculates the productive land area required to sustain or meet the needs of current levels of consumption and assimilate the waste generated by households. Based on converting household personal consumption expenditures to resource/land-use consumption equivalent (expressed in terms of land area required to meet consumption demands) the EF is an important aggregate indicator of the effects of economic decisions on the environment. EF analysis can be compared to the natural carrying capacity (based on arable land available) of the country or region of analysis. Thus it is possible to assess whether a populace is living beyond or within the carrying capacity of the land they occupy, or whether they are living off the natural capital of other nations or regions. EF is a powerful tool for assessing the sustainability and self-reliance of a community. It can also be used for assessing material and energy flows in a trade model that considers physical realities of these flows as well as the monetary expressions of traded imports and exports. It provides a meaningful measure at the individual, household and societal level as to whether or not households are consuming materials for economic prosperity that are beyond the carrying capacity of the local and/or global ecosystems. EF estimates for 52 countries (80 percent of the world’s population) have been calculated by Wackernagel⁹ (http://www.rprogress.org/resources/nip/ef/ef_nations.html). An EF has been estimated in the Alberta GPI Accounts based on the original Wackernagel/Rees model.

The U.S. Sustainable Development Indicator Working Group’s (formally the Inter-Agency Working Group on SD Indicators, reporting to the President’s Council on Sustainable Development) developed a framework (<http://www.sdi.gov/>) that groups indicators in three categories: 1) endowments (capital or wealth, and liabilities); 2) driving forces and processes (savings/investment or dis-savings/depreciation) and 3) current outputs and results (goods and services used; value derived by satisfying wants and needs). This model is consistent with the Alberta GPI Balance Sheet framework showing “endowments” as the

stocks, capacities or condition of assets that current and future generations can draw upon to meet their needs and wants as well as liabilities as the stocks, capacities, or conditions that may impose risk or costs to the welfare of future generations. Many of the U.S. SDI output and results indicators are consistent with the Alberta GPI indicators. The U.S. SDI “driving forces” are identified as directly causing increases or decreases in endowments.

The Genuine Savings Indicator (attributed to Pearce, 1999), which calculated economic well-being by deducting consumption from the GNP/GDP (gross savings), deducting depreciation on produced assets (net savings), the net of depreciation of living capital resources, depletion of mineral resources and pollution costs and adding expenditures on education (as a measure of investment in human capital);

The Barometer of Sustainability (Prescott-Allen, 1995), which is an instrument for assessing a region’s progress toward sustainability objectives (defined by citizens) through the integration of economic, biophysical and social health indicators.

This provides just a sample of the many indicator initiatives that are underway internationally in an attempt to construct alternative systems of measuring economic well-being. Many of these initiatives share common attributes including common indicators and a common premise that GDP and national accounting systems require retrofitting.

8. THE ALBERTA GPI ALBERTA ACCOUNTS BLUEPRINT

The *Genuine Progress Indicators System of Sustainable Well-being Accounting* applied to Alberta, Canada, represent a synthesis of the strengths of the aforementioned well-being accounting systems. I believe there is no right or wrong system of accounting. Indeed, I believe that well-being accounting systems must meet the specific needs of the communities they serve aligning with citizen values of what is held in common as contributing to quality of life.

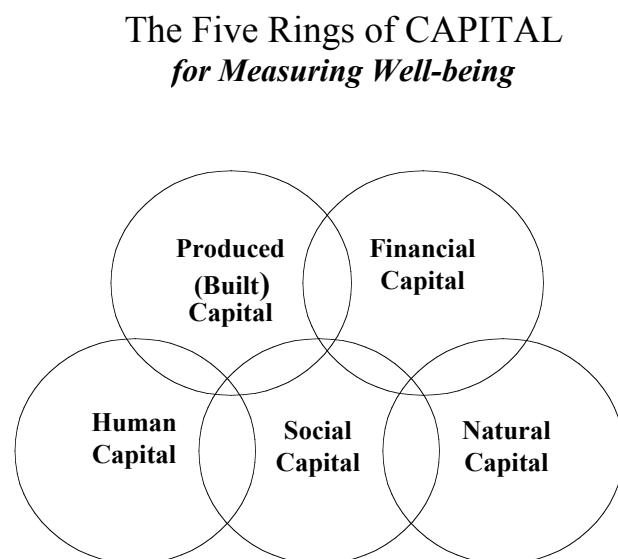
The Alberta GPI accounts represent a customized application of the GPI accounting system containing 51 subaccounts that track economic, social, human health and environmental well-being for the period 1961 to 1999. The accounts track both the physical and monetary (full costs and benefits) conditions of human, social, environmental and produced capital (including financial or credit capital) These accounts allow citizens and decision makers to examine the long-term trends, compare trends and provide a “landscape” portrait of how a society has changed in terms of the condition of the environment, people, households, communities, business, and government. The information can then be used to generate “State of Well-being” annual reports to citizens, as shareholders in total wealth or the conditions of well-being.

The total capital accounting framework in the GPI accounts is centered on the three themes of economy, society and environment, and uses traditional financial accounting structures, including:

- Ledgers (accounts);
- Balance sheet (assets, liabilities, distribution of wealth), and;
- “Net sustainable” income statement (GDP adjusted for human, social and environmental benefits and costs).

The GPI Accounts track the physical, qualitative and monetary conditions of five forms of capital: human, social, natural, produced and financial (see Figure 1). Human, social, natural and spiritual capital is collectively defined as *living capital*.

Figure 1: Human, Social, Spiritual, Natural, Produced and Financial Capital



Wealth is defined as the “condition of well-being” associated with human, social, natural, produced and financial capital. The GPI accounts integrate all forms of capital representing genuine wealth. The current GPI accounting structure assumes that all capital is equal. Of course this is debatable and requires a thoughtful discussion of the importance of one condition of well-being relative to another. Nevertheless, the GPI accounts acknowledge the interconnected nature of the conditions of well-being and that the well-being of the whole is the sum total of its parts. The evidence of substitutability and complementarity within and between classes of wealth can be revealed in the GPI accounts. For example, the GPI accounts can compare trends in economic growth (GDP) with the conditions of human health, social cohesion and the environment. The cost of continued economic growth might be revealed, for example, in declining environmental quality and natural resource stocks. Such analysis allows us to assess the impacts of pursuing one form of wealth management over another.

Human capital

Economics traditionally defines human capital in terms of:

- Health and wellness (life expectancy, disease, mental health, accidents, poverty);
- Intellectual capital (education, knowledge and skills of individuals, household and communities); and
- Time-use (paid and unpaid time use) and productivity (the utility of hours spent at labour)

Labour includes time devoted to paid work and time spent in non-market activities (housework, parenting, eldercare, volunteerism and leisure). Traditionally, economics has focused on measuring paid labour productivity (the amount of output per unit of labour input) or the efficiency of labour as an indicator of healthy economies. But human capital is more than this. Human capital should include measures of physical, mental and spiritual well-being of individuals, households and communities, using objective and subjective measures.

From the perspective of households, human capital should include an account of non-market, unpaid time use by individuals and households (the allocation of a 24-hour period to paid work, housework, parenting,

eldercare, volunteerism, leisure and sleep). In addition, human capital includes the health and wellness of individual members of a household and the well-being of the household as a unit; this notion might extend to the well-being of the community of households. The premise is that a healthy, more educated and skilled labour force will lead to a healthy economy defined as the productive and efficient use of other forms of capital. Human capital, like produced and natural capital, can deteriorate without stewardship or management of human health and intellectual capital of individuals in society and the economy. The GPI accounts consider the condition and monetary values of intellectual capital, health and wellness, and time use.

Spiritual capital

While not explicitly counted, another form of human capital is “spiritual well-being.” But how can we measure the health of the soul along with the health of the body, mind and spirit of individuals? Intuitively, spiritual well-being is as important in defining individual and collective well-being as are bodily health and material needs. Spiritual capital is rarely mentioned or explicitly measured in discussions of the wealth of nations. Perhaps it should remain unmeasured and subjective, but consultation with some religious leaders and theologians in developing the GPI accounting framework for Alberta suggests that at the very least, spiritual well-being should be considered in future accounts.

Social capital

Social capital is broadly defined in terms of the wealth or well-being of the community as a whole. This includes the cohesion and interrelationships of members of a community, both at the family and community level. There are many different approaches to measuring the social health of a community, which could include measures of the health of democracy, political systems, justice, and legal and commercial institutions. Social health can also be assessed in terms of demographics, health and wellness (public health), abuse (physical, mental, sexual), public safety (crime and violence), distribution of income and wealth, poverty, democratic participation, social services, education services, public infrastructure, indigenous community well-being, and archaeological and historical resources.

Produced capital

Produced or built capital includes the stocks of physical equipment, machinery, buildings, and infrastructure that provide service to households and the community that contribute to economic well-being. Most produced capital results from the inputs of natural capital and human capital. The benefits from produced capital included a stream of services that can be measured in monetary terms (e.g., depreciation), in physical terms (e.g., useful energy, the utility of streets, water, power, and sewage systems), and in terms of the value derived from household infrastructure (the home and appliances), automobiles, factories, equipment, public transit, hospitals, or roads and highways. Produced capital is often defined as “durables” in the national income accounts and applies to households, business and government. Historically, public assets and infrastructure have not been accounted for in terms of utility or depreciation costs.¹⁰ To a lesser extent this is also true of household infrastructure. Economists assume that the greater the size of the existing produced capital, the better off society is. However, these assets break down, deteriorate and depreciate physically and in terms of the sustained monetary value of their services. Prudent accounting would begin to measure both the physical condition and expected life of all produced capital and assigns a portion of the depreciation cost against the gross income (i.e., GDP) of a nation or community. This estimated value could then be used as the basis for budgeting to sustain, replace or improve the productive utility of produced capital.

Financial capital

Financial or credit capital (financial wealth) in the form of money or monetary equivalents. This includes fiat currency,⁴ debt-based money instruments (loans, mortgages, bonds), financial savings and investments by households, business and government. All financial capital is created through human institutions (banks, governments) as a medium of exchange between other forms of capital. As such, modern money and money creation (primarily in the form of debt) have little or no relationship with living capital. This presents a controversial conundrum at the very centre of accounting for genuine well-being. If money is an artificial creation and is not explicitly linked to real wealth, then how should we “value” things if not in terms of money? This process of making more money may in fact be eroding the integrity of human, social

⁴ “Fiat” is from Latin, “let it be done.” Fiat currency is paper money that has been authorized as legal tender by government decree, but cannot be exchanged for its value in ordinary coin.

and natural capital upon which genuine economic well-being depends. Traditional stewardship of financial capital involves investing a portion of financial income gained from other forms of capital into a financial stock that will yield a future monetary stream of benefits. Moreover, the process of debt repayment by households, government and business effectively constrains their capacity to pursue genuine well-being objectives. The same can be said for household, farm, student and business debts. However, genuine well-being ultimately depends on sustaining or improving the conditions of living capital. Because a debt-based money system is committed to making money from money and repaying debts, which were fiat from the start, presents a unique accounting challenge. How should we reconcile physical accounting of living capital with accounts of financial assets?

Natural capital

Natural, or “environmental,” capital refers to:

- a) Natural resources (both renewable and nonrenewable);
- b) Land; and
- c) Ecosystems (environmental systems-services).

Natural resources are the basis of the production of manufactured goods while ecosystems provide essential services such as cleaning the air and providing clean water. Ecosystem services also include the provision of productive soil, biodiversity, stable climate, protection against solar radiation and a reliable flow of renewable natural resources. Natural capital is fundamental to the sustainable well-being of societies; it provides the building blocks on which human, social and produced capital ultimately depend. Natural capital accounting is concerned with biophysical measures of the conditions of and changes in renewable resources such as forests; land and soils; air and atmospheric quality; water quality and quantity; fish and wildlife; conservation and preservation of natural habitat and ecosystems; biodiversity; and non-renewable resource stocks and flows such as oil, gas, coal, minerals and metals. Like produced and human capital, natural capital also depreciates in physical and market value terms, thus requiring ongoing investment in time, energy, and other resources to ensure that ecosystems continue to function productively and maintain their flows of natural capital goods and services.

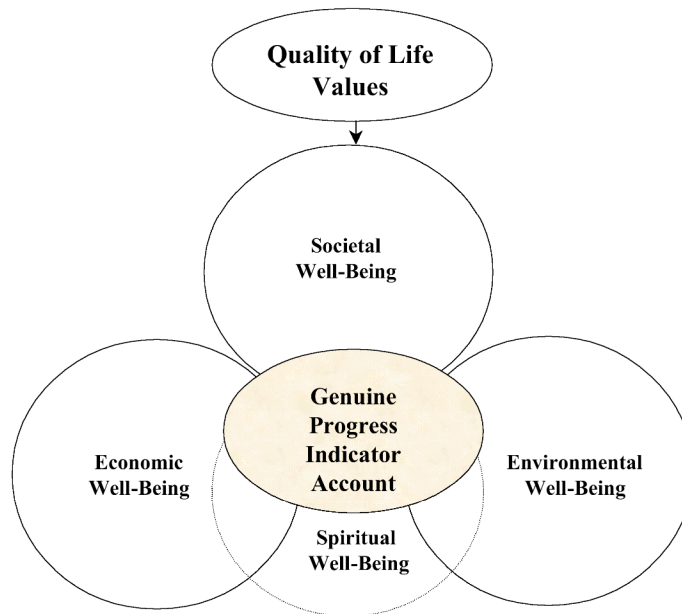
9. STARTING WITH VALUES

Values are at the heart of the quality-of-life measurement issue. Ideally, the values of the individual, households and society should determine the choice of indicators used to measure and manage for the well-being of current and future generations. If what gets measured gets our attention, what we value must ultimately drive what we choose to measure and manage. An assessment of the values of citizens in a community should fundamentally precede the development and choice of indicators (Figure 2). However, discerning societal values and measuring them consistently over time is a challenge.

Engaging citizens in a dialogue about their belief system and what defines quality of life is critical, and is often neglected in indicator and performance measurement initiatives. This can result in a disconnect between what an organization might consider important and what stakeholders and citizens consider important.

Figure 2: Values and GPI Accounts

Alberta Genuine Progress Indicators (GPI) Accounts



In the absence of a robust process, an initial step is possible where indicators are selected that intuitively align with a common set of values exhibited across many communities. This, however, should be viewed as an interim step in an ongoing process of discerning values, engaging citizens in evidence-based value discussions and measuring those things that people in community consider contribute to their genuine well-being.

Values can be solicited through surveys, focus group discussions and other public forums. These value assessments may then be used to identify the indicators that should be developed to inform citizens about the condition or state of the issues they value most. This approach is being taken by the Canterbury-Christchurch, New Zealand community where a quality of life survey is now driving the reporting on indicators directly tied to the values and issues expressed as most important to the citizens.

In Canada, Professor Matthew Mendelsohn of Queen's University has also conducted an extensive analysis of quality of life surveys of Canadians over time. His objective was to:

“Search academic and commercial surveys of Canadians that were undertaken for four types of questions: 1) how satisfied Canadians were with their “quality of life”; 2) their satisfaction with a number of elements of their lives that we deemed to be important to “quality of life” (e.g., their personal health); 3) their satisfaction with how the system was performing on a number of elements we deemed to be important to “quality of life” (e.g., the health care system); and 4) what things they thought were important to a good quality of life.”¹¹

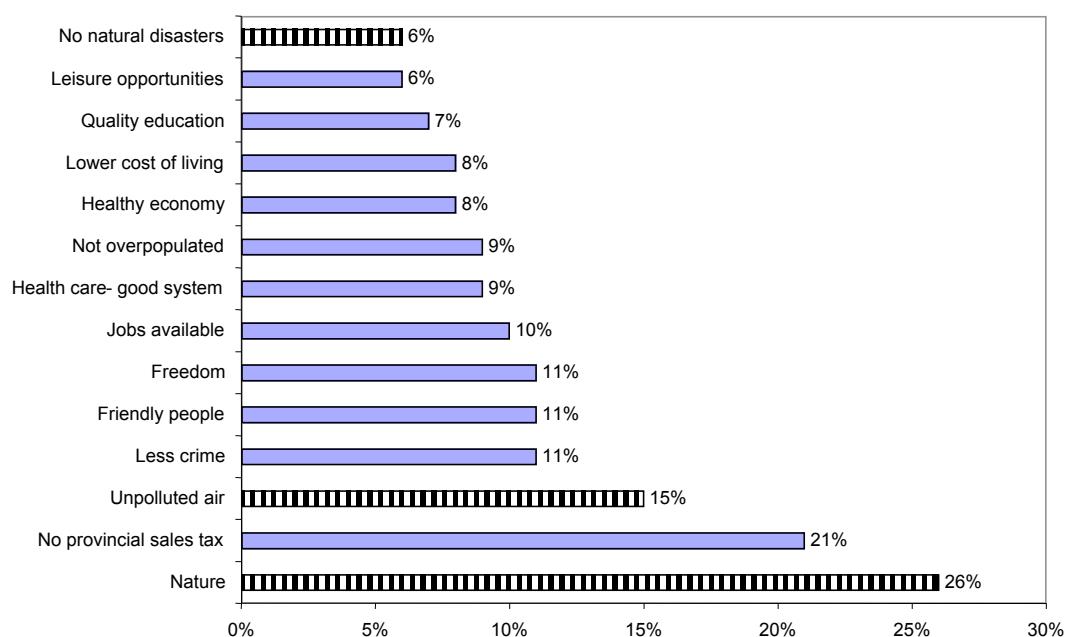
Mendelsohn concludes:

“There is surprisingly little tracking data on Canadians’ quality of life. This is a major shortfall if one is interested in assessing changes in Canadians’ quality of life over time...Canadians’ perceptions of their quality of life do not change dramatically over short periods of time, yet long-time series data are not available. It is therefore crucial to create an index that is replicated every year so that the research community can identify real changes in Canadians’ perception of their quality of life.”

In the case of the Alberta GPI accounts, no longitudinal values data set from opinion polls was available to guide us on the choice and weighting of indicators. Recent opinion polls might be applicable to more recent GPI accounts but it is not appropriate to apply them to historical accounts.

A poll conducted in 1997 for the Alberta Growth Summit found amongst the issues most important to Albertans, natural “capital” and environmental quality ranked high (Figure 3):

Figure 3: What Albertans Value Most (1997)



Source: Alberta Growth Summit, 1997, survey of what Albertans value most

The importance of the natural environment (profile in striped bars) is evident from these results, with 26 percent reporting “nature” as most important, followed by 15 percent reporting “unpolluted air” and 6 percent naming “no natural disasters.”

The Canadian Centre for Policy Research (CPRN), headed by economist Judith Maxwell, is convinced that the correct approach to quality of life measurement is to engage citizens in a dialogue about quality of life and values. The CRPN has examined the values of Canadians to “find out what Canadians regard as the essentials of a high quality of life” and “to create an experimental set of national indicators that reflect what citizens want or value, to test them and, eventually, to contribute to the development of national quality of life indicators that can be used to chart Canada’s progress on the things that matter to Canadians.” The process and the indicators that citizens identify as meaningful may provide an important tool for developing a values weighting system within GPI Accounting systems. Comparing values with the current and historical state of conditions in the well-being of the nation or province or community will provide important insights for citizens, policy makers and elected officials.

The CPRN survey, based on in-depth interviews with 350 Canadians identified by the top 9 issues of importance as well as indicators that are meaningful to citizens (Table 1). CPRN suggests that economic growth and prosperity don’t even register with Canadians as factors they value when assessing the quality of their lives. “Canadians don’t value a well performing economy in and of itself,” said CPRN’s Karen Jackson. “We value it because of its impact, such as providing a living wage. People want to earn enough to pay their bills and provide for their families.”¹²

Table 1: Indicators for Quality of Life Issues in Canada Suggested by Citizens

	Theme	Citizen Suggested Indicators
1	Political rights and general values	<ul style="list-style-type: none"> • Civic involvement or democratic participation • Personal responsibility • Equality of opportunity • Extent of long-term planning • Racist or discriminatory attitudes
2	Health	<ul style="list-style-type: none"> • Illness rates/higher health rates • Access (e.g., health care facilities and professionals) • Natural/alternative health care interventions • Coverage (e.g., drugs, dental care) • Life expectancy rates
3	Education	<ul style="list-style-type: none"> • High school completion rates • Accessibility and affordability of post-secondary education • Public education funding levels • Teacher-student ratios • School violence rates
4	Environment	<ul style="list-style-type: none"> • Increased recycling levels • Ozone layer restoration and/or acid rain levels • Local sustainability indicators • Increased neighborhood cleanliness • Access to and protection of green space
5	Social programs/conditions	<ul style="list-style-type: none"> • Supports for single parents • Employment training programs • Housing accessibility and affordability • Daycare accessibility and affordability • Social assistance rates
6	Personal well-being	<ul style="list-style-type: none"> • Financial security • Stress levels • Availability of leisure time • Self-esteem or self-satisfaction measures • Drug/alcohol abuse rates
7	Community and religion	<ul style="list-style-type: none"> • Volunteer participation rates • Church membership • Poverty and homelessness rates • Social cohesion (e.g., interaction rates with neighbours) • Degree of segregation or cultural isolation
8	Economy and employment	<ul style="list-style-type: none"> • Employment rate/unemployment rate • Income above living wage • Economic growth rates • GDP less credit card debt • Small business supports and investment
9	Government	<ul style="list-style-type: none"> • Voter participation rates • Equitable taxation rates • Access to government legislators • Levels of public trust in government (accountability) • Government waste or inefficiency • Measures of responsiveness

(Source: Canadian Policy Research Network www.cprm.org)

The results of this work are important for future GPI Accounting initiatives at the provincial or national level since Canadian values can now be aligned with meaningful measures or indicators of quality of life and sustainability that will resonate with Canadians. So often, performance measures chosen by governments or derived by experts fail to capture the attention of citizens because they do not provide information that tells citizens about what is most important to them.

The importance ascribed to some of these issues might provide guidance in terms of weighting the GPI accounts, though we feel that a more comprehensive values and quality of life survey is necessary to provide a justifiable scoring system.

10. SYSTEM OF SUSTAINABLE WELL-BEING ACCOUNTS:

The GPI accounting system is best represented as an integration of physical and monetary measures of human, social, environmental and economic well-being as shown in Figure 4 and Table 2.⁵

Figure 4: Genuine Progress Indicator (GPI) System of Well-Being Accounts

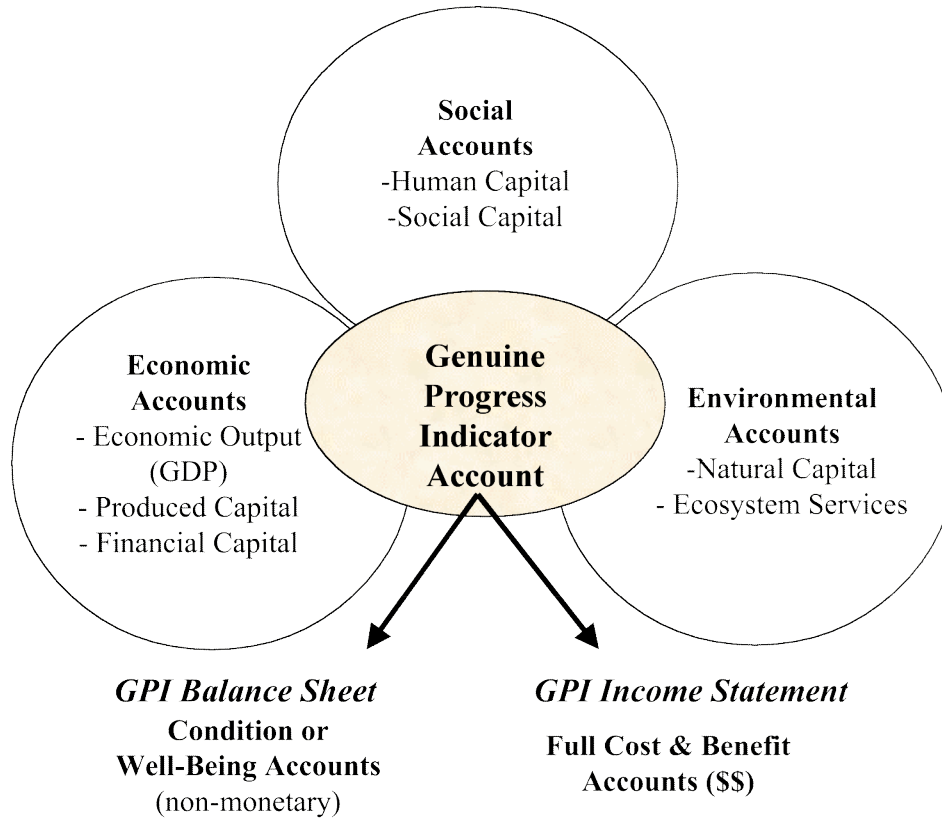


Table 4 shows an example of a prototype GPI Account, which was applied, for the most part, to the province of Alberta, Canada. There are numerous ways of constructing such accounts depending on how a community or society defines well-being. The accounts developed for Alberta are only a first step towards a more complete accounting system that aligns with the values of citizens.

⁵ The Pembina Institute will release more detailed methodological reports for each Genuine Progress Indicator in the coming months.

Table 2: The Genuine Progress Indicators Accounts⁶

Economic Accounts	Economy	GDP (gross domestic product) and its components Trade balance: exports less imports of goods and services
	Livelihood	Disposable income Personal consumption expenditures Debt (household, government, business, farm, student) and net worth Savings (households, government) Employment, unemployment, underemployment
	Produced Capital - Infrastructure	Household infrastructure Public infrastructure
	Transportation	Private, public and commercial transportation (commuting)
Social-Human Health Accounts	Human Capital	<u>Time Use Accounts</u> Paid work Unemployment Unpaid work-time Unpaid housework, parenting and eldercare Volunteerism Leisure time Commuting time
		<u>Health and Wellness</u> Life expectancy (and self-rated health) Premature mortality and disease Suicide (mental health) Obesity (diet) Auto crashes Infant mortality and low birth-weight babies Substance abuse (drugs, alcohol, tobacco) Problem Gambling
	Knowledge Capital	Educational attainment, knowledge and skills
	Social Capital	Poverty Income and wealth inequality (and distribution) Crime and violence Family breakdown (divorce) Democracy
Environmental Accounts	Ecological Footprint Analysis	Ecological Footprint (EF) accounts (food, energy, clothing, transportation) Material and energy flow analysis (MEFA)
	Natural Capital	Non-renewable energy resources and use (oil, gas, coal) Renewable energy capacity (wind, solar, hydro) Minerals Forest sustainability Wetlands and peatlands Agriculture sustainability (soil productivity) Carbon budget Fish and wildlife Parks and wilderness
	Ecosystem Services Accounts	Ecosystem integrity Air quality Greenhouse Gas (GHG) emissions and ozone depleting chemicals Water quality and flow (surface and ground water) Noise pollution Hazardous waste Landfill waste

Other key components of the GPI accounts are a balance sheet and a net sustainable income statement.

⁶ A detailed description of each of the GPI accounts can be found in *The GPI Blueprint: The Genuine Progress Indicator (GPI) Sustainable Well-Being Accounting System* at www.pembina.org

GPI Balance Sheet: This is a compilation of the GPI accounts using a traditional balance sheet framework that shows the annual total well-being or condition of assets, liabilities and distribution of wealth (owner's equity) of a society (see Section 4.3.2). These categories are subdivided into human, social, natural and economic capital. A series of indicators that can be expressed in physical, qualitative and monetary terms is used to construct the balance sheet.

GPI Net Sustainable Income Statement: This is a national or provincial income statement that differs fundamentally from the GDP in that it subtracts from gross output or income (i.e., the GDP) the human, social, and environmental costs (including natural capital depreciation) that contributed to the annual gross income or GDP. It also recognizes the positive contributions of unpaid work, such as volunteering, child care and housework that lie outside the market yet contribute to well-being. Finally, it recognizes that not all expenditures in the economy represent positive contributions to well-being; some things like automobile crashes, environmental disasters, and suicide should be treated as costs, not revenues as they currently are in national income accounts and the GDP.

11. THE GPI ACCOUNTS (LEDGERS)

The GPI accounts include:

- Physical inventory or data of stocks and flows (quantitative or qualitative) of all forms of capital;
- Monetary accounts (full costs and benefits) of all capital stocks and flows, where monetary (market) values are relevant;
- Genuine Progress Indicators (GPIs) derived from either the physical inventory or monetary data in the total capital accounts (ledgers).

Fifty-one indicators (GPIs) were used to construct the Alberta GPI accounts (see Table 3). The choice of these 51 GPIs was based on the Alberta Government's *Measuring Up* performance measures, the U.N.'s Human Development Index, the World Bank's Total Wealth accounts, and the Index for Social Health (Miringoff and Miringoff, 1999).

Table 3: The Alberta GPI Indicators for Economic, Social-Personal and Environmental for Well-being

GPI Economic Well-Being Indicators	GPI Social-Human Well-Being Indicators	GPI Environmental Well-Being Indicators
<ul style="list-style-type: none"> • Economic growth • Economic diversity • Trade • Disposable income • Weekly wage rate • Personal expenditures • Transportation expenditures • Taxes • Savings rate • Household debt • Public infrastructure • Household infrastructure 	<ul style="list-style-type: none"> • Poverty • Income distribution • Unemployment • Underemployment • Paid work time • Household work • Parenting and eldercare • Free time • Volunteerism • Commuting time • Life expectancy • Premature mortality • Infant mortality • Obesity • Suicide • Drug use • Auto crashes • Divorce • Crime • Problem gambling • Voter participation • Educational attainment 	<ul style="list-style-type: none"> • Oil and gas reserve life • Oilsands reserve life • Energy use intensity • Agriculture sustainability • Timber sustainability • Forest fragmentation • Fish and wildlife • Parks and wilderness • Wetland • Peatland • Water quality • Air quality related emissions • Greenhouse gas emissions • Carbon budget deficit • Hazardous waste • Landfill waste • Ecological footprint

Time-series data were drawn primarily from existing statistical sources including Statistics Canada, the Alberta Government and other sources. The study covers the period from 1961 to 1999, providing a longitudinal portrait of Alberta's progress on well-being over the past 40 years.

There is no right or wrong suite of measures in a GPI accounting system. The 51 indicators were chosen to illustrate the utility of the GPI accounting system and the capacity to construct such indicators, as well as composite indices, of well-being in a holistic, systems framework. Clearly, the selection process will undoubtedly result in a bias as to what is considered important to well-being. We acknowledge these shortcomings, which are inherent in most measurement exercises. Ultimately, the choice of measures should be defined through a citizen-based process of identifying and discussing the commonly-held values and vision for well-being. This would have been the first-choice approach for constructing the Alberta GPI accounts, however, time and resources did not allow for this option.

The GPI Balance Sheet (Capital Condition Statement)

Using the information contained in the GPI Account ledgers, a GPI balance sheet (see Table 4) can be constructed showing the current and historical physical conditions of human, social, economic, environmental, financial and produced capital. The GPI Balance Sheet attempts to identify capital in terms of assets, liabilities and the ownership of capital. This is challenging since distinguishing between assets and liabilities as they relate to current and intergenerational well-being is a value laden judgment.

It is nevertheless important for society to identify assets and potential liabilities in this fashion. Potential liabilities (human, social, financial, environmental) may impose future constraints of societal well-being and sustainability. As well, growing inequity in terms of financial wealth and the ownership of land and natural capital can also lead to problems of social cohesion. Because nations and communities generally do not construct such balance sheets, developing the first prototype is a challenge. The Alberta GPI project simply provided a prototype model of a GPI Balance Sheet with an attempt to show the total condition of all capital by converting raw data on the conditions of capital into an index for each of the 51 GPIs. This process is described in more detail in the next section.

Table 4: GPI Balance Sheet Prototype

ASSETS	LIABILITIES
<p>Natural Capital</p> <p style="margin-left: 20px;">Renewable Resources</p> <hr style="margin-left: 20px;"/> <p style="margin-left: 20px;">Agricultural Land Wilderness and Parks Forests Fish and Wildlife Water Air</p> <p style="margin-left: 20px;">Non-renewable Resources</p> <hr style="margin-left: 20px;"/> <p style="margin-left: 20px;">Oil, Gas Coal</p> <p style="margin-left: 20px;">Minerals</p> <p style="margin-left: 20px;">Ecosystem Services</p> <p>Human Capital</p> <p style="margin-left: 20px;">Health Intellectual Capital Time (longevity) Spirituality and Hope</p> <p>Social Capital</p> <p style="margin-left: 20px;">Social Cohesion Democracy</p> <p>Produced/Physical Capital</p> <p style="margin-left: 20px;">Household Infrastructure and Real Estate Business Infrastructure - Fixed Capital Public Infrastructure</p> <p>Financial</p> <p style="margin-left: 20px;">Savings (Heritage Savings & Trust Fund)</p>	<p>Environmental</p> <p style="margin-left: 20px;">Ecological Footprint Industrial Footprint Toxic Waste GHG and Carbon Emissions</p> <p>Human-Social</p> <p style="margin-left: 20px;">Income-Wealth Inequality Stress Suicide Autocrashes Disease Unhealthy Lifestyles (Obesity, Gambling, Substance Abuse)</p> <p>Produced Capital</p> <p style="margin-left: 20px;">Infrastructure Liabilities</p> <p>Financial</p> <p style="margin-left: 20px;">Debt</p> <hr/> <p>NET WORTH/OWNERS EQUITY</p> <p style="margin-left: 20px;">Distribution of Wealth and Power</p>

12. CREATING GPI INDICES AND REPORTS

One of the important features of GPI accounting is the ability to create indices. Any indexing system can be used to normalize a raw data set of multiple indicators, allowing otherwise incomparable indicators to be compared. Indexing also allows for the aggregation of multiple indicators to create composite indices, such as we have done with the Alberta GPI well-being index.

This indexing system is based on various methodological benchmarks including the UN Human Development Index, the Index for Social Health (Miringoff and Miringoff, 1999) and the Edmonton Social Health Index. In all three cases, raw data from an inventory are converted to an index using a numeric scaling process. In this process, a benchmark is chosen against which longitudinal data are then compared and converted to a numeric score on a scale (e.g., from 1 (poorest condition) to 100 (optimum condition)). This conversion of raw data to an index is generally called “normalizing the data set.”

Marc Miringoff (1999) at Fordham University demonstrated the utility of this approach in devising the Index for Social Health (ISH), which he applied to the U.S. The ISH has subsequently been applied to Canada and its provinces by Zeesman and Brink (1997). The ISH comprises 17 human health and social indicators and the conversion and indexing of a time-series of raw data to a numeric scale. With Miringoff’s system, a unique benchmark is chosen for each indicator, based on evidence of the optimal condition over a time series. For example, an indicator for life expectancy would select the longest life expectancy achieved over the time series as the benchmark. All other data points for life expectancy would then be compared with the optimum life expectancy by dividing through the actual raw data in any given time period with that benchmark. This approach to benchmarking and normalizing a data set is particularly attractive since it allows each indicator to be assessed for optimal condition in its own right.

Alternative benchmarking approaches include establishing a common year or time period then converting the raw data set in accordance with that benchmark year. For example, a common year may be selected as the benchmark starting point for normalizing a multiple-variable data set. Trends over time can thus be compared relative to a common starting point. Another approach is to adopt a predefined performance objective or target established by government or others as the benchmark against which current conditions are compared.

To demonstrate the utility of this indexing system, we chose Miringoff's approach, converting original raw data into an index. The most controversial step in the indexing process is the selection of a benchmark for each indicator, since determining what constitutes an optimal or sub optimal condition of well-being is debatable. Nevertheless, assumptions were made, using common sense and intuition about what is a good or poor condition. Clearly, the shortcoming is the problem of selection bias. For example, should a higher rate of taxation be viewed as desirable or undesirable? The answer is: it depends on your view of taxation. To some, paying more taxes is acceptable if there is a commensurate benefit in public services; to others, paying less tax is desirable. Thus indexing is coloured by the values that a society holds in common. Without a rigorous process of discerning such values we can only experiment with positing benchmarks that we regard as reasonable starting points for a discussion and future modification as values are revealed.

The Alberta GPI indices were constructed for each indicator by taking the original raw data set then normalizing the data on a scale from 1 to 100. A score of 1 would suggest poorest condition over time while a score of 100 would suggest the best condition. In benchmarking the Alberta GPI data set we concerned ourselves only with an examination of Alberta.

Ideally, we would compare Alberta's performance across all 51 indicators with that of other provinces or nations. The same benchmarking approach would apply except that the optimal well-being benchmark might be another community over the same time series. This would yield a different set of GPI indicator scores than those we derived by looking at Alberta alone.

The indices derived from raw data allow not only for the comparison of trends in other incomparable indicators of well-being but also for the creation of composite or aggregate indices composed of a family of measures. Determining the importance of individual indicators within an aggregate index is complicated by the fact that values differ among individuals.

For the sake of simplicity and in the absence of clear values for Albertans, we opted to give equal weighting to all 51 Alberta GPIs. Had we attempted to assign greater weight to one or more indicators in the data set, we would have been criticized for selection bias. We believe our approach was reasonable under the circumstances. Moreover, the GPI accounting system allows for "what if" weighting scenarios to be played out.

An example of how the indexing system works is shown using the suicide indicator in the Alberta GPI accounts (Table 5).

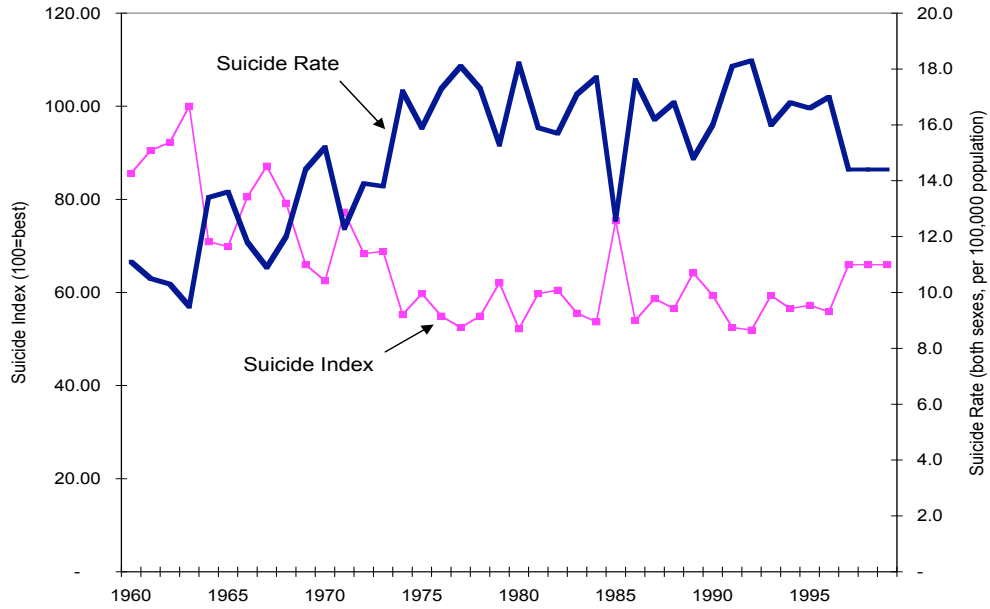
Table 5: Suicide Index

Year	Suicide Rate (raw data)	Suicide Index
	Suicide rate for both sexes per 100,000 population	Benchmark is lowest suicide rate in Alberta over study period, 1964
1961	11.1	85.59
1962	10.5	90.48
1963	10.3	92.23
1964	9.5	100.00
1965	13.4	70.90
1966	13.6	69.85
1967	11.8	80.51
1968	10.9	87.16
1969	12.0	79.17
1970	14.4	65.97
1971	15.2	62.50
1972	12.3	77.24
1973	13.9	68.35
1974	13.8	68.84
1975	17.2	55.23
1976	15.9	59.75
1977	17.3	54.91
1978	18.1	52.49
1979	17.3	54.91
1980	15.3	62.09
1981	18.2	52.20
1982	15.9	59.75
1983	15.7	60.51
1984	17.1	55.56
1985	17.7	53.67
1986	12.6	75.40
1987	17.6	53.98
1988	16.2	58.64
1989	16.8	56.55
1990	14.8	64.19
1991	16.0	59.38
1992	18.1	52.49
1993	18.3	51.91
1994	16.0	59.38
1995	16.8	56.55
1996	16.6	57.23
1997	17.0	55.88
1998	14.4	65.97
1999	14.4	65.97

In this case, the lowest rate of suicide in Alberta (9.5 per 100,000 people) was set as the benchmark for optimum condition for this indicator – the year 1964. The raw data score of 9.5 suicides per 100,000 people is normalized or converted to an index by dividing 9.5 by 9.5 and multiplying by 100. The benchmark rate of 9.5 was then divided by all subsequent annual suicide rates multiplied by 100 to yield a normalized index score.

The result is that changes or trends in the actual condition (raw data) for suicide can be seen in comparison with the index (Figure 5). This figure shows the optimal (lowest) rate of suicide as 1964.

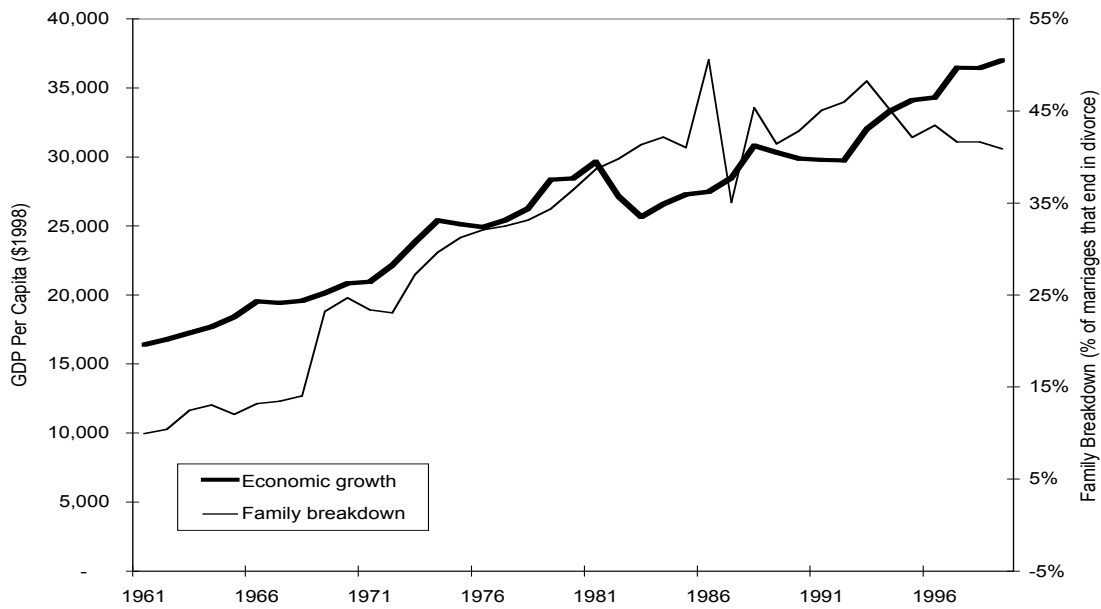
Figure 5: Alberta Suicide Index and Suicide Rates



The trends in individual or multiple indicators can be compared over time. For example, we can answer the question, “How did economic growth track suicide rates over the last 40 years?”

Another feature of the GPI accounts is that it allows users to compare various indicators against each other, in terms of raw data (see Figure 6, which compares divorce rate trends with GDP per capita) and in terms of indices.

Figure 6: Alberta GDP per capita versus Family Breakdown (Divorce Rates), 1961 to 1999



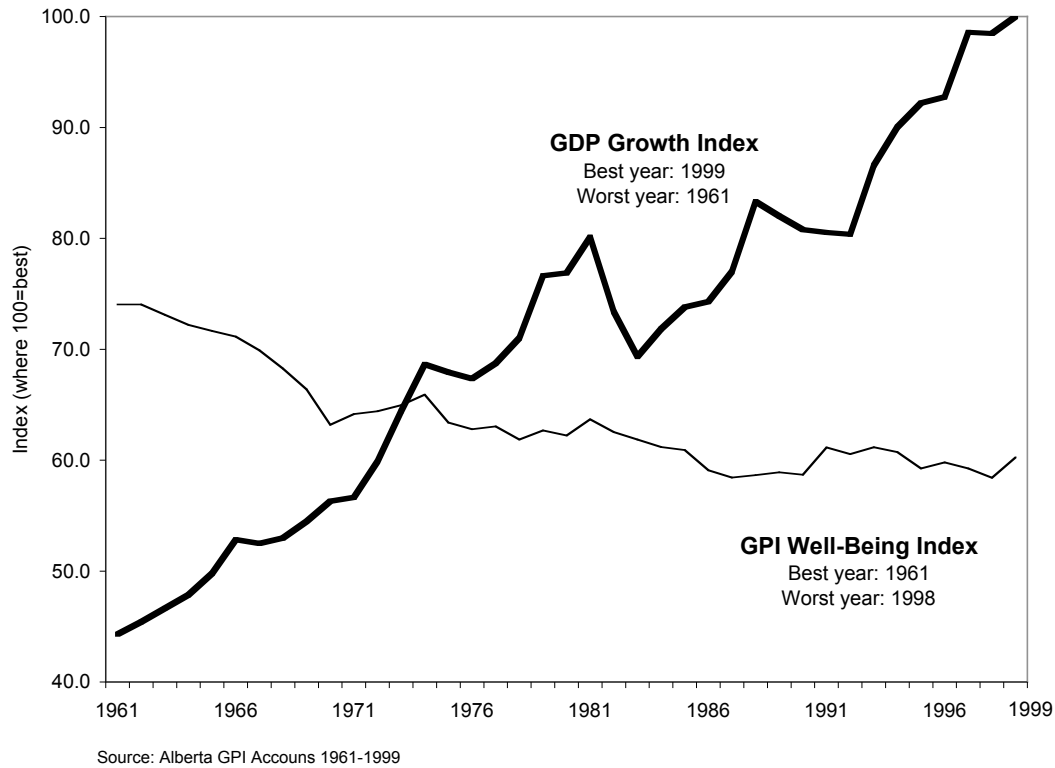
Source: Statistics Canada, CANSIM special retrieval and Alberta Economic Accounts 1999

Because indexing allows for the aggregation of one or more GPI indicators into composite indices by subject category (e.g., economy, society, environment) or as a composite GPI well-being index that uses all 51 GPIs, it enables decision makers to answer such questions as:

“If economic growth was up, how did the overall well-being of the economy, society and environment change over the same time period?”

The answer to that question might be shown as per Figure 7, comparing the GPI Index for Alberta with the GDP per capita index (based on our preliminary findings). The graph suggests that as the economy grew progressively in terms of GDP per capita, overall genuine progress or well-being was rather stagnant. We could also create separate GPI indices according to the three themes of economy, society and environment. Or we could mix and match various indicators to assess correlations and possible relationships.

Figure 7: Alberta GPI Index vs. GDP Index, 1961 to 1999

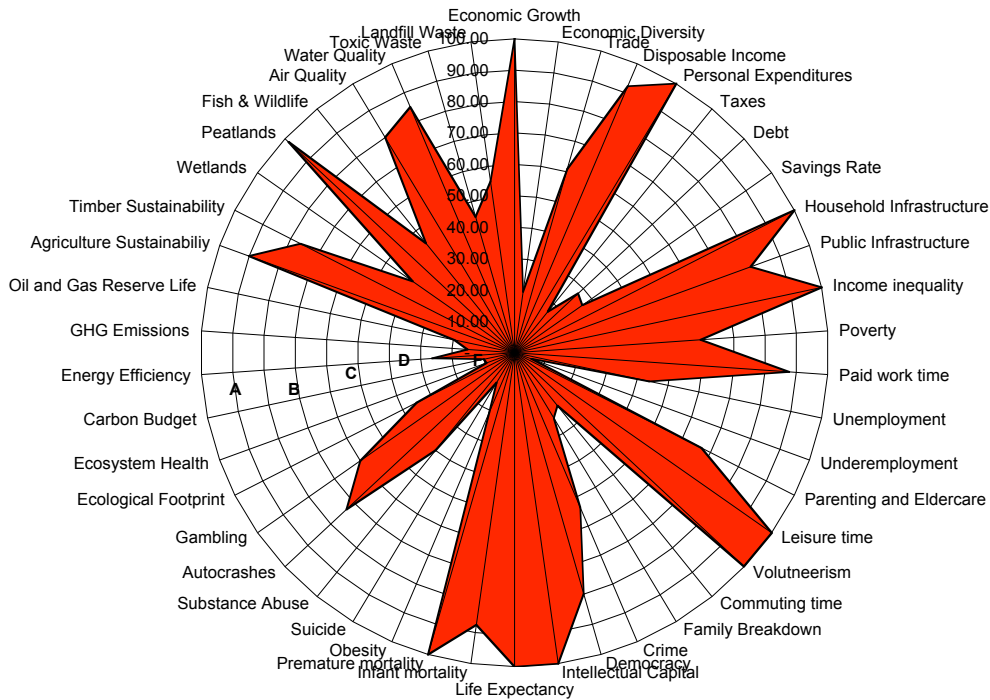


Another creative way of presenting the “condition” statement of the well-being of a society is to present an integrated picture of well-being by comparing the scores of all 50 indicators simultaneously.

Figure 8 illustrates a composite GPI Indicator Account portrait -- a kind of holistic “balance sheet” -- for the year 1999. This GPI “Sustainability Circle” is a visual image of the condition of each of the 50 indicators relative to either a benchmark year or other “best-performance” benchmark.

Those GPI indicators that reflect an optimal state of well-being would score a perfect 100 points, thus their performance would be plotted at the outer edge of the Sustainability Circle. Indicator with a less-than-perfect score would be plotted along an axis from 1 (worst performance, near the centre of the circle) to 100. A perfect GPI Sustainability Circle would be completely filled to the outer edges of the circle. This approach to showing visually the condition of all wealth or well-being in a society is a powerful tool for communicating a number of complex issues.

Figure 8: Alberta GPI Sustainability Circle Index for 1999 (example only)



Individual GPI Sustainability Circles can be constructed by year, thus identifying which year had the best performance across all GPI categories.

Among other things, the GPI Circle index shows that while economic growth has been robust, savings rates are low, taxes are high, and household debt is high. For social and human well-being conditions, life expectancy has increased, premature mortality is lower, and income is more evenly distributed.

Just as corporations and organizations measure the state or condition of their capital and depreciation costs (such as their plants and equipment), their liabilities and net worth in a balance sheet format, so too would the nation, province or local community.

Unlike financial balance sheets, the GPI Balance Sheet does not “balance” *per se*, given that the accounts are expressed largely in non-monetary terms -- that is, qualitative conditions. This is, however, not unlike a steel company or oil company reporting its inventory of steel or its economic reserves of oil and gas. Determining what constitutes a liability to the sustainability of society is also a challenge and would require considerable debate. Our Alberta GPI balance sheet is meant to provide a point for discussion and future development.

The GPI circles can also be constructed according to the three sustainability themes. Figures 9, 10 and 11 show preliminary results for the condition of the Economy, Society and Environment for the year 1999 in Alberta.

Figure 9: Economic GPI Sustainability Circle

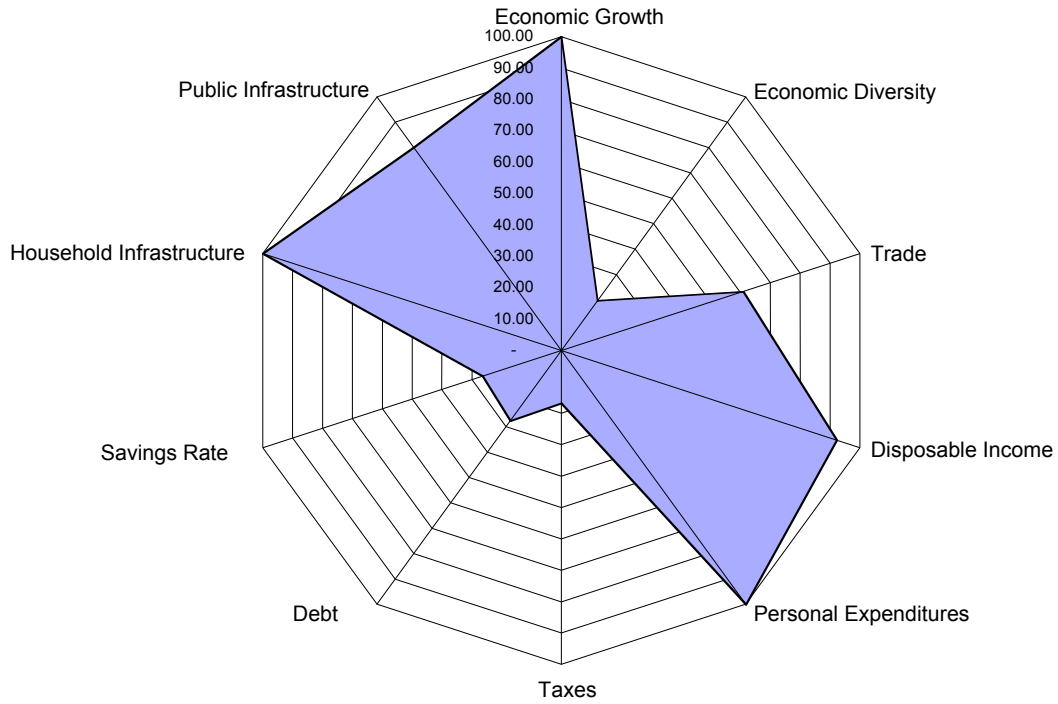


Figure 10 Social GPI Sustainability Circle

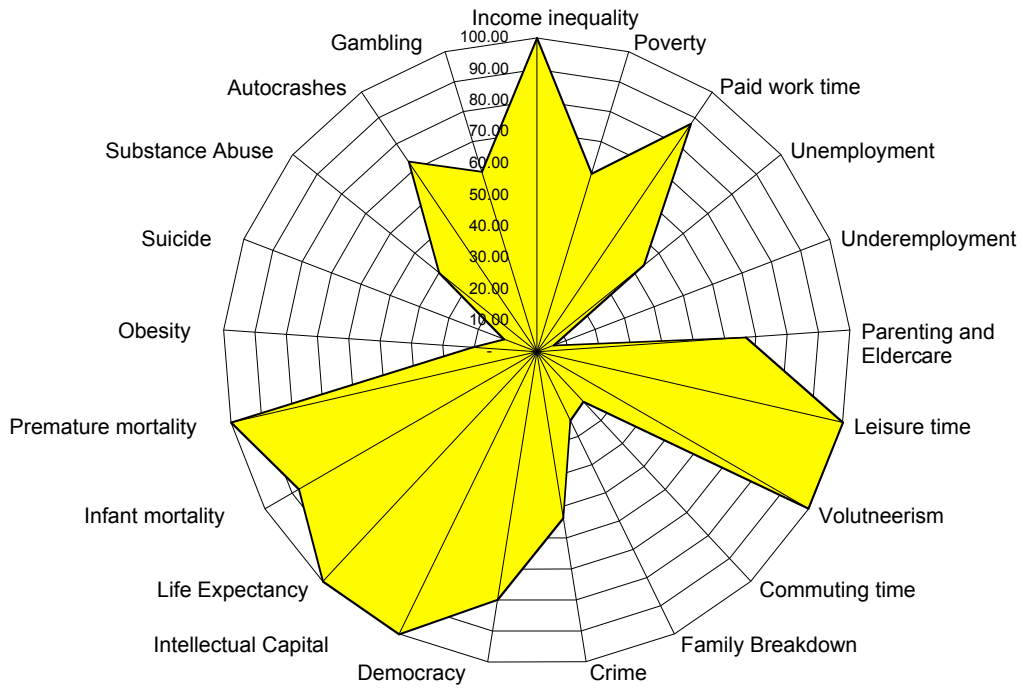
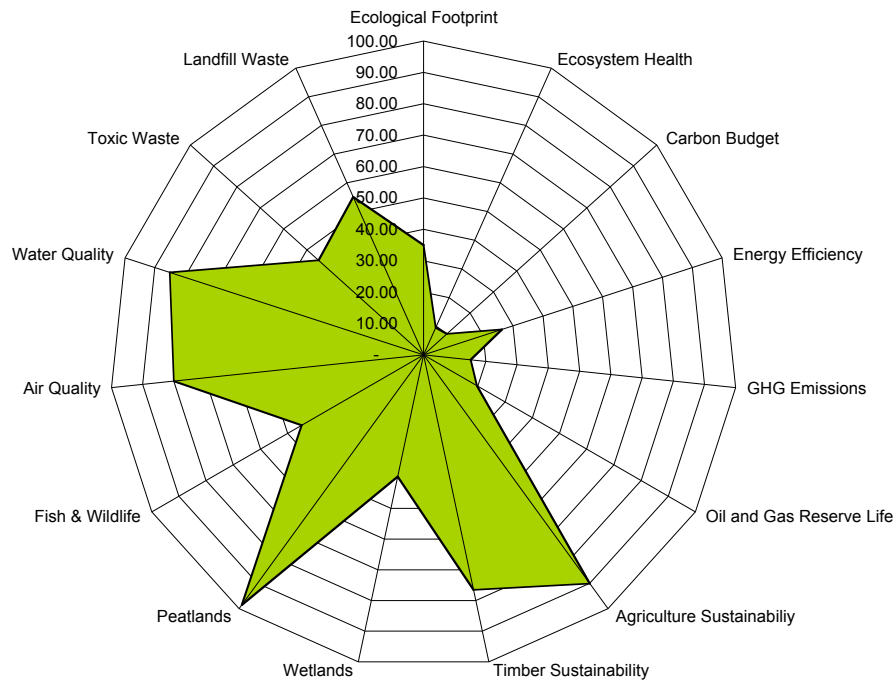






























Figure 11: Environment GPI Sustainability Circle






















Another way of presenting the evidence is in the form of a GPI report card. Table 6 shows the conditions of well-being, using the 51 GPIs, for 1999 and for the highest and lowest index years for the study period; it also shows the long-term trends of changes in conditions, using arrow symbols. The evidence contained in the GPI accounts can be used as the basis for reporting to citizens about the conditions and sustainability of their province or nation, just as corporations report to shareholders through annual performance reports. The information contained in the GPI accounts challenges us to consider how we might improve our stewardship of real wealth to ensure a sustainable future in the 21st century.








Table 6: The Alberta GPI Sustainability Condition Report Card for 1999 and Well-being trends 1961 to 1999.



ECONOMIC WELL-BEING Genuine Progress Indicators	GPI Condition Index in 1999 (100 = best) (0 = worst)	Highest Index Year / Worst Index Year*	Trend in the GPI variable 1961-1999	Description of Trend
Economic growth (real GDP per capita)	100	1999 1961*		The economy (real GDP, 1998\$) grew 400% in 40 years, representing a growth rate of 4.4% per annum or 2.2% per capita.
Economic diversity (distribution of GDP)	38	1971 1983*		Alberta's economy was more diversified in 1999 than in 1985 but less diversified than in 1971.
Trade balance (exports less imports)	61	1996 1971*		The balance of exports to imports has been variable, though slightly improved.
Real disposable income	92	1981 1961*		Higher than in the 1960s and 1970s but virtually unchanged since 1984.
Real weekly wage rate	95	1982 1964*		Real weekly wages while higher in 1999 compared to the 1960s have been stagnant since 1984.
Personal consumption expenditures	100	1999 1961*		Real spending per capita grew at 2.0% per annum.
Transportation expenditures	26	1961 1997*		Real transportation expenditures per capita are growing at 3.8% per year.
Taxes	17	1961 1999*		Average annual growth of real taxes per capita was 5.1% per annum.
Household and personal debt (per capita)	25	1961 1999*		Household and personal debt is growing at 3.8% per capita per annum.
Savings rate	26	1982 1970*		Savings rate fell to 7.5% from a high of 27% in 1982, but was higher than in 1960s
Public infrastructure (value of services)	84	1990 1964*		Value of services increased at 0.6% per annum per capita.
Household infrastructure	94	1989 1961*		Value of services from household appliances and infrastructure has been increasing at 3.3% per capita per annum.
Economic GPI Index	63	1985 1970*		Increased since 1961, but stagnant since 1981.

PERSONAL and SOCIETAL WELL-BEING Genuine Progress Indicators	GPI Condition Index in 1999 (100 = best) (0 = worst)	Highest Index Year / Worst Index Year*	Trend in the GPI variable 1961-1999	Description of Trend
Poverty (percentage living below LICO – low income cut-off)	59	1981 1992*		Rate of poverty was higher in the 1990s than the 1960s but is largely unchanged since 1981.
Income distribution	90	1989 1961*		The distribution of income is more even in the 1990s, but the gap between the earned (market) income of the rich and poor is widening.
Unemployment (rate)	44	1966 1984*		Unemployment is higher than in the 1960s and '70s but has fallen since 1993.
Underemployment	16	1966 1993*		Underemployment, while lower since 1993 is significantly higher than in the 1960s and '70s.
Paid work (time use)	52	1961 1998*		Total hours of paid work per worker have steadily declined since 1961.
Household work (time use)	89	1997 1982*		Hours spent at housework per Albertan were up only slightly in the latter part of the 1990s compared to the '60s.
Parenting and eldercare (time use)	69	1966 1986*		Albertans spend less time (60 hours less per year) with children and parents than ever before.
Free (leisure) time (time use)	100	1999 1961*		Albertans have more slightly more hours of free time (leisure) than before.
Volunteer time (time use)	100	1999 1986*		The hours spent volunteering has remained virtually unchanged at roughly 66 hours per person per year.
Commuting time (time use)	96	1961 1992*		Time spent commuting to and from work was up slightly in the 1990s compared to the '60s but is effectively unchanged
Life expectancy	100	1999 1961*		Albertans are living longer than ever.
Premature mortality	100	1999 1974*		Premature mortality (from all causes except suicide) is declining, since peaking in 1974.
Infant mortality	87	1997 1970*		Infant mortality has declined significantly since the 1960s (an improved condition)
Obesity	21	1985 1999*		Obesity and overweight conditions are rising steadily.
Suicide	66	1964 1993*		Suicide is much higher than in the 1960s, peaking in 1993 and moderating slightly since then.

PERSONAL and SOCIETAL WELL-BEING Genuine Progress Indicators	GPI Condition Index in 1999 (100 = best) (0 = worst)	Highest Index Year / Worst Index Year*	Trend in the GPI variable 1961-1999	Description of Trend
Youth drug use	39	1983 1999*		Youth drug use shows a slight increase since 1968.
Auto crashes	68	1961 1981*		Auto crashes per adult Albertan increased until about 1990 and have since declined.
Divorce and family breakdown	24	1961 1986*		The percentage of marriages that ended in divorce was higher at 41% in 1999 than in the 1960s (10%).
Crime	54	1962 1991*		The rate of crime rose steadily, peaking in 1991, and declining since then.
Problem gambling	6	1973 1999*		With access to more legalized gambling, the cost associated with problem gambling is increasing dramatically.
Voter participation	80	1967 1997*		Fewer eligible voters are casting votes in all elections than at any time in history.
Educational attainment (intellectual capital)	100	1999 1961*		More adults (54% of the adult population) had some post-secondary education in 1999 than ever before.
Societal GPI Index	67	1962 1988*		The GPI Personal and Societal Well-being Index have declined at a rate of 0.7% since 1961, though it has moderated in the latter part of the 1990s.

ENVIRONMENTAL WELL-BEING Genuine Progress Indicators	GPI Condition Index in 1999 (100 = best) (0 = worst)	Highest Index Year / Worst Index Year*	Trend in the GPI variable 1961-1999	Description of Trend
Conventional crude oil and natural gas reserve life	20	1966 1999*		Natural gas and conventional crude oil reserves continue to decline, with replacements not keeping pace with extraction.
Oilsands reserve life	79	1979 1998*		Oilsands reserves are relatively constant given that there are an estimated 300 billion barrels of economic reserves of oil that could last hundreds of years.
Energy use	44	1962 1999*		Total energy demand (intensity of use) continues to rise at a rate of 2.2% per annum, per capita, similar to the GDP per capita.
Agriculture sustainability	62	1999 1961*		The agriculture sustainability index (a composite index of yields, soil organic carbon, summer fallow, pesticide use and salinity) increased somewhat in the 1980s and '90s. However, increasing farm debt, and fertilizer and pesticide use may become problematic.
Timber sustainability	79	1994 1998*		The Timber Sustainability Index (ratio of timber growth to all timber capital depletions) continues to decline, falling below sustainable thresholds in 1998 and 1999.
Forest fragmentation	11	1961 1999*		The fragmentation of Alberta's forests (due to industrial development) has risen so dramatically since the 1960s that an estimated 90% of Alberta's vast productive forest land base is now fragmented.
Parks and wilderness	33	1999 1995*		While the area of parks and wilderness under protection has increased slightly, not all landscape types are adequately represented.
Fish and wildlife	45	1980 1999*		Caribou populations are falling; grizzly bear populations are uncertain, and sport and commercial fisheries are declining.
Wetlands	40	1961 1999*		Area of wetlands has declined at an estimated 0.6% per year since 1961.
Peatland	99	1961 1999*		The area and volume of peatland is largely unchanged.
Water quality	73	1999 1986*		Overall water quality (a composite index of pulp effluent, sewage treatment, water-related illness and river water quality) has improved. However, river water quality shows a slight decline and groundwater conditions are uncertain.

ENVIRONMENTAL WELL-BEING Genuine Progress Indicators	GPI Condition Index in 1999 (100 = best) (0 = worst)	Highest Index Year / Worst Index Year*	Trend in the GPI variable 1961-1999	Description of Trend
Air quality	80	1997 1972*		The Air Quality Index (includes SO ₂ , CO ₂ , VOC, NO _x and PM) has improved. However, some emissions are showing increases, and particulate matter is a health concern.
Greenhouse gas (GHG) emissions	31	1962 1996*		GHG emissions have risen an estimated 3.2% per capita, per annum since 1961.
Carbon budget deficit	14	1974 1998*		Alberta carbon budget deficit (the relationship between CO ₂ emissions to the annual carbon storage by the environment) has increased at 5.4% per annum from 1961-1999, but slowed in the '90s.
Hazardous waste	42	1974 1998*		The volume of hazardous waste increased three fold between 1991 and 1999. Alberta ranked third highest among Canadian provinces for releases of pollutants to air, water, landfill and underground in 1997.
Landfill waste	55	1995 1991*		As a result of recycling efforts, waste to landfills has decreased somewhat, but the target of a 50% reduction by 1999 was not met. Alberta has the lowest rate of recycling and reuse in Canada (17%).
Ecological Footprint	44	1961 1997*		The ecological footprint of each Albertan is increasing at a rate of 1.4% per year with a 1999 footprint roughly six times larger than the average global carrying capacity.
Environment GPI Index	44	1962 1970*		The Environment GPI Index has declined steadily at a rate of 1.0% per annum since 1961.

Alberta GPI Index	61	1961 1998*		The overall GPI Index for Alberta has declined an average 0.5% per annum from 1961-1999, though it moderated slightly in the 1990s.
Alberta Economic Growth (GDP) Index	100	1999 1961*		Total GDP has grown at an annual real rate of 4.4% since 1961 or at 2.2% per capita.

13. THE GPI NET SUSTAINABLE INCOME STATEMENT

The “GPI Net Sustainable Income Statement” is similar to the U.S. GPI (1995) and the ISEW (1989) developed by John Cobb Jr, Herman Daly, and Clifford Cobb (see a prototype in Table 9). The GPI income statement represents the monetary expression of economic well-being consistent with the first GPI and ISEW measurement efforts. The methods adopted for constructing the Alberta GPI net sustainable income statement are based, in part, on the U.S. GPI methodology handbook (Anielski, 1999) and the Australian GPI (Hamilton, 2000). Estimates for Alberta’s GPI net sustainable income statement cover the study period 1961 to 1999.

Like the U.S. GPI and Australian GPI, the result of the Alberta GPI accounts includes a GPI net sustainable economic welfare line (a “revised” GDP) to compare with the GDP over time. As has been shown in the U.S. and Australian GPI work, a rising GDP over 50 years of accounting stands opposed to a declining (U.S) or stagnant (Australia) monetary GPI.

The GPI income statement adjusts GDP for some of the full costs and benefits of human, social and environmental impacts of economic growth. GPI accounting attempts to examine economic growth in terms of the factors that lie outside of national accounts or are simply measured incorrectly or not at all in national accounts. For example, the time spent by individuals and households at unpaid work such as parenting, housework and volunteering is not valued at all in the national accounts or GDP. Other important components are similarly not counted, including the value of services from public and household infrastructure, the value of natural capital (petroleum resources, forests, agricultural soils), and the value of ecological services (watersheds, air sheds, ecosystems). Not accounting for the depreciation value of natural capital as it is extracted or used up is simply poor capital accounting. The other perversion of national accounting is that it considers expenditures on crime, suicide, auto crashes and other social ills (what the GPI regards as “regrettable” expenditures) as a monetary contribution to GDP. Intuitively, it makes no sense to count such ills as genuine progress.

A GPI income statement is much like the income statement of a firm. It consists of gross revenues (benefits) and a series of costs, including the cost of capital depreciation. What is unique to the GPI income statement is that unaccounted benefits are included, and capital encompasses not only produced capital but also human, social and natural capital as well. Since there are no generally accepted accounting principles to guide us, the first prototype GPI income statements will be crude and preliminary. Of course, creating a GPI income statement for a nation is more complicated than generating an income statement for a business. However, any marginal improvement to the nation’s income statement, which in principle is a one-line item called the GDP (akin to a firm reporting only total revenues), is real progress in national accounting.

In the GPI income statement, an attempt is made to identify unaccounted-for benefits that contribute to genuine well-being, and regrettable expenditures that common sense tells us are “costs” of progress rather than genuine contributions. For example, unlike the GDP, the GPI income statement considers expenditures on a home security system as a regrettable cost for people and communities living in fear of crime. Thus expenditures on home security systems would be treated as a negative rather than a positive contribution and would be deducted from the GDP. The economic value (based on economic rent calculations) of depleting non-renewable oil and gas reserves would be treated like any depletion from a finite stock of inventory; that is, as a depreciation cost against income. At the same time, the economic value of depleting renewable resources at rates that deplete the original capital stock (e.g., forests or agricultural land productivity) thus jeopardizing long-term sustainability of natural capital flows would be treated as a cost against GDP. Other perversions can contribute to a sudden jump in state or provincial GDP; examples are disasters such as the Exxon Valdez oil spill or natural disasters like tornados or the ice storms in Ontario and Quebec a few years ago. The jump would largely go unexplained in next year’s economic news of GDP growth, yet common sense says the growth was based on a regrettable event.

Another consideration in the GPI income statement is the nature of government expenditures. Some government expenditures such as health care or education presumably improve the collective well-being of all citizens, but in other cases (e.g., drug addiction counseling, government debt servicing or environmental pollution remediation) these expenditures may be viewed as regrettable or “defensive” expenditures. That

is, they are made in reaction to or in defense of a regrettable loss in the condition of human, social or environmental well-being.

Many possible adjustments could be made to devise a more transparent GDP statement. The biggest challenge is gathering the necessary expenditure and depreciation cost data to complete such a statement. However, such estimates are possible, as has been demonstrated in constructing the U.S. and Australian GPI, and now in the case of the Atlantic GPI initiative for Nova Scotia. The Alberta GPI follows in this tradition.

The importance of presenting a revised GDP account to reflect human, social and natural capital costs of declining conditions or unsustainable paths is obvious. Consider, for example, a future federal or provincial finance minister's budget. Along with projections of economic growth, the budget might also reflect on last year's GDP growth that resulted from productive economic activity **and** from regrettable social and human health costs **and** from the depletion of natural capital stocks or environmental pollution clean-up costs. This would make more transparent the reality that even though GDP may be up, there could be other factors of genuine well-being that will require attention and investment.

With a more holistic and transparent perspective on economic growth, a more robust picture of progress and well-being would emerge, leading to a healthier and more enlightened debate about quality of life and government budgets. This is the goal of GPI accounting. Indeed, some might argue that identifying key expenditure drivers of GDP growth is perhaps the most important benefit of GPI accounting. This was clearly the main success of the original U.S. GPI studies.

Examining the actual structure of the GPI income statement (Table 7) we begin with the gross expenditures of households, or personal consumption expenditures. This is the largest component of GDP and is presumed to correlate with economic well-being of households, which is the focus of our accounting. Accepting the premise that consumption spending contributes to genuine well-being (which is debatable), we then make a series of additions and deductions against our "gross" expenditure starting point. That said, the monetary GPI is strongly biased upwards because of the presumption regarding consumption expenditures and because rising personal consumption expenditures also raise the GDP, depending on their relative importance to an economy's GDP. Of course, much of what we count as personal consumption expenditures may not represent genuine improvements in our well-being and quality of life. Indeed, it may simply be an account of money circulating in an economy chasing goods and services that most household don't need beyond some level of sufficiency.

Proceeding from personal consumption expenditures we adjust for income inequality on the premise that rising income inequality between rich and poor leads to the erosion of social cohesion and overall societal well-being. We then add unaccounted-for benefits including the opportunity labour cost of unpaid work and the value of services from public and household infrastructure. We then deduct regrettable costs and depreciation costs of natural, social and human capital, arriving at a GPI Net Sustainable Income line expressed in monetary terms for any given operating year.

Table 7: GPI Net Sustainable Income Statement (Prototype)

Gross Revenues, Expenditures or Output (Personal Consumption Expenditures)	
Adjust for Income Distribution (inequality using the Gini coefficient)	
ADD: Unaccounted Benefits	<ul style="list-style-type: none"> • Value of Unpaid Work (Volunteerism, Parenting, Housework, Eldercare) • Value of Services from Public Infrastructure (Produced Capital) • Value of Services from Consumer, Household, and Business Durables (Produced Capital) • Value of Ecosystem Services (Forests, Peatlands, Wetlands, Soils, Watersheds)
SUBTRACT:	
Regrettable Costs	<ul style="list-style-type: none"> • Cost of crime • Cost of substance abuse (drugs, alcohol, tobacco) • Cost of obesity and unhealthy lifestyles • Cost of gambling • Cost of family violence and breakdown • Cost of auto accidents and injuries • Cost of public and private environmental clean-up • Cost of toxic waste management • Cost of household/business waste management and pollution control costs
Depreciation/Degradation Costs	<ul style="list-style-type: none"> • ‘Cost’ of income inequality • Depreciation cost of public infrastructure • Depreciation cost of household infrastructure and durables • Value of loss of leisure time • Depreciation cost of nonrenewable resources • Cost of long-term environmental damage from fossil fuel use • Cost of unsustainable forest resource use • Cost of loss of farmland • Cost of loss of wetlands and peatlands • Cost of loss of wildlife and fisheries • Cost of ecosystem service losses • Cost of air pollution • Cost of water pollution • Cost of debt financing • Financial debt servicing costs • Net Capital Investment
= GPI Net Sustainable Income (Net Sustainable Economic Welfare)	

The GPI accounts make the GDP more transparent by identifying the full costs and benefits of capital consumption. For example, as seen in Table 10, the GPI income statement shows that the monetary value of unpaid work (housework, parenting, volunteerism) in Alberta amounted to \$38.8-billion, or 35.4 percent of Alberta’s GDP in 1999—benefits that currently are not counted in the GDP. Furthermore, social costs such as underemployment, auto crashes, crime, divorce, suicide, and problem gambling, which totaled an estimated \$23.4-billion in 1999, or 21.3 percent of GDP, are currently treated as economic gains rather than as regrettable costs. Adding up the costs of natural capital depletion and environmental costs of pollution amounted to \$26.4-billion or 24.0 percent of GDP. The result is a new bottom line that considers which expenditures and income in society contribute to sustained economic welfare.

This methodological approach is based on the U.S. GPI methodology (Anielski and Rowe, 1999), the Australian GPI (Hamilton, 2000) and the important work by Dr. Ron Colman and team with GPI Atlantic.⁷ Valuation modifications for the Alberta GPI income statement were made consistent with Canadian or Alberta values, costs and benefits, drawing from research studies, Statistics Canada data and Alberta Government expenditure data. Some of our estimates of costs and benefits have been based on GPI Atlantic's estimates for Nova Scotia.

We recognize that many opportunities exist to improve the valuation methods necessary for developing rigorous GPI income accounts. Given our experience in the U.S. GPI analysis, we also recognize that many methodological and conceptual biases and controversies with the original U.S. GPI work have not, for the most part, been fully debated or resolved.¹³

The results of the Alberta GPI net sustainable income statement for 1999 are shown in Table 10. The Income Statement complements the GPI Balance Sheet, which shows the physical condition of all capital.

⁷ Detailed description of the methods used to derive individual GPI accounts for Alberta are contained in detailed Alberta GPI background reports to be released in the fall of 2001.

Table 8: Alberta's GPI Net Sustainable Well-Being Income Statement for 1999, in millions of 1998 dollars

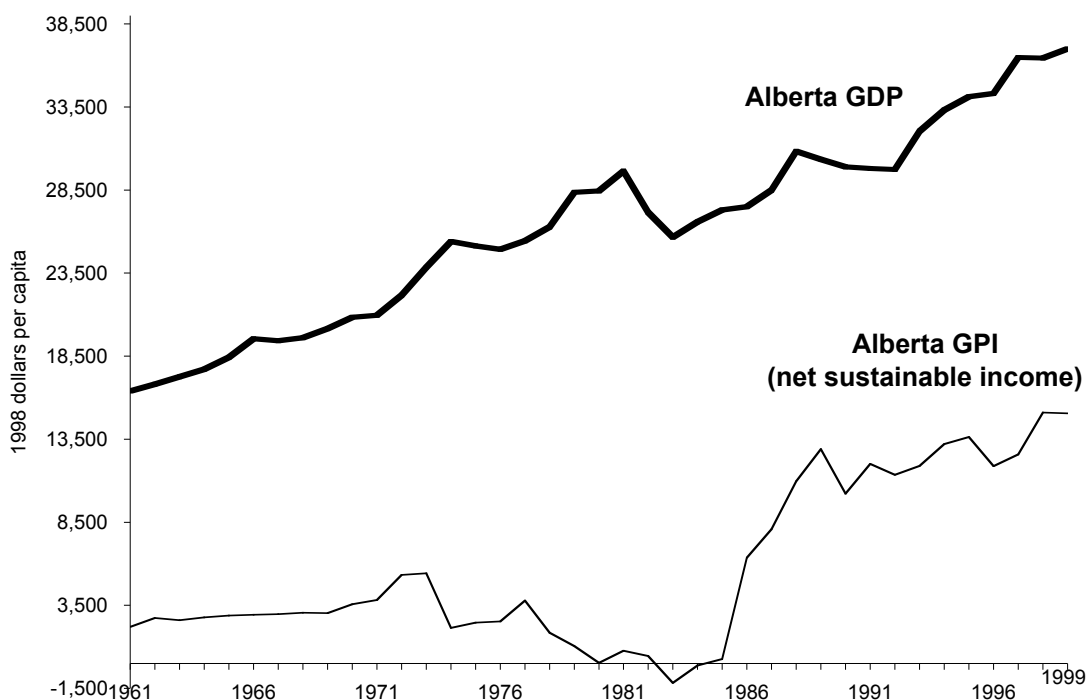
Alberta GPI Income Statement for 1999			
(\$ million 1998 dollars)		\$ millions (1998 dollars)	% of GDP
Gross Domestic Product (expenditure-based)		109,708.43	
Personal consumption expenditures		52,838.59	48.2%
Consumption Expenditures adjusted for income distribution		47,957.49	43.7%
Non-defensive Government Expenditures		7,727.89	7.0%
Value of Services of Consumer Durables		5,532.50	5.0%
Value of Public Infrastructure Services		1,660.96	1.5%
Net Capital Investment		(864.64)	-0.8%
Cost of Household and Personal Debt Servicing		(6,433.77)	-5.9%
Value of unpaid time use			
Value of Housework		32,907.30	30.0%
Value of Parenting and Elder Care		3,291.54	3.0%
Value of Volunteer Work		2,631.30	2.4%
Value of Free Time		0.06	0.0%
		38,830.19	35.4%
Social Costs			
Cost of Consumer Durables		(7,998.17)	-7.3%
Cost of Unemployment and Underemployment		(3,823.98)	-3.5%
Cost of Auto Crashes		(3,026.43)	-2.8%
Cost of Commuting		(4,406.03)	-4.0%
Cost of Crime		(1,833.23)	-1.7%
Cost of Family Breakdown		(147.96)	-0.1%
Cost of Suicide		(2.43)	0.0%
Cost of Gambling		(2,167.50)	-2.0%
		(23,405.73)	-21.3%
Environmental Costs			
Cost of Nonrenewable Resource Use		(10,656.30)	-9.7%
Cost of non-timber forest values due to change in productive forest		(23.78)	0.0%
Cost of Unsustainable Timber Resource Use (loss in pulp production value)		(14.60)	0.0%
Cost of erosion on bare soil on cultivated land (on-site only)		(12.78)	0.0%
Cost of reduction in yields due to salinity on dryland and irrigated cropland		(58.15)	-0.1%
Cost of air pollution		(3,666.00)	-3.3%
Cost of GHG (damage of climate change)		(4,073.33)	-3.7%
Cost of Loss of Wetlands		(7,682.01)	-7.0%
Environmental Cost of Human Wastewater Pollution		(0.57)	0.0%
Non-market Cost of Toxic Waste Liabilities		(4.71)	0.0%
Non-market Cost of Municipal waste Landfills		(190.10)	-0.2%
		(26,382.33)	-24.0%
GPI (Net Beneficial Output), with debt servicing costs		36,999.62	
GPI (Net Beneficial Output), without debt servicing costs		43,433.40	
GPI (with debt) per capita		12,480.10	
GDP per capita		37,005.04	

The GPI Income Statement contains vital information that policy makers can use in their planning and budgeting activities, providing a full assessment of human, social and environmental capital costs and benefits.

The bottom line derived from a GPI Income Statement is essentially the “net sustainable income” bottom line, similar to the U.S. GPI estimate of sustainable economic welfare. It tells us whether we are running an annual “surplus” or “deficit” in genuine progress—whether we are living sustainably off the interest or eroding the capital stock. The GPI Income statement combined with the GPI Balance Sheet allows us to then better budget for investing in sustainability of all capital.

Figure 12 below compares real GDP per capita with the GPI net sustainable income results. The figure shows that while GDP has risen steadily since 1961, the GPI income line was stagnant through the 1960s and recovered after 1986 as the importance of oil and gas diminished and the value of unpaid work rose significantly.

Figure 12: Alberta GPI Net Sustainable Income vs. GDP per capita, 1961 to 1999, in 1998 dollars



Source: Alberta GPI Accounts, GPI income statements, 1961-1999

The key challenge in the GPI Income Statement, as with GPI accounting in general, is determining whether a value being accounted for is a regrettable cost or true depreciation of wealth, capital or well-being. For example, some people might view commuting to work as a desirable expenditure of their time while others might find commuting regrettable and undesirable. Each person and household will hold different values yet a GPI at a regional scale should reflect the values held in common by most households, recognizing there will always be differences of opinion.

14. STRENGTHS AND WEAKNESSES OF THE GPI

Many people will welcome GPI well-being accounting as a refreshing alternative to years of measuring economic progress according to money measures such as the GDP. Others will find these alternative approaches a threat. We consider GPI accounting an opportunity to begin a new legacy for accounting for sustainability in the 21st Century.

Envisioning and developing a new accounting system to measure the sustainable well-being of nations is a bold and humbling undertaking. We expect and welcome critical debate in the spirit of moving beyond the current system of income accounts and GDP measures of economic progress. Our work goes well beyond the original U.S. ISEW and the GPI. John Cobb Jr., the key creator of the ISEW remarked upon reviewing our proposed GPI accounting framework:

“I am amazed and delighted by the thoroughness and thoughtfulness of your work. It goes so far beyond what I even dared to envision when I first decided it was worthwhile to try to construct an indicator (the U.S. ISEW and GPI).”¹⁴

The Alberta GPI accounts are a first step toward an accounting system that would help all of us become genuinely sustainable stewards of living capital. This journey will require as many years of development and continuous improvement as did the development of GDP and national income accounting. The Pembina Institute is committed to this journey and to working with others to build an elegant architecture and practical tools for managing the sustained well-being of living capital — at the household, community, corporate and national level. The GPI represents holistic thinking and synthesis of the best models, tools, data and ideas. We believe the GPI accounting structure is intuitive and that it appeals to common sense. Our goal is continuous improvement of this first generation of GPI accounts and we welcome and encourage input from all stakeholders.

Since the April 2001 release of the first GPI accounts for Alberta _ the report entitled *Alberta Sustainability Trends 2000* – the response has been largely favourable, as the results resonated with average Albertans and Canadians. We believe this is because the GPI accounts provide a holistic mirror that we can use to assess the true conditions of our economy, households, personal health, community health and environmental integrity now and retrospectively. The GPI accounts show that while economic progress has improved well-being in some areas, other areas have not fared so well.

Where criticism has come, it has focused on the issue of values as they relate to the selection, weighting and creation of composite GPI indices of well-being. This reaction is valid and was anticipated. If what we measure is what we value then the choice of indicators and the method of benchmarking good and poor conditions of well-being will colour the GPI portrait that emerges. There is no easy answer as to which indicators should or should not be part of a GPI account, nor are there prescriptions to indexing or solutions about the conditions that are revealed in these accounts. The intent of the GPI accounts was to develop a robust, organic and transparent architecture that would allow for improvement and modification over time.

There has been surprisingly little critique of the monetary GPI accounts. These accounts estimate the full costs and benefits associated with the consumption of living capital, which currently improperly counts as improved economic welfare as the GDP rises with illth (degradation of human, social and natural capital). A vigorous debate about the original GPI monetary accounts occurred after the release of the original ISEW in *The Common Good* by Daly and Cobb (1989) and then again with the release of the reconstituted U.S. GPI by Redefining Progress. The debate over the ISEW was captured in a remarkably candid academic dialogue published in *The Green National Product: A Proposed Index of Sustainable Economic Welfare* by John Cobb Jr. and Clifford Cobb (1994), which ironically is now out of print. Subsequent releases of the U.S. GPI in 1999 (Anielski and Rowe) and again in 2000 (Cobb *et. al.*) received less attention. The recent release of the Australian GPI by Hamilton (2000) has sparked some debate in Australia.¹⁵

The GPI accounting framework has a number of strengths. First, it provides an attractive accounting framework, based on general accounting principles, for measuring the sustainability and condition, trends and full monetary aspects of all capital. Second, GPI Accounting takes a systems approach, recognizing the

interrelationship of a complex array of variables that define well-being. Third, the GPI Accounting framework could be applied at any level of governance – local, provincial or national – and possibly be applied to corporate governance depending on the availability of data. Fourth, the GPI accounts are a transparent and open architecture using the best available data and scholarly analysis of the issues. Fifth, the GPI Accounts are meant to be “living” or dynamic accounts improving with better information, knowledge and shifting societal values. Sixth, the GPI Accounts can be aligned with existing government reporting and performance measurement systems to facilitate business planning and budgeting with a view to sustainability of all capital.

The shortcomings of the GPI Accounting framework are primarily related to the shortcomings of statistical data, indexing, weighting of indicators and aggregation into composite indices. First, data are a chronic limiting factor in constructing such comprehensive longitudinal data sets, sometimes requiring heroic assumptions and statistical extrapolations that would otherwise make such an accounting exercise futile. Changes in methods of gathering, surveying and analyzing statistical data often led to frustration in constructing a 40-year time series for each GPI account for Alberta. In the absence of 40 years of data we either had to extrapolate missing data points, project data back in time or simply leave some data gaps. These data constraints are best appreciated when one understands the tenuous nature of traditional data sets that include the GDP.

Second, the GPI Accounts may be criticized for selection bias. Some might argue that the picture of sustainability is biased by the selection of indicators, the selection of benchmarks for indexing and the assumption that all indicators are equally weighted in computing a composite index. These are all valid concerns and we welcome input as to how these shortcomings might be rectified. We believe that a process of citizen engagement and dialogue could suggest a value set for a community which can then be applied to a GPI account to yield an index that accords with citizen and community values. We believe that such processes will also help to build community as a result of the dialogue about values and genuine well-being. With a robust, inclusive and transparent citizen engagement process whereby a GPI preliminary account might be constructed to kick-off the discussion, a meaningful set of indicators would emerge that align with the values of the community. Moreover, citizens could then become engaged in gathering, analyzing and debating the information that is fed into GPI accounts. Communities would be better equipped with a well-being diagnostic tool to measure and track changes in the condition of living capital and produced capital and thus manage for a sustainable future.

A third potential criticism is that we rely primarily on quantitative data and less on qualitative or subjective data. We believe there is considerable scope for considering this type of input given that well-being can be subjective and sometimes personal assessment.

Fourth, estimating the full benefits and costs associated with the consumption and stewardship of human, social and natural capital is a challenge. In many cases, such information has never been collected. Sometimes a single study estimating costs or benefits must be applied over a longitudinal data set, which clearly is unsatisfactory. The fact that we receive hourly or daily data on the stock market yet have poor information on the full costs associated with real wealth or living capital says a great deal about what we count as meaningful. Traditional accounting methods have shied away from placing monetary values, in the absence of markets, on so-called intangible or non-market assets. Yet, there are real, monetary costs attached to living capital even if these assets go unpriced in a marketplace. Discerning the true costs of such things as air pollution or auto crashes, while challenging in following an audit trail, is nevertheless possible with some effort. Great caution must be exercised to avoid double counting of either costs or benefits in the GPI accounts, which may invalidate some figures. This underscores a key problem with placing money values based on “rubber yardsticks” called dollars on wealth that may have no money-market substitutes or be irreplaceable.

Our goal was to develop a non-prescriptive well-being and sustainable development accounting system that is open, transparent, and dynamic and that evolves over time. The GPI Accounts for Alberta were constructed to be meaningful to citizens and to be a practical decision-making tool for the holistic management of the condition of human, social, built, financial and natural capital assets, liabilities and equity. We believe we have done this. We also believe that GPI accounts should be unique -- customized

according to the needs of each community they serve. We do not think that GPI accounting practices should be universal. Indeed, values and notions of genuine well-being will vary across communities and GPI accounts should reflect those values. Yet, the basic architecture and methods of GPI accounting can be applied at any organizational level.

15. GPI ACCOUNTING FOR WHOM AND FOR WHAT?

Who would use the GPI System of Well-Being Accounts and for what purpose? Like any performance information or accounting system, the GPI Accounts are intended to provide decision makers and stakeholders (in this case citizens) with an account of the “state of the nation” or province. To answer the question “how would GPI Accounts be used to inform public policy?” we need only answer the question “How are current economic information (such as GDP, inflation rates, interest rates) and social indicators used to orient public policy?”

The answer is that we use information to make better decisions. What gets measured gets attention, as the saying goes, and this is key to GPI Accounting and its application to public policy. With such information, decision makers can assess the current conditions and trends in living and monetary capital that are then used to better manage all forms of capital in a society.

The GPI Account is like a house. The foundation of this house called Alberta is our values, and the structural supports are the four elements of nature, economy, people and community. The sub-accounts are like the rooms in the house. We can use the information contained in these accounts like a blueprint to undertake the renovations to ensure the house will be healthy and habitable for generations to come.

The GPI Accounts take a holistic, systems approach to measuring well-being; as in any complex task of this nature, there are difficulties. The challenges of this work, many of which have already been mentioned, include the biases inherent in trying to find a “one-size-fits-all” system for accounting for the well-being and quality of life of nations. Differences in values, morals, and ethics must also be recognized and accommodated in the accounting system. The flexibility of the Alberta GPI Account framework allows new variables, data sets, indicators and different weighting and indexing approaches to be added. This allows us to make “what if” scenario queries of the GPI Accounts and also enables citizens and decision makers to weight variables in accordance with their values, morals, ethics or opinions. These first sets of GPI Accounts reflect, in part, the biases of the researchers and authors but are intended to catalyze a much-needed public debate about how Albertans and Canadians chart a sustainable course for the 21st century.

Using the GPI Accounts and indicators

By taking an integrated approach, the GPI Accounts enable us to assess and measure well-being in both monetary and non-monetary terms. Both non-monetary and monetary accounts would be balanced without one set being more important than the other.

The GPI Accounting system can help us answer some fundamental questions about designing a sustainable future:

- What quality of life and sustainability conditions can future generations expect given today’s economic behaviour?
- Are we better or worse off than we were in the past?
- Are we living off the “interest” of natural capital or are we eroding our capital base to the detriment of future generations?
- Has our overall quality of life improved compared with the past 40 years?
- What is the condition of our environment and the state of our natural capital assets?
- Are we on a sustainable or unsustainable path?
- Do we have more or less quality time with family and friends?
- Are we more or less stressed today than in 1960?
- What has been our return on investment in human, intellectual and natural capital over the past 40 years?

- Are we more or less eco-efficient and energy efficient than in the past?
- How do Canada's and Alberta's ecological footprints compare with natural global carrying capacity and what does the size of these footprints imply in terms of equity for other citizens of the world?
- What burden or long-term liability do increasing debt and shrinking savings impose on households, individuals and government?

The GPI Accounts can also be used to check the values and changing priorities of citizens and governments. They give us a snapshot of where we are today (which is the outcome of past activities and decisions), and a blueprint to design the future we want tomorrow.

Indicators are vital for informing policy makers and society in general about the progress being made in the journey toward sustainability. With the abundance of quantitative and qualitative information now available, we are able, for possibly the first time in history, to manage many large and complex indicator data sets. This capacity means we can intelligently pursue a multi-dimensional, integrated approach to tracking trends in human, social, economic and ecological well-being.

Using the GPI Balance Sheets

The GPI Balance Sheet Accounts illustrate the risks to sustainability that may be emerging; these include water and air quality liabilities, timber sustainability liabilities, toxic waste risks, time stresses, and financial liabilities (debt loads). Such liabilities to sustained well-being could be identified as part of a strategic-business planning process for government or a community.

The GPI Balance Sheets also examine the distribution of income and wealth. In whose hands are Alberta's assets or capital held and, thus, in whose hands is the future sustainability of capital being held? Growing inequality in income, wealth or ownership of built, financial and natural capital would be flagged as a potential threat to social and community cohesion. This may lead to discussions about what degree of inequality is acceptable in a civil society and subsequent exploration of policies that would ensure that wealth is more equitably distributed.

The GPI Balance Sheet and indicators are not intended to be prescriptive about what actions should be taken in the future given current traditions or trends over time. Nor do they suggest that thresholds to sustainable well-being can be readily discerned. They simply reveal existing conditions in the context of historical change. They cause us to pause and reflect: is our journey sustainable or do we need to make mid-course corrections?

The GPI Income Statement – a Tool for Budgeting

The strength of GPI accounting is that it considers both the physical condition of living capital assets and the revealed monetary costs and benefits associated with consuming this capital. With a more complete accounting tool, decision makers are better equipped to manage on a physical, qualitative and fiscal basis.

The monetary GPI Accounts can be an effective budgeting tool to determine the best investment of tax dollars to address public policy issues. Identifying key regrettable expenditure drivers of GDP growth can lead to budgetary decisions to minimize or mitigate these costs. For example, if increasing crime rates are driving up the costs of protecting public and household safety, which subsequently contribute to rising GDP, then such conditions can be more effectively managed with the full-cost evidence contained in the GPI accounts. Also, costs such as the depletion of oil and gas inventory should be treated as depreciation of our natural capital and identified as a cost to GDP rather than a benefit, as accounting convention dictates. On the positive side, unaccounted-for benefits from unpaid work (parenting, housework, volunteering) can be assigned a replacement market value and compared with the value of paid work, which is included in the GDP figures. For example, if volunteer hours in the community are rising while going unaccounted for in the GDP figures as a genuine contribution to societal and economic well-being, then the market value of those volunteer hours can be an important piece of information for guiding economic and fiscal policy.

The information could also be used to compare and align performance outcome measures for assessing the utility of government policy and actions. Assessing the outcome “returns” (improved well-being) on investment of public tax dollars could become more explicit using GPI accounts.

The GPI Income statement thus has a direct link to budget decision making at all levels of society. Combining the GPI Income Statement with the GPI Sustainability Circle indicators would provide decision makers with a more robust measurement and accounting system upon which to make more informed and integrated decisions about the economy, environment and society. This could include evidence of the regrettable degradation of natural resource stocks, environmental quality, or social and human health costs. Budgetary and investment decision making are potentially improved as money is allocated to improve the conditions of living capital in the interest of sustaining its capacity for current and future generations. Equipped with such information it would be possible to assess how genuine “economic” well-being might be enhanced or sustained without compromising the living capital that defines well-being.

A tool to empower citizens

GPI accounting is a tool for empowering citizens with information about the conditions of their overall well-being. The GPI accounts show trends in the condition of the environment, economy and society as these trends affect our quality of life. They expand our perspective and balance the current predominant focus on money by considering the physical and qualitative dimensions of people, communities, and the environment.

The information and indicators derived from the GPI accounts contain a wealth of information that can show clearly how changes in economic well-being at the individual and household level (e.g., real disposable income, debt, taxes and consumption spending) compare with other communities and what their relationship is to trends in human health, community well-being and environmental health.

Using GPI Accounting to develop public policy

GPI accounts can support public policy development. They provide vital information for holistic and integrated policy decision making, covering virtually every area of government policy. Such a holistic perspective on quality of life and well-being presents rare and important opportunity to synthesize processes, policies and information.

An examination of the total condition of a society is essential to understand what constitutes a civil, good and sustainable society. GPI accounting offers individuals, households and communities with holistic and practical tools to examine overall well-being and sustainability issues. They accounts lead to unique opportunities for citizens to engage in evidence-based dialogue and decision making about quality of life and sustainability. GPI accounts should include meaningful indicators that paint a holistic portrait of well-being. If sustainable development is a journey, then GPI accounting provides a compass to help steer the course. GPI accounts are management tools for improving overall well-being and ensuring the sustained stewardship of all living capital. GPI accounting helps citizens understand the tradeoffs and impacts of their individual and collective lifestyle choices on the conditions of well-being of their neighbours, other communities and the natural environment. GPI accounting help decision makers get to the heart of the question: are we on a sustainable course?

16. CONCLUSIONS

The GPI System of Sustainable Well-being Accounting developed by the Pembina Institute is a practical tool for measuring the sustainable well-being of communities and nations. GPI accounting provides a holistic management tool for human, social, natural and produced capital for the purpose of fulfilling the spirit and goals of sustainable development. GPI accounting represents the next stage in developing a more holistic accounting framework as Daly and Cobb (1989) envisioned in *For the Common Good* and advances the original ISEW (Daly and Cobb, 1989) and U.S. GPI (Cobb, Halstead and Rowe, 1995) to the next logical development. That development involves the construction of a two-tiered set of accounts that

track both the physical and monetary conditions of all living (human, social, natural) and produced (manufactured, financial) capital. Because GPI accounts synthesize the trends in the condition of all capital and specifically allow for identification of capital as assets, liabilities (risk) and their ownership (equity) of all capital, they provide a powerful tool for assessing the sustainability of communities at any scale.

GPI accounts provide meaningful answers to the long-standing challenge of GDP-architect Simon Kuznet's calls by politicians for more economic growth (more GDP and cash flow) should show define growth in terms of "what and for whom." For example, the Alberta GPI accounts for 1961 to 1999 provide striking evidence that while GDP continued to grow over 40 years the conditions of living capital grew worse including Alberta's ecological footprint, suicide rates, divorce rates, and forest fragmentation. While making more money in terms of GDP per capita, Albertans have actually grown poor in other respects blunting the economic growth theology that rising GDP lifts the well-being of all citizens.

GPI accounting builds on the strengths of the original ISEW/GPI architecture developed by Daly, Cobb, and Cobb combined with the strengths of other sustainability and quality of life indicator systems, including the Index for Social Health, the UN Human Development Index and the World Bank's total wealth accounts. One of the key benefits is that GPI accounting can be applied at virtually any scale whether at the neighbourhood, municipal, state/provincial, national or global scale. GPI accounts can be customized according to the unique values of the communities they are intended to serve.

GPI accounting bridges the gap of many disciplines using the language and metrics of accounting, economics, and social sciences. The GPI accounts are validated by drawing from information already available from public statistical sources recognized and used in policy development and analysis. Like a diagnostic tool for assessing the health of a patient, the genuine progress indicators provide a full diagnosis of the health or condition of all wealth (living capital) of a society that can be expressed in terms of actual scientific measurement or can be expressed in terms of monetary costs or benefits associated with each living capital component. The GPI accounting system has the added benefit of allowing for comparison of indicators and aggregation of indicators into clusters according to themes such as economy, society, human health and the environment. The GPI accounts can be used to compare, for example, economic growth (as measured by GDP) against other leading environmental, social or human health indicators (such as air quality, ecological footprint, crime rates or life expectancy). Important longitudinal correlation analysis is a possible benefit of GPI accounting to assess how economic growth correlates with environmental, social and human health conditions of well-being.

This new accounting system is not without many challenges as it emerges from the embryonic stage. While many alternative sustainability indicators systems are emerging, there is still no consensus on the best model. The most likely solution is a synthesis of the best features of the collective lot. The GPI accounting system attempts to begin this synthesis process celebrating the best of what exists and providing a glimpse of what is possible as a practical alternative to the UN System of National Accounts. Many will argue to leave GDP accounting alone and would question methodologies for estimating the monetary costs and benefits associated with living capital consumption and management. Others will challenge the inherent indicator choice bias, the creation of composite indices and the weighting of indicators within an accounting system. These are natural and important challenges and should be subject to vigorous academic and community debate. These challenges however provide an opportunity to engage both citizens and experts from a variety of disciplines to improve the information and accounting system to move in the direction of a more meaningful well-being accounting system than using blunt instruments such as the GDP to assess economic well-being.

The GPI accounting system provides a meaningful alternative to the UN System of National Accounts that have been in use over 50 years as the tool for measuring and comparing the economic well-being and wealth of nations. True wealth is defined as the conditions of the well-being of people, families and nature. GPI accounting accords with this intuitive approach to assessing genuine well-being, providing an intuitively attractive accounting architecture that measures such things as time-use, disease, ecological footprints, and other measures of the living wealth of nations. They provide the tools to empower a civil society towards pursuit of a sustainable future for the common good of current and future generations.

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¹ Former Senator Robert Kennedy, in 1968, summed up the shortcomings of the GNP/GDP: “The Gross National Product [and GDP] includes air pollution and advertising for cigarettes, and ambulance to clear our highways of carnage. It counts special locks for our doors, and jails for the people who break them. GNP includes the destruction of the redwoods and the death of Lake Superior. It grows with the production of napalm and missiles and nuclear warheads... And if GNP includes all this, there is much that it does not comprehend. It does not allow for the health of our families, the quality of their education, or the joy of their play. It is indifferent to the decency of our factories and the safety of our streets alike. It does not include the beauty of our poetry or the strength of our marriages, or the intelligence of our public debate or the integrity of our public officials... GNP measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country. It measures everything, in short, except that which makes life worthwhile.”¹ In *The New Republic*, October 20, 1962

² In *The New Republic*, October 20, 1962

³ Kuznets wrote in 1965 “*It does seem to me, however, that as customary national income estimates and analysis are extended, and as their coverage includes more and more countries that differ markedly in their industrial structure and form of social organization, investigators interested in quantitative comparisons will have to take greater cognizance of the aspects of economic and social life that do not now enter national income measurement; and that national income concepts will have to be either modified or partly abandoned, in favour of more inclusive measures, less dependent on the appraisals of the market system... The eventual solution would obviously lie in devising a single yardstick that could then be applied to both types of economies – a yardstick that would perhaps lie outside the different economic and social institutions and be grounded in experimental science (of nutrition, warmth, health, shelter, etc.)*”³

⁴ Review of John Kenneth Galbraith’s address to the Frank M. Engle Lecture in Economic Security at the American College in Bryn Mawr, Pennsylvania in May 1999 appeared in the August 2, 1999 issue of the *IMF Survey*.

⁵ From a speech (May 25, 2001) by the Honourable Paul Martin, Minister of Finance at a Breakfast Organized by the National Round Table on the Environment and the Economy (Ottawa).

⁶ “Chrematistics” is a word you find only in unabridged dictionaries. It refers to “the science of wealth: a branch of political economy relating to the manipulation of prosperity and wealth.” Webster’s New Twentieth Century Dictionary, Unabridged 2nd Edition, 1979.

⁷ The GPI is an expansion of the original Index of Sustainable Economic Welfare (ISEW) conceived and developed by John B. Cobb, Jr., Clifford Cobb and Herman Daly (see *For the Common Good* by Daly and Cobb, 1989, 1994). The GPI embodies these earlier pioneering efforts. The GPI has been replicated in Australia (Hamilton, 2000 and Hamilton and Saddler, 1997) and Canada (Messinger and Tarasofsky, 1997 and Colman, 1998, in the case of GPI Atlantic). The ISEW has been developed for United Kingdom, Germany, Austria, Sweden, Netherlands, Italy, Australia, Chile, and Korea (Jackson and Marks, 1994; Diefenbacher, 1994; Hochreiter et al., 1995 and Stockhammer et.al. 1997; Jackson and Stymne, 1996 and Tammo and Roseburg, 199X; Guenno and Tiezzi, 1996; Hamilton and Saddler, 1997; Castenada, 1997, and Won and Jeong, 1997).

⁸ Henderson, Hazel, Jon Likerman, and Partice Flynn. 2000. “Calvert-Henderson Quality of Life Indicators.” Clavert Group Ltd. and Hazel Henderson, Bethesda, MD.

⁹ Wackernagel, M., Larry Onisto, Alejandro Callejas Linares, Ina Susana López Falfán, Jesus Méndez García, Ana Isabel Suárez Guerrero, Ma. Guadalupe Suárez Guerrero. 1997. *Ecological Footprints of Nations: How Much Nature Do They Use? How Much Nature Do They Have?* Commissioned by the Earth Council for the Rio+5 Forum. Distributed by the International Council for Local Environmental Initiatives, Toronto, 1997.

¹⁰ Indeed, public accountancy has historically treated investments in public infrastructure as literally “valueless” since most capital was written-off at a nominal \$1 in the public accounts. For example, the construction of a hospital or a bridge would not show up on the balance sheet of a city or province but be expensed as an annual operating cost. This goes both against common sense and against conventional capital cost accounting used in general accepting accounting for business. More recently some governments, including the Alberta Government have begun to estimate the book value of public assets (infrastructure) and assign a depreciation cost value.

¹¹ Mendelsohn, Matthew. 2000. "Review of Canadian Quality of Life Survey Data." Queen's University, Canadian Policy Research Networks Background Paper, September 2000.

¹² "Think-tank asks Canadians what 'quality of life' means to them." Edmonton Journal, December 28, 2000, A3

¹³ Most of the current GPI or ISEW analyses replicated internationally have adopted the original U.S. GPI or ISEW methodology without significant change to the accounting architecture. The Alberta GPI project and the Atlantic GPI project for Nova Scotia are the first to consider changes and improvements to the original GPI/ISEW work.

¹⁴ Personal email communication with Dr. John Cobb Jr. September 18, 2000.

¹⁵ Personal communication with Dr. Clive Hamilton, The Australia Institute, January 15, 2001.