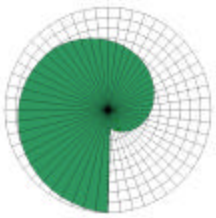


The Alberta GPI Accounts: Time Use

Report # 8

by

Amy Taylor
Mark Anielski

September 2001

Pembina Institute
for Appropriate Development

About the Pembina Institute

The Pembina Institute is an independent, citizen-based organization involved in environmental education, research, public policy development and corporate environmental management services. Its mandate is to research, develop, and promote policies and programs that lead to environmental protection, resource conservation, and environmentally sound and sustainable resource management. Incorporated in 1985, the Institute's main office is in Drayton Valley, Alberta with additional offices in Calgary and Ottawa, and research associates in Edmonton, Toronto, Saskatoon, Vancouver and other locations across Canada. The Institute's mission is to implement holistic and practical solutions for a sustainable world.

The Green Economics Program is dedicated to designing and implementing practical, street-smart economic tools that would reorient society back to the original meaning of the word "economy"—the care and management of the wealth of the household. By developing new tools for measuring the true wealth or well-being of nations, we can help guide Canadians and Albertans to a sustainable future..

For more information on the Pembina Institute's work, please visit our website at **www.pembina.org**, or contact:

The Pembina Institute
Box 7558
Drayton Valley, AB T7A 1S7
tel: 780-542-6272 fax: 780-542-6464
e-mail: info@pembina.org

About this Report

This is one of 28 reports that provide the background for the Genuine Progress Indicators (GPI) System of Sustainable Well-being Accounts. It explains how we derived the various time use indices that were earlier published in *"Sustainability Trends 2000: The Genuine Progress Statement for Alberta, 1961 to 1999."* The research for this report was completed early in 2001. The appendices provide further background and explanation of our methodology; additional details can be obtained by contacting the authors. Appendix A includes a list of all GPI background reports.

In this report we explore the amount of time Albertans dedicate to paid work, unpaid work and free time. We dissect trends in time use from 1961 to 1999 noting changes over time and differences between the sexes and life stages of individuals in Alberta. The report answers the following questions:

1. How much time are Albertans devoting to paid work, unpaid work and free time?
2. How has the time devoted to these activities varied over the study period?
3. How does the time devoted to these activities vary by sex and life stages of Albertans?
4. What is the economic value/cost of the individual time use components? And how does that compare to the value of the Gross Domestic Product?

 ISBN 0-921719-41-8

About the Authors

Amy Taylor is a senior researcher with the Pembina Institute's Green Economics program. She works on establishing measurements of ecological well-being and community sustainability reflected in genuine progress indicators using time series analysis and valuation methods. Amy came to the Institute following contract work with the B.C. Ministry of Finance, where she was the lead author and researcher for the B.C. Government's 1999 discussion paper, "Environmental Tax Shift: A Discussion Paper for British Columbians." She has been a researcher, writer, and public speaker in this field for four years, and combines a background in economics, energy research, and environmental science. Her 1999 Masters in Resource Environmental Management focused on ecological tax reform. Her education includes MRM degree (Masters of Resource Environmental Management) from Simon Fraser University and B.Sc. Hon. (Economics and Environmental Science) from Trent University.

Mark Anielski is Director of the Green Economics team, and has considerable experience in public policy analysis including natural resource, energy, royalty and fiscal policy issues in both the public (Alberta Government) and private (GPC - Government Policy Consultants) sector. He also serves as Senior Fellow to the U.S. economic policy think-tank Redefining Progress in Oakland, California and authored the 1999 U.S. GPI report with journalist Jonathan Rowe. He served as senior analyst on performance measurement with Alberta Treasury and helped produce the Government of Alberta's performance report *Measuring Up.* He currently advises the National Round Table on Economy and the Environment's Sustainable Development Indicator Steering Committee on the development of indicators for measuring sustainability in Canada. Mark also teaches business and the environment in the University of Alberta's School of Business. His expertise is varied and broad including accounting for sustainable development, natural resource accounting, public policy analysis, business planning, and performance measurement. Mark pioneered the development of natural capital accounts for Alberta's timber, oil, gas, coal and other natural capital as well as having experience in the development of performance measurement systems, land use planning and non-market resource valuation, royalty policy analysis (forestry, oil and gas), and analysis of subsidies for both government and private forestry, energy and financial service industries. He holds a Masters degree in forest economics, plus bachelor degrees in economics and forestry.

Acknowledgements and Disclaimer

The author(s) would like to thank a number of individuals for their contributions to this document. Some provided data while others gave their time to review draft material, discuss the issues and offer valuable comments that helped improve the content. We particularly acknowledge the following: Chris Jackson, Catherine Bertrand and Judy Cotterill of Statistics Canada; and Christi Whitford, Volunteer Calgary.

The high quality of the data compiled by Statistics Canada and the opportunity to use this data enabled us to undertake a much more thorough analysis than would otherwise have been possible. We also thank Kim Sanderson for her editing assistance. Finally, the Pembina Institute appreciates the vision of Western Economic Diversification in supporting this project—the first of its kind for Alberta, if not internationally

Contents

Figures

Tables

1.0 Executive Summary

Our current system of accounting, the Gross Domestic Product, does not recognize the value of household work, volunteerism, parenting or free time. For example, when a family goes to a restaurant for a meal, the GDP increases but if the same meal were prepared at home, the time spent on food preparation and cooking would go unregistered in GDP accounting. By focusing on transactions that take place in the market and not valuing household work, parenting, eldercare, volunteerism and free time, the substantial contribution of these sectors to the well-being of Albertans goes largely unnoticed.

In contrast to the GDP, the Genuine Progress Indicator is based on the premise that all time has value whether it is spent at paid work, household work, parenting or at leisure activities, this makes the GPI a more appropriate measure of the well-being of a region. The table below shows hours devoted to unpaid work, paid work and free time in Alberta.

Average Hours per Person (population 15 years and over) per Day Devoted to Unpaid Work, Paid Work and Free Time in Alberta

Year	Unpaid Work (hours per day)	% of Total	Paid Work (hours per day)	% of Total	Free Time (hours per day)	% of Total	Total (hours per day)
1961	3.35	28%	3.69	31%	4.91	41%	11.95
1971	3.27	28%	3.41	29%	5.16	44%	11.85
1981	3.19	27%	3.21	27%	5.41	46%	11.81
1986	3.04	27%	2.91	25%	5.50	48%	11.45
1992	3.19	27%	2.90	24%	5.76	49%	11.85
1998	3.48	29%	2.68	22%	5.80	48%	11.96
percent change, 1961-1998	+4%		-27%		+18%		0%

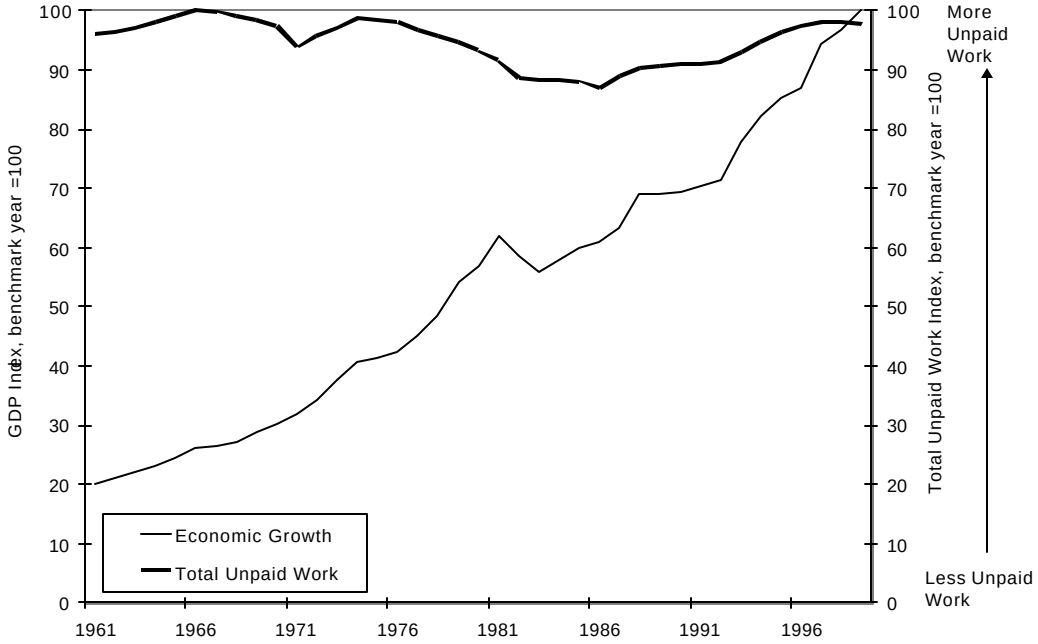
Sources: Statistics Canada. *"Households' Unpaid Work: Measurement and Valuation,"* Catalogue No. 13-603E, No. 3. Statistics Canada, *"Where Does Time Go?"* Catalogue No. 11-612 E No. 4. Statistics Canada, *Canadian Social Trend, Autumn 1993, "Time Use of Canadians in 1992*," Catalogue No. 11-008E. Statistics Canada, *"Overview of the Time Use of Canadians in 1998,"* Catalogue No. 12F0080XIE. Some data are extrapolations of data found in these reports. Unpaid work figures were derived in this analysis.

As the table demonstrates, time spent at unpaid work and as free time is no less important than time spent at paid work. Indeed, as the Alberta population ages and workers retire, time is shifting away from paid work and toward more free time. Given the substantial amount of time devoted to both unpaid work and free time, it is not surprising that the economic value of these activities is significant. Unpaid work in Alberta was valued at $38,826-million (1998$) in 1999, the equivalent of 1,512,177 full-time jobs and equal to 35 percent of Alberta's 1999 GDP. The economic value of the increase in free time in Alberta between 1961 and 1999 was $59,618 (1998$) more in 1999 than in 1961.

The figure below shows unpaid work in Alberta as an index. The figure also shows the trend in provincial GDP over the study period. For the index, 100 is set equal to the highest number of hours of unpaid work per person 15 years and over that occurred in the study period. Deviation from that year is measured as an index over time. We call the year in which the most hours of unpaid work occurred in the province the benchmark year. In the case of unpaid work in Alberta,

our benchmark year was 1966. In 1966, unpaid work (hours per person, population 15 years and over) amounted to 1,273 hours per year. Thus, the index indicates that as unpaid hours of work in Alberta have deviated from the baseline of 1,273 hours per person (population 15 years and over) per year, we have moved closer to or further from our benchmark year.

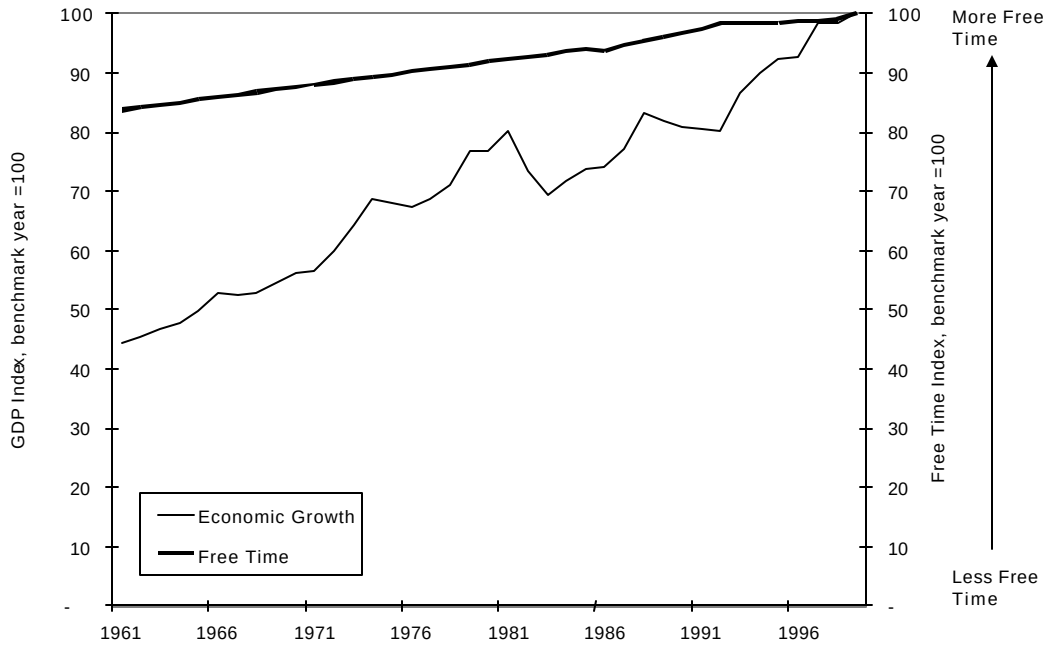
Unpaid Work in Alberta as an Index, 1961 to 1999



Hours devoted to unpaid work per person were fewest in 1986. Since 1986, hours of unpaid work per person have increased and were higher in 1999 than they were in 1961. Despite the recent increase in total unpaid work depicted in the index above, our research found that the time devoted to some unpaid activities increased and for others it decreased. Specifically, we found that time devoted to parenting and eldercare declined over the study period. Many factors likely influenced that decline, including increased labour force participation by mothers, fewer children per household and more meals at restaurants.

The figure below shows free time in Alberta as an index. This figure also shows the trend in provincial GDP over the study period. In this case, 100 is set equal to the highest number of hours per person (population 15 years and over) devoted to free time in the province over the study period. Deviations from that level are then measured as change in the index over time. Again, we call the year in which the most hours of free time occurred the benchmark year. In this case our benchmark year was 1999. On average, in 1999, 5.9 hours per person (population 15 years and over) per day were devoted to free time. Thus, as hours of free time increased over the study period in Alberta, the index moved closer to the benchmark year and further from zero.

Free Time in Alberta as an Index, 1961 to 1999



The table and figures above only tell part of the story however. Specifically, the increase in free time and the decline in paid work are not shared equally by all age groups or by both sexes in Alberta. While baby boomers are moving into retirement, women, especially working mothers, continue to experience significant levels of stress as they juggle job, family and household commitments. Statistics Canada indicates that one out of three full-time employed mothers suffer from extreme levels of stress. In fact, women's stress levels are highest and "virtually explode" in the case of full-time employed mothers.[1] Nearly 70 percent of full-time employed, married mothers felt rushed on a daily basis, and women's stress levels were found to increase with both marriage and children.

2.0 What is time use?

Albertans use their time in many ways, but not all are valued equally by traditional measures of economic activity. The time we spend at work, and for which we receive payment, is valued in the marketplace and respected by conventional economics. Other uses of our time, such as caring for children or parents, volunteering or doing household chores, are important and legitimate uses of personal energy, but tend to be discounted or ignored entirely in most financial accounting systems.

This report highlights the trends in time use from 1961 to 1999 in Alberta, noting changes and differences between the sexes and life stages of individuals. We also look at the economic value or cost of each of the time use components: paid work, unpaid work and free time. In all cases, we attempt to explain the trends we present, drawing on relevant literature to highlight probable explanations. The report analyzes four components of time use by Albertans over the study period: paid work, commuting, unpaid work and free time. For each section, we define the time use component, explain the methods we used to measure the economic and other trends over time, and present the results of the analysis. All data in this report pertain only to the Alberta population that is 15 years of age and over.

3.0 Paid Work in Alberta

3.1 What is paid work?

Consistent with Statistics Canada definitions, we define time spent at paid work to include paid work and related activities.[*] This encompasses all functions directed toward market activity including paid work, commuting and time spent looking for employment.[2] We explore time spent commuting in greater in detail Section 4.

3.2 How We Measured Paid Work in Alberta

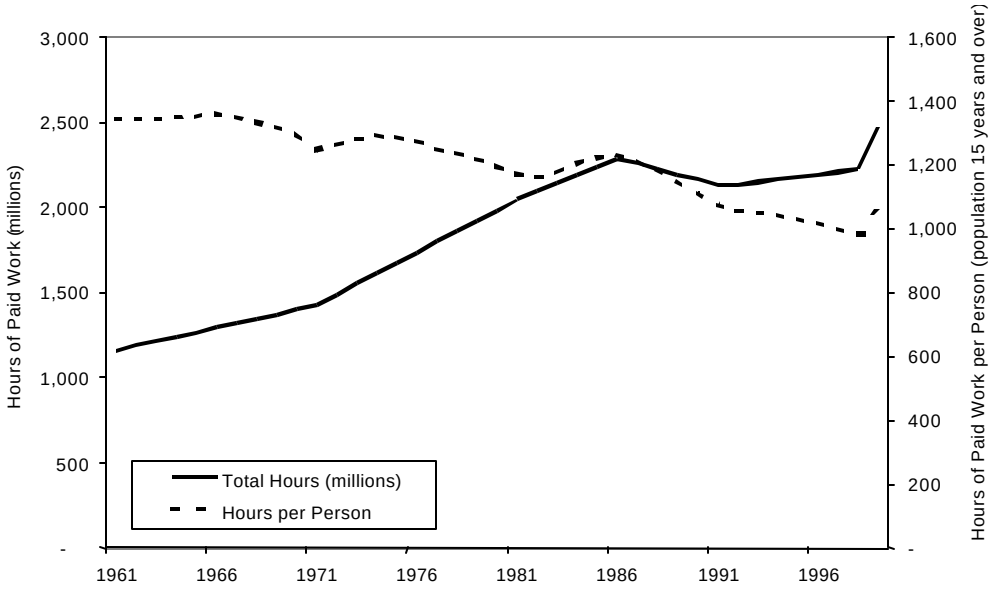
The paid work data used in this analysis come National Accounts estimates, which are based on the Labour Force Survey and Survey of Employment, Payrolls and Hours for Canada and distributed by province using Labour Force Survey data. The data on paid work for 1981, 1986 and 1992 are presented in Statistics Canada's publication titled *Households' Unpaid Work: Measurement and Valuation*. The 1998 data come directly from Statistics Canada. Total hours of paid work per year were used to calculate hours of paid work per person per year (population 15 years of age and older) in Alberta for 1981, 1986, 1992 and 1998. We then used this information to extrapolate the trend in hours of paid work to 1961 and 1971. The extrapolation was based on a regression analysis of the known data points. We do not include an economic evaluation of paid work as the monetary value of paid work in Alberta is already captured in the GDP and thus is accounted for in the GPI under the section on personal consumption (GPI Report #2).

3.3 Paid Work in Alberta: How Much?

Figure 1 shows hours spent at paid work per year for Alberta. The graph indicates both total hours of paid work and paid work per person (population 15 years and over) for the province. Although total hours of paid work continue to increase in Alberta (increasing by 113 percent from 1961 to 1999), hours of paid work per person decreased by 21 percent over the study period. Specifically, total hours of paid work increased from 1,161 million hours in 1961 to approximately 2,473 million hours in 1999. At the same time, hours per person (population 15 years of age and over) declined from 1,345 in 1961 to 1,060 in 1999. Thus the increase in total hours of paid work is due largely to an increase in the population aged 15 years and over (170 percent increase) and a larger paid workforce in Alberta over this time period. The decline in hours per person stems from the substantial proportion of the population that is moving into retirement as well as reduced labour force participation by men. Given this trend, it is not surprising that hours of paid work per household have also declined steadily since 1961. In 1961, members of the average Alberta household worked an estimated 3,318 hours per year compared with 2,301 hours in 1999, amounting to a 31 percent reduction.

[*] The conventional and most widely used and understood definition of paid work is limited to time spent on work done for pay and/or profit; it does not include commuting, time spent looking for work, unpaid coffee and meal breaks, etc. The General Social Survey definition of paid work used in this analysis is unique to time use studies.

Figure 1: Paid Work in Alberta, 1961 to 1999



Source: Statistics Canada, General Social Survey Data

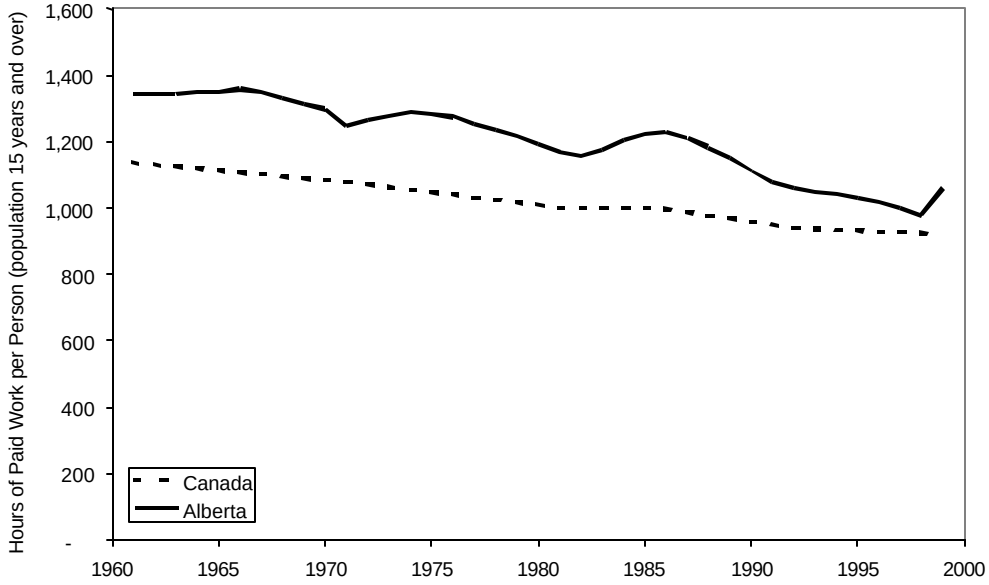
At the same time as hours of paid work per household fell, household real disposable income rose an estimated 58 percent from 1961 to 1999. However, in the 1990s the hours of paid work by households continued to decline while real average household disposable income remained relatively stagnant. When these two trends are combined, we see that the average household real income per hour of paid work remained virtually unchanged in the 1990s, averaging roughly $24.57 per hour (1998$). This is still more than 2.3 times the 1961 hourly rate of $10.57 per Alberta household, which suggests that the average Alberta household in 1999 made about the same amount of money as it did in 1990 while working fewer hours for paid work.

Hours of paid work are not split evenly between the sexes. Of the total hours of paid work for 1998, women contributed an average of 3.3 hours per day, compared with 5.3 hours per day for men.[3] This is an increase from 1992 when men devoted 4.5 hours per day and women devoted 2.7 hours per day to paid work.[4] This means that women worked 60 percent of the hours that men did for pay in 1992, and 62 percent of the hours men did in 1998. This trend of increasing hours devoted to paid work by women in Alberta is not surprising given the substantial increase in labour force participation by women in the last several decades. Indeed, the increase in the number of Canadian women aged 15 and over working outside the home accounted for 73 percent of all growth in employment between 1975 and 1993. Women's participation in the labour force in Canada increased from 44 percent in 1975 to 58 percent in 1993. Over the same period, men's participation in the labour force declined from 78 percent in 1975 to 73 percent in 1993. More women were employed in Alberta than in any other province in 1993. Fifty-eight percent of women in Alberta were employed in 1993; 54 percent in Saskatchewan, Manitoba and Ontario; and 52 percent in British Columbia. Employment in Quebec and the Atlantic Provinces was less than 50 percent.[5]

Despite the increase in hours of paid work by women in Alberta over time, altering the number of hours devoted to paid work remains one of the primary means women use to help cope with changing life roles. Research by Statistics Canada reveals that even while women may continue to work full-time over the course of their life, they will limit the number of hours devoted to full-time work during complex life stages (for example, married women aged 25 to 44, with children). While young, unmarried women in Canada without significant family and household commitments (aged 18-24) devoted the most time to paid work (7.3 hours per day), full-time employed married mothers allocated the least amount of time (5.3 hours a day) to paid work in 1992. In contrast, Statistics Canada found that full-time employed men in Canada do not alter the number of hours devoted to paid work (nearly 7.0 hours a day) with changing life stage complexity.[6]

Figure 2 compares hours devoted to paid work in Alberta with similar figures for Canada. As the figure indicates, Albertans (population 15 years and over) spend more time per person at paid work than does the population aged 15 years and over in Canada, on average as a whole. In 1961, Albertans spent 18 percent more hours on paid work than did the average Canadian; by 1999, that difference was 15 percent.

Figure 2: Paid Work in Alberta and Canada, 1961 to 1999

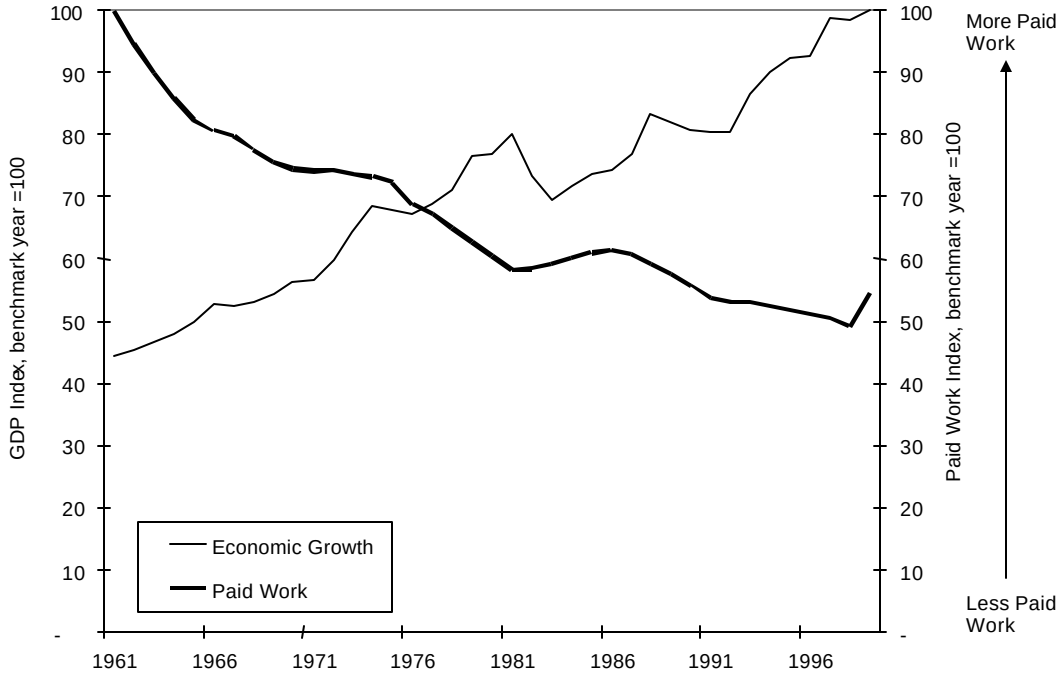


Source: Statistics Canada, General Social Survey Data

3.4 Paid Work in Alberta as an Index

Figure 3 shows paid work in Alberta as an index. The figure also shows the trend in provincial GDP over the study period. For the index, 100 is set equal to the highest number of hours worked per week over the study period, provided that number does not exceed 40 hours per week. Beyond 40 hours per week, some workers will be "overworked" and thus be sacrificing free time, time with family, volunteer work or household work. In other words, beyond 40 hours per week of work, the balance between paid work and unpaid work is less than ideal.[†] The year in which the highest number of hours devoted to paid work occurred in the province is referred to as the benchmark year. Deviation from that year is measured as an index over time. In the case of paid work in Alberta, our benchmark year is 1961. In 1961, paid workers in Alberta worked an average of 2,821 hours per labour force participant per year. This is the equivalent of 38.65 hours per week. Thus, the index indicates that as hours of paid work in Alberta have declined, we have moved further from our benchmark year and closer to zero. The decline in the number of hours worked per week over the study period is likely the result of a number of factors, most noticeably the aging population. An aging population implies that more workers are moving into retirement and thus out of paid work. The substantial increase in the number of underemployed workers in Alberta over the study period is also influencing the decline in hours of paid work.

Figure 3: Paid Work in Alberta as an Index, 1961 to 1999



[†] Some argue that a 35-hour work week is a better ideal than a 40-hour work week.

4.0 Commuting in Alberta

In this analysis, time spent at paid work includes the time spent traveling to and from work on a daily basis. In this section we extract time spent commuting from paid work and explore it in greater detail. In addition, we consider direct expenditures on commuting in Alberta over the study period.

4.1 Why measure the cost of commuting?

The time and money that people spend commuting on a daily basis are not time and money well spent. Every day, people spend varying amounts of time in their cars, largely alone, to get to and from work, and the GDP does not account in any way for this time. The GPI on the other hand, values people's time whether it is used for paid work, unpaid work or commuting. In the GPI accounting framework, time spent commuting is seen as unproductive time that would be better spent with families, at work or at leisure.

In addition to their time, commuters also spend a significant amount of money to drive, service and maintain their vehicles. According to the GDP, the more money people spend getting to and from work, the better off society is. The further people have to travel and the more they spend on gasoline, oil and vehicle maintenance and repairs, the more the GDP increases. Although this type of expenditure does not contribute to the well-being of society, the GDP registers it as an increase. In other words, the GDP does not distinguish regrettable expenditures from expenditures that contribute to the well-being of society and, as such, it is not an appropriate measure of well-being. In contrast, the GPI accounting framework distinguishes regrettable expenditures from other types of expenditures. According to the GPI, expenditure on commuting is regrettable and is therefore deducted from the GPI. Thus the more people commute, and the more time and money they spend to do so, the more the GPI declines.

4.2 How We Measured the Cost of Commuting

Data on time spent commuting come from Statistics Canada's General Society Survey (GSS). Data are available for select years and were extrapolated over the study period. The Statistics Canada data used in this analysis are for the average time spent going to and from work in Canada and are assumed to be the same for Alberta. These data also include time spent taking side trips on the way to and from work. We have adjusted Statistics Canada's estimates to exclude time spent taking side trips to the grocery store or running other errands on the way to and from work because we account for this time in the unpaid work section of our analysis. Thus we subtract travel time related to unpaid work from Statistics Canada's estimates for total time spent commuting.[‡] We include time spent both in a personal automobile and time spent traveling by bus or subway. The cost of time spent commuting for each year in the study period is valued according to the average wage rate in Alberta for that year. In this way, the cost of the time spent commuting is valued at what could have been earned had the commuter spent the same amount of time at work.

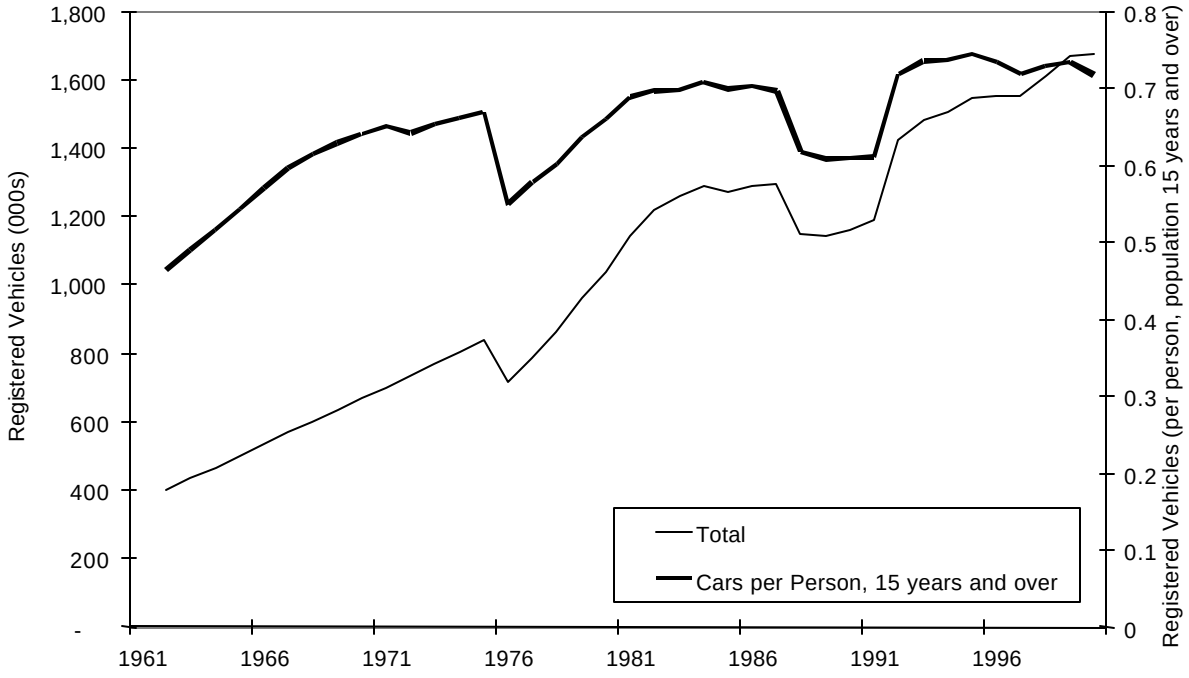
[‡] By subtracting time spent in transit related to unpaid work, we avoid double counting. However, in doing so we also underestimate the time spent commuting, as not all time spent in transit related to unpaid work occurs on the way to or from paid work. Future analysis should consider the exact proportion of commuting time spent running errands related to unpaid work and adjust the estimate accordingly.

Vehicle expenditure data also come from Statistics Canada. In this analysis we include personal expenditure on new and used motor vehicles, motor vehicle parts and repairs, fuels and lubricants, auto-related services and purchased transport.[7] These data are national but are prorated for Alberta according to the number of vehicles registered in Alberta relative to Canada. Data on the number of vehicles registered in Alberta and Canada come from Statistics Canada for 1975 to 1999 and are extrapolated over the entire study period based on a regression analysis of the known data points. Of the total expenditure related to vehicles, we assume 70 percent of the expenditure to be actual expenditure while 30 percent is depreciation. Further, we estimate that of the total actual expenditure, 30 percent of it relates to commuting. This is consistent with the U.S. GPI method.[8] We prorated expenditures on purchased transport for Alberta according to Alberta's share of the national population.

4.3 Commuting in Alberta: How Much?

Figure 4 shows the trend in the total number of registered vehicles and registered vehicles per person (population 15 years and over) in Alberta over the study period. We estimate that the number of registered passenger automobiles in Alberta has increased by 318 percent since 1961. This increase is substantially larger than the 144 percent increase for Canada as a whole. While there were 0.46 passenger automobiles for every person in Alberta aged 15 years and over in 1961, in 1999, this number was 0.72.

Figure 4: Number of Registered Vehicles in Alberta, 1961 to 1999



Source: Trend extrapolated from Statistics Canada CANSIM data

Given the significant increase in the number of registered passenger automobiles in Alberta over the study period, it is not surprising that the vast majority of people travel to and from work in a car or truck. Indeed, travel to and from work is the most common reason for weekday vehicle use.[9] Table 1 shows the results of a survey conducted as part of the 1996 federal census. The

survey collected data on the usual mode of travel for Alberta commuters. As the figures indicate, 76 percent of workers drove a car, truck or van to work. It is somewhat surprising that a mere seven percent were passengers in cars, trucks and vans in 1996. However, according to Statistics Canada's General Social Survey, 77 percent of commuters were alone in their vehicles in 1998 while 69 percent of them were alone in 1986.[10] The data indicate that very few workers either take public transit or walk to work—eight percent and seven percent respectively.

Table 1: Usual Mode of Travel for Workers Travelling in Alberta in 1996

Mode of Travel	Number of Workers	% of Total
Car, truck, van driver	812,195	76%
Car, truck, van passenger	75,820	7%
Public Transit	88,325	8%
Walked to Work	74,075	7%
Bicycle	11,845	1%
Motorcycle	935	0%
Taxi-cab	1,910	0%
Other	10,160	1%
Total	1,075,265	

Source: 1996 Federal Census

The figures in Table 1 for Alberta are quite similar to numbers specific to Edmonton. The 1994 Household Travel Survey by the City of Edmonton revealed that 76 percent of workers drove a car to work (Table 2). An additional eight percent of workers were passengers in a car.

Table 2: Weekday Journey to Work for Edmonton, 1994

Mode of Travel to Work	# of Daily Trips	Average Journey Time (minutes)	Average Journey Distance (km)	% Share
Car driver	283,300	24.4	11.3	76%
Car passenger	30,600	19.1	8.8	8%
Transit	41,000	41.1	9.0	11%
Walk	19,600	25.4	1.7	5%
Total	374,500			

Source: City of Edmonton, 1994 Household Travel Survey

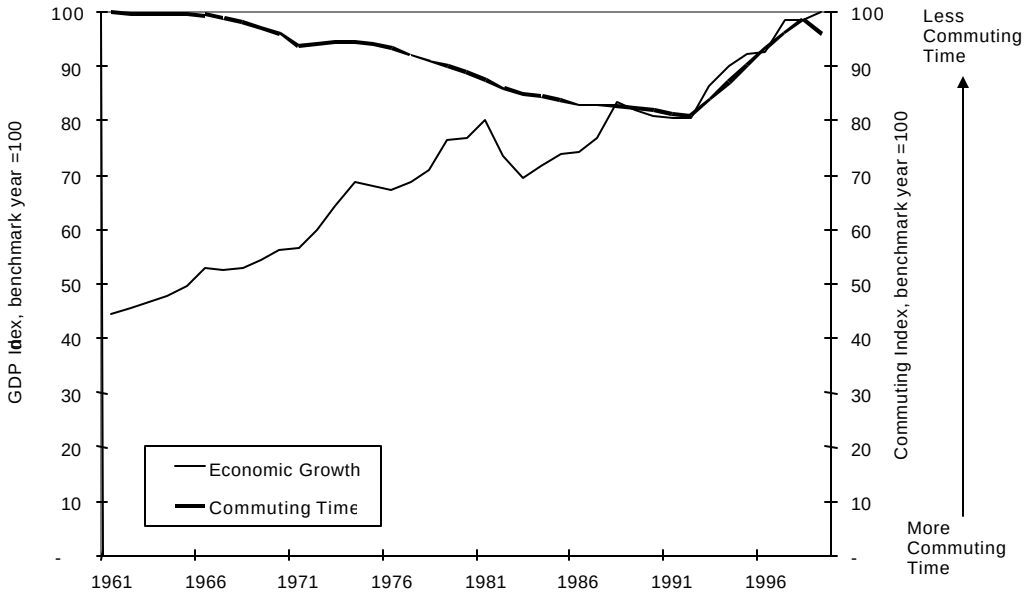
The percentage of workers using public transit in Edmonton in 1994 was slightly higher than the percentage using public transit in Alberta as a whole in 1996 (11 percent versus eight percent). On a national level the use of public transit services increased in both the 1970s and 1980s. Ridership in Canada peaked in 1990 when 1.53 billion passengers used public transit. Ridership declined between 1990 and 1996 and increased slightly in 1997 and 1998.[11] Many factors affect use of public transit, including family size, cost, employment circumstances, fuel costs, parking rates, distance to work, convenience and community size, making it difficult to predict what the long-term trend in ridership will be in Alberta.[12]

4.4 Commuting in Alberta as an Index

Figure 5 shows time spent commuting as an index over the study period. To correct for changes in the workforce from 1961 to 1999, we set 100 equal to the least amount of time spent commuting per worker in Alberta over the study period and measured change from that year as an index over time. We include travel by personal automobile and by transit. We call the year in which the least amount of time was spent commuting per worker in the province the benchmark year. In the case of commuting in Alberta, our benchmark year is 1961. In 1961, workers in Alberta spent an average of 24 minutes per day traveling to and from work by vehicle and transit. Thus, as the index demonstrates, time spent commuting increased steadily from 1961 to 1992 and has declined since 1992, although it is still above 1961 levels. The figure also shows the trend in GDP over the study period.

By 1999, the provincial estimate for average travel time to and from work fell to 25 minutes per day from a high of 30 minutes per day per worker in 1992 when both transit and automobile travel were taken into account. When travel by automobile only is taken into account, we estimate that time spent traveling by car declined from 38 minutes per day to 30 minutes per day. This recent drop in commuting time is consistent with Statistics Canada's estimates for travel time in mid-sized census metropolitan areas (CMAs), which fell from 61 minutes per day in 1986 to 57 minutes per day in 1998 for those traveling by car.[13] Mid-sized CMAs in Canada include Ottawa-Hull, Edmonton, Calgary, Quebec City, Winnipeg, Hamilton, London and Kitchener. The Statistics Canada figures shown here for mid-sized CMAs include the travel time of side trips taken on the way to or from work while our figures do not. The time spent at such activities is captured in Section 5 on unpaid household work. As will be described below, time spent per person per day on such tasks (shopping and transportation related to parenting for example) increased by 27 percent from 1961 to 1999. Thus, although time spent commuting has not changed significantly since 1961 (an increase of only four percent), time spent going to the grocery store and running other errands related to unpaid work has increased 27 percent. When commuting time is combined with time spent on such errands, it is clear that time spent traveling by personal automobile (whether it be for paid or unpaid work) has increased.

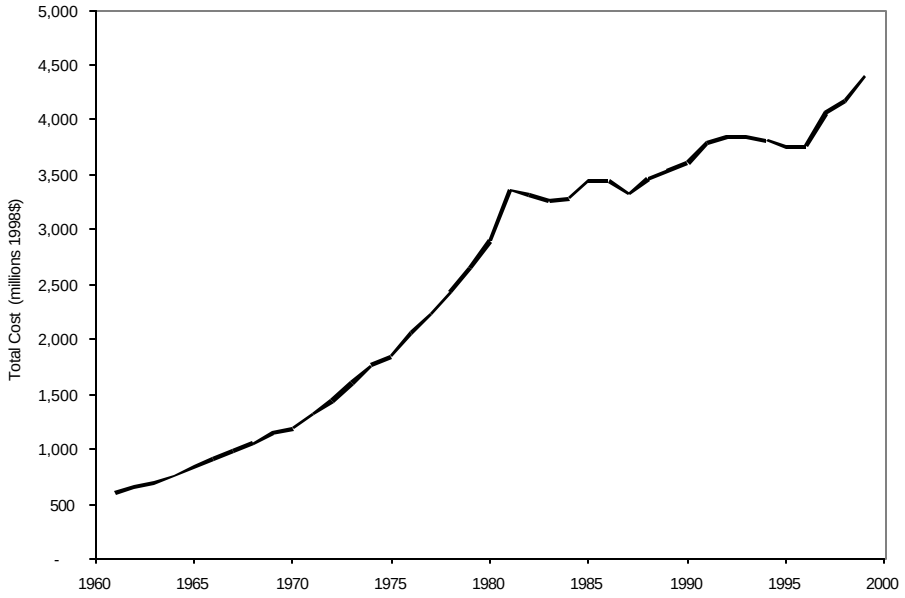
Figure 5: Time Spent Commuting in Alberta as an Index, 1961 to 1999



4.5 The Economic Cost of Commuting in Alberta

Figure 6 shows the estimated economic cost of commuting over the study period. This includes both direct commuting expenditures and the value of the time devoted to such travel. As the figure indicates, the cost of commuting increased substantially over the study period. While commuting cost Albertans $608-million (1998$) in 1961, it cost $4,406-million (1998$) in 1999. That is a 624 percent increase in just 39 years. The cost of commuting accounted for 2.78 percent of provincial GDP in 1961, and 4.02 percent of provincial GDP in 1999. In 1961, approximately 29 percent of the total was direct expenditure incurred due to commuting. The other 71 percent was the value of the time spent commuting. With the recent slight decline in the amount of time devoted to commuting in Alberta, it is not surprising that in 1999 the split between direct expenditure and the value of time spent commuting was 35:65.

Figure 6: The Economic Cost of Commuting in Alberta, 1961 to 1999



In this analysis we are not trying to capture the total cost of transportation, just the cost of commuting. Thus, as was stated in section 4.2 on how we measured the cost of commuting, only 30 percent of actual expenditure on personal vehicles is directly attributable to commuting. It is estimated that total transportation expenditures, commuting and otherwise, represent 15-20 percent of average household income and Gross Domestic Product.[14] This is substantially more than what we have captured in this analysis. The difficulty with the remaining portion of expenditure is discerning how much of it should be deemed "regrettable." With respect to commuting, we know that the time and money devoted to commuting are not productive. However, we are less certain of other expenditures of time and money related to personal vehicle transportation as, for example, a substantial proportion of vehicle owners actually use their vehicle as part of the job.

Our analysis included only direct expenditure and the value of time spent commuting, but obviously the cost of commuting also includes substantial environmental and social costs such as collisions. Motor vehicles produce a host of air pollutants, including carbon monoxide, particulate matter, nitrogen oxides, volatile organic compounds, sulphur oxides, carbon dioxide, methane,

road dust, and toxic gases such as benzene. These emissions cause human illness and death, crop and property damage, global warming, ozone depletion, acid rain and reduced visibility.[15] Indeed, the price that vehicle owners pay per kilometre of travel is substantially less than the true cost of the travel when environmental and social factors are taken into account. Research indicates that for every dollar spent on vehicle operating costs (the cost of fuel, etc.) approximately $2.70 in costs are imposed on society.[16] Thus a large portion of the true costs of driving are being subsidized by society at large in the form of reduced air quality and risk of injury or death, among other things.

As this analysis shows, the cost of commuting in Alberta is substantial, totaling $3,965-million (1998$) in 1999. This includes both direct expenditure on commuting and the value of time spent commuting. The truth is that we have captured only a relatively small portion of the total costs of commuting in the province and thus consider our estimates to be conservative. We have not included the environmental or social costs associated with commuting, such as air emissions; loss of green space; human and animal health impacts; and crop, building and material damage. Were we to include estimates for these things, our cost of commuting in Alberta would be substantially higher but the uncertainty associated with quantifying such costs would be significant.

5.0 Unpaid Work in Alberta

5.1 Why measure unpaid work?

The amount of unpaid work in Alberta is substantial. In total, Albertans contributed 2,903 million hours of unpaid work in 1999—the equivalent of 1,512,000 full-time jobs, valued at approximately $38,830-million (1998$). The value of unpaid work in Alberta amounted to 35 percent of Alberta's 1999 GDP, which was valued at $109,708-million (1998$) in 1999.

Despite these huge numbers, our current accounting system fails to recognize such contributions. When a family eats at a restaurant, the Gross Domestic Product increases. If the same meal is prepared at home, the time put into preparing and cooking the meal is not registered in GDP accounting. By focusing on transactions that take place in the market and ignoring unpaid work, the substantial contribution of the unpaid sector to the well-being of Albertans goes largely unnoticed, making the GDP an inappropriate measure of the well-being of a region. Indeed, it was never intended to be used in such a manner. In contrast to the GDP, the Genuine Progress Indicator is based on the premise that all work has value whether done for the marketplace or not. This section of our analysis quantifies the contribution of the unpaid work sector in Alberta, presenting estimates of both hours and monetary value of unpaid work by activity type and sex, from 1961 to 1999.

5.2 What is unpaid work?

The Genuine Progress Indicator measures unpaid work as work that could conceivably be purchased in the marketplace; that is, someone else could be paid to do the work. Consistent with definitions used by Statistics Canada,[17] we define unpaid work as including the following:

Domestic Work - includes meal preparation, cleaning, clothing care, repair and maintenance and other domestic work (pet care, for example).

Help and Care (within the household) - includes child care and adult care that takes place within the home. In this study we refer to "help and care" as parenting and eldercare.

Management and Shopping - includes household management and administration and shopping for goods and services.

Transportation and Travel - includes taking children places as well as all travel related to management and shopping, domestic work and transporting household adults to various places (work, school and hospital, for example).

Other Unpaid Work - includes volunteer work, other help and care (helping friends, neighbours and relatives with housework, cooking and transportation, for example) and transport related to volunteer work and other help and care. In this study we refer to "other unpaid work" as volunteerism.

5.3 How We Measured Unpaid Work in Alberta

Unpaid work data come from Statistics Canada's General Social Survey (GSS).[18] Along with New Zealand and Russia, Canada has been heralded one of the most progressive nations in conducting time-use surveys. Data for 1961, 1971, 1981, 1986 and 1992 are from *Household Unpaid Work: Measurement and Valuation*.[19] Unfortunately, the only provincial data available in this publication are for total unpaid hours of work. However, at the national level, hours of unpaid work are available by type of activity (domestic work, shopping and management, transportation and travel, parenting and eldercare and other unpaid work/volunteerism).

Thus, to measure the hours of unpaid work for Alberta by unpaid activity type, we first calculated values for the national average hours of unpaid work per person per year by dividing total hours of unpaid work by activity for Canada, by population 15 and over (see tables 3, 4 and 5). We then multiplied these national averages by the Alberta population 15 and over. This was done for the total population, the male population and the female population in Alberta. Using this method, we were able to develop estimates for hours of unpaid work for Alberta disaggregated by sex into domestic work, management and shopping, parenting and eldercare (help and care), transportation and travel, and volunteerism (other unpaid work). Statistics Canada used a similar method to derive their provincial estimates for total unpaid work. Unlike our analysis, however, where we use national average by sex for the various types of unpaid work, they used national estimates for 58 different demographic groups to estimate a total value for unpaid work for Alberta. The Statistics Canada values for total unpaid work derived for Alberta will be useful for comparison with the sum of the estimates of unpaid work by activity type derived in our analysis.

The unpaid work data for 1998 also come from Statistics Canada.[20] Unfortunately, several of the categories for unpaid work in this publication do not compare directly with those used in the publication cited above. First, the 1999 publication does not present transportation as its own category; instead time spent in transit is lumped with whatever activity the transportation was associated with. For example, time spent traveling to and from the grocery store would be accounted for in "shopping for goods and services." Second, management is not included with shopping, as it is in the 1995 publication, rather it is included in other household work. Third, shopping includes shopping for personal care services (like hair cuts) and medical and dental care in the 1998 data. These are not included in shopping in the data for previous years. Fourth, civic and volunteer work is defined in the 1999 publication much more broadly than volunteer work in the 1995 publication is (other unpaid work). Specifically, the 1995 publication includes formal volunteer work with an organization, informal other help and care given to persons outside one's own household but not via a formal volunteer organization, and the travel related to both of the above. In contrast, the 1999 definition for civic and volunteer work encompasses all that is included in the 1995 publication plus personal and medical care given to members of one's own household, and activities related to political, civic, union, professional associations, youth, fraternal and social organizations, self-help groups and coaching. Due to the much broader definition used in the later publication, the data from the 1995 publication are not directly comparable with data from the 1999 publication.

The 1998 data were thus reorganized and adjusted to achieve comparability across the entire study period (1961 to 1998). Because other household work includes management, and shopping includes transportation in the 1999 publication, these two categories were combined into one category (sum of shopping for goods and services and other household unpaid work). This number was subsequently disaggregated into management and shopping, and transportation according to the ratio of transportation to transportation plus management and shopping in 1992.

In this way, transportation became its own category and management was added to shopping.[§] Time spent shopping for personal care services and medical and dental care was removed from the 1998 data. The data for civic and volunteer work needed to be adjusted to be consistent with data that were included in the 1995 publication. This was accomplished by looking at the ratio of other unpaid work for 1992 to civic and volunteer work for 1992 for Alberta. In the case of the total population in Alberta, other unpaid work accounted for 45 percent of civic and volunteer work. Thus, the 1998 estimate for civic and volunteer work was reduced by 55 percent to establish an estimate that would be comparable with the other unpaid work category in 1992.

Once the categories of unpaid work in 1998 were adjusted and reorganized, we calculated values for average time spent at each activity for Canada and multiplied these by the population in Alberta for 1998 by sex to get hours of unpaid work for 1998.

Table 3: Average Annual Hours of Unpaid Work per Person per Year by Activity, (population 15 years and over), Canada

Year	Domestic Work	Parenting and Eldercare	Management and Shopping	Transportation and Travel	Volunteerism
1961	691.83	198.24	149.93	115.58	67.52
1971	673.74	181.07	155.90	118.10	66.45
1981	662.33	157.31	160.80	118.35	66.53
1986	616.78	124.05	195.76	111.68	59.86
1992	682.64	128.60	169.36	115.92	67.08
1998	620.50	146.00	236.68	177.98	67.08

Source: Statistics Canada General Social Survey Data

Table 4: Average Annual Hours of Unpaid Work per Person (population 15 years and over) per Year by Activity, Males, Canada

Year	Domestic Work	Parenting and Eldercare	Management and Shopping	Transportation and Travel	Volunteerism
1961	390.53	100.45	122.46	112.86	61.06
1971	393.00	93.49	127.83	113.49	61.22
1981	407.71	84.01	132.46	113.12	59.45
1986	340.58	68.05	171.98	100.76	45.16
1992	443.41	74.15	135.97	99.60	77.76
1998	328.50	109.50	208.40	169.76	55.99

Source: Statistics Canada General Social Survey Data

[§] The 1998 estimate for hours spent at transportation and travel will be slightly underestimated and that for parenting and eldercare will be slightly overestimated as the latter was not corrected for whatever transportation and travel time was associated with parenting and eldercare. We assume this to be a relatively small amount relative to transportation and travel associated with shopping and certainly the total hours spent at household unpaid work for 1998 will still be a reflection of actual time use.

Table 5: Average Annual Hours of Unpaid Work per Person (15 years and over) per Year by Activity, Females, Canada

Year	Domestic Work	Parenting and Eldercare	Management and Shopping	Transportation and Travel	Volunteerism
1961	996.16	297.01	177.67	118.34	74.04
1971	948.68	266.85	180.69	122.62	74.27
1981	907.30	227.73	188.07	123.38	73.45
1986	880.31	177.47	218.34	122.21	73.89
1992	893.35	180.60	201.31	131.54	75.13
1998	803.00	219.00	263.64	187.52	81.96

Source: Statistics Canada General Social Survey Data

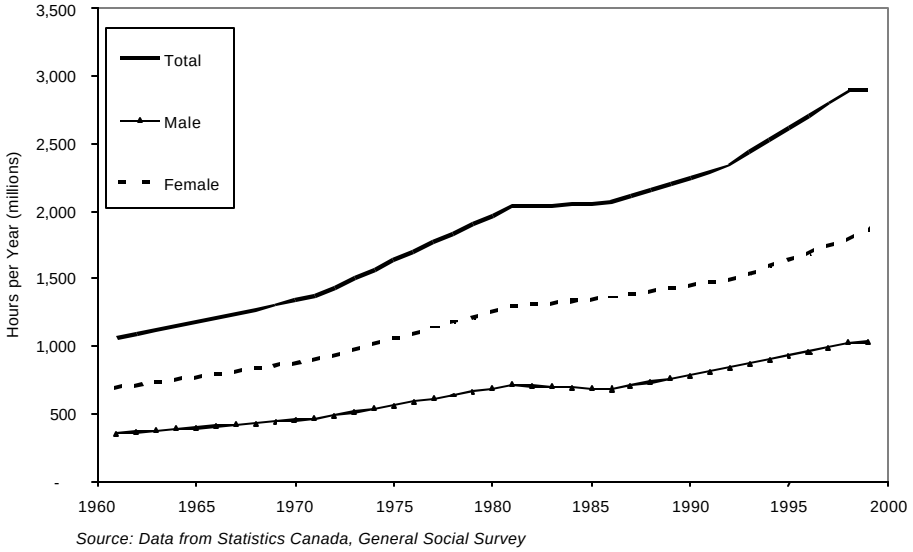
Having estimated hours of unpaid work by activity type and sex for Alberta, we used the replacement cost generalist method to estimate the monetary value of unpaid work in Alberta over time. The replacement cost generalist method values all unpaid work consistent with an hourly rate that would be earned were the unpaid work to be replaced by paid work in the marketplace. The hourly wage rates are from Statistics Canada's census data on employment earnings and are available provincially in *Households' Unpaid Work: Measurement and Valuation* for 1961, 1971, 1981, 1986 and 1992. The imputed cost value for 1998 was extrapolated from the 1961 to 1992 data. Thus, to value the unpaid work using the replacement cost generalist method for each year of data (1961, 1971, 1981, 1986, 1992 and 1998), we multiplied the hours of unpaid work for each activity type by the imputed costs of unpaid work for childcare and domestic work particular to Alberta. For example, the hours of unpaid work dedicated to parenting and eldercare were multiplied by the imputed costs for "physical care of children" specific to Alberta ($7.02 for 1992). Similarly, management and shopping, transportation and travel, and domestic work were all valued at the imputed costs for "other domestic work" ($9.48 for 1992); again this value is specific to Alberta. It will be useful to compare Statistics Canada's estimates for the total value of unpaid work for Alberta with the sum of the values derived in this analysis.

The data were then extrapolated over the study period, 1961 to 1999. The extrapolation method used in this analysis assumes a constant growth rate between known data points; i.e., for 1961 to 1971, from 1971 to 1981, etc. The monetary value of unpaid work in Alberta is converted to 1998 dollars using Alberta Treasury's Consumer Price Index.

5.4 Unpaid Work in Alberta: How Much?

In 1961, the Albertan population aged 15 and over contributed a total of 1,055 million hours to unpaid work in the province, the equivalent of over 549,000 full-time jobs.** According to the results derived in this study, that number had increased 175 percent by 1999. This includes domestic work, parenting and eldercare, management and shopping, transportation and volunteerism. Total unpaid working hours in Alberta in 1999 were 2,903 million, the equivalent of 1,512,000 full-time jobs. Figure 7 shows total unpaid work hours for Alberta (population 15 and up) over time by sex.

Figure 7: Unpaid Work in Alberta, Population 15 years and over, 1961 to 1999

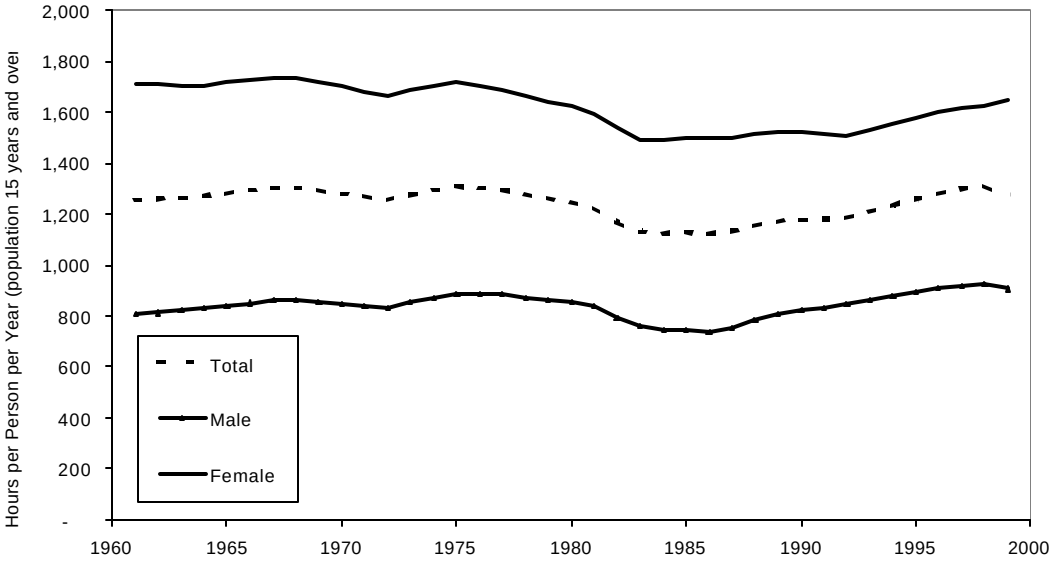


Source: Data from Statistics Canada, General Social Survey

As Figure 7 indicates, there was a steady increase in the amount of total unpaid work done in Alberta over the study period, with the female population contributing up to 65 percent of total hours of unpaid work. This increase in total unpaid work from 1961 to 1999 is due largely to increases in population over the same period. Indeed, when compared with changes in population in Alberta from 1961 to 1999, we see that the population aged 15 years and over increased from 862,700 in 1961 to 2,332,405 in 1999—or 170 percent. In fact, the average time spent on total unpaid work per person (population 15 years and over) per year increased by only two percent from 1961 to 1999; from approximately 1,223 hours per person per year in 1961, to 1,244 hours per person per year in 1999 (Figure 8).

** Assumes a 40-hour a week job over 48 weeks of work.

Figure 8: Unpaid Work in Alberta per Person, Population 15 years and over, 1961 to 1999



Source: Data from Statistics Canada, General Social Survey

However, this increase in average hours spent per person on total unpaid work does not hold for both males and females or for all types of unpaid work. Indeed, the average number of hours of total unpaid work by females has declined by five percent since 1961 while that for males has increased by 14 percent (Table 6).

Table 6: Average Time Spent at Total Unpaid Work by Sex (hours per person, population 15 years and over, per year)

Year	Total Population	Male Population	Female Population
1961	1,223.10	787.36	1,663.21
1971	1,195.27	789.02	1,593.11
1981	1,165.32	796.76	1,519.94
1986	1,108.13	726.52	1,472.22
1992	1,163.60	830.90	1,481.92
1998	1,271.58	895.49	1,578.46
% change, 1961 to 1998	4%	14%	-5%

Source: Data from Statistics Canada, General Social Survey

As well, when unpaid work is disaggregated into the various activity types, we see that for both management and shopping, and transportation, the average number of hours spent per person (population 15 years and over) per year increased over the study period (Table 7).

Table 7: Average Time Spent at Unpaid Work by Activity (hours per person, population 15 years and over, per year)[††]

Year	Domestic Work	Parenting and Eldercare	Management and Shopping	Transportation and Travel	Volunteerism
1961	691.83	198.24	149.93	115.58	67.52
1971	673.74	181.07	155.90	118.10	66.45
1981	662.33	157.31	160.80	118.35	66.53
1986	616.78	124.05	195.76	111.68	59.86
1992	682.64	128.60	169.36	115.92	67.08
1998	620.50	146.00	236.68	177.98	67.08
% change, 1961 to 1998	-10%	-26%	58%	54%	-1%

Source: Data from Statistics Canada, General Social Survey

Table 8 compares total hours spent at unpaid work in Alberta with total hours spent at paid work. While total unpaid hours in 1961 were fewer than total paid hours, that is no longer the case. Hours devoted to unpaid work exceeded those devoted to paid work in both 1992 and 1998. In full-time job equivalent terms, the unpaid work sector exceeded all other jobs in the province in 1992 and 1998.

Table 8: Total Unpaid and Paid Work and Full-time Job Equivalents Alberta

Year	Total Unpaid Work Hours (millions)	Number of Full-time Job Equivalents: Unpaid Work	Total Paid Work Hours (millions)	Number of Full-time Job Equivalents: Paid Work	Unpaid/ Paid, %
1961	1,055	549,567	1,161	604,482	91%
1971	1,369	713,174	1,427	743,467	96%
1981	2,034	1,059,319	2,045	1,065,104	99%
1986	2,062	1,073,891	2,288	1,191,695	90%
1992	2,344	1,220,709	2,133	1,110,938	110%
1998	2,892	1,506,612	2,225	1,158,741	130%
% change, 1961 to 1998		174%		92%	

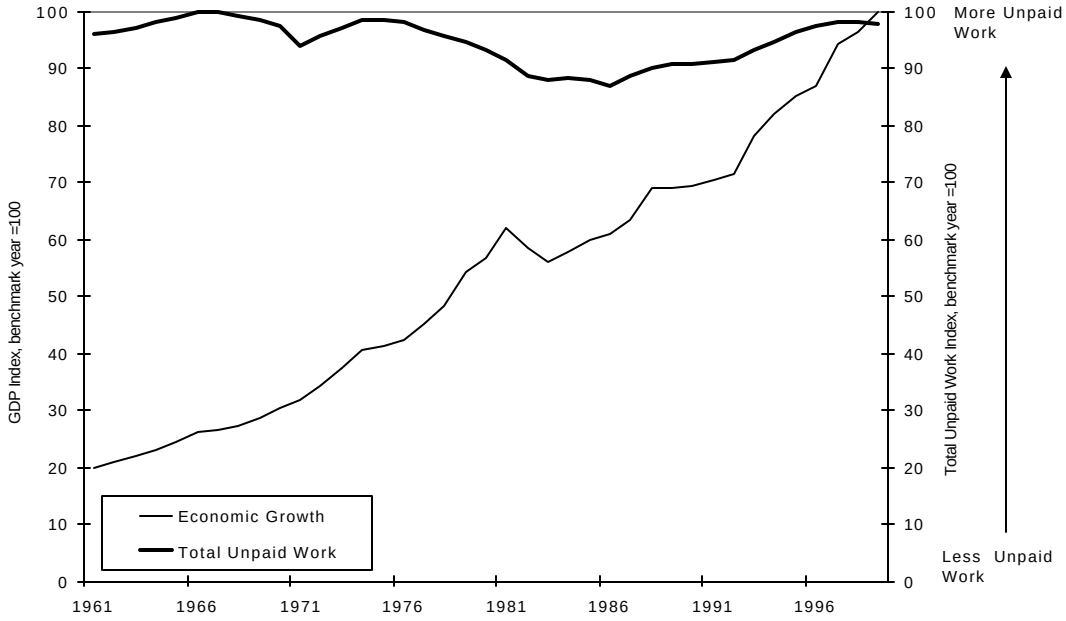
Source: Data from Statistics Canada, General Social Survey

[††] The changes in time devoted to unpaid work from 1961 to 1998 are probably at least partly due to inconsistencies in the data between 1961 and 1998. Differences in classifications of activities between these years meant direct comparison was not possible. We have tried to alter the 1998 data to be comparable with data from previous years but the results of that exercise are somewhat uncertain. See the section on how we measured unpaid work in Alberta for details.

5.5 Unpaid Work in Alberta as an Index

Figure 9 shows unpaid work in Alberta as an index. The figure also shows the trend in provincial GDP over the study period. For the index, 100 is set equal to the highest number of hours of unpaid work per person (population 15 years and over) that occurred in the study period. Deviation from that year is measured as an index over time. We call the year in which the most hours of unpaid work occurred the benchmark year. In the case of unpaid work in Alberta, our benchmark year is 1966. In 1966, the number of unpaid hours of work per person (population 15 years and over) was 1,273. Thus, the index indicates that as unpaid work hours Alberta have deviated from 1,273 hours per person per year we have moved closer to or further from our benchmark year. While the number of unpaid hours for men has increased, women's hours have experienced a slight decline. Similarly, while hours devoted to domestic work and parenting and eldercare have declined, those devoted to management and shopping, and transportation have increased.

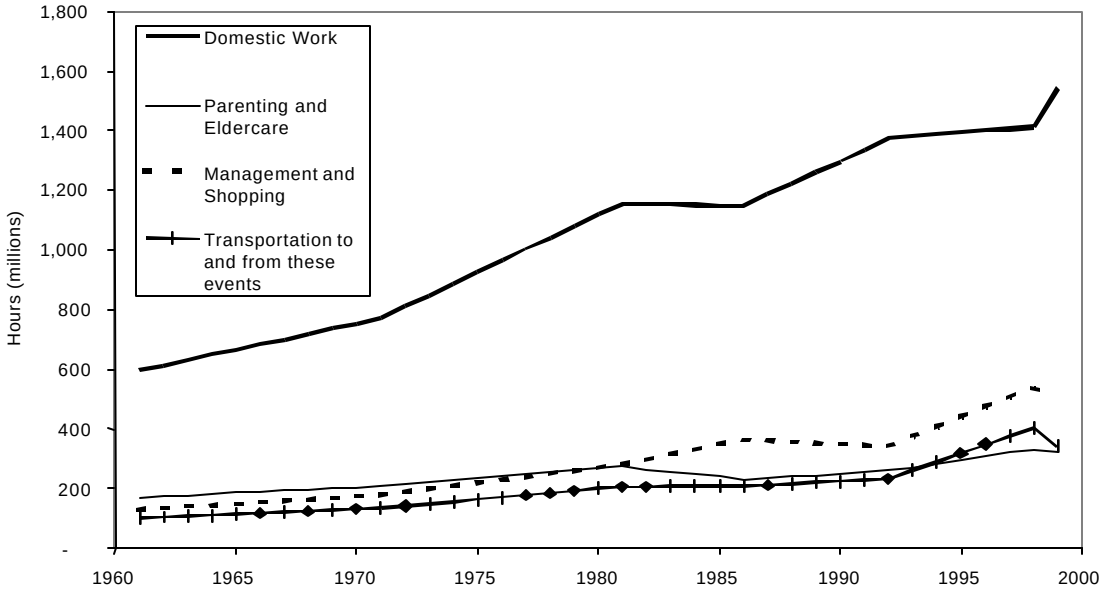
Figure 9: Unpaid Work in Alberta as an Index, 1961 to 1999



5.6 Less Time With Family: Household Unpaid Work in Alberta by Activity

Total unpaid work comprises household unpaid work and volunteerism. Household unpaid work represents the bulk of total unpaid work (90-95 percent over the study period) and can be further disaggregated into domestic work, parenting and eldercare, shopping and management, and transportation and travel. Figure 10 disaggregates household work into the above categories for Alberta. In 1999, household unpaid work accounted for over 2,727 million hours of unpaid work. In full-time job equivalents that is: 803,006 full-time jobs attributable to domestic unpaid work; 167,002 full-time jobs attributable to parenting and eldercare; 271,117 full-time jobs attributable to management and shopping; and 178,487 full-time jobs to transportation.

Figure 10: Household Unpaid Work in Alberta, 1961 to 1999



Source: Data from Statistics Canada, General Social Survey

Parenting and eldercare consumed more time than management and shopping, and transportation in 1961, but in 1998 it consumed less time than these activities. In fact, the percentage of household unpaid work attributable to parenting and eldercare fell steadily from 17 percent in 1961 to 12 percent in 1999. The share of household unpaid work attributable to domestic work has also fallen since 1961, from 60 percent to 57 percent. All other household unpaid activities increased over this same period: management and shopping increased from 13 percent in 1961 to 19 percent in 1998; and transportation increased from 10 percent in 1961 to 13 percent in 1998. A closer look at trends in household size[‡‡] might explain the decline in hours devoted to parenting and eldercare.

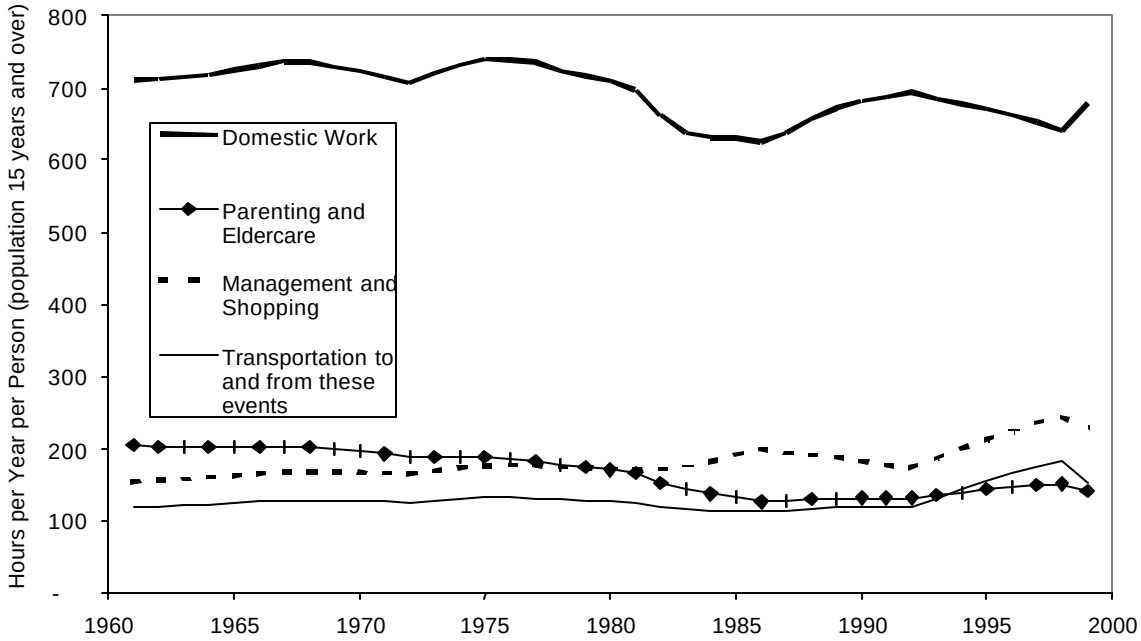
Children under the age of five made up more of Canada's total population in 1961 than in 1999 as families contained more children in 1961 than they did in 1999. Thus, fewer children require care in Canada today than in recent decades and so a decline in hours devoted to parenting would be expected. However, while fertility rates are declining in Canada, the proportion of the population made up of seniors is increasing. In 1992, seniors comprised 12 percent of the population, an increase from just nine percent in 1961.[21] Given this trend, we might expect to see the reduction in parenting hours offset by an increase in eldercare such that the two factors balance and overall time devoted to parenting and eldercare would remain relatively stable. However, this is not what the data indicate. Indeed, the decline in hours devoted to parenting and eldercare, despite the increase in the number of seniors, likely reflects two factors: the improving health status of Canada's senior population; and the growing likelihood that seniors will not live with their adult children. Care of the elderly is only included in the parenting and eldercare category of unpaid work if the senior lives in the same house as whoever is responsible for giving the care. If someone helps an aging parent who has his or her own home, it is considered informal voluntary work rather than parenting and eldercare and is included in the volunteerism component of unpaid work.

[‡‡] Number of occupants in a house

A second factor influencing the decline in hours devoted to parenting and eldercare between 1961 and 1998 is the trend towards increasing labour force participation by women. Most households in the 1990s have two adults in the workforce and thus the combined hours dedicated to paid work increased substantially over the study period. In 1992, dual-earner families made up 61 percent of all two-spouse families, up from just 33 percent in 1967.[22] The increasing number of hours that households are devoting to paid work while still trying to maintain a house and do the regular shopping could be manifesting itself in a decline in hours devoted to child care in Alberta. In fact, the demand for paid childcare increased significantly over the study period in spite of the reduced fertility rates in Canada. According to the National Child Care Study conducted by Statistics Canada, most children under the age of 13 participated in at least one supplementary care arrangement in 1992. The survey revealed that 47.8 percent of Canadian children under the age of six, and 32.2 percent of children between the ages of 6 and 12 are in supplementary arrangements.[23] Yet despite substantial increases in the number of supervised day care spaces available in Canada—350,000 in 1992, over three times the number in 1980—only a portion of Canada's child care requirements are currently being met.[24]

Along with changing trends in time spent at parenting and eldercare, hours devoted to domestic work are also noteworthy. Figure 11 shows household work by activity type per person (population 15 years and over) in Alberta. Despite the trend in increasing total hours devoted to all household work activities, plus time spent at parenting and eldercare, time spent on domestic work per person shows a slight decline over the study period.

Figure 11: Household Unpaid Work per Person in Alberta, Population 15 years and over, 1961 to 1999



Source: Data from Statistics Canada, General Social Survey

Table 9 shows hours devoted to domestic work in Alberta from 1961 to 1998. While total hours devoted to domestic work increased by 137 percent, hours per person (population 15 years and over) declined by 10 percent.

Table 9: Hours of Domestic Work per Year, Alberta

Year	Total Hours	Average Hours per Person* per Year
1961	596,845,501	692
1971	771,834,635	674
1981	1,155,988,055	662
1986	1,147,634,748	617
1992	1,374,987,150	683
1998	1,411,559,317	621
% change, 1961 to 1998	137%	-10%

* Population 15 years and over.
Source: Data from Statistics Canada, General Social Survey

One factor contributing to the trend in fewer domestic hours per person could be that more time is spent eating out. Data from Statistics Canada's Food Expenditure Survey revealed that in 1969, households spent 15 percent of their food budget on food purchased from restaurants. By 1982, that portion had increased to 25 percent, and by 1996, it was 28 percent.[25]

A second factor could be time-saving devices, as the last several decades have seen substantial investments by households in such appliances. According to Statistics Canada, by 1992, most households had an electric stove, a refrigerator and a vacuum cleaner, and approximately three out of four households had a microwave oven, a freezer, an automatic washer and a dryer.[26] In the 15 years between 1982 and 1997, the percentage of households with automatic dishwashers increased from just under 33 percent to almost 49 percent. This increase pales compared with the increase in households with microwave ovens over the same period. In 1982, just 10.2 percent of households in Canada had a microwave but by 1997, 86.3 percent did; Alberta had more households with microwaves than any other province by 1997, 90.3 percent.[27]

Given the substantial growth in household time-saving devices as well as the increase in meals purchased from restaurants, it is surprising that the decline in average hours spent per person (population 15 years and over) on domestic work has not been more significant. It fell by only 71 hours per person per year from 1961 to 1998. That is a decline of just 0.19 hours (11.4 minutes) per day, or 1.33 hours (79.8 minutes) per week[28] from 1961 to 1998. Of the 168 hours available in one week, this is a drop of just 0.0079 percent from 1961.

It appears that factors in addition to the acquisition of time-saving devices and restaurant meals are influencing the number of unpaid hours devoted to domestic work in Canada and Alberta. One possible consideration is the time spent maintaining and repairing such devices. According to Chris Jackson, the accumulation of time-saving appliances "may also lead to more time being spent on appliance repairs and maintenance or on seeking repair services."[29] Likewise, Bose et al (1984) found that time and effort saved by some appliances is offset by assembling, using, cleaning, maintaining and repairing the equipment.[30]

Other considerations include changes in household size (i.e., the number of people living in a house) and dwelling size. Over the study period, household size decreased and dwelling size

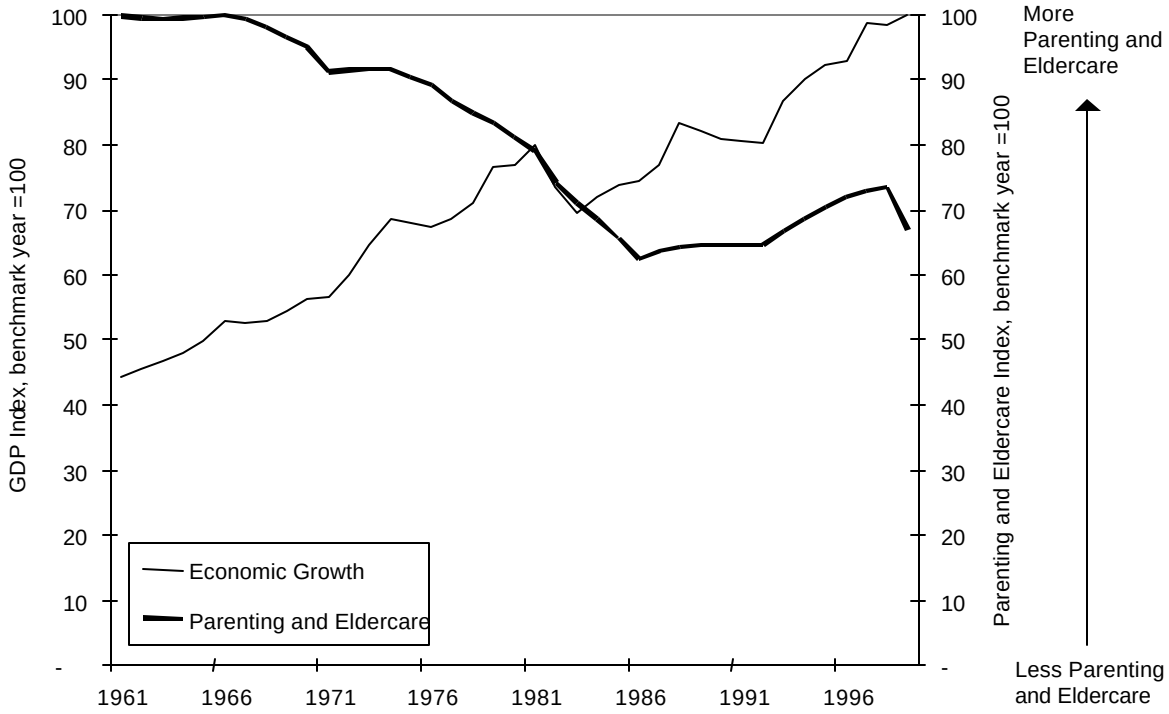
increased in Canada. Average household size in 1961 was 3.9 people; by 1992 it had fallen to 2.6, implying that fewer people than in the past are now available to contribute to unpaid work. At the same time, the average number of rooms per dwelling rose from 5.4 in 1961 to 5.9 by 1992. Thus, while fewer people are available to help with domestic work today relative to 1961, there are more rooms to clean now than in 1961.

Dr. Ronald Colman of GPI Atlantic explains, "There is evidence to suggest that in fact, the focus on accumulating material possessions has actually increased the overall work and debt burden. More hours are required to support higher levels of consumption; there are more rooms to clean in even larger houses; smaller families have made household production more inefficient; and higher levels of household capital require more maintenance, repair and replacement."[31]

5.7 Parenting and Eldercare in Alberta as an Index

Figure 12 shows parenting and eldercare in Alberta as an index. The figure also shows the trend in provincial GDP over the study period. For the index, 100 is set equal to the highest number of hours per person (population 15 years and over) devoted to parenting and eldercare in the province over the study period. Deviations from that year are then measured as change in the index over time. We call the year in which the most hours of parenting and eldercare occurred the benchmark year. In this case, the benchmark year was 1966. In 1966, 199 hours per person (population 15 years and over) per year were devoted to parenting and eldercare. As hours of parenting and eldercare decreased, the index moves further from the benchmark year and closer to zero. As we have explained, the decline in hours devoted to parenting and eldercare is likely the result of a number of factors including fewer children per household, a healthier senior population and more hours devoted to work.

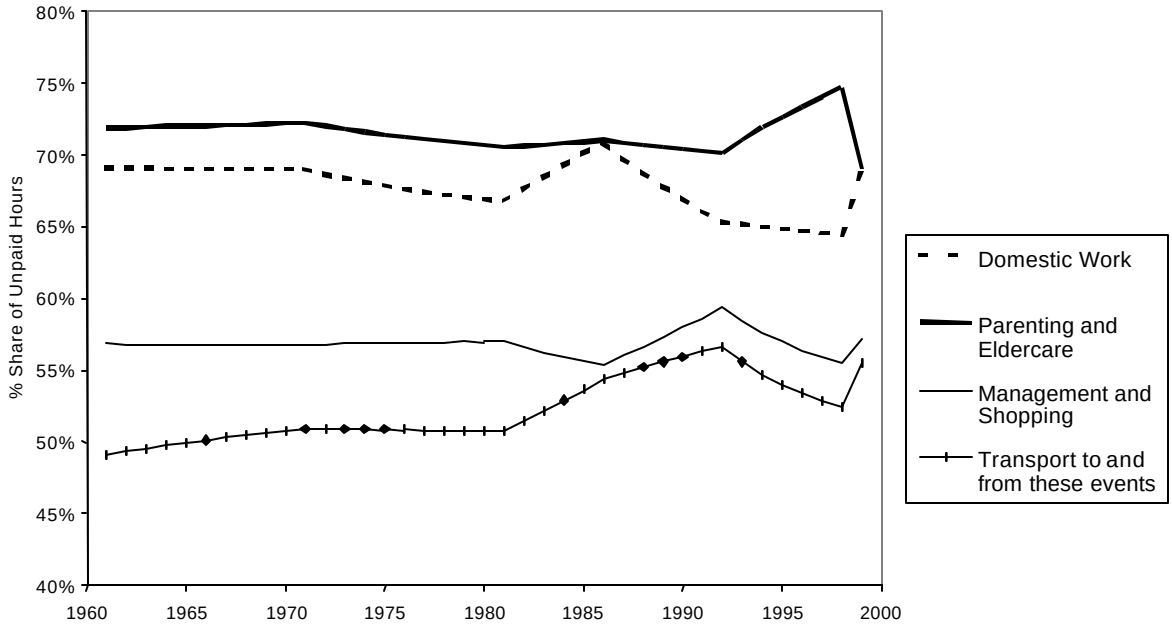
Figure 12: Parenting and Eldercare as an Index in Alberta, 1961 to 1999



5.8 The Time-Stressed: Household Unpaid Work in Alberta by Sex

Figure 13 shows the female share of household unpaid work for Alberta over time.

Figure 13: Female Share of Household Unpaid Work in Alberta, 1961 to 1999



Source: Data from Statistics Canada, General Social Survey

Although the female share of parenting and eldercare has fallen since 1961, from 72 percent to 69 percent, that share is still well over 50 percent. The female share of management and shopping and domestic work was the same in 1999 as in 1961, 57 percent and 69 percent respectively, and transportation increased from 49 percent to 55 percent.

Table 10 shows the number of unpaid working hours for both employed and unemployed females aged 15 and up in Canada over time, with a sharp increase in the number of total unpaid hours worked by employed females between 1961 and 1992—an increase of 311 percent. In contrast, for not-employed females the increase in total unpaid hours from 1961 to 1992 was only 12.5 percent.

Table 10: Unpaid Work, Millions of Hours, Females 15 years and over, Canada

	Year	Unpaid Work	Household Work	Domestic Work	Parenting and Eldercare	Management and Shopping	Transportation and Travel
Employed	1961	1713	1817	952	222	275	166
	1971	3284	3124	1825	480	494	324
	1981	5344	5092	2962	787	790	534
	1986	5879	5573	3353	691	967	562
	1992	7043	6754	4061	913	1043	737
% change, 1961 to 1992		311%	272%	327%	311%	279%	344%
Not Employed	1961	8238	7890	5008	1555	787	539
	1971	8513	8123	5200	1496	844	583
	1981	8872	8438	5504	1344	969	620
	1986	8745	8318	5392	1072	1203	651
	1992	9271	8733	5773	1075	1174	711
% change, 1961 to 1992		13%	11%	15%	-3%	49%	32%

Source: Statistics Canada, "Households Unpaid Work: Measurement and Valuation," Catalogue No. 13-603E, No.3

The increase in unpaid hours of work for employed women in Canada is probably largely explained by the substantial increase in female labour force participation rates. According to Statistics Canada, women accounted for almost three-quarters (73 percent) of all growth in employment between 1975 and 1993. Specifically, women's participation in the labour force increased from 44 percent in 1975 to 58 percent in 1993. Over the same period, men's participation in the labour force declined from 78 percent in 1993 to 73 percent in 1973. As a result, women in Canada made up 45 percent of all people active in the labour force in 1993, up from just 37 percent in 1975. Provincially, Alberta had the highest labour force participation rate for women in 1993 at 64 percent; Ontario was second at 60 percent, followed by Manitoba and Saskatchewan with 59 percent, and British Columbia with 58 percent. Participation rates in the remaining provinces were lower, ranging from 54 percent in Quebec to 46 percent in Newfoundland.[32]

Canada's increasing female labour force participation rate over the last several decades applies to mothers and non-mothers alike. According to Statistics Canada, "[O]ne remarkable change in labour force participation that has occurred is the entrance of women with young children."[33] Fifty-four percent of women in Canada with children under three years of age were part of the paid work force in 1992, up from 39 percent in 1981. In the case of women whose youngest child was aged three to five, the proportion of mothers working outside the home increased from 47 percent in 1981 to 59 percent in 1992. In total, 70 percent of women with children under 16 were in the labour force in 1993, a substantial increase from just 55 percent in 1981.[34] In contrast, Statistics Canada has found that, for fathers, the age of their children makes no difference to either labour force participation rate or employment levels.[35]

Despite the substantial increase in female labour force participation in Canada and Alberta, including mothers, women still bear most of the responsibilities for maintaining their families.[36] Indeed, as Table 11 indicates, married mothers, employed full-time spend 1.7 hours more per day on average doing household work than their male counterparts (4.6 hours per day for married, employed mothers versus 2.9 hours per day for married, employed fathers). That is a 58 percent

difference in hours devoted to unpaid household work. Moreover, research by Frederick (1995) reveals that while the proportion of women participating in the labour force declines in the presence of children, from 71 percent for women without children to 45 percent for mothers, men actually increase their labour force participation in the presence of children, from 82 percent to 89 percent.[37]

Table 11 also highlights differences in unpaid work between married and single mothers and employed and not-employed mothers. As the figures show, married mothers who are not employed dedicate the most time to unpaid work while single mothers employed full-time dedicate the least amount of time to unpaid work.

Table 11: Average Time Spent on Unpaid Household Work, Parents aged 25-44, Canada, 1992

	Employed full-time			Employed part-time	Not Employed	
Hours per day	Married fathers	Married mothers	Lone-parent mothers	Married mothers	Married mothers	Lone-parent mothers
Cooking	0.4	1.2	0.8	1.7	1.8	1.6
Housekeeping	0.2	1.0	0.7	1.6	1.9	1.9
Repairs	0.4	-	0.2	0.1	0.1	0.0
Other	0.5	0.3	0.3	0.3	0.3	0.3
Shopping	0.6	0.8	1.0	0.9	1.1	0.7
Child Care	0.9	1.3	1.0	2.0	2.3	2.5
Total	2.9	4.6	4.1	6.6	7.5	7.1

Source: Frederick, Judith. "As Time Goes By…Time Use of Canadians." Statistics Canada, Catalogue No. 89-544E

Although full-time employed mothers do fewer hours of unpaid household work than either unemployed or part-time mothers, this reduction does not offset the time spent at paid work. Despite working between 30 and 40 hours a week at a paid job, full-time employed mothers contributed 56 percent of the hours of not-employed married mothers in 1992. Furthermore, although husbands increased the number of hours they devoted to primary childcare when they became fathers, they did not increase the number of hours spent on household chores when their wives worked full-time.[38] Indeed, research by Statistics Canada revealed that contrary to what one might expect, spouses of full-time employed women devoted 18 minutes less each day to unpaid work relative to a sole-earner husband.[39] Under these circumstances it is not surprising that "the cohort with the least amount of leisure time [in 1992] was full-time employed, married mothers (3.6 hours a day)."[40]

With the increasing role of females in the labour force, particularly mothers, and the perpetual demand of household unpaid work that is largely filled by mothers whether they are employed or not, it is not surprising that women in Canada and Alberta alike are experiencing significant levels of time-related stress. Statistics Canada research indicates that one out of three full-time employed mothers suffer from extreme levels of stress. Women's stress levels were found to increase with both marriage and children and nearly 70 percent of full-time employed, married mothers felt rushed on a daily basis. In fact, women's stress levels are highest and "virtually explode" in the case of full-time employed mothers.[41]

The National Child Care Study conducted by Statistics Canada revealed that mothers with two or more preschoolers had a higher chance of experiencing severe job and family tension compared with mothers with only school-aged children at home (22.1 percent vs. 17.5 percent).[42] Men showed no changes in stress levels due to either marriage or the presence of children. And "[l]one parent mothers were less likely than married mothers to agree they did not have time for fun any more and were less likely to feel the need to spend more time alone."[43] Research on the cost of family and work stress has estimated that work and family conflicts cost employers at least $2.7-billion per year in the form of family-related absences from work. This research found that stressed employees took an average of 13.2 days off to deal with family-related problems compared with the 5.9 days typical of those who report low levels of work and family conflict. This estimate does not include health care costs that arise from family and work stress. Such extra trips to the doctor are estimated to amount to at least another $425-million annually.[44]

5.9 Giving Freely: Volunteerism in Alberta

In keeping with Statistics Canada's 1995 publication *Households' Unpaid Work: Measurement and Valuation*, we define other unpaid work as that which includes volunteer work, other help and care, and the transportation related to both of these activity types. It is worth noting, however, that depending on how one defines volunteerism, estimates for hours devoted to this activity can vary substantially. For example, Statistics Canada's National Survey of Giving, Volunteering and Participating measures only formal volunteering—that is, volunteer work done via an organization. In the same 1995 publication, Statistics Canada includes both formal volunteering and informal help and care given to persons outside one's own household, but not via a formal volunteer organization. In their 1999 publication, *Overview of the Time Use of Canadians in 1998* Statistics Canada employs an even broader definition of volunteerism that includes formal and informal volunteerism as well as civic work. Specifically, they include formal volunteerism, informal help and care, personal and medical care given to members of one's own household, and activities related to political, civic, union, professional associations, youth, fraternal and social organizations, self-help groups and coaching. Table 12 shows hours dedicated to formal volunteerism (from the National Survey of Giving, Volunteering and Participating), formal and informal volunteerism (estimate derived in this analysis), and civic and voluntary work (here, voluntary work includes both formal and informal volunteerism as in the 1998 data from Statistic's Canada's General Social Survey) in Alberta.

Table 12: Thousands of Hours Dedicated to Various Forms of Volunteerism in Alberta, 1997/98

	Formal Volunteerism (1997)	Formal and Informal Volunteerism (1998)	Civic and Voluntary Work, formal and informal (1998)
Hours (thousands)	128,323	152,609	249,099
Hours per person (population 15 years and over)	58	67	110
Full-time job equivalents	66,835	79,484	129,739

According to the definition used in this analysis, in 1961 volunteerism accounted for over 58 million hours of unpaid work in Alberta. By 1999, that number had increased to over 175 million hours. Thus in 1999, the volunteerism sector was worth the equivalent of 91,555 full-time jobs—an increase of 61,217 equivalent full-time jobs from 1961 to 1999. Figure 14 shows total hours dedicated to volunteerism in Alberta over time by sex.

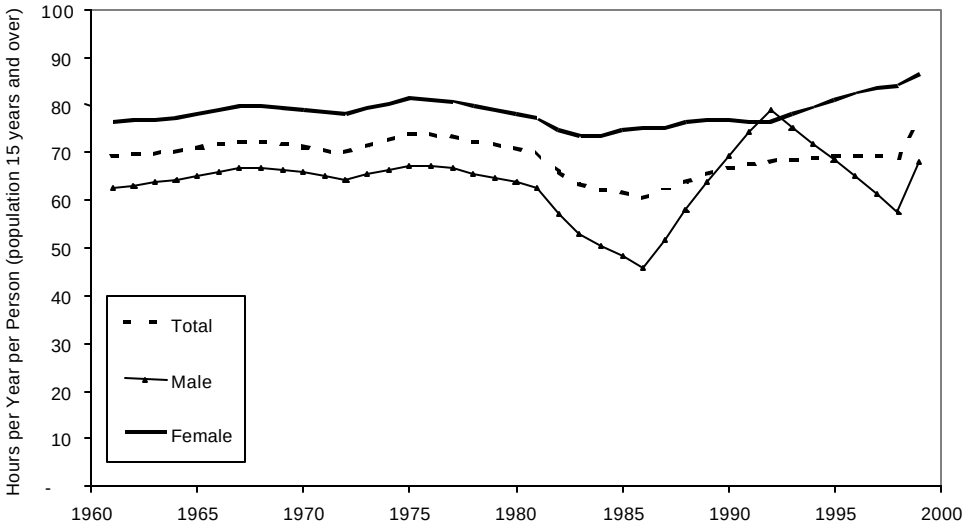
Figure 14: Volunteerism in Alberta, Population 15 years and over, 1961 to 1999

Source: Data from Statistics Canada, General Social Survey

While total hours devoted to volunteerism in Alberta continue to rise substantially, hours per person (for the population 15 years of age and over in Alberta) have increased by much less (Figure 15). Specifically, while total volunteer hours in Alberta increased by 202 percent from 1961 to 1999, hours per person increased by only 12 percent.

Hours volunteered by males aged 15 years and over have varied more than those contributed by females. It appears that volunteerism by the male population varies somewhat with unemployment and underemployment. Particularly in 1992 and 1999, we see that as underemployment and unemployment have increased for the male population, so too have volunteer hours.

Figure 15: **Volunteerism in Alberta Per Person, Population 15 years and over, 1961 to 1999**



Source: Data from Statistics Canada, General Social Survey

Liane Greenberg, of the Canadian Centre for Philanthropy, examined the nature of giving and volunteering in Alberta in a report entitled *Giving and Volunteering in Alberta*.[45] The report is based on results from the National Survey of Giving, Volunteering and Participating (NSGVP), conducted by Statistics Canada in November and December of 1997. The survey results indicate that formal volunteers[46] in Alberta contributed an average of 146 hours each during the study year for a total of 128 million hours. This is equivalent to 67,000 full time jobs, or four percent of Alberta's labour force. When compared with the total full-time job equivalents for all volunteerism, these figures show that most volunteerism in Alberta is attributable to the formal volunteer sector (67,000 of 77,409 full-time jobs, almost 87 percent).

The NSGVP revealed that in both 1987 and 1997, 40 percent of Albertans aged 15 and over volunteered for a charitable or non-profit organization, and that 30 percent of all volunteer hours were contributed by only five percent of volunteers. These individuals gave 537 hours or more of their time. The next 20 percent of volunteers gave between 187 hours and 536 hours per year and accounted for 41 percent of all volunteer hours. Taken together, 25 percent of volunteers contributed 71 percent of all volunteer hours.

5.10 A Closer Look at Alberta's Voluntary Sector

5.10.1 Who volunteers in Alberta?

According to Liane Greenberg and the NSGVP,[47] Albertans aged 35 to 54 were the most likely to volunteer, with 40 percent in this age group volunteering in 1997. This same group contributed the greatest percentage of total volunteer hours (27 percent), and accounted for the largest percentage of volunteers (28 percent). Although seniors (aged 65 and older) were least likely to volunteer, this group volunteered the most hours. In terms of changes in volunteerism by age category over time, Statistics Canada presented results from the 1997 National Survey of Giving, Volunteering and Participating in a publication titled *Caring Canadians, Involved Canadians*. The report showed that the volunteer rate by age group in Canada from 1987 to 1997 either remained relatively stable or increased slightly for most age groups. The volunteer rate among 15-24 year olds was the one exception. The volunteer rate for this age group almost doubled from 18 percent in 1987 to 33 percent in 1997.[48]

The NSGVP also showed that in the study year, volunteerism (both participation and hours contributed) increased with education. Albertans with a university degree were most likely to volunteer (55 percent), while Albertans with less than a high school education were least likely to volunteer (29 percent). Similarly, Albertans with a university degree volunteered the most hours, contributing an average of 178 hours annually. Volunteers with some post-secondary education gave 171 hours while volunteers with less than a high school education volunteered the least number of hours annually, just 118 hours.[49]

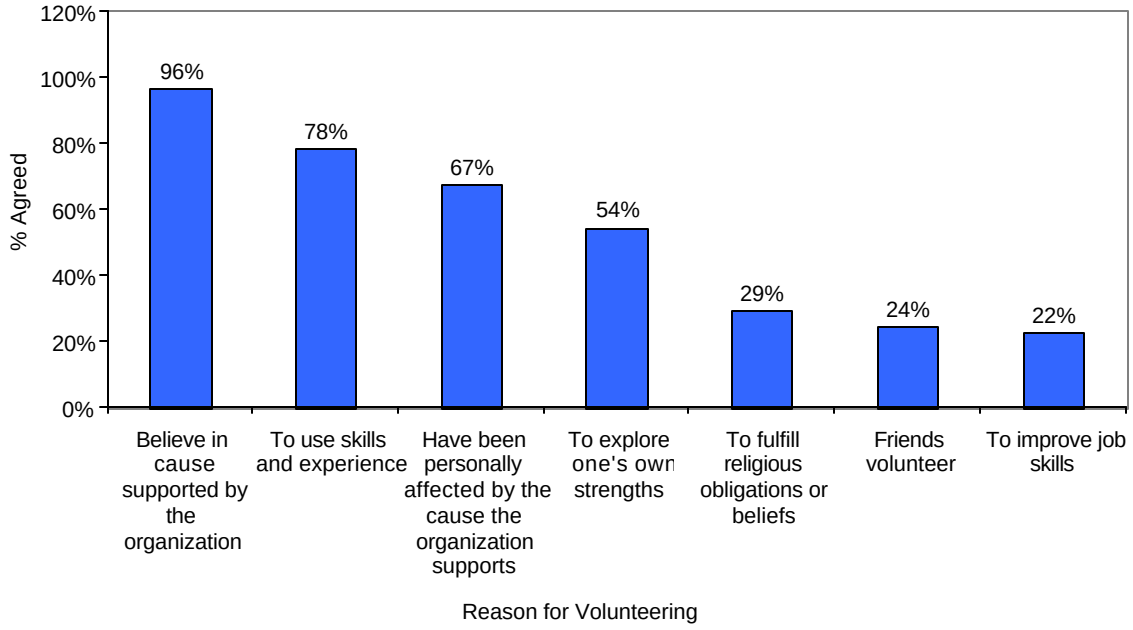
Differences in volunteerism with sex and employment were also evident from the survey. Although men tended to contribute, on average, more hours per year than women (151 hours vs. 142 hours), women in Alberta were more likely to volunteer than men (46 percent vs. 35 percent), and to contribute more hours (55 percent of total volunteer hours in the study year). Albertans employed part-time were more likely to volunteer than those who were employed full-time, unemployed or not in the labour force.[50]

5.10.2 Why volunteer?

Figure 16 presents the reasons why Canadian volunteers donated their time and energy in 1997, with the main reason being a belief in the cause supported by the organization.

The only age group to show substantial increases in volunteer rates between 1987 and 1997 was the 15-24 age group; over half of this group (54 percent) was more likely to volunteer to improve their job opportunities.[51] A closer look at the underemployment of this age group of Canadians might reveal a link between increasing volunteer rates to improve job opportunities and underemployment of youths. This relationship is investigated further in the Employment Report in this series (GPI Employment Accounts, #6).

Figure 16: Reasons for Volunteering, Canadian Volunteers aged 15 and over, 1997



Source: Statistics Canada, Catalogue No. 71-542-XIE

5.10.3 What about the rest of Canada?

Table 13 shows formal volunteerism data for Alberta relative to other provinces and to Canada as a whole over time. The number of volunteers increased in all provinces between 1987 and 1997. While the total annual volunteer hours increased in some provinces and decreased in others, the average annual hours per volunteer declined in all provinces from 1987 to 1997. Likewise, the volunteer service hours per capita in Canada and the provinces declined from 1987 to 1997. Thus, despite a general increase in the number of volunteers in Canada and Alberta, the reduction in hours devoted to volunteering means that we have experienced a decline in the volunteer services in Alberta as well as in many other provinces. In 1987, Alberta tied with Saskatchewan for the most volunteer hours per capita in Canada. By 1997, Alberta's hours per capita had declined more than Saskatchewan's hours and Alberta barely held onto second place nationally.

Table 13: Volunteerism in Canada via Formal Volunteer Organizations, 1987, 1997

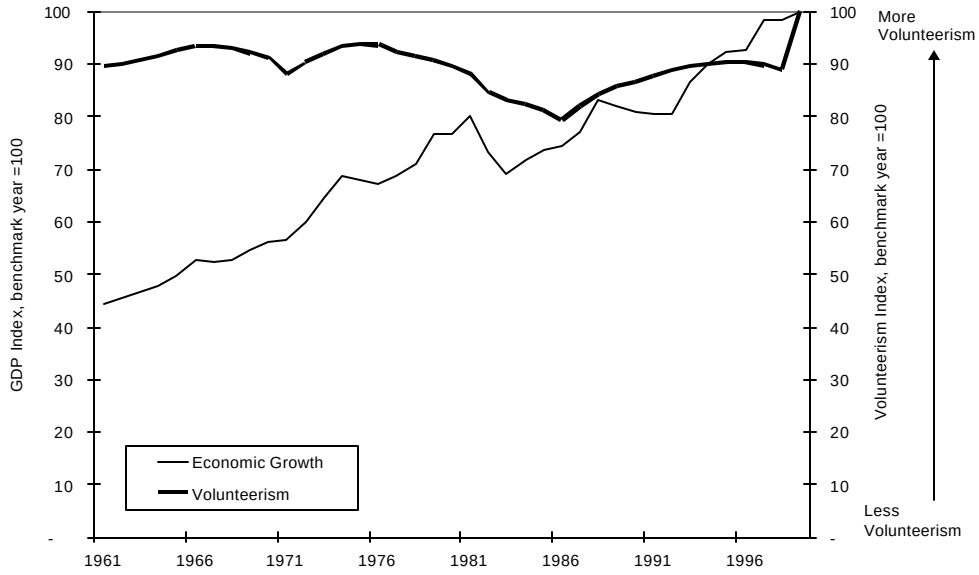
	Number of volunteers (,000)		Total annual volunteer hours (,000)		Average annual hours per volunteer		Volunteer service hours per capita (total population)	
	1987	1997	1987	1997	1987	1997	1987	1997
Canada	5,337	7,472	1,017,548	1,108,924	191	149	38.3	36.5
Nfld	110	150	22,600	20,494	206	137	39.2	36.7
N.S.	218	283	40,901	40,029	188	141	45.6	42.3
N.B.	162	208	34,097	34,121	211	164	46.6	44.8
Quebec	1,005	1,313	206,911	196,974	206	150	30.4	26.5
Ontario	1,870	2,890	352,923	421,596	189	146	36.4	36.8
Manitoba	303	344	48,748	44,763	161	130	44.2	39.2
Sask.	276	361	50,497	48,311	183	134	49.2	47.3
Alberta	701	878	121,035	128,323	172	146	49.2	44.9
B.C.	661	1,005	135,166	169,443	205	169	44.1	43.0

Source: Colman (from various sources). These figures include only formal volunteering. In this study, we have included both formal volunteering and some types of informal volunteering (including helping friends, neighbours, relatives and others with housework, cooking, transportation, repairs and maintenance; looking after a neighbour's child; tending to a sick friend).

5.11 Volunteerism in Alberta as an Index

Figure 17 shows volunteerism in Alberta as an index. The figure also shows the trend in provincial GDP over the study period. For the index, 100 is set equal to the highest rate of volunteerism that occurred over the study period and measures change from that year as an index over time. We call the year in which the highest volunteerism rate occurred in the province the benchmark year. In this case the benchmark year was 1999. We estimate that in 1999, 75 hours per person (population 15 years and over) per year were devoted to volunteerism in Alberta. Thus, as volunteerism in Alberta has deviated from that level, the index has moved closer or further from the benchmark year.

Figure 17: Volunteerism in Alberta as an Index, 1961 to 1999



5.12 Big Money: The Economic Value of Unpaid Work in Alberta

In this analysis we use the replacement cost generalist method to estimate the monetary value of Alberta's unpaid work sector. Table 14 shows the cost values used to calculate the value of unpaid work using this method.

Table 14: Replacement Values (dollars/hour) for Valuing Unpaid Work by Type of Activity, Generalist Method, Alberta (current dollars)

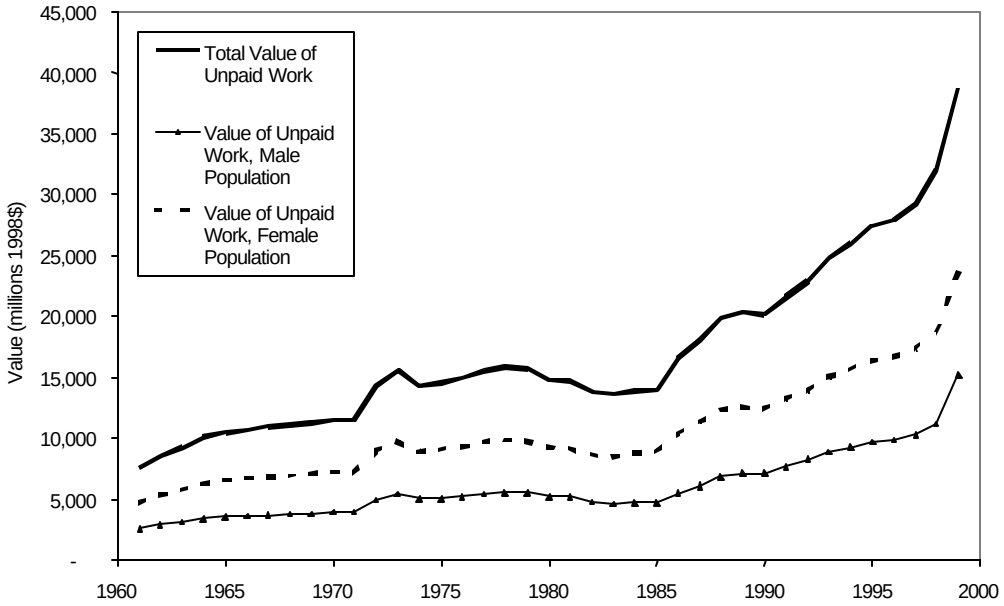
Year	Childcare	Volunteerism*	All Remaining Household Work
1961	0.80	1.57	1.11
1971	1.41	2.78	1.96
1981	4.80	6.67	5.55
1986	5.10	7.90	7.04
1992	7.02	10.17	9.48
1998	8.67	12.51	11.57

* These figures are averages of cost values for the individual components of other unpaid work. Namely they are the averages of cost values for other volunteer work, other help and care, and the transportation related to these two activities.

Source: Statistics Canada Catalogue No. 13-603E, Households' Unpaid Work: Measurement and Valuation. The imputed cost value for 1998 was extrapolated from the 1961 to 1992 data.

In 1961, the unpaid sector in Alberta was worth $7,611.83-million (1998$). By 1999, that number had increased by 410 percent to $38,830-million (1998$), which was 35 percent of GDP. Figure 18 shows the increasing value of the unpaid sector in Alberta over time by sex.

Figure 18: The Economic Value of Unpaid Work in Alberta, 1961 to 1999

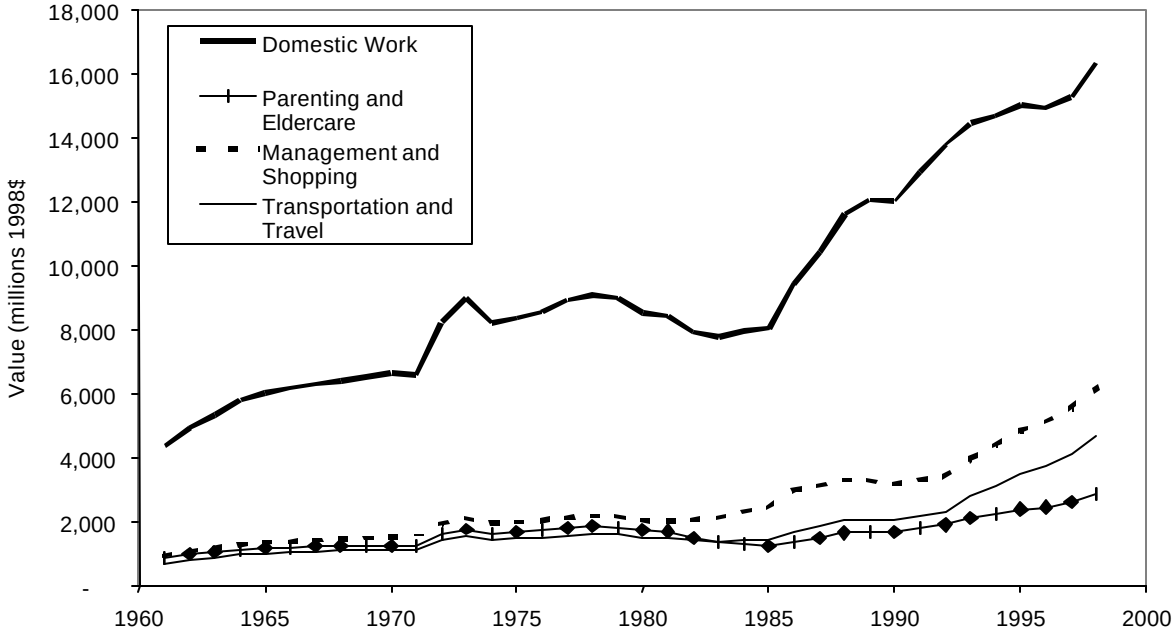


Source: Data from Statistics Canada, General Social Survey

Sixty-three percent of the value of unpaid work in 1961 was attributable to females aged 15 and over in Alberta. That figure changed by only four percent over the study period. In 1999, 59 percent of the value of unpaid work was attributable to females aged 15 and over in Alberta. This slight reduction occurred despite a significantly disproportionate increase in female participation in the labour force in Alberta over the same time period.

As was the case with **hours** of household unpaid work, the **value** of household unpaid work is split between domestic work, parenting and eldercare, management and shopping, and transportation and travel. Domestic work accounts for the greatest portion of household work, an estimated $21,054-million (1998$) in 1999 (Figure 19).

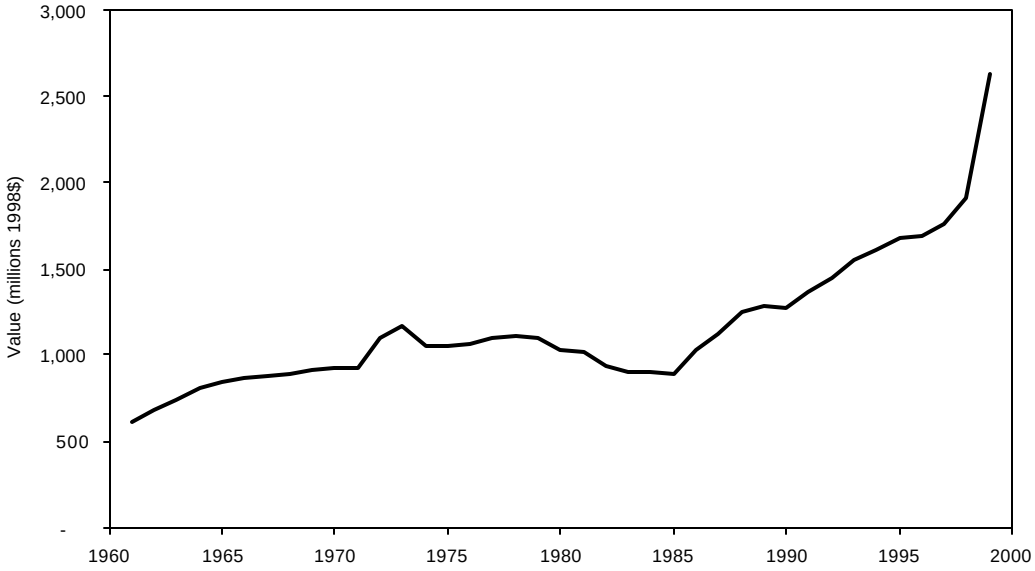
Figure 19: The Economic Value of Household Unpaid Work in Alberta, 1961 to 1999



Source: Data from Statistics Canada, General Social Survey

Like household work, the voluntary sector in Alberta is significant, with Alberta ranking second among provinces in terms of volunteer service hours per capita. Figure 20 shows the economic value of volunteerism in Canada. In 1961, volunteerism in Alberta was worth over $610-million (1998$); by 1999, we estimate it was worth over $2,631-million (1998$), equal to approximately 2.4 percent of 1999 provincial GDP. The rather sharp increase in the value of volunteerism between 1998 and 1999 is influenced by the increase in the number of hours devoted to volunteerism, particularly in the case of the male population, as depicted in Figure 14 above.

Figure 20: The Economic Value of Volunteerism in Alberta, 1961 to 1999



Source: Data from Statistics Canada, General Social Survey

In section 5.9, we provided several definitions of volunteerism, including formal volunteerism, informal volunteerism, and civic and voluntary work. In this study we include both formal and informal volunteerism but not civic work. Because the economic value of the voluntary sector is derived from the hours devoted to volunteerism, the manner in which volunteerism is defined will necessarily have consequences for the estimated economic value of volunteerism. Table 15 shows the economic value of volunteerism according to the different definitions. As the table indicates, the definition influences the value of the voluntary sector. While the most restrictive definition of volunteerism is valued at 1.5 percent of GDP (1997), the broadest definition of volunteerism yields an estimate that is almost twice as large, 2.9 percent (1998).

Table 15: Thousands of Hours Dedicated to Various Forms of Volunteerism in Alberta, 1997/98

	Formal Volunteerism (1997)	Formal and Informal Volunteerism (1998)	Civic and Voluntary Work (formal and informal) (1998)
Hours (thousands)	128,323	152,609	249,099
Economic Value (1998$)	1,605,320,730	1,909,138,590	3,116,228,490
% of GDP	1.5%	1.8%	2.9%

5.12.1 Economic Value of Unpaid Work in Alberta Under Different Valuation Methods

Several different methods can be used to measure the value of unpaid work. In this analysis we use the replacement cost generalist method. Other methods include the replacement cost specialist method, the opportunity cost method, and output valuations of unpaid work.

The replacement cost specialist method differs from the replacement cost generalist method in that it includes wage rates for occupations beyond child care and domestic work. It includes wage rates for: preparing food or meals, food or meal cleanup, clothes repair and shoe care, home repair and maintenance, gardening and grounds maintenance, and laundry and ironing, among others. The value of each unpaid activity is valued according to the wage rate that corresponds to the specific unpaid task. Food and meal preparation, for example, is valued at the wage rate of chefs and cooks; food or meal cleanup is valued at the wage rate of waiters, hostesses and stewards.

The opportunity cost method measures unpaid work according to the money that an individual would earn in his or her own profession. Thus, unpaid work done by an engineer would be valued according to the amount of money the engineer would have earned had he or she devoted the same number of hours to engineering regardless of the unpaid task the engineer was doing. Wage-based valuation methods like replacement and opportunity cost methods account for only the labour inputs into household production. Other inputs include capital equipment and machinery, entrepreneurial ability and skills, and resource and energy use.[52] To measure the full value of household production therefore, one would have to account for labour inputs as well as other inputs.

One way to measure the total value of household production is to add the value of capital inputs and building use to the value of labour inputs. Another option is the direct valuation of production outputs whereby the quantity of household outputs per person per unit of time are established and then valued according to the market prices of goods of similar quality. Taxes and subsidies, the cost of purchased inputs into production, other intermediate goods, and the cost of use of that portion of the dwelling dedicated to the particular output are then subtracted. The outputs are then aggregated over all items and households, resulting in an aggregate value for household production. With this method, the output from housekeeping would, for example, be estimated in accordance with the number of nights of accommodation provided, consistent with the average price of motel rooms. The portion of the dwelling dedicated to housekeeping as well as any purchased inputs (utilities, cleaning supplies, paper products, etc) would then be subtracted from the estimate. Dr. Andrew Harvey, Department of Economics, and Director, Time Use Research Program, Saint Mary's University has developed this latter output valuation method for Canada using Statistics Canada's 1992 time use survey.

Results from Ron Colman's work indicate the differences in valuation that result from various methods in relation to the replacement cost generalist method for the Nova Scotia GPI.[53] The replacement cost specialist method yields results about 20 percent higher than the generalist method. The opportunity cost method yields results about 56 percent higher than the replacement cost generalist method. The output valuation developed by Dr. Harvey assesses the value of unpaid work at 23 percent higher than the replacement cost generalist method. Thus the estimates presented in this analysis provide conservative estimates for the value of unpaid work in Alberta relative to alternative valuation methods. Assuming the differences in results discerned by Dr. Colman hold for Alberta, Table 16 shows estimates for the economic value of unpaid work for Alberta under each of the methods discussed above.

Table 16: Value of Unpaid Work in Alberta per Year Under Various Valuation Methods (millions 1998$)

Year	Replacement Cost Generalist	Replacement Cost Specialist	Pretax Opportunity Cost	Output Valuation Method*
1961	7,612	9,134	11,874	9,363
1971	8,552	10,263	13,342	10,520
1981	9,273	11,128	14,466	11,406
1986	10,065	12,078	15,701	12,380
1992	10,484	12,581	16,355	12,895
1998	10,751	12,901	16,771	13,223

*Assumes Dr. Harvey's method of output valuation rather than the method that involves summing labour inputs with capital and dwelling use.

5.13 Alberta's Unpaid Work Comparison with Non-Disaggregated Statistics Canada Estimates for Unpaid Work

We did not use Statistics Canada's estimates for unpaid work for Alberta because such data were not readily available by unpaid activity type. Thus, we developed a method for obtaining disaggregated results for Alberta based on the average annual hours of unpaid work per person (population 15 years and over) in Canada. Table 17 shows the difference in hours and value of unpaid work between the aggregate Statistics Canada numbers and the sum of the estimates developed in this analysis for 1961, 1971, 1981, 1986 and 1992.

The difference in estimates is greatest with the 1981 data, with differences in the 1961 and 1992 data being relatively small. In all cases, the Alberta GPI estimates are larger than the aggregate values reported directly by Statistics Canada. We would expect a certain degree of difference between the two estimates due solely to rounding, but most of the difference has to do with the details of the methods used to derive the two estimates. Both our analysis and Statistics Canada's analysis are based on national estimates for average hours devoted to unpaid work. However, Statistics Canada used national estimates for 58 different demographic groups to derive an estimate for total unpaid work for Alberta. Our analysis used estimates for the two sexes to derive estimates for unpaid work by sex and activity type. Thus, the main explanation for the resulting differences is that Statistics Canada controls for provincial variations in employment (as a component of the demographic groups) while our estimate does not. Employment in Alberta tends to be higher than in the rest of Canada. Consequently, when we compute time at unpaid work based on national average data, without correcting for employment differences, more weight is given to the unpaid work of employed persons and less weight to the unpaid work of unemployed persons in Alberta than in the rest of Canada. Because employed persons spend less time at unpaid work than the unemployed, the averages for unpaid work in Alberta are lower than the rest of Canada. In other words, the average number of hours of unpaid work by activity type in Canada exceeds the number for Alberta because Alberta has a higher employment rate.

A second factor relates to the use of different population data sets. In the mid-1990s, Statistics Canada revised upwards all of its population figures back to 1971. In our analysis, we used these revised figures while Statistics Canada's analysis used special Statistics Canada tabulations that did not include the revisions. Thus, we would expect our estimates to exceed those of Statistics Canada due to the relatively higher population figures used in our analysis. Despite the differences, it is important to note that in the case of the value of unpaid work where we see larger discrepancies relative to hours, by employing the replacement cost generalist method we

were actually developing what are considered to be conservative estimates for the value of unpaid work. So although the estimates developed in this analysis exceed the aggregate values presented by Statistics Canada, they are still considered to be conservative estimates relative to other valuation methods.

Table 17: Comparison of Statistics Canada Alberta Estimates for Hours and Value of Unpaid Work (non-disaggregated) with Alberta GPI Estimates (sum of disaggregated data)

Year	Total Unpaid Work (Hours)	Alberta GPI Estimate (Hours)	Difference (%)	Total Unpaid Work ($)	Alberta GPI Estimate ($)	Difference (%)
1961	1,068	1,055	-1%	1,145	1,145	0%
1971	1,284	1,369	7%	2,432	2,632	8%
1981	1,879	2,034	8%	10,254	11,213	9%
1986	1,934	2,062	7%	13,254	14,163	7%
1992	2,244	2,344	4%	20,659	21,674	5%

Note: 1998 data are not shown here because the 1999 report (*Overview of the Time Use of Canadians in 1998*) does not contain provincial data.

6.0 Alberta's Free Time

6.1 What is free time?

In keeping with Statistics Canada definitions, we define free time as time that is not allocated to paid or unpaid work or to personal care (sleep, meals, washing, dressing, relaxing and naps). Free time includes three main activities: passive leisure (television viewing, reading and listening to music); socializing (in homes, restaurants and bars); and active leisure (attending and participating in entertainment and sports events).[54]

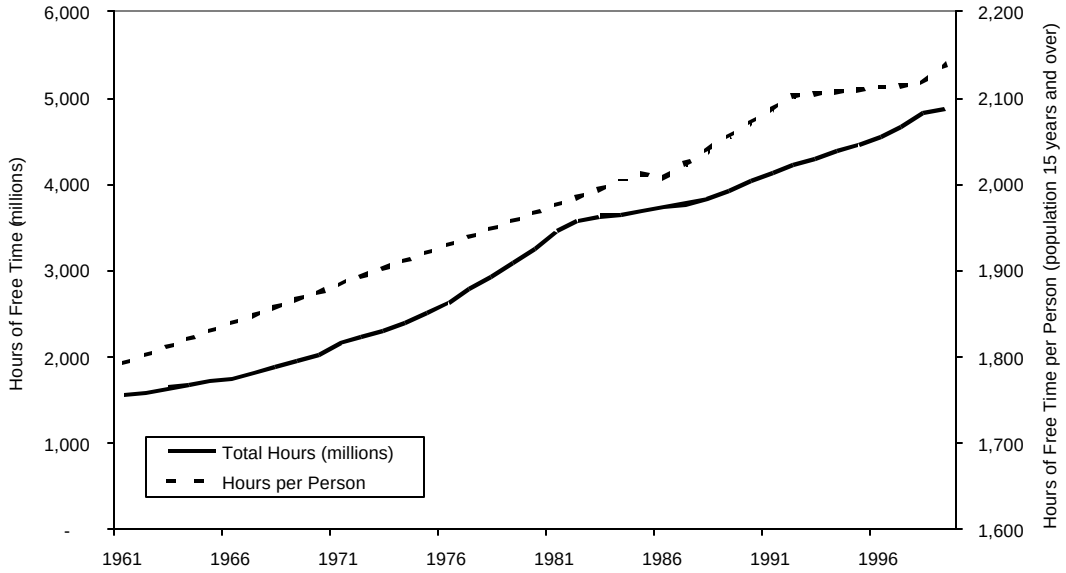
6.2 How We Measured Free Time in Alberta

As was the case with the other time-use indicators, the free time data used in this analysis come from Statistic's Canada's General Social Survey (GSS). From the GSS we obtained estimates for hours of free time for the Canadian population 15 years and older for 1986, 1992 and 1998.[55] We extrapolated this information over the study period using regression analysis to derive estimates for hours spent at free time per person per year for the Canadian population 15 years and over from 1961 to 1999. We then multiplied by the population in Alberta 15 years and over to get estimates for amount of free time per year in Alberta from 1961 to 1999. Next, we measured the change in leisure hours per year from 1961 as the difference between hours of free time in 1961 and every other year. To assign an economic value to the change in free time over the study period, we multiplied the hours of free time gained or lost for each year since 1961 by the average real wage rate for Alberta for each particular year.

6.3 Alberta's free time: How Much?

Figure 21 shows hours of free time per year for Alberta. The graph indicates total hours of free time and free time per person (population 15 years and over). Unlike time spent at paid work, which showed total hours increasing and hours per person decreasing slightly, here both total hours of free time and free time per person are increasing. Specifically, total hours of free time went from 1,547 million hours in 1961 to 4,867 million hours in 1999—a 215 percent increase. Hours of free time per person (population 15 years of age and over) per year also increased from 1,793 to 2,140, a 19 percent increase. This indicates that the increase in total hours devoted to free time over the study period is not due solely to increases in population. In the case of free time, the hours devoted to free time per person are also increasing. This is a somewhat surprising result given the increasing labour force participation rate by women in Alberta and Canada in the last several decades.

Figure 21: **Free Time in Alberta, 1961 to 1999**



Source: Data from Statistics Canada, General Social Survey

Employed people have substantially less free time than their unemployed counterparts, and employed women, faced with the double burden of work and home, have the least amount of free time.[56] In fact, full-time employed women have 25 percent fewer hours for free time than unemployed women.[57] One might expect this effect to be mitigated by the lower fertility rates experienced in Canada of late—fewer children to attend to means more free time. However, lower fertility rates lead not just to more free time but also allow women more time for paid work. Given the increasing number of hours women are devoting to paid work, we would expect the amount of free time to decline. As figure 21 shows, however, this is clearly not the case. Other factors must also be influencing the trend in free time in Alberta. Indeed, the trend toward more hours of free time per person is likely explained by Canada's aging population. Retired people in Canada average almost twice as much free time as the employed. Thus, as the baby boomers move into retirement, Canada and Alberta have both seen an increase in the number of hours of free time per person.[58]

Free time is the time over which Albertans have the most discretion. With this time, individuals can choose, for example, to read a book, go for a run, visit a friend or watch television. Results from the 1986 GSS indicate that television, combined more recently with the VCR, consumed 42 percent of our free time in 1986. Averaged over the Canadian population aged 15 years and older, Canadians spent almost six times the number of hours watching television (2.3 hours) as reading books and newspapers (0.4 hours per day) in 1986.[59] By 1998, the amount of free time Canadians devoted to television viewing fell to 37 percent of total free time and the gap between time spent watching television and reading books, magazines and newspaper declined (Table 18).

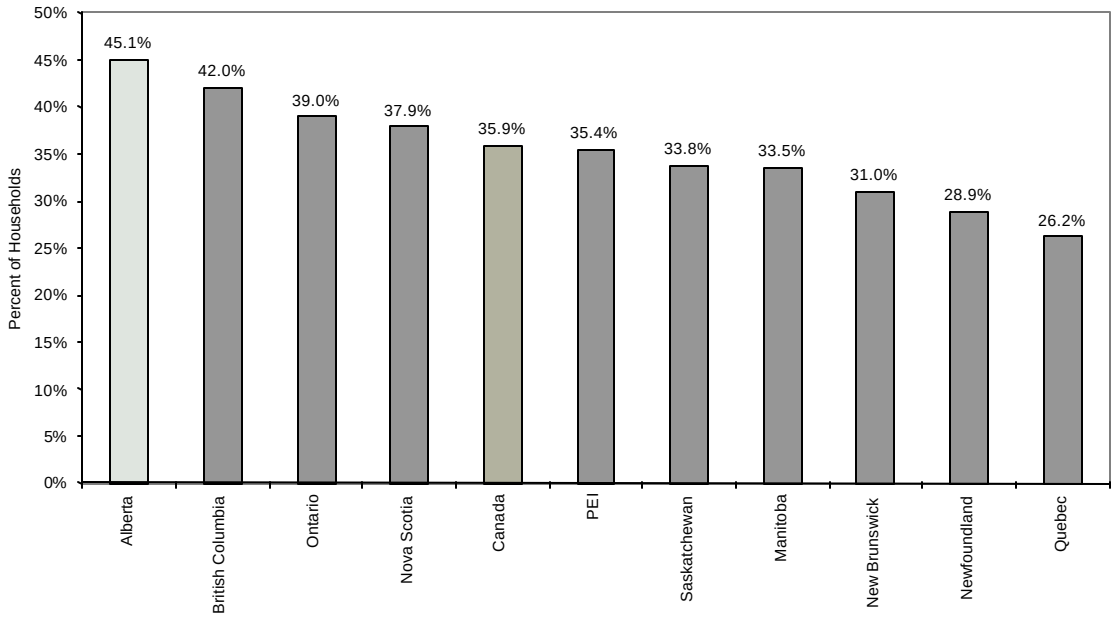
Table 18: How Canadians Spent Their Free Time in 1998

	Hours Per Day		
Activity	**Total Population**	**Male Population**	**Female Population**
Socializing	**1.9**	**1.9**	**2.0**
• Restaurant meals	0.3	0.3	0.3
• Socializing in homes	1.3	1.2	1.4
• Other socializing	0.3	0.3	0.3
Television, Reading and Other Passive Leisure	**2.7**	**2.9**	**2.6**
• Watching television	2.2	2.4	2.0
• Reading books, magazines, newspapers	0.4	0.4	0.5
• Other passive leaders	0.1	0.1	0.1
Sports, Movies and Other Entertainment Events	**0.2**	**0.2**	**0.2**
Active Leisure	**1.0**	**1.1**	**0.8**
• Active sports	0.5	0.6	0.4
• Other active leisure	0.5	0.5	0.5
Total	**5.8**	**6.0**	**5.6**

Source: Statistics Canada. Overview of the Time Use of Canadians in 1998

Although television viewing consumes a large portion of Canadians' free time, it is also the activity most readily sacrificed when necessary.[60] Indeed, data from the GSS indicate that television viewing is becoming increasingly less important as a leisure activity and other activities such as live stage performances, attending museums and going to movies are becoming more important.[61] While television is becoming less important as a leisure activity, the use of the Internet is becoming more important. Indeed, the number of households using computer communications, predominantly via the Internet, is rising rapidly. In 1998, 35.9 percent of Canadian households were regular users of computer communications. In 1997, that figure was only 29.4 percent.[62] While in 1998, computer communications usage rates increased in every province, Alberta boasted the highest usage rate of any province—34.1 percent (Figure 22).

Figure 22: Proportion of all Households Using Computer Communications, by Province, 1998



Source: Dickson, Paul and Jonathon Ellison. 1999. "Getting connected or staying unplugged: The growing use of computer communications services." Ministry of Industry.

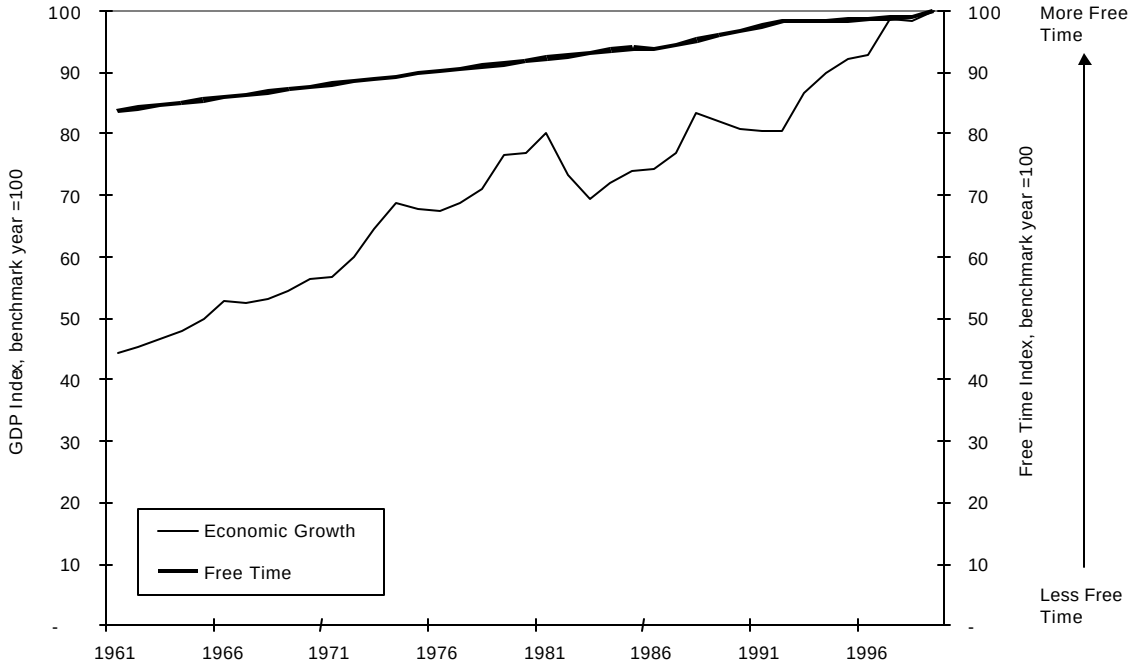
Internationally, a recent study by PricewaterhouseCoopers, called the Canadian Consumer Technology Study, found that Canada uses the Internet more than any other country in the world. Internet use in Canada now averages 5.2 hours per week, up from 3.9 hours last year. The United States is a close second at 4.2 hours per week.[63]

Free time also varies by sex. As table 18 indicates, men enjoy more hours of free time than women. This is a prevalent trend over both the study period and the life cycles of men and women. The 1986 GSS found that, on average, men have nearly one half-hour more free time than women each day. According to the 1992 GSS, men had consistently more free time than women,[64] as was also the case in 1998 (see table 18). Although free time declines with increased role complexity (first with marriage and again with parenting) for both men and women in Canada, with the exception of unmarried women aged 18-24, men enjoyed more free time than women across all ages and life stages (unmarried, married, married parents). Furthermore, the 1988 General Social Survey revealed that mothers share a greater portion of their leisure time (almost one half versus one third of a father's free time) with their children.[65] This difference in free time between men and women across virtually all life stages probably explains, at least in part, the higher stress levels found among women in Canada and Alberta. A study by the Canadian Fitness and Lifestyle Research Institute found that stress levels increase as free time decreases and as work demands increase.[66] It is not surprising that women juggling job, household and parenting commitments have the fewest hours of free time of any cohort and also the highest stress levels. Despite the trend in increasing free time per person in Alberta shown in Figure 21, it is likely the retirees who are enjoying the increase in free time while women in Canada and Alberta continue to experience time stress.

6.4 Free Time in Alberta as an Index, 1961 to 1999

Figure 23 shows free time in Alberta as an index. The figure also shows the trend in provincial GDP over the study period. For the index, 100 is set equal to the highest number of hours per person (population 15 years and over) devoted to free time in the province over the study period. Deviations from that year are then measured as change in the index over time. We call the year in which the most hours of free time occurred in the province the benchmark year. In this case our benchmark year was 1999. In 1999, an average of 5.9 hours per person (population 15 years and over) per day were devoted to free time. Thus, as hours of free time have increased over the study period, the index has moved closer to the benchmark year and further away from zero. It is important to remember, despite the trend in the index towards increasing free time, that an abundance of free time in Alberta is not experienced by all ages or by both sexes.

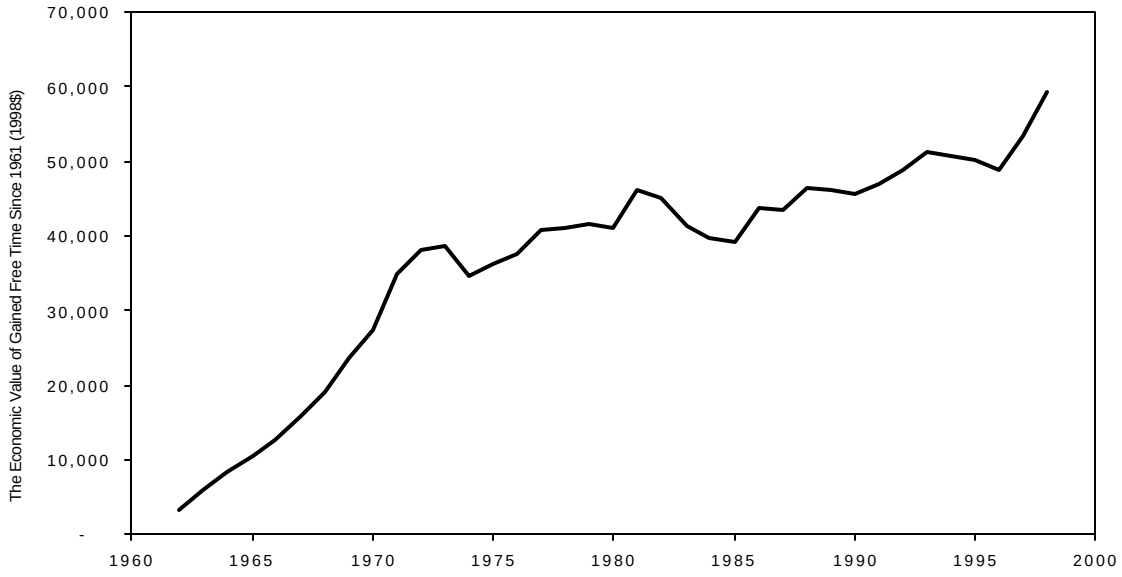
Figure 23: Free Time in Alberta as an Index, 1961 to 1999



6.5 The Economic Value of Free Time in Alberta

Figure 24 shows the economic value of free time in Alberta over the study period. As one would expect, given the increase in total hours devoted to free time over the study period, the economic value of gained free time in 1999 is substantial. The value of free time is measured as the value of the increase in free time from 1961, the base year. We multiplied every hour of free time gained since 1961 by the average real wage rate for the particular year to estimate the economic value of free time. Thus, while free time was worth $3,292 (1998$) in 1962, it was worth $56,669 (1998$) in 1999. The value of gained free time will appear in the GPI as an *addition* reflecting a move toward improving the balance between paid work, unpaid work and free time in Alberta for the population as a whole.

Figure 24: The Economic Value of Free Time Gained in Alberta Since 1961



7.0 A Day in the Life of an Albertan: Past and Present

Table 19 compares time spent at unpaid work, paid work (including commuting) and free time for Alberta over the study period. Several trends are evident in this comparison. First, the average Albertan dedicated virtually the same number of hours to the sum of unpaid work, paid work and free time in 1961 and 1998. Despite this, the data reveal several changes in time spent at individual activities. The average number of hours per person (population 15 years and over) devoted to unpaid work and free time increased, while hours dedicated to paid work per day fell over the study period. Similarly, in 1961, paid work amounted to 31 percent of the total time dedicated to unpaid work, paid work and free time. By 1998, that figure had fallen to 22 percent while the proportion of time dedicated to unpaid work and free time had increased. As the data indicate, Albertans are now, on average, spending more time on unpaid work and free time than they are at paid work. The aging population in Canada and Alberta likely explains much of this trend, as the baby boomers move into retirement.

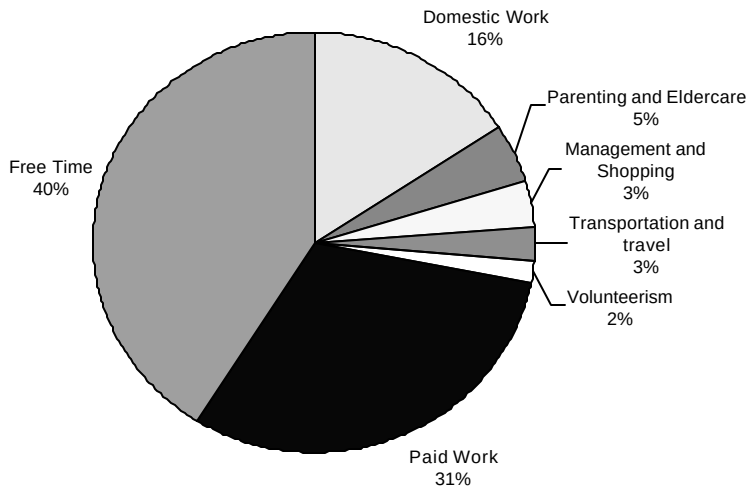
Table 19: Average Hours per Person (Population 15 years and over) per Day Devoted to Paid Work, Unpaid Work and Free Time in Alberta Over Time

Year	Unpaid Work	% of Total	Paid Work	% of Total	Free Time	% of Total	Total
1961	3.35	28%	3.69	31%	4.91	41%	11.95
1971	3.27	28%	3.41	29%	5.16	44%	11.85
1981	3.19	27%	3.21	27%	5.41	46%	11.81
1986	3.04	27%	2.91	25%	5.50	48%	11.45
1992	3.19	27%	2.90	24%	5.76	49%	11.85
1998	3.48	29%	2.68	22%	5.80	48%	11.96
% change, 1961-1998	4%		-27%		18%		0%

Sources: Statistics Canada. "Households' Unpaid Work: Measurement and Valuation," Catalogue No. 13-603E, No. 3. Statistics Canada, "Where Does Time Go?" Catalogue No. 11-612 E No. 4. Statistics Canada, Canadian Social Trend, Autumn 1993, "Time Use of Canadians in 1992," Catalogue No. 11-008E. Statistics Canada, "Overview of the Time Use of Canadians in 1998," Catalogue No. 12F0080XIE. Some data are extrapolations of data found in these reports. Unpaid work figures were derived in this analysis.

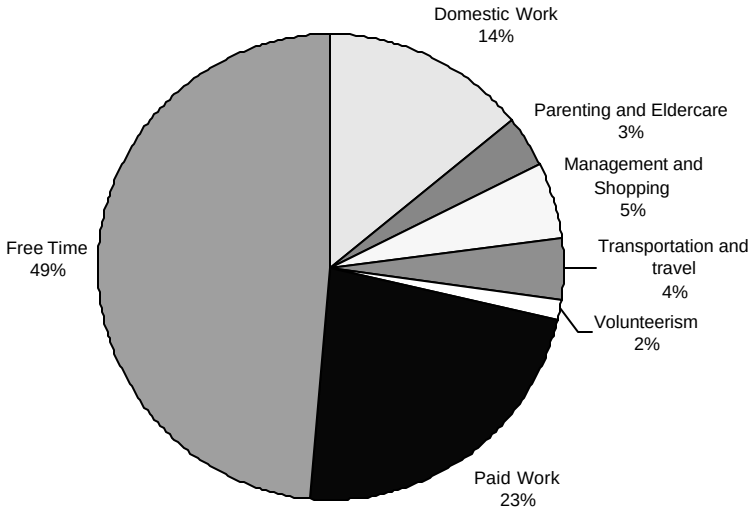
Figures 25 and 26 break the information shown above into individual components for 1961 and 1998. The figures reveal a reduction in paid work and an increase in free time. While time devoted to domestic work and parenting and eldercare fell from 1961 to 1998, time spent at management and shopping, and transportation increased. The amount of time devoted to volunteerism remained stable over the study period.

Figure 25: 1961 Time Use in Alberta, Average Hours per Person (Population 15 years and over) per Day



The hours devoted to these various unpaid activities totaled 11.95 hours in 1961 and 11.90 hours in 1998. The remaining 12.05 and 12.10 hours in a twenty-four hour cycle are devoted to education and related activities and personal activities. The bulk of these remaining hours are spent sleeping.

Figure 26: 1998 Time Use of Albertans, Average Hours per Person (Population 15 years and over) per Day



Although the Gross Domestic Product was never intended to be used as a measure of well-being, it is often mistakenly viewed as such and is therefore frequently used in that way. Because the GDP focuses on measuring economic transactions that take place in the market,[§§] it fails to account for the unpaid work sector, which in the case of Alberta, is sizable. The significant contribution of domestic work, parenting and eldercare, household management and shopping, and volunteerism are not accounted for in the GDP, nor is the value of free time. These important activities contribute to the well-being of society and should be recognized in any accounting system that is used to measure the well-being of a region.

Measuring these valuable contributions to society also reveals important stories about the nature and characteristics of unpaid work in a region. By quantifying unpaid work in Alberta, we demonstrated trends towards increasing hours of total unpaid work in Alberta over time. Measuring unpaid domestic work showed reductions in average hours of domestic work per person (population 15 years and over) over time, perhaps partly as a result of increasing investments in time-saving household appliances. As well, by measuring unpaid work, in this study we were able to consider the share of unpaid work in Alberta by sex. As this analysis indicates, women in Alberta continue to contribute more hours to unpaid work than their male counterparts—despite the significant increase in female participation in the labour force over the last several decades.

Furthermore, because the GDP does not account for the value of unpaid work, any shift from the unpaid sector to the paid sector (from unpaid child care to paid day care, for example) is measured as economic growth by the GDP. Despite the increase in GDP, the reality is that such a shift may not result in an increase in the total production of the economy; the same amount of child care is taking place but paid care has been substituted for unpaid care. Such shifts, from unpaid to paid work, are estimated to overstate GDP growth by up to 0.8 percentage points a year.[67]

To the extent that governments, businesses and individuals rely on the Gross Domestic Product to aid in decision making and policy development, that which is not accounted for in the GDP will go unnoticed. Such is the case with households' unpaid work in Alberta. The Genuine Progress Indicator provides a measurement tool that accounts not only for paid transactions (adjusted for those transactions that are considered to be "regrettable") but unpaid transactions as well. By explicitly recognizing the value of households' unpaid work in the accounting framework, the GPI highlights the significant contribution of the unpaid sector to the overall well-being of Albertans.

There are, of course, uncertainties with placing a monetary value on something that is not actually exchanged in the market. Ultimately, we hope that governments, businesses and individuals would recognize both monetary and non-monetary indicators in their decision-making and policy development processes. Some, like Marilyn Waring, have suggested that instead of just economic accounts, we should use time use studies, qualitative environmental assets and market statistics as indicators for comprehensively assessing the well-being and progress of society. In this way, factors for which there is a market could be measured according to their market value and factors for which there are no markets would be measured according to some other appropriate quantitative or qualitative indicator. The current reality is dominated by and speaks largely in economic terms. Until this is no longer the case, there is reason to place value on that which does not readily have a market in order to have it recognized in policy development and decision-making arenas.

[§§] GDP does include some non-market transactions including implicit rentals on owner-occupied homes and for produce grown on farms for the farmer's own consumption.

Appendix A. List of Alberta GPI Background Reports

A series of Alberta GPI background reports accompanies the *Alberta Sustainability Trends 2000* report and this report. These documents are being released in late 2001 and early 2002 and will be available on the Pembina Institute's website at www.pembina.org.

Alberta GPI Background Reports and Sustainability Indicators

GPI Background Reports	GPI Accounts Covered by Report
1. Economy, GDP and Trade	• Economic growth (GDP) • Economic diversity • Trade
2. Personal Consumption Expenditures, Disposable Income and Savings	• Disposable income • Personal expenditures • Taxes • Savings rate
3. Money, Debt, Assets, and Net Worth	• Household debt
4. Income Inequality, Poverty and Living Wages	• Income distribution • Poverty
5. Household and Public Infrastructure	• Public infrastructure • Household infrastructure
6. Employment	• Weekly wage rate • Unemployment • Underemployment
7. Transportation	• Transportation expenditures
8. Time Use	• Paid work time • Household work • Parenting and eldercare • Free time • Volunteerism • Commuting time
9. Human Health and Wellness	• Life expectancy • Premature mortality • Infant mortality • Obesity
10. Suicide	• Suicide
11. Substance Abuse; Alcohol, Drugs and Tobacco	• Drug use (youth)
12. Auto Crashes and Injuries	• Auto crashes
13. Family Breakdown	• Divorce
14. Crime	• Crime
15. Gambling	• Problem gambling
16. Democracy	• Voter participation
17. Intellectual Capital and Educational Attainment	• Educational attainment
18. Energy (Oil, Gas, Coal and Renewable)	• Oil and gas reserve life • Oilsands reserve life
19. Agriculture	• Agricultural sustainability
20. Forests	• Timber sustainability • Forest fragmentation

GPI Background Reports	GPI Accounts Covered by Report
21. Parks and Wilderness	• Parks and wilderness
22. Fish and Wildlife	• Fish and wildlife
23. Wetlands and Peatlands	• Wetlands • Peatlands
24. Water Resource and Quality	• Water quality
25. Energy Use Intensity, Greenhouse Gas Emissions and Air Quality	• Energy use intensity • Air quality-related emissions • Greenhouse gas emissions
26. Carbon Budget	• Carbon budget deficit
27. Municipal and Hazardous Waste	• Hazardous waste • Landfill waste
28. Ecological Footprint	• Ecological footprint

Appendix B. Time Use Data

Hours of Paid Work per Person in the Labour Force per Year, Paid Work Index, where benchmark year =100, Time Spent Commuting (average minutes per day per worker, travel by automobile and transit) and Commuting Index, where benchmark year =100

Year	Paid Work	Paid Work Index	Commuting	Commuting Index
1961	2,821	100.00	24	100.00
1962	2,668	94.56	24	99.76
1963	2,536	89.89	24	99.58
1964	2,422	85.83	24	99.57
1965	2,321	82.27	24	99.54
1966	2,274	80.61	24	99.55
1967	2,254	79.88	24	98.98
1968	2,191	77.65	25	98.07
1969	2,137	75.74	25	97.10
1970	2,100	74.43	25	96.10
1971	2,093	74.18	26	93.87
1972	2,095	74.24	25	94.27
1973	2,079	73.69	25	94.48
1974	2,065	73.19	25	94.63
1975	2,037	72.20	26	94.07
1976	1,940	68.76	26	93.34
1977	1,899	67.29	26	92.08
1978	1,832	64.94	26	91.06
1979	1,771	62.77	27	90.12
1980	1,710	60.60	27	88.93
1981	1,647	58.36	27	87.70
1982	1,647	58.38	28	85.88
1983	1,670	59.18	28	85.04
1984	1,694	60.05	28	84.55
1985	1,721	61.01	29	83.81
1986	1,733	61.44	29	82.97
1987	1,715	60.79	29	82.94
1988	1,670	59.19	29	82.83
1989	1,624	57.54	29	82.46
1990	1,575	55.82	29	81.94
1991	1,516	53.73	30	81.44
1992	1,502	53.24	30	81.01
1993	1,496	53.02	29	84.05
1994	1,479	52.42	28	87.19
1995	1,463	51.86	27	90.38
1996	1,444	51.16	26	93.51
1997	1,425	50.52	25	96.30
1998	1,385	49.10	24	98.85
1999	1,463	51.86	25	96.00

Hours of Unpaid Work per Person (population 15 years and over) per Year and Unpaid Work Indices, where benchmark year =100

Year	Total Unpaid Work	Total Unpaid Work Index	Volunteerism	Volunteerism Index	Parenting and Eldercare	Parenting and Eldercare Index
1961	1,223	96.1	68	89.6	198	99.8
1962	1,229	96.5	68	90.1	198	99.4
1963	1,236	97.1	68	90.7	197	99.2
1964	1,248	98.1	69	91.7	198	99.5
1965	1,260	99.0	70	92.6	198	99.7
1966	1,273	100.0	71	93.6	199	100.0
1967	1,272	99.9	71	93.6	197	99.3
1968	1,263	99.2	70	93.0	195	97.9
1969	1,252	98.3	70	92.2	192	96.5
1970	1,240	97.4	69	91.4	189	95.0
1971	1,195	93.9	66	88.2	181	91.1
1972	1,219	95.8	68	90.3	182	91.5
1973	1,238	97.2	69	92.0	182	91.6
1974	1,256	98.6	71	93.6	182	91.7
1975	1,255	98.6	71	93.8	180	90.5
1976	1,250	98.2	71	93.7	177	89.1
1977	1,230	96.7	70	92.4	172	86.8
1978	1,217	95.6	69	91.6	169	84.9
1979	1,205	94.7	69	91.0	166	83.3
1980	1,186	93.2	68	89.7	162	81.3
1981	1,165	91.6	67	88.3	157	79.2
1982	1,129	88.7	64	84.6	147	74.1
1983	1,122	88.1	63	83.1	141	71.0
1984	1,125	88.4	62	82.5	136	68.6
1985	1,121	88.1	61	81.2	131	65.7
1986	1,108	87.1	60	79.4	124	62.4
1987	1,131	88.9	62	82.1	126	63.6
1988	1,148	90.2	63	84.3	128	64.4
1989	1,155	90.7	65	85.7	128	64.6
1990	1,157	90.9	65	86.8	128	64.6
1991	1,159	91.1	66	87.8	128	64.6
1992	1,164	91.4	67	89.0	129	64.7
1993	1,186	93.2	67	89.5	133	66.7
1994	1,207	94.8	68	90.0	136	68.6
1995	1,226	96.3	68	90.3	140	70.4
1996	1,241	97.5	68	90.4	143	71.9
1997	1,248	98.1	68	89.9	145	72.9
1998	1,248	98.1	67	89.0	146	73.5
1999	1,254	97.8	75	100.0	137	69.2

Hours of Domestic Work, Management and Shopping, Transportation and Free Time per Person per Year and Free Time Index, where benchmark year =100

Year	Domestic Work	Management and Shopping	Transport to and from Unpaid Work Events	Free Time	Free Time Index
1961	692	150	116	1,793	84
1962	695	152	117	1,802	84
1963	699	154	118	1,811	85
1964	705	157	120	1,820	85
1965	712	159	122	1,829	85
1966	719	162	123	1,839	86
1967	718	163	124	1,848	86
1968	712	162	123	1,857	87
1969	706	162	123	1,866	87
1970	699	161	122	1,875	88
1971	674	156	118	1,884	88
1972	688	160	121	1,893	88
1973	699	164	123	1,902	89
1974	710	167	125	1,912	89
1975	710	168	126	1,921	90
1976	708	169	126	1,930	90
1977	697	167	124	1,939	91
1978	690	166	123	1,948	91
1979	684	165	122	1,957	91
1980	674	163	120	1,966	92
1981	662	161	118	1,975	92
1982	639	165	115	1,985	93
1983	632	172	114	1,994	93
1984	632	182	114	2,003	94
1985	626	189	113	2,012	94
1986	617	196	112	2,008	94
1987	636	193	114	2,023	95
1988	651	190	115	2,039	95
1989	661	185	116	2,055	96
1990	668	179	116	2,071	97
1991	675	174	116	2,087	98
1992	683	169	116	2,102	98
1993	675	183	128	2,105	98
1994	667	196	140	2,107	98
1995	659	208	151	2,110	99
1996	650	219	161	2,112	99
1997	636	229	170	2,115	99
1998	621	237	178	2,117	99
1999	662	223	147	2,140	100

Appendix C. U.S. GPI Cost of Commuting Methodology

This appendix outlines the U.S. GPI Cost of Commuting methodology as described in *The 1998 U.S. Genuine Progress Indicator: Methodology Handbook*. The handbook accompanies a series of spreadsheets for each of the 26 parameters of the U.S. GPI. Thus, references to "columns" in the description below relate to the accompanying spreadsheets. For complete details, see *The 1998 U.S. Genuine Progress Indicator: Methodology Handbook* prepared by Mark Anielski, Redefining Progress, 1998.

Data Source:

U.S. Department of Transportation. (1995, 1990) *National Personal Transportation Sur*veys 1995 and 1990. The 1995 survey (http://www-cta.ornl.gov/npts/1995/doc/NPTS_Booklet.pdf) and the 1990 Survey http://www-cta.ornl.gov/npts/1990/index.html

Calculation:

Direct Costs

The cost of commuting consists of two elements: direct or out-of-pocket costs, and indirect or time costs. Direct costs are user-operated transportation (mostly private cars) and purchased local transportation (buses, subways, etc.).

Since around 30 percent of the cost of user-operated transportation is depreciation of private vehicles, which shows up as an element in Column F, only 70 percent of these expenses are included in the calculation of direct commuting costs. In addition, only 30 percent of non-commercial vehicle miles traveled are for commuting. Thus, the estimated defensive expenditure for user-operated transportation is (.7)(.3) or 0.21 times annual expenditures. The 1994 and 1995 figures from the 1995 GPI have been revised according to the 1998 National Income and Product Accounts (NIPA) (August 1998).

The motor vehicles and parts chain-type price deflator was available upon special request from the Department of Commerce and is used to deflate nominal dollar estimates of owner transportation to chained 1992-dollar estimates.

In the case of purchased local transportation, it was assumed that 30 percent was for commuting as well. The original data for the 1995 GPI have been revised according to the August 1998 NIPA. For example, the original 1994 figure for purchased local transportation was $9.5-billion; the revised figure is $8.9-billion. Original 1995 GPI estimates for the direct cost of commuting are converted from 1982$ expenditures to 1992 chained dollars by multiplying the ratio of the 1982$ deflator over the 1992 chained-dollar deflator for personal consumption expenditures, chain-type price index.

Indirect Costs

For the time cost of commuting, values for per-person commute times per year were available for only two years—1975 and 1985. The time spent commuting for all years before 1975 was assumed to be the same as in 1975. Between 1975 and 1985, the average rate of growth was around 1.2 percent. From 1985 to 1997, changes in commuting time (average work travel time in minutes) are based on the Nationwide Personal Transportation Surveys of 1983, 1990 and 1995

conducted by the Department of Transportation. In 1983, the average commute was 18.2 minutes (one way to work). In 1990, it was 19.7 minutes and in 1995, 20.7 minutes, for a net increase of 13.7 percent between 1983 and 1995. The average growth rate between 1983 and 1990 was 1.18 percent, and was used to estimate travel time for 1986 to 1990. The change between 1990 and 1995, based on the National Personal Transportation Survey, averages 1.02 percent per year, which is used to estimate travel times from 1991 to 1997.

The average work trip length in miles increased from 8.5 miles in 1983 to 10.6 miles in 1990 to 11.6 miles in 1995, for a net increase of 36.5 percent since 1983. The average work trip speed increased from 28 mph in 1983 to 33.6 mph in 1995—a 20 percent increase. Therefore, while trip length increased, average travel time to work did not increase as much because average work trip speeds increased considerably.

A value of $8.72 per hour in 1992 dollars (not $11.20 per hour, the average wage rate used in other columns) was assigned to commuting time as the estimate of cost of commuting on the assumption that roughly one-fourth of commuting time might be considered leisure (that is, time spent alone).

Total Costs

To calculate the cost of commuting, divide column b (user-operated costs, current dollars) by column c (motor vehicle price index, 1992 chained dollars). The result is then multiplied by 0.21 in column e for reasons explained above.

For purchased local transportation: divide column i by the ratio of the 1982$ deflator over the 1992$ chained dollar deflator for personal consumption expenditures, chain-type price index. (We anticipated a chain-type price deflator being available for subsequent GPI estimates.) Then multiply column i by 0.30 (for reasons explained above) and add to column e to produce column k, which is the total direct cost of commuting. Time costs are calculated by multiplying the number of employed persons in a year (column m) by the average amount of time spent by each worker commuting per year (column n) times the wage rate of $8.72 (column o). The result in column p is added to the direct costs in column k to equal total commute costs.

Rationale:

The time and money spent on the commute to work are part of the cost of being employed. They are necessary, and the person paying for them generally receives little direct satisfaction. Even though commuting is a largely unpleasant experience, the GDP treats it as a consumer benefit; it goes up every time someone spends more money getting to work. The GPI reverses that, and subtracts the cost of commuting.

There are two distinct types of such costs. The first is the money spent to pay for a vehicle, or for a bus or train fare; the second is the lost time that might have been spent on other, more enjoyable or productive activities. The direct (out of pocket) costs of commuting were calculated as follows:

$$C = 0.3 (A - 0.3 A) + 0.3 B$$

$$= 0.3 (0.7 A) + 0.3 B$$

$$= 0.21 A + 0.3 B$$

where:

C: is the direct cost of commuting.
0.3: is the estimated portion of total non-commercial vehicle miles used in commuting in 1983 (see Statistical Abstract 1987, table 1033, p. 591).
A: is the cost of user-operated transport (mainly cars) from the National Income and Product Accounts, table 2.4).
0.3 A: is the estimated cost of depreciation of private cars (excluded here to avoid double counting since it is already an element in Column F) from the Statistical Abstract (1987, table 1040, p. 593).
0.3: is the estimated portion of passenger miles on local public transportation used for commuting.
B: is the price of purchased local transportation (see National Income and Product Accounts, Table 2.4).

The indirect costs of commuting (i.e., the value of the time lost) are calculated as the total number of people employed each year times the estimated annual number of hours per worker spent commuting times a constant value for the time. Because some people regard commuting as part nuisance and part leisure, we assigned a value of $8.72 per hour (rather than the $11.20 per hour for lost leisure). The number of hours per year was derived from survey data on time use by households (Leete-Guy and Schor 1992, p. 9). See Figure 7 for the total increase in commuting hours for the nation as a whole.

Comments:

According to the National Transportation Survey, the *Census of Population and Housing, 1990* (U.S. Bureau of the Census), the average commuting or travel time to work for the U.S. is estimated at 22.4 minutes in 1990. http://www.census.gov/population/socdemo/journey/ustime90.txt. This varied from a high of 28.6 minutes in New York State, to a low of 13.0 minutes in North Dakota; California average commuting time was 24.6 minutes.

According to the 1980 Census (http://www.census.gov/population/socdemo/journey/ustime.txt) the average commuting time was 21.7 minutes. In 1990, roughly 58.5 percent of 115,070,274 commuting workers (16 years and older who did not work at home) spent more than 45 minutes traveling to work—down slightly from 1980 when 59.6 percent of the 94,487,095 commuting workers spent 45 minutes or more traveling to work and back. While the average commute time is up slightly from the 1980 Census it shows that more workers are commuting longer—in the 20-45 or more minute categories.

According to the Reason Foundation, authors Peter Gordon and Harry W. Richardson (*The Facts about 'Gridlock' in Southern California*, Policy Study No. 165, August 1993) estimate the average commuting time in Los Angeles increased two minutes between 1967 and 1990, from 24 minutes to 26 minutes. (See http://www.ncpa.org/ea/eajf94/eajf94l.html.)

Appendix D. U.S. GPI Value of Housework Methodology

This appendix outlines the U.S. GPI Value of Housework methodology as described in *The 1998 U.S. Genuine Progress Indicator: Methodology Handbook*. The handbook accompanies a series of spreadsheets for each of the 26 parameters of the U.S. GPI. Thus, references to "columns" in the description below relate to the accompanying spreadsheets. For complete details see *The 1998 U.S. Genuine Progress Indicator: Methodology Handbook* prepared by Mark Anielski, Redefining Progress, 1998.

Data Source:

The estimates in this column are derived from the earlier work of Prof. Robert Eisner who estimated the value of housework. In email contact with Prof. Eisner, he had not updated his original 1985 work nor was he aware of others who had. Robert Eisner can be reached at eisner@nwu.edu; phone 847-491-5394; room 317 Andersen Hall, Department of Economics, Northwestern University, 2003 Sheridan Road, Evanston, Illinois 60208-2600.

> Eisner, Robert. 1985. Total Incomes System of Accounts. *Survey of Current Business* 65 (January): 24-48.

Calculation:

Eisner estimated the total value of services performed outside the market, including both housework and academic work by students. (The GPI includes only the housework component of his estimates.) He included estimates for the years 1946, 1956, 1966, 1976, and 1981. These estimates are used in the 1998 GPI account as they were in the original 1995 GPI estimates.

Convert Robert Eisner's 1972 constant dollar estimates of the annual value of housework for those five years into a series of annual estimates in chained 1992 dollars.

Deflator

Rather than adopting the complex deflator calculations of the 1995 GPI, we instead take Eisner's nominal dollar estimates of unpaid household work (excluding student academic work) and convert these to chained 1992 dollars using the chain-type deflator for personal consumption expenditures.

Divide Eisner's nominal dollar estimates of household labor (unpaid household work, excluding student academic work) by their corresponding 1992 chain-type price deflator for personal consumption expenditures to convert to chained 1992 dollars.

Extrapolation

In the absence of current estimates of the value of unpaid housework since Eisner's 1985 work, we are faced with extrapolating the 1995-1997 data points based on the past trends using the regression analysis of the 1995 GPI.

The original GPI estimates estimated the value of housework in other years, running a regression as follows:

1. Calculate the natural log of the six data points.
2. Run a regression on those values against appropriate values for the corresponding years (1946 = 0, 1956 = 10, and so on). The result is a constant of 6.50 and an "x" coefficient

of 0.0128. This means the estimated rate of growth of the value of time spent on housework is 1.28 percent per year.

3. Use the constant (6.50) as the base for 1946 (the first year of the series). Calculate the value of the following year by multiplying the annual increase of 1.28 percent by the value of the year (e.g., 1956=10) and adding the result to the base.
4. Finally, calculate the actual value of housework, by taking the natural exponent of the resulting column.

Rationale:

The GPI views household investments of time as an investment in the well-being and management of the collection of households, which is how the word "economy" is defined. Conventional economic and national income accounting treats such investments of time by parents and families as having no "market" value, as if the expenditure of the precious resource, time, provides no "value" to our economy. Yet the fact that the value of housework and parenting is absent from our national income accounts and the GDP is both counter-intuitive and inconsistent with how "economy" (*oikonomia* in Greek) is defined—as the management of the household. If time invested in housework and parenting **is not** an investment in the management and viability of the nation's households, then we must return to studying Greek and rediscovering what we really mean by the word economy.

In his work, Eisner treated the value of an hour of housework as equivalent to the amount that a family would have to pay to hire someone to do equivalent work in their home. He also assumed that technological change did not increase the productivity of housework substantially despite the rapid growth of productivity in the market sector of the economy. As a result, the growth of the value of housework at 1.3 percent was only slightly greater than the 1.23 percent average rate of population growth in the United States from 1950 to 1995. One might make other assumptions about the growth of productivity of housework. That would increase the rate of growth of this column considerably.

Despite all the "labour-saving" devices introduced during the past 80 years, the number of hours spent doing housework has changed very little. In the second decade of this century, housewives spent an average of 56 hours per week doing such work. They were still spending about 53 hours per week in 1965-66 (Cowan 1983, pp. 63-64, 159). A study in the 1980s showed that women devoted 35 to 43 *weekday* hours to housework (depending on their employment), which suggests that average hours are probably still around 50 to 55 per week (Berk 1985).

Professor Ronald Colman in his work on the Atlantic GPI for Canada (1998) provides the most recent North American figures for unpaid hours of housework based on a time use survey conducted by Statistics Canada in the 1996 *General Survey on Time Use*. Colman shows that hours of housework have remained remarkably constant over the past 100 years in a narrow range of 52 to 56 hours, with an average 52.5 hours of unpaid housework per week in Canada in 1996.

Since hours spent on household work have not decreased as women have joined the paid workforce, it is women and, by association, their families who have suffered the most from a decline in leisure time, as shown in Column J. This illustrates why it is essential to take both the household and the market sectors into account to assess how the economy actually affects people's lives.

Comments:

The value of housework and parenting represents the single most important positive adjustment in the GPI. This is not surprising given that the value of the time spent in these activities is significant if priced at average real wage rates. Valuing this time commitment suggests the importance of placing value on our most precious resource: time. Colman's recent work on *The Economic Value of Unpaid Housework and Parenting in Nova Scotia* provides considerable knowledge and insight into how to address this important measurement issue in future GPI or ISEW updates.

The use of Eisner's original estimates of the value of housework, which extend from 1946 to 1981, have not been updated by Eisner or other researchers, to our knowledge. Contact with socio-economists Prof. D.E. Benson and Prof. Susan Roxburgh at Kent State University (Department of Sociology) provided no new leads on new empirical estimates.

While Eisner's estimates are important, the continued use of these estimates might be reconsidered in light of recent extensive methodological work on the value of housework by Ronald Colman. His methodological paper examines trends in hours of housework in both Canada and the U.S., looking at studies with time diary figures back to 1913 from various sources. His findings suggest that the time spent on housework per household has remained virtually unchanged for 100 years and remains roughly between 51 and 56 hours per week. The most recent North American figure from Statistics Canada's *General Survey on Time Use* reported an average of 52.5 hours spent at unpaid housework. Sporadic time estimates dating from 1953 to 1992 show that the hours of housework have been as high as 56 hours (1968) and as low as 52 hours (1953) per week. Given some time use data, it would seem possible to calculate an opportunity cost of unpaid housework by multiplying the average hours of unpaid housework times the number of households times a real average wage (opportunity cost wage) to replace the Eisner estimates. We have not attempted such an estimate in the 1998 GPI account.

Additional Sources:

Colman, Ronald. 1998. *The Economic Value of Unpaid Housework and Child Care in Nova Scotia*. Atlantic GPI. Halifax, Canada. August 1998.

Prof. D.E. Benson (Professor of Sociology, Kent State University (http://www.kent.edu/sociology/dbenson) dbenson@kent.edu Phone: (330) 672-2226

Berk, Sarah Fenstermaker. 1985. *The Gender Factory*. New York: Plenum.

Cowan, Ruth Schwartz. 1983. *More Work for Mother*. New York: Basic Books.

Appendix E. U.S. GPI Value of Volunteer Time Methodology

This appendix outlines the U.S. GPI Value of Volunteer Time methodology as described in *The 1998 U.S. Genuine Progress Indicator: Methodology Handbook*. The handbook accompanies a series of spreadsheets for each of the 26 parameters of the U.S. GPI. Thus, references to "columns" in the description below relate to the accompanying spreadsheets. For complete details see *The 1998 U.S. Genuine Progress Indicator: Methodology Handbook* prepared by Mark Anielski, Redefining Progress, 1998.

Data Source:

The biggest hurdle to overcome in calculating the value of volunteer activity over time is to find consistent, accurate time-series data of the amount of volunteer labour provided. We used three surveys conducted by the U.S. Bureau of Labor statistics in 1965, 1974, and 1989 plus statistics on volunteerism from the Independent Sector for 1993 to 1996.

Independent Sector. (various issues). *Giving and Volunteering in the United States, 1994*. Washington, D.C.: Independent Sector. Contacts: John Thomas, tel: (202) 223-8100; or Erin Heffron, tel: (202) 416-0556, Assistant Director Research

Bureau of Labor Statistics. 1990. "Thirty-Eight Million Persons Do Volunteer Work." *News*, 90-154, March 29, 1990. Washington, D.C.: U.S. Department of Labor.

U.S. Department of Labor. 1969, 1975. *Americans Volunteer*. Washington, D.C.: U.S. Department of Labor.

Calculation:

For the three years of the Bureau of Labor Statistics (BLS) survey, the total number of volunteer hours per year is calculated as follows:

Total number volunteer hours per year	=	Number of volunteers	X	Average number of hours per week	X	Average number of weeks per year
where average number of weeks per year	=	52 weeks per year	X	$\frac{\text{Number of volunteers in a week}}{\text{Number of volunteers in an entire year}}$		

The estimate of total hours is then multiplied by the average real wage rate (non-farm) for the period 1959 to 1998, which amounts to $11.20 per hour, in 1992 dollars ($7.70/hr in 1982 dollars). This yields total value of volunteer hours per year.

These surveys provide the only consistent time series available over the years of the GPI, but there are some comparability problems due to inconsistent questions. Fortunately, it was possible to corroborate the BLS data for one period. One study (ACTION 1976) showed that there was a tripling of the value in constant dollars of volunteer time in organized services from 1965 to 1974, which is approximately the same growth rate as the data from BLS for all volunteerism, including informal activity.

The Independent Sector in Washington, D.C. gathers giving and volunteer statistics every two years. The most recently reported statistics for volunteerism are for 1991, 1993 and 1995 from *Giving and Volunteering in the United States, 1996 edition* prepared by the Independent Sector. Beginning in 1998, they switched to odd year statistical surveys, therefore the subsequent survey was in 1999 based on 1998 volunteer activities.

The 1996 giving and volunteering report showed a slight increase in volunteerism from 1993 to 1995, from an estimated 19,481 million annual volunteer hours in 1993 to 20,303 million hours in 1995, a 4.2 percent increase. However, this represents only a partial recovery to the peak in volunteer hours in 1991 of 20,497 million hours. The 1995 statistic represents less than a one-percent decline in volunteerism since 1991.

In 1996, 49 percent of adults (18 years or older), or roughly 93 million individuals, volunteered an average of 4.2 hours per week, a small increase from 1994 when 48 percent of the adult population volunteered their time. The Independent Sector estimates the value of volunteer time per hour at $13.73 in 1996 ($12.51/hr in 1992 dollars) based on the average non-agricultural hourly wage rate. This is slightly higher than the real hourly wage we used, of $11.20/hr (1992$).

The BLS estimated 38 million volunteers in 1989 versus the Independent Sector's estimate of 60.9 million volunteers (figure excludes informal volunteers) in 1987, that is, 60 percent higher than the actual figures used.

Extrapolation

We have re-estimated the previous GPI statistics for volunteer statistics for 1991 through 1995 based on the percentage change in biannual total volunteer hour statistics reported by the Independent Sector. Given the lack of volunteer data from BLS, this is the most practical approach to estimating figures beyond the 1989 BLS data set. For 1996 and 1997, estimates were based on the percentage change in total volunteerism based on biannual statistics for 1987-1995 from the Independent Sector figures.

The estimated value of volunteer work for other years is interpolated and extrapolated. Volunteerism from 1950 to 1965 is assumed to have grown at the same rate that it did from 1974 to 1989. For recent years, time spent volunteering has been fluctuating. The surveys by the Independent Sector report total hours volunteered (excluding informal hours) for organizations rising from 14.9 million hours in 1988 to 15.7 million hours in 1989. This is followed by a decline to 15.2 million in 1991 and 15.0 million in 1993, then an increase to 15.8 million in 1995, for a net increase of 0.77 percent from 1989 to 1995.

Rationale:

Most of the important work done in America is unpaid. This includes not just housework and parenting at home, but also the broader realm of time spent engaged with the neighbourhood and community. Work done here is the nation's informal safety net, the invisible social matrix on which a healthy market economy depends. Whether each additional lawyer, broker or advertising account executive represents a net gain for the nation is arguable. But there is little question that workers in the under-served community and volunteer sectors—the churches and synagogues, civic associations and informal neighbourly efforts—are doing work that is desperately needed.

Despite its crucial contribution, however, this work goes entirely untallied in the GDP. The GPI begins to correct this omission, as it includes a rough estimate of work in the home.

Additional Sources:

ACTION. 1976. *The Value of Volunteer Services in the United States*. Pamphlet no. 3530.4. Washington, D.C.: ACTION.

Independent Sector. 1994. *Giving and Volunteering in the United States, 1994*. Washington, D.C.: Independent Sector.

Appendix F. U.S. GPI Loss of Leisure Methodology

This appendix outlines the U.S. GPI Value of Loss of Leisure methodology as described in *The 1998 U.S. Genuine Progress Indicator: Methodology Handbook*. The handbook accompanies a series of spreadsheets for each of the 26 parameters of the U.S. GPI. Thus, references to "columns" in the description below relate to the accompanying spreadsheets. For complete details, see *The 1998 U.S. Genuine Progress Indicator: Methodology Handbook* prepared by Mark Anielski, Redefining Progress, 1998.

Data Sources:

Council of Economic Advisers (CEA). 1995. Economic Report of the President. Washington, D.C.: U.S. Government Printing Office.

Leete-Guy, Laura and Juliet B. Schor. 1992. *The Great American Time Squeeze: Trends in Work and Leisure, 1969-1989*. Economic Policy Institute Briefing Paper. Washington, D.C.: Economic Policy Institute.

Juliet Schor, Women's Studies, Harvard University, tel: (617) 495-9022 jschor@fas.harvard.edu

Bob Drago, drago@csd.uwm.edu, time diary studies.

Calculation:

Data

Leete-Guy and Schor estimated the percentage of the labour force that is unconstrained; i.e., able to work as many hours as the workers desired, for the years 1969, 1973, 1979, and 1989 (all peak years in the business cycle). See Leete-Guy and Schor (1992, p. 7, Table 6; or p.33, Table 5).

Since the proportion of the labour force that was unconstrained fell from 1969 to 1989, it is assumed that there was also a decline from 1950 to 1969. We estimated the value for the year 1950 on the assumption that leisure declined during the period, but at about one-sixth the rate in later years. (The unemployment rate was very low in the 1950s and 1960s.)

In discussions with Juliet Schor, she had not updated the last 1989 estimates of underemployment although Larry Mishel, Economic Policy Institute (EPI) is tracking the issue though using a different accounting method than Schor used. You can't simply add the Economic Policy Institute's estimates to Schor's figures. The only possible way to reconcile Schor's estimates with those of the Economic Policy Institute is to extrapolate her figures based on the Economic Policy Institute's recent estimates of change since 1989.

The Economic Policy Institute (1998) provides estimates of underemployment as a percentage of total employable workforce for 1994 to 1997, whereby the EPI uses Bureau of Labor Statistics and the BLS definition of underemployment (see http://146.142.4.24/cgi-bin/surveymost): underemployment is a percentage of total employable workforce plus discouraged and otherwise constrained persons. These estimates were 11.4 percent (1994), 10.6 percent (1995), 10.2 percent (1996), and 9.4 percent (1997). These are used for estimating the percentage of the labour force that was unconstrained for 1994 to 1997.

BLS calculates in terms of number of persons, unemployed, discouraged persons (stopped looking for work), and people who want to work but can't, as a percentage of the willingly

employable work force. The denominator does not include people who choose to opt out of the labour force. EPI looked at cross sectional data of different worker cohorts using BLS data and estimated underemployment percentages for 1994-1997, which could be used to extrapolate from the last GPI data point estimate using Schor's figures according to discussions with Jared Bernstein of the EPI.

Larry Mishel and Jared Bernstein (Jbernstein@epinet.org), Economic Policy Institute; tel: (202) 775-8810 1660, L Street NW Suite 1200, Washington, DC 20036; fax: (202) 775-0819.

Larry Mishel et.al (1996) estimate that annual hours of work increased by 26 hours between 1989 and 1994, or an average annual increase of 5.2 hours per year. This rate is used to extrapolate Schor's estimates of annual hours of work from 1989 from 1990 to 1997.

Data on the total civilian labour force are taken from the *Economic Report of the President 1998* http://www.access.gpo.gov/eop/ and from the Bureau of Labor Statistics website http://www.bls.gov/datahome.htm

Calculation:

For the GPI, leisure was defined as the difference between 3,650 hours per year (10 hours per day) and the actual number of hours worked. The choice of 10 hours per day was somewhat arbitrary. It is based on the presumption that sleep and other necessities require 14 hours per day, leaving 10 per day of discretionary time.

The amount of leisure that enters the GPI is not the total per year, however. The GPI includes only the *difference* between the value of leisure in 1969 (the year with the greatest amount of leisure) and the current year.

The value of lost leisure per worker (relative to 1969) is multiplied by the proportion of the work force that is unconstrained and by the total work force. Only the "lost leisure" of the unconstrained work force is included. The non-work hours of the constrained members of the workforce are treated as a cost for them, not as leisure, because they would prefer to work more hours. (This is treated in Column K—underemployment.)

The calculation can be summarized as follows:

Value of lost leisure	=	Civilian labour force	X	Percentage of labour force that is unconstrained	X	Hours of lost leisure per worker per year	X	$11.20 per hour			
where hours of lost leisure per worker per year	=	975 hours (amount of leisure per worker in 1969)		-	(3,650 hours of potential leisure per worker per year)		-	(Total hours of annual work per worker)			

Figures for the percentage of the civil labour force that is unconstrained for 1994 to 1997 are based on the BLS estimates of percentage of labour force that is underemployed less 100 percent.

Rationale:

One of the chief advantages of growth in GDP is supposed to be the increased leisure made possible by higher productivity. However, that has not been the actual result. Instead, tens of millions of Americans have found themselves on a treadmill of work and consumption that never seems to slow down. The result is less free time. But this loss of well-being is totally ignored in the GDP. Since free time is not traded in the market the way that labour time is, leisure is invisible to the conventional economic reckoning.

As a result, GDP creates the illusion that the nation is getting richer when, in fact, people are working longer hours to produce more. They are merely giving up something that is not priced (free time), for something with a price tag (labour time). A more accurate calculation would offset the loss of leisure that went along with the increased output. In other words, the measure of the nation's well-being ought to include the value of leisure time gained or lost.

But how should we value free time if we accounted for it? We could account for every non-working hour (including hours spent sleeping), valued at the average wage rate. With 136 million people in the labour force in 1997 and each with 15 hours of potential leisure time per day and 24 hours per day on weekends, that amounts to around 870 billion hours of potential leisure for the working population alone. Valued at an average real wage of $11.20 per hour, their leisure would be worth about $9.7-trillion in 1997. If the leisure time of children, seniors and others not in the labour force were included, the total would amount to at least $20-trillion, which is far greater than the 1997 GDP of $7.2-trillion.

Additional Sources:

Leete-Guy, Laura and Juliet B. Schor. 1994. Assessing the Time-Squeeze Hypothesis: Hours Worked in the United States, 1969-89. *Industrial Relations*, 33 (4): 25-43.

Schor. Juliet. 1997. *Civic Engagement and Working Hours: Do Americans Really Have More Free Time Than Ever Before*? Paper prepared for presentation at Conference on Civic Engagement in American Democracy, September 26-28, 1997, Portland, Maine.

Robinson, John P. and Ann Bostrom. 1994. "The overestimated workweek? What time diary measures suggest." *Monthly Labour Review*. August 1994.

Bluestone, Barry and Stephen Rose. 1997. "Overworked and Underemployed: Unraveling an Economic Enigma." *The American Prospect*, no. 31 (March-April 1997): 58-69. http://epn.org/prospect/31/31blue.html

Appendix G. Australia GPI Value of Household and Community Work Methodology

This appendix outlines the Australia GPI Cost of Unemployment methodology, as described in *Tracking Well-being in Australia The Genuine Progress Indicator 2000*. Appendix A of that report contains a complete set of Australia GPI data organized into a series of columns. Thus, references to "columns" in the description below relate to the columns as presented in the above-mentioned publication. For complete details, see *Tracking Well-being in Australia The Genuine Progress Indicator 2000* prepared by Clive Hamilton and Richard Denniss, Australia Institute, 2000.

Unpaid household work has always made a large contribution to human welfare. Indeed, the history of industrialization has, in large measure, been the history of transferring activities out of the household sector into the market sector. This trend continues. With changes in the workforce—and in particular the entry of women into paid labour—more tasks that were previously performed unpaid and in the home are now purchased in the market. These include housekeeping, take-away food, restaurant meals, gardening services and paid child care. Transfers from the household to the market sector are recorded as increases in GDP, but this exaggerates the true increase in well-being. The GPI is therefore adjusted to account for the value of household labour in Australia.

The amount of household work and voluntary community activity is known from the time-use surveys carried out by the Australian Bureau of Statistics (ABS). However, in the GPI not all hours of household work are valued and added to the index. Time devoted to some activities is excluded because it is in the nature of leisure rather than work that produces household goods and services. There are a number of ways of applying a dollar value to an hour of household and community labour. We have chosen the housekeeper replacement method—the most conservative method—and have used the hourly wage rate for cleaners to value household and community work ($13 in 1999).

The question of what to include in household work involves some difficult choices. The key question is which activities in the household are properly considered to produce household goods and services rather than to contribute to leisure. Researchers in this area have generally adopted the rule, developed by Margaret Reid in 1934, that household work includes those activities which "might be replaced by market goods or paid services, if circumstances such as income, market conditions and personal inclinations permit the service being delegated to someone outside the household group" (quoted in ABS 1994).

Thus meal preparation is work while consumption of meals is not. Shopping for household items is work but window shopping is not. Some elements of child care involving parental love cannot be bought in the marketplace. Under the heading "household work" Jackson and Stymne's (1996) Swedish ISEW includes child care, housework, odd jobs and shopping for necessities but excludes recreational shopping, travel for shopping and gardening. The latter are regarded as essentially leisure activities.

The source for data on amounts of household and community work in Australia is Ironmonger (1994), which provides data for the years 1974, 1987 and 1992. Data on number of hours worked have been updated using the 1997 ABS time use survey (ABS 1997 Cat No. 4153.0) along with the follow up ABS publication that values household and voluntary work (ABS 2000, Cat No. 5240.0).

The table below shows the allocation of time among various household activities and voluntary work for 1992 and 1997. It is apparent that the total number of hours worked per week for each household remained unchanged at 27.65.

Unpaid time use per household 1992 and 1997

Activity	1992	1997
Domestic activities	140	139
Child care	32	31
Purchasing	45	45
Voluntary work and care	20	22
TOTAL (min/day)	237	237
TOTAL (hours/week)	27.65	27.65

Source: ABS 1997b, Cat. No. 4153.0, pp. 17-18
Note that the figure in the 1997 publication for 1992 has been revised a little due to reclassification—down from 27.78 hours to 27.65 hours.

Combining the latest ABS data with the analysis by Ironmonger (which also relies on ABS data) provides the data in the table below.

Hours of Household and Community Work in Australia

Year	1974	1987	1992	1997
Total hours per week (million)	249	322	380	404
Population 15+ (million)	9.899	12.577	13.679	14.604
Hours per person per week	25.15	26.60	27.65	27.65

Source: Derived from Ironmonger (1994); updated from ABS (1997)

To cover the GPI study period, estimates of total hours of household work per annum are derived from interpolation and extrapolation of the estimates in Table 3 for hours per person per week and from changes in the population over 15. For the years between 1974 and 1992 we interpolate linearly. For the 2000 GPI we use the 27.65 figures for 1992 and 1997 and assume that the same number applies for the intervening and subsequent years through to 1999-2000. For the years prior to 1974 the evidence is thin, but as it seems likely that weekly hours declined slightly in the 1950s and 1960s we assume that they declined in a secular trend from 28 hours per person per week in 1950 (D. Ironmonger, *pers. comm.*). Figures for the adult population are derived from RBA (1996; Table 4.2), updated using ABS Cat. No. 3101.0, Australian Demographic Trends 1999-2000.

There is a good case for arguing that the comprehensiveness of Ironmonger's definition overstates what may reasonably be regarded as "household work" under the definition given by Reid. GPIs for other countries have excluded certain activities from their definitions of household work because they are better defined as leisure activities that confer value on the household through the activity of performing them rather than by way of the product at the end. It would be difficult to argue that parents regard an hour of looking after their own children as in all cases equivalent to an hour of paid child care. Some gardening (whether for ornamental or vegetable reasons) and some household repairs may also fall into this category (the shed is a sanctuary as well as a workplace), as would window shopping. In constructing the Swedish ISEW, Jackson and Stymne (1996) exclude gardening and recreational shopping. They also omit travel, arguing that travel for shopping does not represent an increase in welfare. Indeed, elsewhere in the GPI

(Column K) we *deduct* the costs of commuting, regarding them as defensive expenditures. The same exclusions have been made in constructing the ISEW for the UK (Jackson and Marks 1994).

The Australian GPI excludes 100 percent of gardening, lawn care and pool care, and 50 percent of home maintenance, pet care, shopping and associated travel and childcare. According to the breakdown of household work by activity in ABS (1994: Table B) these proportions account for around 30 percent of total household work in 1992. Assuming that this proportion remained constant from 1950 to 1996 (a strong assumption), we adjust our estimate of the value of household labour downward by 30 percent.

The value of household and community work is derived from the number of hours worked per annum and a "shadow wage rate" representing the value of an hour of work. There are a number of ways of deriving such a shadow wage rate. They are reviewed and applied to 1997 data in ABS (1997b). We have adopted the "housekeeper replacement cost method," derived by applying the wage rate for housekeepers to the hours worked.

Endnotes

[1] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E.
[2] Statistics Canada, Catalogue No. 12F0080XIE.
[3] Data presented in the 1998 GSS results.
[4] Devereaux, Mary Sue. 1993. "Time Use of Canadians in 1992," *Canadian Social Trends-Autumn 1993*. Statistics Canada, Catalogue No. 11-008E.
[5] Statistics Canada. 1994. *Women in the Labour Force.* Statistics Canada, Catalogue No. 75-507E.
[6] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E.
[7] Statistics Canada. CANSIM Data. Labels: D16179, D16180, D16181, D16182, D16183.
[8] Anielski, Mark. 1998. *The 1998 U.S. Genuine Progress Indicator Methodology Handbook.* Redefining Progress, San Francisco.
[9] Clark, Warren. Spring 2000. "Traffic report: Weekday commuting patterns," *Canadian Social Trends.* Statistics Canada Catalogue No. 11-008.
[10] Clark, Warren. Spring 2000. "Traffic report: Weekday commuting patterns," *Canadian Social Trends.* Statistics Canada Catalogue No. 11-008.
[11] Kohn, Harold. *Factors Affecting Urban Transit Ridership*. Statistics Canada Catalogue No. 53F0003-XIE.
[12] Kohn, Harold. *Factors Affecting Urban Transit Ridership*. Statistics Canada Catalogue No. 53F0003-XIE.
[13] Clark, Warren. Spring 2000. "Traffic report: Weekday commuting patterns," *Canadian Social Trends.* Statistics Canada Catalogue No. 11-008.
[14] Litman, Todd. *Transportation Cost: Analysis: Techniques, Estimates and Implications.* Victoria Transport Policy Institute, Victoria, British Columbia.
[15] Litman, Todd. *Transportation Cost: Analysis: Techniques, Estimates and Implications.* Victoria Transport Policy Institute, Victoria, British Columbia.
[16] Litman, Todd. *Transportation Cost: Analysis: Techniques, Estimates and Implications.* Victoria Transport Policy Institute, Victoria, British Columbia.
[17] Statistics Canada. 1995. *Households' Unpaid Work: Measurement and Valuation.* Statistics Canada Catalogue No. 13-603E, No. 3.
[18] Statistics Canada's General Social Survey (GSS) collects data on a variety of socioeconomic topics from approximately 10,000 households. They survey operates on a five-year cycle, each year examining one of five core subjects: health, time use, accidents and criminal victimization, education and work, and family and friends (from Canadian Social Trends-Autumn 1993).
[19] Statistics Canada. 1995. *Households' Unpaid Work: Measurement and Valuation.* Statistics Canada Catalogue No. 13-603E, No. 3.

[20] Statistics Canada. 1999. *Overview of the Time Use of Canadians in 1998*. Statistics Canada, Catalogue No. 12F0080XIE.
[21] Jackson, Chris. 1996. "Measuring and Valuing Households' Unpaid Work", *Canadian Social Trends-Autumn 1996*. Statistics Canada, Catalogue No. 11-008-XPE.
[22] Statistics Canada. 1994. *Women in the Labour Force.* Statistics Canada, Catalogue No. 75-507E.
[23] Statistics Canada. *Canadian National Child Care Study Where Are the Children? An Overview of Child Care Arrangements in Canada.* Statistics Canada.
[24] Statistics Canada. 1994. *Women in the Labour Force.* Statistics Canada, Catalogue No. 75-507E.
[25] Statistics Canada. 1996. "Canadians Dine Out," *Family Food Expenditures in Canada*. Statistics Canada, Catalogue No. 62-554-XPB.
[26] Jackson, Chris. 1996. "Measuring and Valuing Households' Unpaid Work", *Canadian Social Trends-Autumn 1996*. Statistics Canada, Catalogue No. 11-008-XPE.
[27] Statistics Canada. 1997. *Household Facilities and Equipment*. Statistics Canada, Catalogue No. 64-202-XPB.
[28] Over a seven-day week.
[29] Jackson, Chris. 1996. "Measuring and Valuing Households' Unpaid Work," *Canadian Social Trends-Autumn 1996*. Statistics Canada, Catalogue No. 11-008-XPE, p. 28.
[30] Bose, Christine, Philip Bereano and Mary Malloy. 1984. "Household Technology and the Social Construction of Housework," *Technology and Culture*, Vol. 25, No. 1, January 1984.
[31] Colman, Ronald. 1998. *The Economic Value of Unpaid Housework and Childcare in Nova Scotia*. GPI Atlantic, Nova Scotia, p. 32.
[32] Statistics Canada. *Women in the Labour Force*. Statistics Canada.
[33] Statistics Canada. *Women in the Labour Force.* Statistics Canada, page 75.
[34] Statistics Canada. *Women in the Labour Force.* Statistics Canada.
[35] Statistics Canada. *Women in the Labour Force.* Statistics Canada.
[36] Statistics Canada. *Women in the Labour Force.* Statistics Canada.
[37] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E.
[38] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E.
[39] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E.
[40] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E, page 27.
[41] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E.
[42] Stone, Lery and Donna Lero. "Factors in Job-Family Tension, A Perspective from the National Child Care Survey and the Total Work Account System," *Dimensions of Job-Family Tension.* Statistics Canada, Catalogue No. 89-540E.
[43] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E, page 30.
[44] The Vanier Institute of the Family. 2000. *Profiling Canada's Families*. The Vanier Institute of the Family.
[45] Greenberg, Liane. *Giving and Volunteering in Alberta*. Canadian Center for Philanthropy. www.nsgvp.org/n-r4a-1.htm.
[46] Volunteer work via an organization.
[47] Greenberg, Liane. *Giving and Volunteering in Alberta*. Canadian Center for Philanthropy. www.nsgvp.org/n-r4a-1.htm.
[48] Statistics Canada. *Caring Canadians Involved Canadians Highlights from the 1997 National Survey of Giving, Volunteering and Participating*. Statistics Canada, Catalogue No. 71-542-XIE.
[49] Greenberg, Liane. *Giving and Volunteering in Alberta*. Canadian Center for Philanthropy. www.nsgvp.org/n-r4a-1.htm.
[50] Greenberg, Liane. *Giving and Volunteering in Alberta*. Canadian Center for Philanthropy. www.nsgvp.org/n-r4a-1.htm.

[51] Greenberg, Liane. *Giving and Volunteering in Alberta*. Canadian Center for Philanthropy. www.nsgvp.org/n-r4a-1.htm.
[52] Colman, Ronald. 1998. *The Economic Value of Unpaid Housework and Childcare in Nova Scotia*. GPI Atlantic, Nova Scotia.
[53] Colman, Ronald. 1998. *The Economic Value of Unpaid Housework and Childcare in Nova Scotia*. GPI Atlantic, Nova Scotia.
[54] Statistics Canada. 1999. *Overview of the Time Use of Canadians in 1998*. Statistics Canada, Catalogue No. 12F0080XIE.
[55] Data for Alberta was not readily available. This assumes that the average free time per person per day for Canada is the same as that for Alberta.
[56] Statistics Canada. *Where Does Time Go?* Statistics Canada, Catalogue No. 11-612E, No.4.
[57] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E.
[58] Statistics Canada. *Where Does Time Go?* Statistics Canada, Catalogue No. 11-612E, No.4.
[59] Statistics Canada. *Where Does Time Go?* Statistics Canada, Catalogue No. 11-612E, No.4.
[60] Statistics Canada. *Where Does Time Go?* Statistics Canada, Catalogue No. 11-612E, No.4.
[61] Gorman, Tom. 1997. "Canadian Television in Transition," *Canadian Social Trends-Spring 1997*. Statistics Canada, Catalogue No. 11-008-XPE.
[62] Dickinson, Paul and Jonathon Ellison. 1999. *Getting Connected or Staying Unplugged: The growing use of computer communications services.* Ministry of Industry, Canada.
[63] CBC. 2000. "Canada world champs in Internet use." WebPosted Thursday November 16, 2000.
[64] Frederick, Judith. 1995. *As Time Goes By…Time Use of Canadians.* Statistics Canada, Catalogue No. 89-544E.
[65] Silver, Cynthia. 2000. "Being there: The time dual-earner couples spend with their children," *Canadian Social Trend-Summer 2000.* Statistics Canada, Catalogue No. 11-008.
[66] Canadian Fitness and Lifestyle Research Institute. 1996. *How Canadians spend their time.* Canadian Fitness and Lifestyle Research Institute, Bulletin No. 6.
[67] Colman, Ronald. 1998. *The Economic Value of Unpaid Housework and Child Care in Nova Scotia*. GPI Atlantic, Nova Scotia.