

Actuarial Report

(5th)

on the

OLD AGE SECURITY PROGRAM

as at 31 December 2000



Office of the Superintendent
of Financial Institutions

Office of the Chief Actuary

Bureau du surintendant
des institutions financières

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Canada

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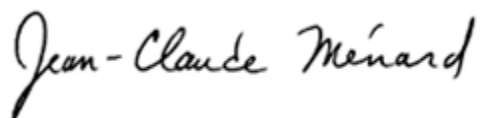
7 May 2002

The Honourable Jane Stewart, P.C., M.P.
Minister of Human Resources Development
House of Commons
Ottawa, Canada
K1A 0G5

Dear Minister:

In accordance with section 3 of the *Public Pensions Reporting Act*, I am pleased to submit the Actuarial Report prepared as at 31 December 2000, of the pension plan established under the *Old Age Security Act*.

Yours sincerely,

A handwritten signature in black ink, reading "Jean-Claude Ménard". The signature is written in a cursive, flowing style.

Jean-Claude Ménard, F.S.A., F.C.I.A.
Chief Actuary

Table of Contents

Table of Contents.....	5
Tables and Graphs.....	6
I. Executive Summary	9
A. Purpose of Actuarial Report.....	9
B. Scope of Actuarial Report.....	9
C. Main Findings	10
II. Methodology	11
III. Best-Estimate Assumptions	12
A. Introduction.....	12
B. Demographic Assumptions.....	13
C. Economic Assumptions	16
D. Recipient Rates	19
IV. Results	21
A. Overview.....	21
B. Number of Beneficiaries	23
C. Average Annual Benefits and Expenditures	26
D. Cost Ratios.....	27
V. Conclusion	36
VI. Actuarial Opinion.....	37
Appendix A – Summary of Plan Provisions	38
Appendix B – Assumptions and Methods	44
Appendix C – Sensitivity Tests.....	69
Appendix D – Reconciliation With Previous Report.....	76
Appendix E – Detailed Projections of Beneficiaries and Expenditures	79
Appendix F – Acknowledgements.....	88

Tables and Graphs

	Page
Table 1 Best-Estimate Demographic and Economic Assumptions.....	12
Table 2 Population	15
Table 3 Economic Assumptions.....	18
Table 4 Recipient Rates.....	20
Table 5 Beneficiaries (Historical)	24
Table 6 Beneficiaries (Projected).....	25
Table 7 Average Annual Benefits and Expenditures (Historical).....	28
Table 8 Average Annual Benefits and Expenditures (Projected)	29
Table 9 Expenditures as Percentage of GDP (Historical)	30
Table 10 Expenditures as Percentage of GDP (Projected).....	31
Table 11 Expenditures as Percentage of CPP/QPP Contributory Earnings (Historical).....	32
Table 12 Expenditures as Percentage of CPP/QPP Contributory Earnings (Projected)	33
Table 13 Expenditures as Percentage of Total Employment Earnings (Historical).....	34
Table 14 Expenditures as Percentage of Total Employment Earnings (Projected)	35
Table 15 Fertility Rates	45
Table 16 Mortality Rates	47
Table 17 Life Expectancies (Without Improvements)	48
Table 18 Life Expectancies (With Improvements)	48
Table 19 Population by Age.....	50
Table 20 Analysis of Population	51
Table 21 Births, Net Migrants and Deaths	52
Table 22 Active Population.....	54
Table 23 Employment of Population Ages 15 to 69	56
Table 24 Basic Pension Recipient Rates (%)	60
Table 25 GIS and Allowance Recipient Rates	62
Table 26 Projected Maximum Monthly Benefits.....	66
Table 27 Average Benefits as Percentage of Maximum Rates	67
Table 28 Sensitivity-Test Assumptions	70
Table 29 Life Expectancy in 2050 Under Alternative Assumptions	72
Table 30 Sensitivity-Test Results.....	75
Table 31 Financial Results - 1998 to 2000.....	76
Table 32 Reconciliation of Costs as Percentage of GDP	77
Table 33 Beneficiaries (Basic Pension)	79
Table 34 Expenditures (Basic Pension)	79
Table 35 GIS Beneficiaries (Total)	80
Table 36 GIS Expenditures (Total)	80
Table 37 GIS Beneficiaries (Single)	81
Table 38 GIS Expenditures (Single)	81
Table 39 GIS Beneficiaries (Spouse a Pensioner)	82
Table 40 GIS Expenditures (Spouse a Pensioner)	82
Table 41 GIS Beneficiaries (Spouse Not a Pensioner)	83

Table 42	GIS Expenditures (Spouse Not a Pensioner)	83
Table 43	GIS Beneficiaries (Spouse with Allowance)	84
Table 44	GIS Expenditures (Spouse with Allowance)	84
Table 45	Allowance Beneficiaries (Total)	85
Table 46	Allowance Expenditures (Total)	85
Table 47	Allowance Beneficiaries (Regular)	86
Table 48	Allowance Expenditures (Regular)	86
Table 49	Allowance Beneficiaries (Survivor).....	87
Table 50	Allowance Expenditures (Survivor).....	87
Chart 1	Life Expectancy at Age 65	14
Chart 2	Population Distribution by Age	15
Chart 3	Distribution of the Population Aged 15 and Over	17
Chart 4	Distribution of Beneficiaries by Level of Pension	20
Chart 5	Analysis of Population by Age Group	22
Chart 6	Expenditures as Proportion of GDP	22
Chart 7	Analysis of Expenditures by Type	27
Chart 8	Total Fertility Rate	46
Chart 9	Net Migration as % of Population.....	49
Chart 10	Population	51
Chart 11	Components of Population Growth.....	52
Chart 12	Beneficiaries by Level of Benefit (Basic Pension – Males Aged 65+)	60
Chart 13	Beneficiaries by Level of Benefit (Basic Pension – Females Aged 65+).....	61
Chart 14	GIS Single Recipient Rates (Males)	63
Chart 15	GIS Single Recipient Rates (Females).....	63
Chart 16	Allowance Recipient Rates (Males).....	64
Chart 17	Allowance Recipient Rates (Females)	64
Chart 18	GIS Recipient Rates by Level of Benefit.....	65
Chart 19	Allowance Recipient Rates by Level of Benefit.....	65

I. Executive Summary

This is the Fifth Actuarial Report since the implementation of the *Old Age Security Act* in 1952. It presents the results of an actuarial examination of the status of the Old Age Security (OAS) program as at 31 December 2000, and includes projections of future experience through the year 2075. The Fourth Actuarial Report, as at 31 December 1997, was tabled in the House of Commons on 3 June 1999. The next report is scheduled as at 31 December 2003.

A. Purpose of Actuarial Report

This report has been prepared in compliance with the timing and information requirements of the *Public Pensions Reporting Act*, which provides that the Chief Actuary shall prepare a triennial actuarial report on the benefits under the various Parts of the *Old Age Security Act*, being as follows:

- Part I: Basic OAS Pension
- Part II: Guaranteed Income Supplement (GIS)
- Part III: Allowance

Another important purpose of the report is to inform the general public of the current and projected financial status of the OAS. It provides information to evaluate its financial situation over a long period, provided the program remains unchanged. Such information should facilitate a better understanding of the financial status of the program and the factors that influence costs, contributing to an informed public discussion of issues related to it.

B. Scope of Actuarial Report

Section II presents the general methodology used in preparing the actuarial estimates included in this report, which are based on the key “best-estimate” assumptions described in Section III. Section IV includes information on key demographic and financial indicators and on the projection of beneficiaries, expenditures and cost ratios. Section V presents a general conclusion while Section VI presents the actuarial opinion regarding this report.

The various appendices provide supplemental information on the provisions of the program, the description of the data, the assumptions and methods employed, the sensitivity analysis and the reconciliation of the results shown in this report with those presented in the previous actuarial report.

C. Main Findings

The results of the actuarial projections of the financial status of the Old Age Security program presented in this report are generally consistent with the trends revealed in the previous actuarial report.

- Demographic changes will have a major impact on the ratio of workers to retirees; the ratio of the number of people aged 20 to 64 to those aged 65 and over is expected to fall from about 4.9 in 2001 to 2.2 in 2075.
- The number of beneficiaries for the basic pension is expected to more than double over the next 30 years, growing from 3.8 million in 2001 to 8.4 million by 2030.
- The number of Guaranteed Income Supplement and Allowance beneficiaries is expected to increase by 54% over the next 30 years, growing from 1.5 million in 2001 to 2.3 million by 2030. The percentage increase is less than for the basic pension due to the expected decline in recipient rates for these benefits over the same period.
- Total annual expenditures are expected to increase by 44% over the next 10 years, from \$25 billion in 2001 to \$36 billion in 2010 and to \$109 billion by 2030.
- The ratio of expenditures to Gross Domestic Product (GDP) is expected to increase from its 2001 level of 2.3% to 2.4% in 2010 because the increasing flow of new beneficiaries is only partially offset by the effect of the indexation formula. Maximum benefits are indexed to the rate of inflation, which is assumed to be lower than the rate of growth in both the GDP and the income of new retirees, which reduces the amount of income tested benefits payable.
- The ratio of expenditures to gross domestic product increases from 2.4% in 2010 to a high of 3.2% in 2030, driven largely by the retirement of the baby boom generation.
- Over the longer term, the effect of price-indexation of benefits predominates and results in the reduction of the ratio of expenditures to gross domestic product to 2.1% by the end of the projection period in 2075, or about 10% lower than its current level.

II. Methodology

The actuarial examination of the Old Age Security program involves projections of its expenditures and cost measurement bases over a long period of time, so that the future impact of historical and projected trends in demographic and economic factors can be properly assessed. The actuarial estimates in this report are based on the current provisions of the OAS, the data regarding the starting point for the projections, the best-estimate assumptions regarding future demographic and economic experience, and the methodology for translating this information into estimates of future expenditures.

Since the Old Age Security program is financed from general tax revenues on a pay-as-you-go basis, there is no need to project either contributions or investment earnings. However, projections have been made of total employment earnings, gross domestic product (GDP) and combined Canada Pension Plan (CPP) and Québec Pension Plan (QPP) contributory earnings, which are then used as bases for measuring the relative costs over the projection period.

The costing begins with a projection of the general population of Canada. This requires assumptions regarding demographic factors such as fertility, migration and mortality.

Expenditures are made up of the benefits paid out and the administrative expenses. Benefits are projected by applying assumptions regarding recipient rates for various types and levels of benefits to the projected population at the relevant ages, along with assumptions regarding increases in the maximum benefit rates. Administrative expenses (a relatively small component of expenditures) are projected based on historical experience.

The total employment earnings and combined CPP and QPP contributory earnings cost measurement bases are derived by applying labour force participation and job creation rates to the projected population and by projecting average annual employment earnings; this requires assumptions such as wage increases and proportion of CPP/QPP contributors. The GDP is then simply derived by extrapolating the historical relationship between GDP and total employment earnings.

The assumptions and results presented in the following sections make it possible to measure the financial status of the program over the projection period.

III. Best-Estimate Assumptions

A. Introduction

The information required by statute, which is presented in Section IV, requires making several assumptions regarding future demographic and economic trends. The projections included in this report cover a long period of time (75 years) and the assumptions are determined by putting more emphasis on historical trends than on short-term trends. These assumptions reflect our best judgement and are referred to in this report as the “best-estimate” assumptions. The assumptions were chosen to form a coherent whole, taking into account certain interrelationships among them.

Table 1 presents a summary of the most important assumptions used in this report and those used in the previous report. The assumptions are described in more detail in Appendix B.

Table 1 Best-Estimate Demographic and Economic Assumptions

Report 5 (as at 31 December 2000)					Report 4 (as at 31 December 1997)				
Total fertility rate		1.64			1.70				
Net migration rate		0.50% of population to 2015 0.52% of population 2020+			0.50% of population				
Mortality		1990-92 Life Tables for Canada with future improvements differing by Report							
Canadian life expectancy at birth:			<u>2000</u>	<u>2025</u>		<u>2000</u>	<u>2025</u>		
		Males:	76.2 years	78.8 years	Males:	76.2 years	78.0 years		
		Females:	81.6 years	83.2 years	Females:	82.2 years	83.8 years		
Unemployment rate		6.5%			7.0%				
Participation rate		Aged 15-69: 72.5% (2030)			Aged 15-69: N/A ¹				
Real-wage differential		1.1% (2015+)			1.0% (2003+)				
Rate of increase in prices		3.0% (2015+)			3.0% (2003+)				
Recipient Rates			<u>2001</u>	<u>2025</u>	<u>2050</u>		<u>2001</u>	<u>2025</u>	<u>2050</u>
		OAS:	98%	98%	98%	OAS:	97%	97%	97%
		GIS:	35%	27%	21%	GIS:	35%	25%	21%
		Allowance:	7%	5%	3%	Allowance:	7%	4%	2%

¹ The methodology of the previous report did not specifically use labour force participation rates.

B. Demographic Assumptions

The demographic projections start with the population of Canada on 1 July 2000, to which is applied fertility, migration and mortality assumptions. The population projections are essential to determine the number of beneficiaries.

The distribution of the population by age has changed considerably over the last 35 years, with the population aging each year since then. The causes of this aging are examined in the following subsections.

1. Fertility

The first cause of the aging of the Canadian population is the large drop in the total fertility rate over the last three decades, relative to the baby boom generation born from the mid-1940s to the mid-1960s. The total fertility rate in Canada has dropped rapidly from an average level of about 4.0 in the 1950s to 1.75 in the late 1970s and to 1.65 over the last two decades.

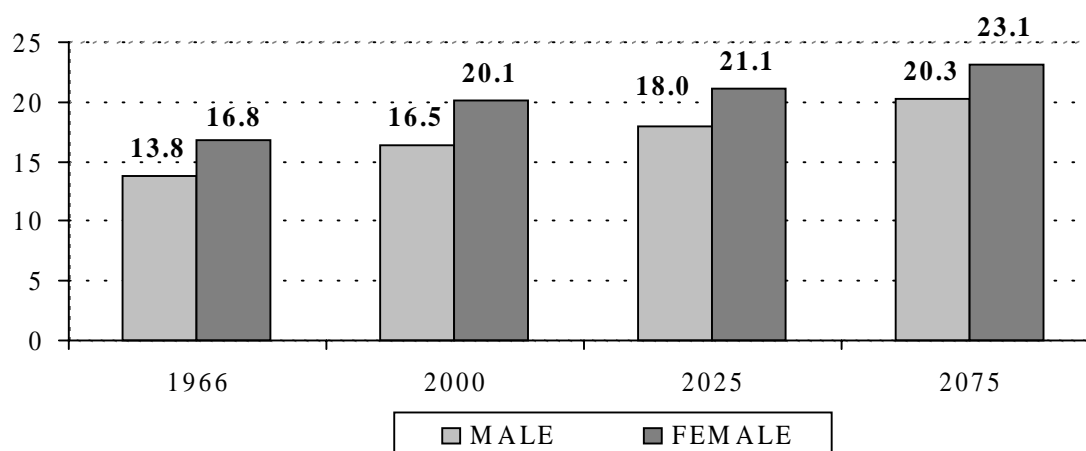
The decrease occurred as a result of changes in a variety of social, medical and economic factors. It seems unlikely that fertility rates will return to historical levels in the absence of significant societal changes. It was therefore assumed that the total fertility rate for Canada would increase slightly from its 1997 level of 1.55 to an ultimate level of 1.64 in 2007.

2. Mortality

Another element that has contributed to the aging of the population is the significant reduction in age-specific mortality rates. This can be best measured by the increase in life expectancy at age 65, which directly affects how long benefits will be paid to the beneficiaries. Life expectancy at age 65 has increased 20% for men between 1966 and 2000, rising from 13.8 to 16.5 years. For women, life expectancy at age 65 has also increased 20%, from 16.8 to 20.1 years over the same period.

Mortality improvements are expected to continue in the future, but at a slower pace than observed over the last 25 years. The ultimate rates of improvement were established by adjusting the results of a detailed study prepared by the Social Security Administration in the United States for their 2000 Trustees Report. The adjustments are to reflect, in part, historical differences between Canada and the United States. Rates of improvements are assumed to grade down from their current levels to their ultimate levels by year 2021. Chart 1 shows the changes in life expectancy at age 65 since 1966 to the end of the projection period.

Chart 1 Life Expectancy at Age 65
(years)



3. Net Migration

Net migration (i.e. the excess of immigration over emigration) is unlikely to materially reduce the continued aging of the population unless (1) the level of immigration rises significantly above what has been observed historically and (2) the average age at immigration falls dramatically. Net external migration to Canada was 0.47% of the population in 2000 and has averaged about 0.50% of the population over the last 15 to 20 years. Based on a continuation of these net migration levels and the expected pressures on the labour markets due to the impending retirement of the baby boom generation, an ultimate assumption of 0.52% of population has been established for years 2020 and beyond. The initial 0.47% level is gradually increased to 0.50% in 2005, then kept constant until 2015 and finally increased uniformly to 0.52% for 2020 and thereafter to take into account the effects of the anticipated labour shortage. The ultimate 0.52% is comparable to the actual averages observed over the last 10 to 15 years.

4. Population Projections

Chart 2 shows the evolution of the Canadian population distribution by age since 1966. One can easily observe that the triangular shape of the 1970s is becoming more rectangular, thus leading to an older population on average. The effects of the baby boom and baby bust can be seen. The chart also reveals that the number of people aged 85 and over is expected to increase dramatically over the next 50 years. Table 2 shows the population for three age groups (i.e. 0-19, 20-64 and 65 and over) over the projection period. The ratio of people aged 20-64 to those aged 65 and over is a measure that approximates the number of working-age people to retirees. Because of the population aging, this ratio drops by more than half during the projection period, from 4.9 in 2001 to 2.2 in 2075.

Chart 2 Population Distribution by Age
(thousands)

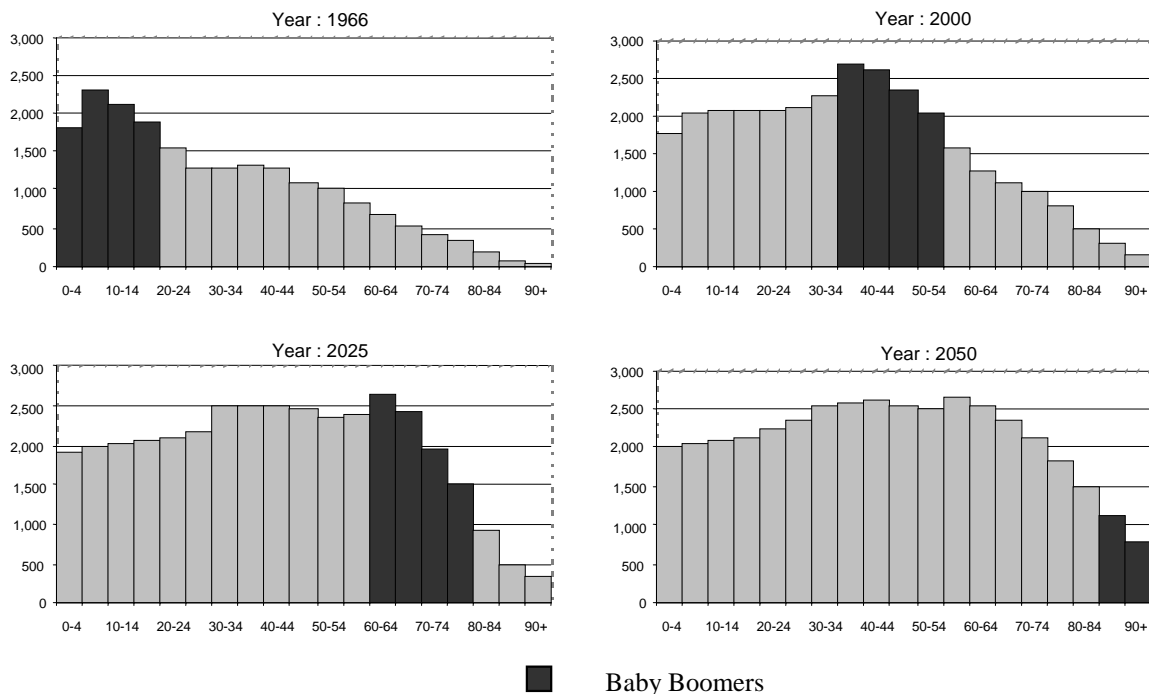


Table 2 Population
(thousands)

Year	Total	Ages 0-19	Ages 20-64	Ages 65 and over	Ratio of 20-64 To 65 and over
2001	31,015	7,914	19,189	3,913	4.9
2002	31,281	7,892	19,417	3,971	4.9
2003	31,548	7,872	19,642	4,034	4.9
2004	31,816	7,852	19,862	4,102	4.8
2005	32,085	7,833	20,081	4,172	4.8
2006	32,355	7,817	20,286	4,252	4.8
2007	32,624	7,809	20,477	4,338	4.7
2008	32,892	7,804	20,647	4,441	4.6
2009	33,160	7,789	20,822	4,549	4.6
2010	33,425	7,758	21,007	4,660	4.5
2015	34,727	7,673	21,570	5,485	3.9
2020	35,989	7,829	21,718	6,441	3.4
2025	37,145	7,983	21,626	7,537	2.9
2030	38,129	8,060	21,506	8,563	2.5
2050	40,587	8,283	22,568	9,736	2.3
2075	43,260	8,739	23,779	10,742	2.2

C. Economic Assumptions

The expenditures are presented as cost ratios using three different measurement bases, namely total employment earnings, gross domestic product and combined CPP/QPP contributory earnings. These cost bases are projected using economic assumptions such as labour force participation rates, employment rates, unemployment rates and average employment earnings increases. For benefit projection purposes, assumptions regarding the rate of increase in prices and recipient rates for the various benefits are also required.

One of the key elements underlying the best-estimate key economic assumptions relates to the expected labour shortage due to the aging of the population and the retirement of the baby boom generation between 2010 and 2030. Labour force growth will weaken as the population of labour force age expands at a slower pace. The outlook for the participation rates also points to slower labour force growth. Growing labour shortages, especially after 2005, are assumed to force higher real-wage growth. The higher real wages will also help to keep people in the labour force who might otherwise retire. The net result is an unemployment rate drop.

1. Labour Force

Employment levels are reflected in the actuarial projection model through the assumption regarding the proportions of the population, by age and sex, who have earnings in a given year. These proportions vary not only with the rate of unemployment, but also reflect trends to increased workforce participation by women, longer periods of formal education among young adults and changing retirement patterns of older workers.

Because of the aging of the population, the labour force participation rates for Canadians aged 15 and over are expected to decline from 66.1% in 2001 to 61.0% by 2030. A more useful measure of the working-age population is the participation rates of those aged 15 to 69, which are expected to slightly decline from 73.2% in 2001 to 72.5% in 2030. After 2001, the participation rate of those aged 55 and over increases gradually. Moreover, the narrowing of the gap between the age-specific participation rates of men and women continues but at a much slower pace than in the past, except for women aged 55 and over. The participation rate for the latter group increases at a faster rate at the beginning of the period, when the generation of women historically most active in the labour force reaches age 55.

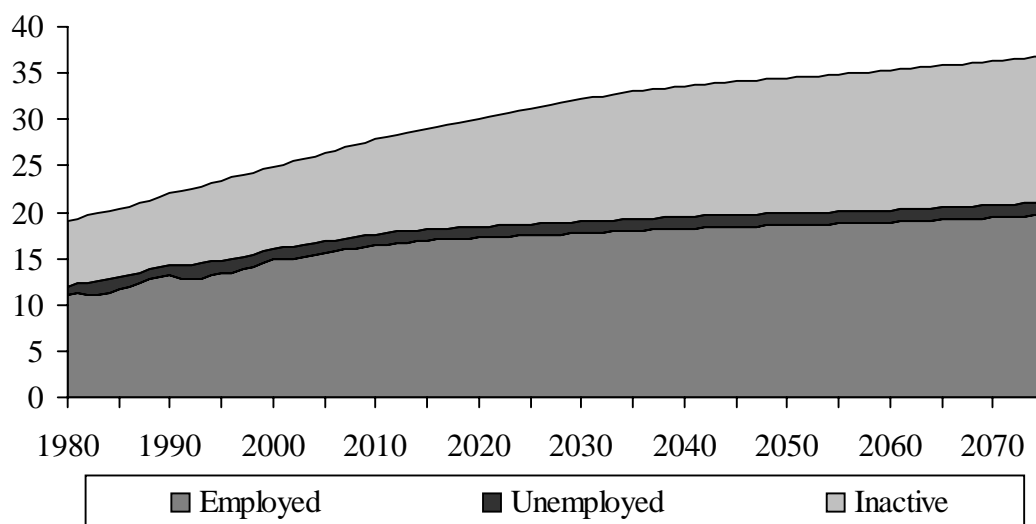
The rate of job growth in Canada was 1.8% on average from 1976 to 2000, based on available employment data; it is assumed that the number of jobs increases by 0.5% in 2001.

An economic slowdown followed by a recovery is assumed at the beginning of the projection period. The job creation rate decreases to 0.3% in 2002. From 2003 to 2007 the rate is about 1.2% on average and 0.5% from 2008 to 2020. For 2020 and thereafter,

because of the aging of the population, the job creation rate follows the labour force growth rate of about 0.2%.

The job creation rate is determined on the basis of the short-term economic outlook and the natural unemployment rate, which remains at around 7.0% until 2010. Thereafter, the relative stability of the labour force makes it possible for the natural unemployment rate to drop to 6.5% around 2015. Chart 3 below shows the impact of the employment and participation assumptions on the employment status of the population aged 15 and over.

Chart 3 Distribution of the Population Aged 15 and Over
 (millions)



2. Wage Increases

Wage increases have an impact on the financial balance of the program in two ways. In the short term, an increase in the average employment earnings translates into higher total employment earnings, GDP and combined CPP/QPP contributory earnings, with little immediate impact on benefits. Therefore, costs in relation to these measurement bases will decrease. Over the longer term, higher average earnings in relation to the level of prices may be expected to produce lower payouts for income-tested benefits such as the GIS and Allowance. The long-term projected costs relative to the various measurement bases are more dependent on the differential between the assumed annual rate of wage increases and price increases (the real-wage differential) than on the absolute level of wage increases assumed.

Many factors have influenced the real rate of increase in average annual earnings, including general productivity improvements, the move to a service economy, decreases in the average hours worked and fluctuation in the size of the workforce. Considering

these factors, together with the historical trends, the expected labour shortage and judgement regarding the long-term course of the economy, an ultimate real increase in average earnings of 1.1% has been assumed for 2015 and thereafter. Combined with the price increase assumption described below, it results in assumed nominal annual increases in average earnings of 4.1% in 2015 and thereafter. In contrast, no increase is expected for 2002 as a result of the expected economic slowdown. For the period 2003 to 2015, the real increase in average annual earnings is assumed to gradually increase from zero to the ultimate rate of 1.1%. The assumed increase in average annual earnings and in the proportions of earners results in projected average annual real increases in total employment earnings of about 1.7% for the period 2001 to 2020. This decreases to about 1.4% ultimately, reflecting the 1.1% real increase in average annual wages and the 0.3% annual growth in the working-age population.

3. Price Increases

Price increases, as measured by changes in the Consumer Price Index, tend to fluctuate from year to year. Based on historical trends, the renewed commitment of the Bank of Canada and the government to keep inflation between 1% and 3% over the next five years and judgement about the long-term outlook for inflation, an ultimate rate of price increase of 3.0% has been assumed for 2015 and thereafter. Recognizing recent experience, the rate of price increase is assumed at 2.8% for 2001 and 2.0% for years 2002 to 2005. From 2006 the rate is then uniformly increased to its ultimate level of 3.0% in 2015. Table 3 presents a summary of the main economic assumptions.

Table 3 Economic Assumptions

Year	Real Increase in Average Annual Wage	Price Increase	Labour Force			
			Participation Rate	Job Creation Rate	Unemployment Rate	Labour Force Annual Increase
	(%)	(%)	(%)	(%)	(%)	(%)
2001	(0.50)	2.8	66.1	0.5	7.4	1.2
2002	0.00	2.0	65.8	0.3	7.8	0.7
2003	0.55	2.0	65.4	1.0	7.5	0.6
2004	0.60	2.0	65.4	1.4	7.2	1.2
2005	0.65	2.0	65.4	1.3	7.1	1.2
2006	0.70	2.1	65.4	1.2	7.1	1.1
2007	0.75	2.2	65.3	1.1	7.0	1.0
2008	0.80	2.3	65.1	1.0	6.9	0.9
2009	0.90	2.4	65.0	0.9	6.8	0.9
2010	1.00	2.5	65.0	0.9	6.8	0.9
2015	1.10	3.0	64.1	0.4	6.5	0.4
2020	1.10	3.0	62.9	0.3	6.5	0.3
2025	1.10	3.0	61.7	0.2	6.5	0.2
2050	1.10	3.0	59.7	0.1	6.5	0.1
2075	1.10	3.0	59.2	0.2	6.5	0.2

D. Recipient Rates

Old Age Security recipient rates represent the proportion of the Canadian population that have received (historical) or are projected to receive these benefits. The historical recipient rates of sex-distinct cohorts of the basic pension were studied in order to determine the best-estimate assumption.

For males, the ultimate recipient rates for the basic pension are assumed to increase gradually from 93% at age 65 to 99.5% at ages 70 and over. For females, the recipient rates are assumed to increase gradually from 93.5% at age 65 to 98.5% at ages 75 and over. The projected 1% difference between the ultimate recipient rates of males and females is consistent with the historical gap between the two sexes. The distribution of recipient rates by level of benefit for the basic pension for year 2001 is projected by age and sex based on the trend over the last five years.

The recipient rates for Guaranteed Income Supplement and Allowance by age, sex, type and level of benefit for year 2001 were used as the starting point for determining the best-estimate assumption. The previous actuarial report introduced a formula for the projection of these recipient rates. This was done to take into account the assumption that each new cohort of beneficiaries will be somewhat wealthier than the preceding one and thus fewer members will be eligible for these benefits.

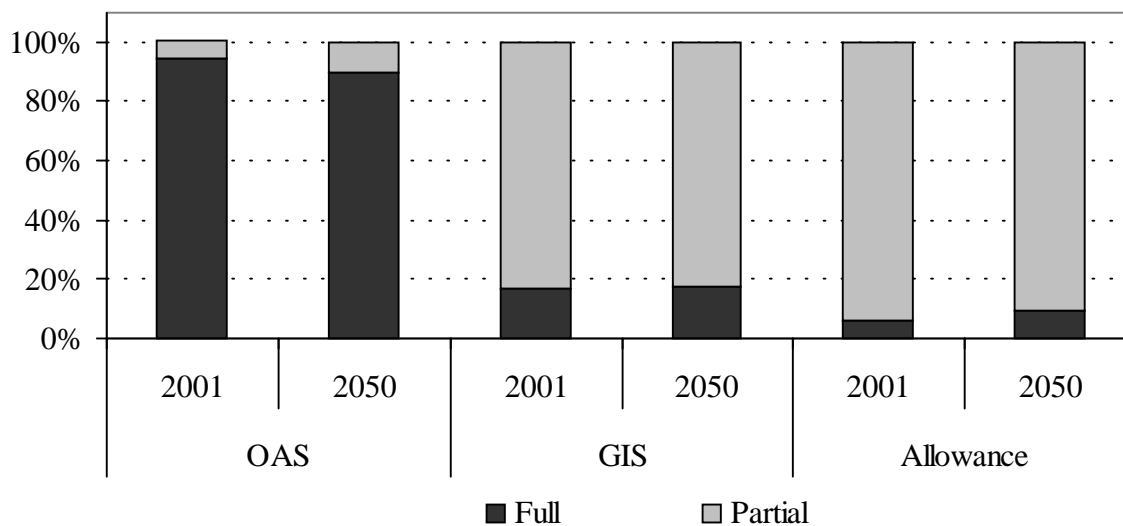
For this report, experience adjustment factors were introduced into the projection formula. These new experience adjustment factors were developed to adjust the formula so that characteristics and trends of recipient experience by age, sex, type of benefit and level of benefit over the last five years would be reproduced more closely. These experience adjustment factors were used for the first 10 years of the projection period. The change in the assumed recipient rates by level of benefit is automatically taken into account by the formula.

Table 4 presents a summary of the assumed recipient rates. Chart 4 presents the assumed recipient rates for benefits by level of pension.

Table 4 Recipient Rates
 (population aged 65+)

	Males			Females		
	2001	2025	2050	2001	2025	2050
OAS	98.7%	98.6%	98.8%	98.1%	97.7%	97.9%
GIS-Single	10.6	8.6	6.9	30.2	23.6	20.6
GIS-Spouse a Pensioner	11.5	7.6	5.3	8.6	6.5	3.7
GIS-Spouse not a Pensioner	3.5	2.7	1.5	0.9	0.8	0.6
GIS-Spouse with Allowance	3.4	3.2	2.2	0.3	0.3	0.2
GIS-All	29.0%	22.1%	15.9%	40.0%	31.1%	25.1%
Allowance-Regular	0.9	0.5	0.3	8.7	5.4	2.5
Allowance-Survivor	0.4	0.3	0.2	4.5	3.3	2.3
Allowance-All	1.3%	0.8%	0.5%	13.2%	8.7%	4.8%

Chart 4 Distribution of Beneficiaries by Level of Pension



IV. Results

A. Overview

The results of the projections of the financial status of the Old Age Security program presented in this report are generally consistent with the trends revealed in the previous actuarial report. The key observations and findings are as follows.

- Demographic changes will have a major impact on the ratio of workers to retirees; the ratio of the number of people aged 20 to 64 to those aged 65 and over is expected to fall from about 4.9 in 2001 to 2.2 in 2075 (see Chart 5).
- The number of beneficiaries for the basic pension is expected to more than double over the next 30 years, from 3.8 million in 2001 to 8.4 million by 2030.
- The number of Guaranteed Income Supplement and Allowance beneficiaries is expected to increase by 54% over the next 30 years, growing from 1.5 million in 2001 to 2.3 million by 2030. The percentage increase is less than for the basic pension due to the expected decline in recipient rates for these benefits over the same period.
- Total annual expenditures are expected to increase by 44% over the next 10 years, from \$25 billion in 2001 to \$36 billion in 2010 and to \$109 billion by 2030.
- The ratio of expenditures to Gross Domestic Product (GDP) is expected to increase from its 2001 level of 2.3% to 2.4% in 2010 because the increasing flow of new beneficiaries is only partially by the effect of the indexation formula. Maximum benefits are indexed to the rate of inflation, which is assumed to be lower than the rate of growth in both the GDP and the income of new retirees, which reduces the amount of income tested benefits payable.
- The ratio of total expenditures to GDP increases from 2.4% in 2010 to a high of 3.2% in 2030, driven largely by the retirement of the baby boom generation (see Chart 6).
- Over the longer term, the effect of price-indexation of benefits predominates and results in the reduction of the ratio of expenditures to GDP to 2.1% by the end of the projection period in 2075, or about 10% lower than its current level.

Over time, indexing benefit rates more slowly than the rate of growth in average employment earnings means that benefits will replace a decreasing share of an individual's preretirement earnings. In the past, this issue has been addressed through occasional ad hoc increases in the benefit rates. One of the sensitivity tests shown in

Appendix C provides an indication of the impact on projected results if benefit rates are increased to partially reflect the growth in real wages.

Chart 5 Analysis of Population by Age Group

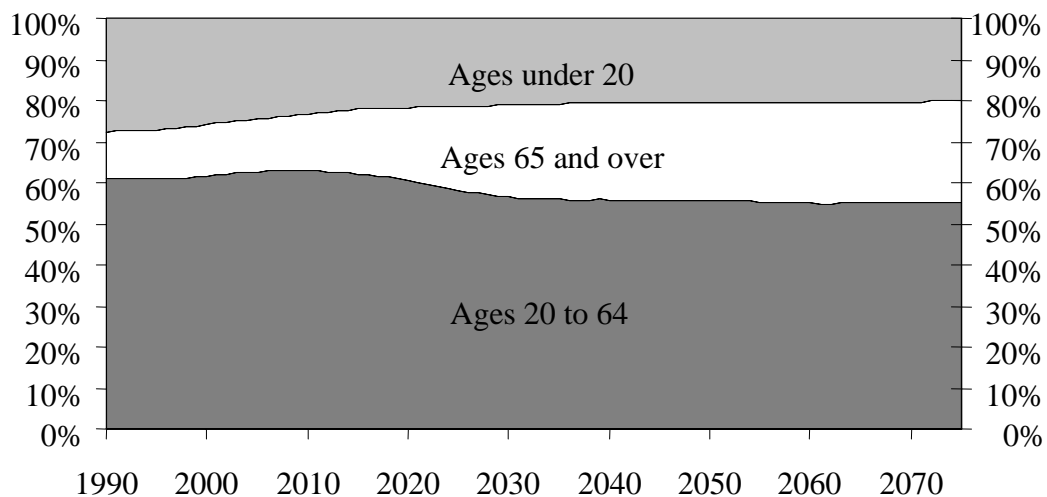
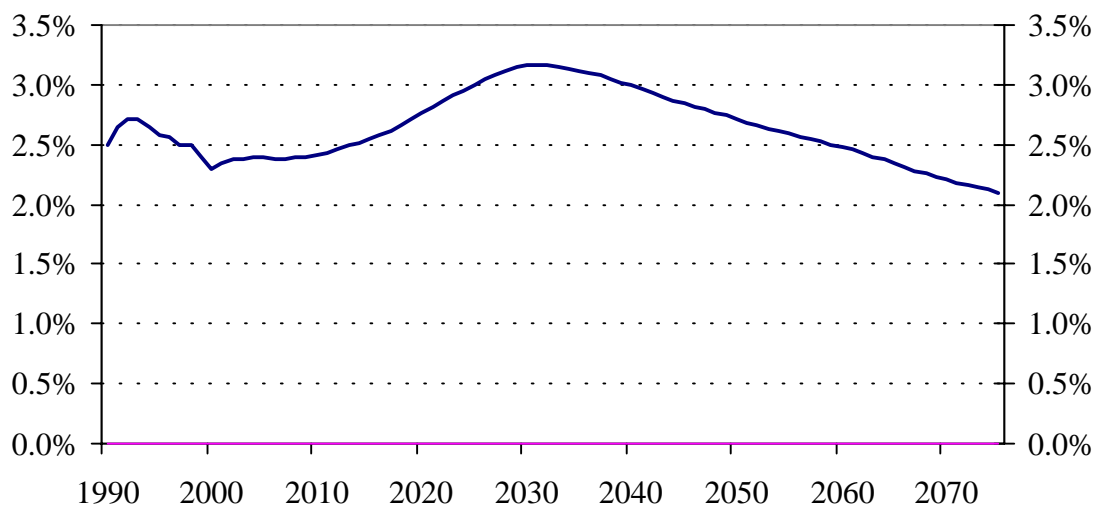


Chart 6 Expenditures as Proportion of GDP



B. Number of Beneficiaries

Tables 5 and 6 present the historical and projected number of beneficiaries along with the respective assumed overall recipient rates. The number of beneficiaries is the product of the projected population and the relevant recipient rates, which vary by year, age, sex, benefit type and level.

The number of beneficiaries for the basic pension is expected to more than double over the next 30 years, growing from 3.8 million in 2001 to 8.4 million by the end of 2030. This is a direct result of the anticipated population aging and the retirement of the baby boom generation over that period. By contrast, after 2030, due to the relative stability in the growth of the population aged 65 and over and in the basic pension recipient rates, the number of beneficiaries is expected to continue to increase but at a slower pace until the end of the projection period. The number of basic pension beneficiaries is projected to reach a level of 10.6 million by 2075. The 1989 basic pension claw-back provision, which applies to high-income pensioners, has a minimal impact on recipient rates; however, it has a greater effect on the average annual benefit (see section C below).

The number of GIS beneficiaries will increase by 57% over the next 30 years, growing from 1.4 million in 2001 to 2.2 million by 2030. Again, this is a direct result of the anticipated population aging and of the retirement of the baby boom generation over that period. However, the increase in the number of GIS beneficiaries is smaller than for the basic pension as recipient rates for GIS benefits is expected to decrease by 28% over the same period. Each successive cohort of new retirees is assumed to be wealthier than the preceding one as retirement income increases in line with the rate of growth in wages, while the income limits for GIS are assumed to increase in line with prices. Over the projection period, this has the effect of reducing the number of individuals who might have otherwise been recipient of a benefit. After 2030, due to the relatively stable growth in the population aged 65 and over and the assumed further decrease in recipient rates, the number of beneficiaries is projected to decline to 1.7 million by 2075.

The number of Allowance beneficiaries is expected to increase by 41% over the next 20 years, growing from 95,000 in 2001 to 134,000 by the end of 2020. The effect of the growth in the 60-64 age group (to which the Allowance applies) over the next 20 years is partially offset by the assumption that the recipient rates for Allowance benefits will decrease by 28% over the same period. After 2020, the Allowance recipient rates continue to decrease while the growth in the population aged 60 to 64 stabilizes. As a result, the number of Allowance beneficiaries is expected to decline to 41,000 by 2075.

Table 5 Beneficiaries (Historical)

Year	Number of Beneficiaries			Recipient Rates		
	OAS ¹	GIS	A	OAS ¹	GIS	A
	(thousands)	(thousands)	(thousands)	(%)	(%)	(%)
1961	922	-	-	100.8	-	-
1962	945	-	-	101.0	-	-
1963	967	-	-	101.1	-	-
1964	988	-	-	101.1	-	-
1965	1,078	-	-	98.4	-	-
1966	1,199	-	-	98.1	-	-
1967	1,332	662	-	98.1	41.6	-
1968	1,470	760	-	97.7	46.7	-
1969	1,629	803	-	97.4	48.0	-
1970	1,689	816	-	98.4	47.6	-
1971	1,735	932	-	98.4	52.9	-
1972	1,780	998	-	98.5	55.2	-
1973	1,825	1,058	-	98.4	57.0	-
1974	1,874	1,069	-	98.4	56.1	-
1975	1,925	1,069	7	98.3	54.6	0.8
1976	1,975	1,084	59	97.6	53.6	6.4
1977	2,035	1,112	72	97.4	53.2	7.8
1978	2,098	1,127	73	97.3	52.3	7.9
1979	2,179	1,164	76	97.7	52.2	8.2
1980	2,259	1,191	81	98.0	51.7	8.5
1981	2,326	1,232	84	97.9	51.8	8.5
1982	2,389	1,228	85	97.8	50.3	8.2
1983	2,448	1,229	86	98.0	49.2	8.0
1984	2,511	1,246	89	97.9	48.6	8.0
1985	2,595	1,290	100	97.9	48.7	8.9
1986	2,683	1,316	139	98.0	48.1	12.2
1987	2,778	1,336	140	97.9	47.1	12.2
1988	2,862	1,342	135	97.8	45.8	11.6
1989	2,948	1,339	128	97.4	44.2	11.0
1990	3,036	1,325	121	97.3	42.4	10.3
1991	3,127	1,309	115	97.2	40.7	9.6
1992	3,210	1,300	110	97.0	39.4	9.2
1993	3,289	1,313	108	97.6	39.0	8.9
1994	3,367	1,340	109	97.9	39.0	9.0
1995	3,447	1,338	104	98.1	38.1	8.6
1996	3,524	1,341	102	98.4	37.4	8.3
1997	3,589	1,364	100	98.1	37.3	8.3
1998	3,656	1,368	97	98.0	36.7	8.0
1999	3,715	1,372	97	98.0	36.2	7.9
2000	3,781	1,363	95	98.2	35.4	7.6

¹ The overall recipient rates have been calculated as the ratio of the number of beneficiaries during June of the given year to the population in the appropriate age range. Some of the rates exceed 100% due to differences between census and beneficiary databases.

Table 6 Beneficiaries (Projected)

Year	Number of Beneficiaries			Recipient Rates		
	OAS	GIS	A	OAS	GIS	A
	(thousands)	(thousands)	(thousands)	(%)	(%)	(%)
2001	3,848	1,379	95	98.3	35.3	7.4
2002	3,901	1,400	99	98.3	35.3	7.4
2003	3,964	1,421	103	98.3	35.2	7.4
2004	4,031	1,441	107	98.3	35.1	7.4
2005	4,100	1,461	112	98.3	35.0	7.4
2006	4,178	1,479	115	98.3	34.8	7.3
2007	4,263	1,496	121	98.3	34.5	7.1
2008	4,363	1,517	125	98.2	34.2	7.0
2009	4,469	1,537	130	98.2	33.8	6.9
2010	4,577	1,555	134	98.2	33.4	6.8
2011	4,704	1,577	137	98.2	32.9	6.7
2012	4,877	1,610	135	98.2	32.4	6.6
2013	5,049	1,642	133	98.2	31.9	6.4
2014	5,216	1,671	133	98.2	31.5	6.2
2015	5,385	1,699	133	98.2	31.0	6.0
2016	5,556	1,728	134	98.2	30.5	5.9
2017	5,732	1,756	135	98.2	30.1	5.8
2018	5,917	1,787	135	98.2	29.7	5.6
2019	6,116	1,820	135	98.2	29.2	5.5
2020	6,325	1,855	134	98.2	28.8	5.3
2021	6,532	1,889	133	98.2	28.4	5.2
2022	6,747	1,924	132	98.2	28.0	5.1
2023	6,966	1,959	130	98.2	27.6	5.0
2024	7,183	1,993	128	98.2	27.3	4.9
2025	7,403	2,027	125	98.2	26.9	4.8
2026	7,623	2,061	121	98.2	26.6	4.7
2027	7,832	2,091	116	98.3	26.2	4.6
2028	8,043	2,122	110	98.3	25.9	4.5
2029	8,242	2,150	104	98.3	25.6	4.4
2030	8,419	2,172	99	98.3	25.4	4.2
2035	8,938	2,197	86	98.4	24.2	3.7
2040	9,209	2,161	79	98.5	23.1	3.3
2045	9,405	2,101	73	98.4	22.0	3.0
2050	9,583	2,026	67	98.4	20.8	2.6
2055	9,791	1,946	62	98.4	19.6	2.4
2060	10,084	1,879	53	98.4	18.3	2.2
2065	10,225	1,800	48	98.5	17.3	1.9
2070	10,378	1,729	44	98.5	16.4	1.7
2075	10,579	1,669	41	98.5	15.5	1.6

C. Average Annual Benefits and Expenditures

The historical and projected average annual benefits and total expenditures by type are presented in Tables 7 and 8.

The projected basic pension average annual benefit of \$5,069 in 2001 amounts to about 97% of the projected maximum annual OAS benefit for 2001. The average annual benefit is assumed to decrease to about 93% of the maximum or \$10,633 by 2030. The existence of partial benefits (introduced in 1977 for those with less than 40 years of residence) and the 1989 claw-back provision (reduces the benefit by 15 cents for each dollar of income above a minimum threshold) are both assumed to put downward pressure on the average annual OAS benefit. Currently, about 5% of the OAS pensioners are affected by the claw-back provision, resulting in the repayment of about 3% of the total amount of the basic pensions payable.

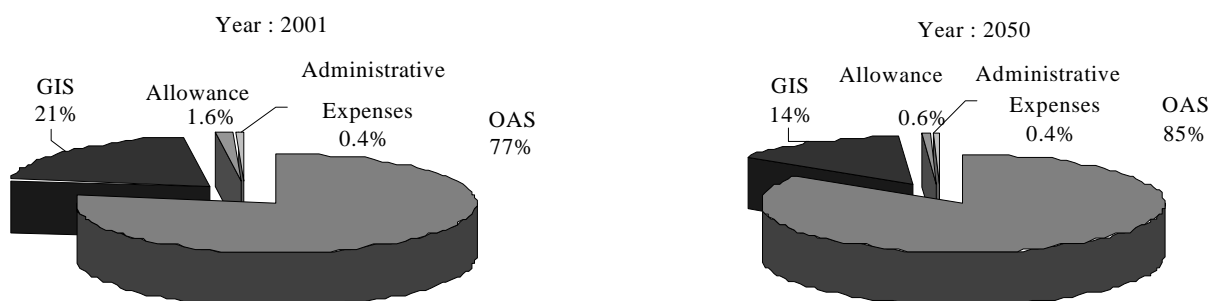
The projected GIS overall average annual benefit is \$3,807 in 2001, which is about 61% of the projected maximum annual GIS single rate for 2001. In contrast to the basic pension, the overall distribution of the number of beneficiaries by type and level of benefit is assumed to remain relatively stable over the projection period. For this reason, the average benefit remains at about 61% of the maximum GIS single rate throughout the projection period and reaches \$8,298 by 2030.

The projected overall Allowance average annual benefit is \$4,200 in 2001, which is about 45% of the projected maximum regular annual benefit for 2001. The distribution of the number of beneficiaries by type of benefit is assumed to change over the projection period. The Allowance survivor benefit expressed as a proportion of total Allowance benefit is assumed to increase over the projection period. For this reason, the average benefit increases from about 45% of the maximum Allowance regular rate in 2001 to about 49% by 2030. The average annual Allowance benefit reaches \$9,879 by 2030.

Total benefit expenditures are the product of the number of beneficiaries and the relevant average benefit by age, sex, and benefit type and level. Projected total annual expenditures for benefits and administrative expenses are \$25 billion in 2001, rising to \$36 billion in 2010 and \$109 billion by 2030.

Finally, it is interesting to note the changing distribution of expenditures by type of benefit over the projection period, as shown in Chart 7 for 2001 and 2050. The basic pension benefits represent 77% of total expenditures in 2001 but by 2050 this share increases to 85% as the recipient rates for GIS and Allowance benefit decrease significantly over the same period.

Chart 7 Analysis of Expenditures by Type



D. Cost Ratios

With the program being financed through general revenues on a pay-as-you-go basis, it is useful to express its annual expenditures in relative terms rather than in dollar terms. For this reason, the expenditures are presented as cost ratios using three different measurement bases. The three bases retained are total employment earnings, gross domestic product (GDP) and combined CPP/QPP contributory earnings. The details regarding how these measurement bases were projected is included in Appendix B of the report.

The GDP basis was derived from projected total employment earnings using the historical relationship between the two. Tables 9 and 10 present the historical and projected annual expenditures as a percentage of GDP.

The combined CPP/QPP contributory earnings basis was derived from CPP contributory earnings as projected under the 18th CPP Actuarial Report as at 31 December 2000 but adjusted to take into account QPP contributory earnings, using the historical relationship between the two. This measurement basis facilitates a direct comparison of the cost of the program with the costs of the CPP and QPP by using the same contributory basis. Tables 11 and 12 present the historical and projected annual expenditures as a percentage of CPP/QPP contributory earnings.

The total employment earnings basis is derived from the CPP total employment earnings as projected under the 18th CPP Actuarial Report as at 31 December 2000 but adjusted to account for Québec's total employment earnings. The adjustment is determined by using the historical relationship between total employment earnings as published by Statistics Canada and the total employment earnings applicable to Canada less Québec for the purpose of the Canada Pension Plan. Tables 13 and 14 present the historical and projected annual expenditures as a percentage of total employment earnings.

Table 7 Average Annual Benefits and Expenditures (Historical)

Year	Average Annual Benefit			Expenditures				
	OAS ¹	GIS	A	OAS ¹	GIS	A	Expenses	Total
	(\$)	(\$)	(\$)	(\$ million)	(\$ million)	(\$ million)	(\$ million)	(\$ million)
1961	654	-	-	603	-	-	3	606
1962	763	-	-	721	-	-	3	724
1963	802	-	-	775	-	-	3	778
1964	892	-	-	881	-	-	3	884
1965	851	-	-	917	-	-	4	921
1966	840	-	-	1,007	-	-	5	1,012
1967	840	326	-	1,119	216	-	7	1,342
1968	857	318	-	1,260	242	-	7	1,509
1969	874	322	-	1,424	259	-	9	1,692
1970	954	336	-	1,611	274	-	9	1,894
1971	962	504	-	1,668	470	-	12	2,150
1972	989	698	-	1,761	697	-	9	2,467
1973	1,167	686	-	2,130	725	-	8	2,863
1974	1,344	766	-	2,519	819	-	9	3,347
1975	1,498	838	1,842	2,883	896	13	10	3,802
1976	1,645	924	1,622	3,249	1,001	95	19	4,364
1977	1,751	951	1,567	3,563	1,057	113	22	4,755
1978	1,911	1,025	1,662	4,009	1,155	122	25	5,311
1979	2,082	1,261	1,846	4,537	1,468	140	27	6,172
1980	2,279	1,488	2,100	5,147	1,772	169	34	7,123
1981	2,544	1,770	2,339	5,918	2,180	197	42	8,337
1982	2,848	1,935	2,559	6,804	2,376	217	45	9,442
1983	3,065	2,040	2,692	7,504	2,508	232	54	10,298
1984	3,217	2,241	2,751	8,077	2,792	245	56	11,170
1985	3,351	2,542	2,941	8,696	3,278	295	60	12,329
1986	3,484	2,598	3,356	9,346	3,419	468	59	13,292
1987	3,624	2,677	3,446	10,070	3,577	482	59	14,188
1988	3,764	2,776	3,521	10,774	3,725	476	56	15,031
1989	3,927	2,877	3,621	11,579	3,851	464	62	15,957
1990	4,112	2,985	3,732	12,484	3,954	452	67	16,957
1991	4,331	3,133	3,892	13,545	4,102	447	63	18,157
1992	4,452	3,252	3,968	14,292	4,227	438	77	19,034
1993	4,522	3,346	3,974	14,872	4,393	430	90	19,785
1994	4,574	3,423	3,967	15,403	4,587	431	71	20,493
1995	4,593	3,439	3,950	15,832	4,601	411	107	20,950
1996	4,663	3,458	3,956	16,433	4,636	398	132	21,599
1997	4,721	3,453	3,935	16,944	4,710	393	85	22,131
1998	4,779	3,517	3,964	17,470	4,810	386	105	22,771
1999	4,819	3,567	3,990	17,903	4,894	388	106	23,291
2000	4,937	3,682	4,087	18,669	5,019	389	99	24,176

¹ Due to administrative practice, the figures shown for 1989 to 1995 include the amounts clawed back from higher-income pensioners.

Table 8 Average Annual Benefits and Expenditures (Projected)

Year	Average Annual Benefit			Expenditures				
	OAS	GIS	A	OAS	GIS	A	Expenses	Total
	(\$)	(\$)	(\$)	(\$ million)	(\$ million)	(\$ million)	(\$ million)	(\$ million)
2001	5,069	3,807	4,200	19,503	5,251	400	113	25,267
2002	5,172	3,893	4,295	20,178	5,451	424	117	26,170
2003	5,264	3,967	4,396	20,868	5,637	452	121	27,078
2004	5,359	4,043	4,499	21,600	5,828	482	126	28,036
2005	5,455	4,121	4,600	22,365	6,022	513	130	29,030
2006	5,557	4,203	4,706	23,218	6,215	543	135	30,111
2007	5,666	4,291	4,819	24,156	6,421	583	140	31,299
2008	5,784	4,385	4,948	25,238	6,654	620	146	32,658
2009	5,910	4,488	5,071	26,410	6,899	657	153	34,119
2010	6,044	4,599	5,196	27,666	7,152	696	160	35,674
2011	6,188	4,717	5,337	29,106	7,437	730	168	37,440
2012	6,342	4,839	5,520	30,934	7,793	743	178	39,647
2013	6,506	4,973	5,688	32,849	8,165	757	188	41,959
2014	6,680	5,116	5,866	34,842	8,550	780	199	44,370
2015	6,864	5,269	6,056	36,963	8,954	807	210	46,934
2016	7,056	5,429	6,253	39,206	9,381	838	222	49,647
2017	7,253	5,595	6,454	41,570	9,827	871	235	52,503
2018	7,470	5,766	6,667	44,198	10,303	903	249	55,653
2019	7,693	5,942	6,890	47,053	10,814	929	265	59,061
2020	7,924	6,123	7,120	50,113	11,357	953	281	62,705
2021	8,160	6,311	7,350	53,304	11,919	980	298	66,500
2022	8,404	6,504	7,595	56,707	12,511	1,001	316	70,535
2023	8,655	6,704	7,845	60,294	13,130	1,021	335	74,780
2024	8,914	6,911	8,104	64,027	13,770	1,039	355	79,190
2025	9,180	7,123	8,373	67,962	14,439	1,049	376	83,825
2026	9,454	7,343	8,650	72,066	15,132	1,047	397	88,642
2027	9,736	7,570	8,926	76,247	15,833	1,039	419	93,538
2028	10,026	7,804	9,233	80,645	16,562	1,019	442	98,668
2029	10,326	8,046	9,551	85,105	17,297	995	465	103,863
2030	10,633	8,298	9,879	89,513	18,020	976	488	108,998
2035	12,308	9,690	11,601	110,007	21,287	996	595	132,886
2040	14,261	11,300	13,654	131,332	24,414	1,078	706	157,530
2045	16,538	13,150	16,080	155,546	27,624	1,175	830	185,176
2050	19,178	15,299	18,947	183,794	31,003	1,265	972	217,034
2055	22,235	17,791	22,311	217,704	34,625	1,390	1,142	254,861
2060	25,773	20,671	26,298	259,899	38,846	1,390	1,351	301,485
2065	29,860	24,049	30,958	305,303	43,279	1,479	1,575	351,636
2070	34,614	27,966	36,506	359,234	48,352	1,622	1,841	411,050
2075	40,135	32,503	43,016	424,571	54,233	1,776	2,163	482,742

Table 9 Expenditures as Percentage of GDP (Historical)

Year	Gross Domestic Product	Expenditures as % of Gross Domestic Product				
	(\$ billion)	OAS	GIS	A	Expenses	Total
		(%)	(%)	(%)	(%)	(%)
1961	41	1.46	-	-	0.01	1.47
1962	45	1.61	-	-	0.01	1.62
1963	48	1.61	-	-	0.01	1.62
1964	53	1.67	-	-	0.01	1.68
1965	58	1.58	-	-	0.01	1.59
1966	65	1.55	-	-	0.01	1.56
1967	70	1.60	0.31	-	0.01	1.92
1968	76	1.65	0.32	-	0.01	1.98
1969	84	1.70	0.31	-	0.01	2.01
1970	90	1.78	0.30	-	0.01	2.10
1971	99	1.69	0.48	-	0.01	2.18
1972	110	1.60	0.63	-	0.01	2.24
1973	129	1.65	0.56	-	0.01	2.22
1974	154	1.63	0.53	-	0.01	2.17
1975	174	1.66	0.52	0.01	0.01	2.19
1976	200	1.62	0.50	0.05	0.01	2.18
1977	221	1.61	0.48	0.05	0.01	2.15
1978	246	1.63	0.47	0.05	0.01	2.16
1979	280	1.62	0.52	0.05	0.01	2.20
1980	315	1.63	0.56	0.05	0.01	2.26
1981	361	1.64	0.60	0.05	0.01	2.31
1982	381	1.79	0.62	0.06	0.01	2.48
1983	412	1.82	0.61	0.06	0.01	2.50
1984	451	1.79	0.62	0.05	0.01	2.48
1985	487	1.79	0.67	0.06	0.01	2.53
1986	514	1.82	0.67	0.09	0.01	2.59
1987	560	1.80	0.64	0.09	0.01	2.53
1988	615	1.75	0.61	0.08	0.01	2.45
1989	659	1.76	0.58	0.07	0.01	2.42
1990	682	1.83	0.58	0.07	0.01	2.49
1991	687	1.97	0.60	0.07	0.01	2.64
1992	702	2.03	0.60	0.06	0.01	2.71
1993	730	2.04	0.60	0.06	0.01	2.71
1994	773	1.99	0.59	0.06	0.01	2.65
1995	812	1.95	0.57	0.05	0.01	2.58
1996	839	1.96	0.55	0.05	0.02	2.57
1997	885	1.91	0.53	0.04	0.01	2.50
1998	916	1.91	0.53	0.04	0.01	2.49
1999	975	1.84	0.50	0.04	0.01	2.39
2000	1,056	1.77	0.48	0.04	0.01	2.29

Table 10 Expenditures as Percentage of GDP (Projected)

Year	Gross Domestic	Expenditures as % of Gross Domestic Product				
	Product	OAS	GIS	A	Expenses	Total
	(\$ billion)	(%)	(%)	(%)	(%)	(%)
2001	1,081	1.80	0.49	0.04	0.01	2.34
2002	1,101	1.83	0.50	0.04	0.01	2.38
2003	1,136	1.84	0.50	0.04	0.01	2.38
2004	1,175	1.84	0.50	0.04	0.01	2.39
2005	1,216	1.84	0.50	0.04	0.01	2.39
2006	1,263	1.84	0.49	0.04	0.01	2.38
2007	1,313	1.84	0.49	0.04	0.01	2.38
2008	1,364	1.85	0.49	0.05	0.01	2.39
2009	1,420	1.86	0.49	0.05	0.01	2.40
2010	1,481	1.87	0.48	0.05	0.01	2.41
2011	1,545	1.88	0.48	0.05	0.01	2.42
2012	1,613	1.92	0.48	0.05	0.01	2.46
2013	1,685	1.95	0.48	0.04	0.01	2.49
2014	1,762	1.98	0.49	0.04	0.01	2.52
2015	1,840	2.01	0.49	0.04	0.01	2.55
2016	1,923	2.04	0.49	0.04	0.01	2.58
2017	2,006	2.07	0.49	0.04	0.01	2.62
2018	2,093	2.11	0.49	0.04	0.01	2.66
2019	2,181	2.16	0.50	0.04	0.01	2.71
2020	2,273	2.20	0.50	0.04	0.01	2.76
2021	2,369	2.25	0.50	0.04	0.01	2.81
2022	2,468	2.30	0.51	0.04	0.01	2.86
2023	2,572	2.34	0.51	0.04	0.01	2.91
2024	2,680	2.39	0.51	0.04	0.01	2.95
2025	2,793	2.43	0.52	0.04	0.01	3.00
2026	2,912	2.47	0.52	0.04	0.01	3.04
2027	3,038	2.51	0.52	0.03	0.01	3.08
2028	3,169	2.55	0.52	0.03	0.01	3.11
2029	3,306	2.57	0.52	0.03	0.01	3.14
2030	3,450	2.59	0.52	0.03	0.01	3.16
2035	4,261	2.58	0.50	0.02	0.01	3.12
2040	5,273	2.49	0.46	0.02	0.01	2.99
2045	6,507	2.39	0.42	0.02	0.01	2.85
2050	8,009	2.29	0.39	0.02	0.01	2.71
2055	9,853	2.21	0.35	0.01	0.01	2.59
2060	12,150	2.14	0.32	0.01	0.01	2.48
2065	15,043	2.03	0.29	0.01	0.01	2.34
2070	18,619	1.93	0.26	0.01	0.01	2.21
2075	23,004	1.85	0.24	0.01	0.01	2.10

Table 11 Expenditures as Percentage of CPP/QPP Contributory Earnings (Historical)

Year	CPP/QPP Contributory Earnings (\$ billion)	Expenditures as % of CPP/QPP Contributory Earnings				
		OAS	GIS	A	Expenses	Total
		(%)	(%)	(%)	(%)	(%)
1961	-	-	-	-	-	-
1962	-	-	-	-	-	-
1963	-	-	-	-	-	-
1964	-	-	-	-	-	-
1965	-	-	-	-	-	-
1966	20	5.05	-	-	0.03	5.07
1967	23	4.87	0.94	-	0.03	5.84
1968	25	5.03	0.97	-	0.03	6.03
1969	27	5.29	0.96	-	0.03	6.29
1970	28	5.69	0.97	-	0.03	6.69
1971	30	5.57	1.57	-	0.04	7.18
1972	32	5.49	2.17	-	0.03	7.70
1973	35	6.09	2.07	-	0.02	8.19
1974	44	5.72	1.86	-	0.02	7.60
1975	52	5.53	1.72	0.02	0.02	7.30
1976	60	5.44	1.68	0.16	0.03	7.31
1977	67	5.33	1.58	0.17	0.03	7.11
1978	74	5.39	1.55	0.16	0.03	7.15
1979	85	5.34	1.73	0.16	0.03	7.26
1980	95	5.40	1.86	0.18	0.04	7.47
1981	110	5.40	1.99	0.18	0.04	7.60
1982	129	5.27	1.84	0.17	0.03	7.31
1983	126	5.95	1.99	0.18	0.04	8.17
1984	148	5.47	1.89	0.17	0.04	7.57
1985	148	5.86	2.21	0.20	0.04	8.31
1986	171	5.48	2.00	0.27	0.03	7.79
1987	184	5.46	1.94	0.26	0.03	7.70
1988	198	5.44	1.88	0.24	0.03	7.60
1989	207	5.59	1.86	0.22	0.03	7.70
1990	229	5.44	1.72	0.20	0.03	7.39
1991	233	5.81	1.76	0.19	0.03	7.79
1992	237	6.03	1.78	0.18	0.03	8.04
1993	236	6.29	1.86	0.18	0.04	8.37
1994	239	6.44	1.92	0.18	0.03	8.57
1995	259	6.12	1.78	0.16	0.04	8.10
1996	249	6.59	1.86	0.16	0.05	8.66
1997	262	6.46	1.80	0.15	0.03	8.44
1998	287	6.08	1.67	0.13	0.04	7.93
1999	296	6.05	1.65	0.13	0.04	7.87
2000	325	5.75	1.55	0.12	0.03	7.45

Table 12 Expenditures as Percentage of CPP/QPP Contributory Earnings (Projected)

Year	CPP/QPP Contributory Earnings (\$ billion)	Expenditures as % of CPP/QPP Contributory Earnings				
		OAS	GIS	A	Expenses	Total
		(%)	(%)	(%)	(%)	(%)
2001	331	5.88	1.58	0.12	0.03	7.62
2002	337	5.98	1.62	0.13	0.03	7.76
2003	347	6.02	1.63	0.13	0.03	7.81
2004	358	6.04	1.63	0.13	0.04	7.84
2005	369	6.06	1.63	0.14	0.04	7.87
2006	384	6.05	1.62	0.14	0.04	7.84
2007	400	6.04	1.61	0.15	0.04	7.83
2008	417	6.05	1.60	0.15	0.04	7.83
2009	435	6.08	1.59	0.15	0.04	7.85
2010	454	6.09	1.57	0.15	0.04	7.85
2011	475	6.12	1.56	0.15	0.04	7.87
2012	498	6.21	1.56	0.15	0.04	7.96
2013	522	6.29	1.56	0.14	0.04	8.03
2014	548	6.36	1.56	0.14	0.04	8.10
2015	575	6.43	1.56	0.14	0.04	8.17
2016	603	6.50	1.56	0.14	0.04	8.24
2017	632	6.58	1.56	0.14	0.04	8.31
2018	661	6.68	1.56	0.14	0.04	8.42
2019	692	6.80	1.56	0.13	0.04	8.53
2020	724	6.92	1.57	0.13	0.04	8.66
2021	756	7.05	1.58	0.13	0.04	8.79
2022	790	7.17	1.58	0.13	0.04	8.92
2023	826	7.30	1.59	0.12	0.04	9.05
2024	863	7.42	1.60	0.12	0.04	9.18
2025	902	7.54	1.60	0.12	0.04	9.30
2026	942	7.65	1.61	0.11	0.04	9.41
2027	986	7.74	1.61	0.11	0.04	9.49
2028	1,030	7.83	1.61	0.10	0.04	9.58
2029	1,077	7.90	1.61	0.09	0.04	9.64
2030	1,127	7.95	1.60	0.09	0.04	9.67
2035	1,406	7.82	1.51	0.07	0.04	9.45
2040	1,755	7.48	1.39	0.06	0.04	8.98
2045	2,180	7.13	1.27	0.05	0.04	8.49
2050	2,698	6.81	1.15	0.05	0.04	8.04
2055	3,335	6.53	1.04	0.04	0.03	7.64
2060	4,128	6.30	0.94	0.03	0.03	7.30
2065	5,126	5.96	0.84	0.03	0.03	6.86
2070	6,360	5.65	0.76	0.03	0.03	6.46
2075	7,873	5.39	0.69	0.02	0.03	6.13

Table 13 Expenditures as Percentage of Total Employment Earnings (Historical)

Year	Total Employment Earnings (\$ billion)	Expenditures as % of Total Employment Earnings				
		OAS	GIS	A	Expenses	Total
		(%)	(%)	(%)	(%)	(%)
1961	20	2.99	-	-	0.01	3.01
1962	22	3.33	-	-	0.01	3.34
1963	23	3.35	-	-	0.01	3.37
1964	25	3.49	-	-	0.01	3.50
1965	28	3.27	-	-	0.01	3.28
1966	31	3.21	-	-	0.02	3.22
1967	35	3.22	0.62	-	0.02	3.86
1968	38	3.34	0.64	-	0.02	4.00
1969	42	3.38	0.61	-	0.02	4.01
1970	46	3.53	0.60	-	0.02	4.15
1971	50	3.33	0.94	-	0.02	4.30
1972	56	3.14	1.24	-	0.02	4.40
1973	65	3.30	1.12	-	0.01	4.44
1974	77	3.29	1.07	-	0.01	4.37
1975	89	3.24	1.01	0.01	0.01	4.27
1976	102	3.17	0.98	0.09	0.02	4.26
1977	113	3.15	0.93	0.10	0.02	4.20
1978	123	3.27	0.94	0.10	0.02	4.33
1979	138	3.29	1.06	0.10	0.02	4.47
1980	156	3.29	1.13	0.11	0.02	4.55
1981	180	3.29	1.21	0.11	0.02	4.64
1982	192	3.55	1.24	0.11	0.02	4.93
1983	200	3.75	1.25	0.12	0.03	5.15
1984	215	3.75	1.30	0.11	0.03	5.19
1985	232	3.75	1.41	0.13	0.03	5.32
1986	247	3.78	1.38	0.19	0.02	5.37
1987	269	3.75	1.33	0.18	0.02	5.28
1988	295	3.65	1.26	0.16	0.02	5.10
1989	319	3.63	1.21	0.15	0.02	5.01
1990	333	3.74	1.19	0.14	0.02	5.09
1991	339	4.00	1.21	0.13	0.02	5.36
1992	343	4.17	1.23	0.13	0.02	5.55
1993	347	4.28	1.27	0.12	0.03	5.70
1994	356	4.33	1.29	0.12	0.02	5.76
1995	366	4.32	1.26	0.11	0.03	5.72
1996	376	4.37	1.23	0.11	0.04	5.75
1997	398	4.26	1.18	0.10	0.02	5.56
1998	419	4.17	1.15	0.09	0.03	5.43
1999	445	4.02	1.10	0.09	0.02	5.23
2000	476	3.92	1.05	0.08	0.02	5.08

Table 14 Expenditures as Percentage of Total Employment Earnings (Projected)

Year	Total Employment	Expenditures as % of Total Employment Earnings				
	Earnings (\$ billion)	OAS (%)	GIS (%)	A (%)	Expenses (%)	Total (%)
2001	488	4.00	1.08	0.08	0.02	5.18
2002	497	4.06	1.10	0.09	0.02	5.27
2003	513	4.07	1.10	0.09	0.02	5.28
2004	532	4.06	1.10	0.09	0.02	5.27
2005	550	4.07	1.09	0.09	0.02	5.28
2006	572	4.06	1.09	0.09	0.02	5.27
2007	594	4.07	1.08	0.10	0.02	5.27
2008	617	4.09	1.08	0.10	0.02	5.29
2009	642	4.11	1.07	0.10	0.02	5.31
2010	670	4.13	1.07	0.10	0.02	5.32
2011	699	4.16	1.06	0.10	0.02	5.35
2012	730	4.24	1.07	0.10	0.02	5.43
2013	762	4.31	1.07	0.10	0.02	5.50
2014	797	4.37	1.07	0.10	0.02	5.57
2015	833	4.44	1.08	0.10	0.03	5.64
2016	870	4.51	1.08	0.10	0.03	5.71
2017	908	4.58	1.08	0.10	0.03	5.78
2018	947	4.67	1.09	0.10	0.03	5.88
2019	987	4.77	1.10	0.09	0.03	5.98
2020	1,029	4.87	1.10	0.09	0.03	6.10
2021	1,072	4.97	1.11	0.09	0.03	6.20
2022	1,117	5.08	1.12	0.09	0.03	6.31
2023	1,164	5.18	1.13	0.09	0.03	6.43
2024	1,213	5.28	1.14	0.09	0.03	6.53
2025	1,264	5.38	1.14	0.08	0.03	6.63
2026	1,318	5.47	1.15	0.08	0.03	6.73
2027	1,375	5.55	1.15	0.08	0.03	6.81
2028	1,434	5.62	1.16	0.07	0.03	6.88
2029	1,496	5.69	1.16	0.07	0.03	6.94
2030	1,561	5.73	1.15	0.06	0.03	6.98
2035	1,928	5.71	1.10	0.05	0.03	6.89
2040	2,386	5.50	1.02	0.05	0.03	6.60
2045	2,945	5.28	0.94	0.04	0.03	6.29
2050	3,624	5.07	0.86	0.03	0.03	5.99
2055	4,459	4.88	0.78	0.03	0.03	5.72
2060	5,498	4.73	0.71	0.03	0.02	5.48
2065	6,807	4.49	0.64	0.02	0.02	5.17
2070	8,425	4.26	0.57	0.02	0.02	4.88
2075	10,409	4.08	0.52	0.02	0.02	4.64

V. Conclusion

The retirement of the baby boomers over the next 30 years will increase the expenditures of the program. For this reason, total annual expenditures expressed as a percentage of gross domestic product (GDP) are expected to grow from 2.3% in 2001 to a high of 3.2% in 2030. As each successive cohort of new retirees is assumed to be wealthier than the preceding one, recipient rates for benefits will continue to decrease over the projection period. This drives the cost of the program down, with the result that annual expenditures are expected to fall to 2.1% of GDP by 2075.

A more pessimistic demographic outlook, based on the continuing downward trend in fertility rates, and a better economic outlook, especially regarding labour force participation rates, are the main forces underlying the results of this report when compared to the previous report.

The projected financial status presented in this report is based on the assumed demographic and economic outlook over the long term. Therefore it remains important to review the program's long-term financial status on a regular basis by making periodic actuarial reports. For this purpose, as required by the *Public Pensions Reporting Act*, the next such review will be as at 31 December 2003.

VI. Actuarial Opinion

In our opinion, considering that this report was prepared pursuant to the *Public Pensions Reporting Act*:

- the methodology employed is appropriate and consistent with sound actuarial principles;
- the data on which this report is based are sufficient and reliable; and
- the assumptions used are, in aggregate, reasonable and appropriate.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice.



Michel Montambeault, F.S.A., F.C.I.A.
Senior Actuary



Jean-Claude Ménard, F.S.A., F.C.I.A.
Chief Actuary

Appendix A – Summary of Plan Provisions

I. Introduction

The *Old Age Security Act* came into force in December 1951. Since that time it has been amended several times, the most recent occasion as a result of Bill C-23 (the *Modernization of Benefits and Obligations Act*), which received Royal Assent on 29 June 2000. Effective 1 January 2001 this Act extends benefits and obligations to same-sex couples who have been cohabiting in a conjugal relationship for at least one year.

Benefits provided under the *Old Age Security Act* include the basic pension, the Guaranteed Income Supplement (GIS), and the Allowance, which started being paid in 1952, 1967, and 1975, respectively.

II. Financing

All benefits provided under the *Old Age Security Act* are currently financed from federal general tax revenues.

III. Basic Pension

The basic pension is a monthly benefit available, on application, to anyone age 65 or over who meets the residence requirements specified in the *Old Age Security Act*.

A. Eligibility Conditions

To qualify for a basic pension, a person must be 65 years of age or over, and

- must be a Canadian citizen or a legal resident of Canada on the day preceding the approval of his or her application; or
- if the person no longer lives in Canada, must have been a Canadian citizen or a legal resident of Canada on the day preceding the day he or she stopped living in Canada.

A minimum of 10 years of residence in Canada after reaching age 18 is required to receive a basic pension in Canada. To receive the pension outside the country, a person must have lived in Canada for a minimum of 20 years after reaching age 18. An international social security agreement may assist a person to meet the 10- and 20-year requirements.

B. Amount of Benefits

The amount of a person's pension is determined by how long he or she has lived in Canada, according to the following rules:

- A person who has lived in Canada, after reaching age 18, for periods that total at least 40 years may qualify for a full OAS pension.
- A person who has not lived in Canada for 40 years after reaching age 18 may still qualify for a full pension if, on 1 July 1977, he or she was 25 years of age or over, and
 - lived in Canada on that date, or
 - had lived in Canada before that date and after reaching age 18, or
 - possessed a valid immigration visa on that date.

In such cases, the individual must have lived in Canada for the 10 years immediately prior to approval of the application for the pension. Absences during this 10-year period may be offset if, after reaching age 18, the applicant was present in Canada before those 10 years for a total period that was at least three times the length of absence. In this instance, however, the applicant must also have lived in Canada for at least one year immediately prior to the date of the approval of the application. For example, an absence of two years between the ages of 60 and 62 could be offset by six years of presence in Canada after age 18 and before reaching age 55.

- A person who cannot meet the requirements for the full OAS pension may qualify for a partial pension. A partial pension is earned at the rate of $1/40^{\text{th}}$ of the full monthly pension for each complete year of residence in Canada after reaching age 18. Once a partial pension has been approved, it may not be increased as a result of additional years of residence in Canada.

The maximum monthly pension was \$442.66 during the fourth quarter of 2001. This rate is adjusted quarterly, as described in section VI below. The amount of pension paid to persons with high incomes is reduced through a provision of the *Income Tax Act*. For 2001, the reduction applies to persons whose total income exceeds \$55,309. Since 2000, this income threshold is indexed upward in accordance with increases in the Consumer Price Index; previously it was indexed at CPI less 3%. For every dollar of income above this limit, the amount of basic pension is reduced by 15 cents. The full pension is thus eliminated when a pensioner's net income is \$90,195 or above in 2001.

IV. Guaranteed Income Supplement

The GIS is a monthly benefit paid to residents of Canada who receive a basic pension (either the full amount or a partial amount) and who have little or no other income.

Payment of the GIS may begin in the same month as payment of the basic pension. The amount of the benefit varies according to income (see below). Since 1999, most of those receiving GIS can continue to do so by filing their income tax returns, rather than making a new application each year. The amount of monthly payments may increase or decrease according to reported changes in a person's yearly income. Unlike the basic pension, GIS is not subject to income tax. GIS is not payable outside Canada beyond a period of six months following the month of departure from Canada, regardless of how long the person previously lived in Canada.

A. Eligibility Conditions

To receive the GIS, a person must be receiving a basic pension. The yearly income of the person (or, the combined income of the person and his or her spouse or common-law partner) cannot exceed certain limits.

Persons admitted to Canada as sponsored immigrants after 6 March 1996 and persons qualifying for benefits from 2001 onward are not eligible, generally speaking, to receive the GIS for the duration of the sponsorship, up to a maximum of ten years. Exceptions are made, however, if an immigrant's sponsor dies, is incarcerated for a period of more than six months, is convicted of a criminal offence relating to the sponsored individual, or undergoes personal bankruptcy.

B. Amount of Benefits

The amount of the GIS to which a person is entitled depends on his or her length of residence in Canada, marital status and income. If the person is married or living in a common-law relationship, the combined income of the person and his or her spouse or common-law partner is taken into account in determining the amount of the GIS.

To be entitled to a full benefit, persons admitted to Canada after 6 March 1996 and persons qualifying for benefits from 2001 onward must have resided in Canada for at least 10 years after reaching age 18. If a person to whom either of these conditions applies has less than 10 years of residence, a partial benefit is payable provided, as noted in the previous section, that the person is not a sponsored immigrant who is still in the period of sponsorship. The partial benefit is calculated at the rate of $1/10^{\text{th}}$ of the amount of the full benefit for each complete year of residence in Canada after age 18. The proportion payable is recalculated each year, taking into account additional residence in Canada during the previous year, building gradually to a full benefit after 10 years. The 10-year requirement for entitlement to a full benefit does not apply to

persons who qualify for benefits before the year 2001 and who were permanent residents of Canada on or before 6 March 1996.

Income for purposes of the GIS is defined in the same way as for purposes of federal income tax, with a few specific exceptions – the most important of which is income from the basic pension. In general, income includes any other money which a person receives, such as a retirement pension from the Canada or Québec Pension Plan or a private (occupational) pension plan, a foreign pension, interest, dividends, rents or wages.

Generally speaking, income received in the previous calendar year is used to calculate the amount of benefits paid in a fiscal year (i.e. a 12-month period ending on 31 March). However, if an individual or spouse or common-law partner has retired or has suffered a loss of income, an estimate of income for the current calendar year may be substituted for the income of the preceding calendar year.

These are two basic rates of payment for a maximum GIS. The first applies to single individuals – including widowed, divorced or separated persons as well as individuals who have never married – and to persons whose spouse or common-law partner receives neither the basic pension nor the Allowance. The second rate applies both to legally married couples and couples living in common-law relationships, where both spouses receive the basic pension. The single rate is higher than the married rate. However, each spouse in a couple or common-law partner relationship is entitled to his or her own benefit, so the combined benefits for a couple are higher than those for a single person.

The maximum monthly GIS amounts were \$526.08 for single persons and \$342.67 for persons who are married or living in a common-law partnership, respectively, during the fourth quarter of 2001. These rates are adjusted quarterly, as described in section VI below. If a person is receiving a partial basic pension, the maximum GIS is increased by the difference between that partial pension and the full basic pension.

For a single, widowed, divorced or separated person, the maximum monthly GIS is reduced by 50 cents for every dollar of other monthly income. The maximum allowable income before GIS stops being paid is \$12,648 in the fourth quarter of 2001.

If both spouses or common-law partners are receiving the basic pension, the maximum monthly GIS of each person is reduced by 25 cents for every dollar of other combined monthly income. In the fourth quarter of 2001, the maximum allowable income before GIS stops being paid is \$30,624 if the spouse or common-law partner is a non-pensioner or a Allowance recipient and \$16,464 if the spouse or common-law partner is a pensioner.

A special provision applies in the case of a couple in which only one spouse or common-law partner is a pensioner and the other is not eligible for either the basic pension or the Allowance. In this instance, the pensioner can receive the GIS at the higher rate paid to

those who are single. Moreover, the maximum monthly GIS is reduced by 25 cents for every dollar of the couple's combined monthly income (excluding, as usual, the pensioner's basic pension), and the first reduction is made only when the combined yearly income of the couple reaches 12 times the basic monthly pension plus \$48.

V. Allowance

The Allowance is a monthly benefit designed to recognize the difficult circumstances faced by couples living on the pension of only one spouse or common-law partner as well as by many widowed persons. An application must be made each year. Benefits are not considered as income for income tax purposes. The Allowance is not payable outside Canada beyond a period of six months following the month of departure from Canada, regardless of how long the person previously lived in Canada.

A. Eligibility Conditions

The Allowance may be paid to a basic pensioner's spouse or common-law partner, or to a widow or widower, who is between the ages of 60 and 64 and who has lived in Canada for at least 10 years after reaching age 18. An applicant must also be a Canadian citizen or a legal resident of Canada on the day preceding the approval of the application. To qualify for a benefit, the combined yearly income of the applicant and the spouse or common-law partner, or the annual income of the widow or widower, cannot exceed certain limits. For a couple, the basic pension and GIS benefits are not included in their combined yearly income.

The Allowance stops being paid when the person becomes eligible for a basic pension at age 65, leaves Canada for more than six months, or dies. For a couple, the Allowance stops being paid if the older spouse or common-law partner ceases to be eligible for the GIS or if the spouses separate or divorce or dissolve their common-law partnership. In addition, in the case of widows and widowers, the Allowance ceases if the person remarries. Sponsored immigrants are subject to the same conditions regarding eligibility as are described in the preceding section concerning the GIS.

B. Amount of Benefits

The Allowance is an income-tested benefit. Like the GIS, if the person is married or living in a common-law relationship, the combined income of the person and his or her spouse or common-law partner is taken into account in determining the amount of the Allowance. In addition, to be entitled to the full Allowance, persons admitted to Canada after 6 March 1996 and persons qualifying for benefits from 2001 onward must have resided in Canada for at least 10 years after reaching age 18. If a person to whom either of these conditions applies has less than 10 years of residence, a partial Allowance is payable, calculated at the rate of $1/10^{\text{th}}$ of the amount of the full Allowance for each complete year of residence in Canada after age 18. The proportion payable is recalculated each year, taking into account additional residence in Canada during the

previous year, building gradually to a full Allowance after 10 years. The 10-year requirement for entitlement to a full Allowance does not apply to persons who qualify for benefits before the year 2001 and who were permanent residents of Canada on or before 6 March 1996.

The maximum amount payable to the spouse of a pensioner is equal to the combination of a full basic pension and the maximum GIS at the married rate. The maximum amount payable to a widowed person is somewhat higher. During the fourth quarter of 2001, the maximum monthly Allowance amounts were \$785.33 and \$867.02 for the spouse or common-law partner of a pensioner and a widowed person, respectively. These rates are adjusted quarterly, as described in section VI below.

The maximum monthly Allowance is reduced by 75 cents for every dollar of the person's monthly income (or the couple's combined monthly income) until the OAS-equivalent is reduced to zero. Then, for a couple, both the GIS-equivalent portion of the Allowance and the pensioner's GIS are reduced by 25 cents for every additional dollar of the couple's combined monthly income, i.e. in this case no Allowance becomes payable if income is over \$23,568 in the fourth quarter of 2001. For a widow or widower, the GIS-equivalent portion is reduced by 50 cents for every additional dollar of monthly income, i.e. in this case no Allowance becomes payable if income is over \$17,304 in the fourth quarter of 2001.

VI. Inflation Adjustments

All maximum benefit amounts under the *Old Age Security Act* are adjusted at the beginning of each calendar quarter in line with changes in the Consumer Price Index (CPI). However, maximum benefit amounts are not allowed to decrease.

Appendix B – Assumptions and Methods

I. Introduction

This section describes the assumptions and methods underlying the financial projections in Section IV of the report. The future cash flows and cost ratios are over a long period of time, i.e. 2001 to 2075, and depend on assumptions such as fertility, mortality, migration, labour force, unemployment rate and inflation. These assumptions form the basis for the projections of future expenditures and cost measurement bases.

Although the economic and demographic assumptions have been developed using the best available information, the resulting estimates should be interpreted with caution. These estimates are not intended to be predictions of the future financial status of the program but, rather, to be indicators of the expected trend under certain economic and demographic conditions. To the extent applicable, these assumptions are consistent with the best-estimate assumptions used in the Eighteenth Canada Pension Plan Actuarial Report as at 31 December 2000.

II. Demographic Projections

Both the historical and projected population of Canada is required for the calculation of future benefits. The population of Canada as at 1 July 2000 is used as a starting point. The population is then projected by age and sex from one year to the next by adding births and net migrants and subtracting deaths. By applying the fertility, mortality and migration assumptions to the starting population, the annual numbers of births, deaths and net migrants were developed.

A. Initial Population as at 1 July 2000

The starting point for the demographic projections is the most recent Statistics Canada population estimates as at 1 July 2000 for Canada, by age and sex. The estimates are based on the 1996 census and are adjusted for the census undercount.

B. Fertility Rates

The fertility rate for a given age and calendar year is the average number of live births per female of that age during that year. The total fertility rate for a calendar year is the average number of children that would be born to a woman in her lifetime if she experienced the age-specific fertility rates observed in, or assumed for, that year.

The total fertility rate for Canada has declined significantly over the last 50 years, from a high of about 4.0 in the late 1950s to a low of about 1.55 in the late 1990s. The total fertility rate increased briefly over the early 1990s to reach a level of about 1.70. For most of the 1990s the total fertility rate has been quite stable but a new downward trend has been observed recently. Currently the total fertility rate stands at about 1.55. These

variations in the total fertility rate have resulted from changes in many factors, including social attitudes, economic conditions and changing attitudes to contraception.

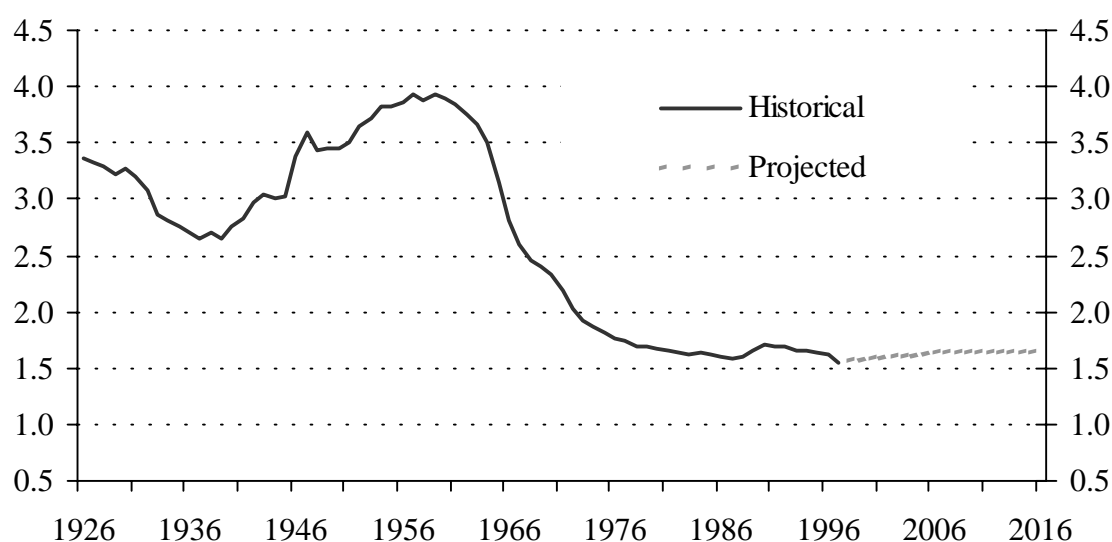
In this report, it was assumed that the total fertility rate from 2007 onward would be 1.64. This assumed ultimate rate reflects historical trends in fertility by age group over the last 10 to 15 years. It is slightly higher than the most recently observed rate. A small increase in the total fertility rates is expected over the medium-term horizon because of continued trends in women having their first child at a later age due to increased labour force participation, later marriages and longer stays in the education system. There are signs that increases in the divorce rate, in the labour force participation rate of women, and in the percentage of never-married women are slowing or even becoming decreases (all factors that have contributed significantly to the drop of the total fertility rate over the last 25 years). Economic conditions are also assumed to improve over the medium term and could help families plan for additional children.

Consequently, the assumed age-specific fertility rates for the next few years were obtained by interpolating between the actual current rates and the assumed ultimate rates. Finally, in accordance with the experience over the last 25 years, the assumed ratio of male to female births was maintained at 1.056. Table 15 and Chart 8 below show the historical and projected age-specific and total fertility rates for Canada.

Table 15 Fertility Rates

Year	Annual Fertility Rate (per 1,000 women)							Total Fertility Rate (per woman)
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
2001	21.3	63.0	100.3	90.6	35.9	6.0	0.2	1.59
2002	21.6	62.7	99.4	92.2	36.7	6.3	0.3	1.60
2003	21.9	62.4	98.5	93.8	37.5	6.5	0.3	1.60
2004	22.2	62.2	97.7	95.3	38.4	6.7	0.3	1.61
2005	22.4	61.9	96.8	96.9	39.2	6.9	0.3	1.62
2006	22.7	61.7	96.0	98.4	40.1	7.1	0.3	1.63
2007	23.0	61.4	95.1	100.0	40.9	7.3	0.3	1.64
2008	23.0	61.4	95.1	100.0	40.9	7.3	0.3	1.64
2009	23.0	61.4	95.1	100.0	40.9	7.3	0.3	1.64
2010+	23.0	61.4	95.1	100.0	40.9	7.3	0.3	1.64

Chart 8 Total Fertility Rate



C. Mortality

The starting point for mortality rate projections in this report is the mortality rates from the Statistics Canada publication “Life Tables, Canada and Provinces, 1990-1992”. According to these tables, life expectancies at birth for males and females in Canada were 74.6 and 80.9 years, respectively. The 1995-1997 Life Tables were not yet available for this report.

To reflect anticipated sustained improvements in life expectancy, the 1990-1992 mortality rates were projected to 1996 using the actual improvements in mortality experienced since 1991. This approach produced life expectancies at birth and at age 65 of 75.5 and 16.1 years for males and 81.2 and 20.0 years for females, respectively, which compared reasonably well with figures published by Statistics Canada for 1996. Mortality rates thus obtained for 1996 were then further projected to the end of the projection period using the following annual rates of mortality improvement. For 1997 to 2020, the annual rates of mortality improvement, varying by age, sex and calendar year, were obtained by linear interpolation between:

- the average improvement rates experienced in Canada between 1987 and 1996, and
- the fixed improvement rates described below in respect of the period 2021 and thereafter.

For 2021 and subsequent years, the assumed rates of improvement vary by age and sex only and not by calendar year. These ultimate rates were derived from an analysis of the Canadian and U.S. experience over the last century and are generally consistent with the

Alternative II assumption used in the 2000 Social Security Administration Old-Age and Survivors Insurance and Disability Insurance Trust Fund trustees report.

Table 16 Mortality Rates
(annual deaths per 1,000 people)

Age	Males				Females			
	2001	2025	2050	2075	2001	2025	2050	2075
0	5.17	3.14	2.23	1.59	4.23	2.77	2.02	1.48
10	0.10	0.06	0.05	0.04	0.09	0.07	0.06	0.05
20	0.82	0.59	0.50	0.43	0.31	0.25	0.22	0.19
30	1.14	0.97	0.82	0.70	0.45	0.38	0.34	0.30
40	1.85	1.60	1.36	1.16	0.97	0.83	0.73	0.64
50	3.68	2.79	2.40	2.07	2.41	1.97	1.74	1.53
60	9.95	7.40	6.36	5.47	6.03	5.03	4.44	3.92
65	16.71	12.67	10.90	9.38	9.46	7.90	6.97	6.15
70	28.38	22.41	19.28	16.58	15.51	13.22	11.66	10.29
75	44.07	36.22	31.16	26.81	25.97	22.58	19.92	17.57
80	75.58	65.16	56.77	49.46	46.60	41.32	36.45	32.16
85	123.12	110.46	96.23	83.84	81.90	75.56	66.66	58.81

The projected mortality rates in Table 16 indicate a narrowing of the gap between male and female life expectancies over the long term. This trend has been observed over the last 20 to 25 years in Canada. The yearly increase in life expectancies in the early years of the projection reflects the significant increase observed over the last 25 years. Thereafter, there is a projected slowdown in the increase in life expectancies consistent with the low rate of improvement in mortality assumed for years 2021 and thereafter.

For 2001 to 2075, life expectancy at birth is projected to grow from 76.4 to 82.0 years for males and from 81.7 to 85.8 years for females. Table 17 shows the resulting Canadian life expectancies at various ages for specified calendar years, assuming that the mortality rates of each such year will remain unchanged thereafter (i.e. without subsequent improvements). Table 18 is similar to Table 17, the only difference being that it takes into account the assumed mortality improvements after the specified calendar year (i.e. with subsequent improvements). Given the continuing trend to greater longevity, Table 18 is considered to be more realistic than Table 17.

Table 17 Life Expectancies (Without Improvements)¹

Age	Males				Females			
	2001	2025	2050	2075	2001	2025	2050	2075
0	76.4	78.8	80.4	82.0	81.7	83.2	84.5	85.8
10	66.9	69.1	70.7	72.2	72.1	73.5	74.7	76.0
20	57.1	59.3	60.8	62.3	62.3	63.6	64.8	66.0
30	47.6	49.7	51.1	52.6	52.4	53.8	55.0	56.2
40	38.2	40.2	41.6	43.0	42.7	44.0	45.2	46.4
50	29.0	30.9	32.3	33.6	33.3	34.5	35.7	36.8
60	20.4	22.1	23.3	24.5	24.4	25.4	26.5	27.5
65	16.5	18.0	19.1	20.3	20.2	21.1	22.1	23.1
70	13.0	14.2	15.3	16.3	16.2	17.1	18.0	18.9
75	10.0	10.9	11.8	12.8	12.6	13.3	14.1	15.0
80	7.4	8.1	8.8	9.7	9.4	9.9	10.7	11.4
85	5.4	5.8	6.5	7.2	6.8	7.2	7.8	8.4

¹ Based on the projected mortality rates for the given calendar year.

Table 18 Life Expectancies (With Improvements)²

Age	Males				Females			
	2001	2025	2050	2075	2001	2025	2050	2075
0	81.4	83.2	84.9	86.5	85.5	86.9	88.3	89.5
10	71.2	72.9	74.5	76.1	75.5	76.7	78.0	79.3
20	60.8	62.4	64.0	65.6	65.1	66.3	67.6	68.9
30	50.6	52.1	53.7	55.3	54.8	56.0	57.2	58.5
40	40.6	42.1	43.6	45.1	44.6	45.8	47.0	48.2
50	30.8	32.3	33.7	35.1	34.6	35.8	37.0	38.2
60	21.5	22.9	24.2	25.5	25.2	26.3	27.4	28.5
65	17.3	18.6	19.8	21.0	20.7	21.8	22.8	23.9
70	13.5	14.7	15.7	16.9	16.6	17.5	18.5	19.5
75	10.3	11.2	12.2	13.2	12.8	13.6	14.5	15.4
80	7.5	8.2	9.1	9.9	9.5	10.1	10.9	11.7
85	5.4	5.9	6.6	7.4	6.8	7.3	7.9	8.6

² Cohort life expectancies that take into account subsequent improvements in mortality and therefore differ from the calendar year life expectancies of Table 17.

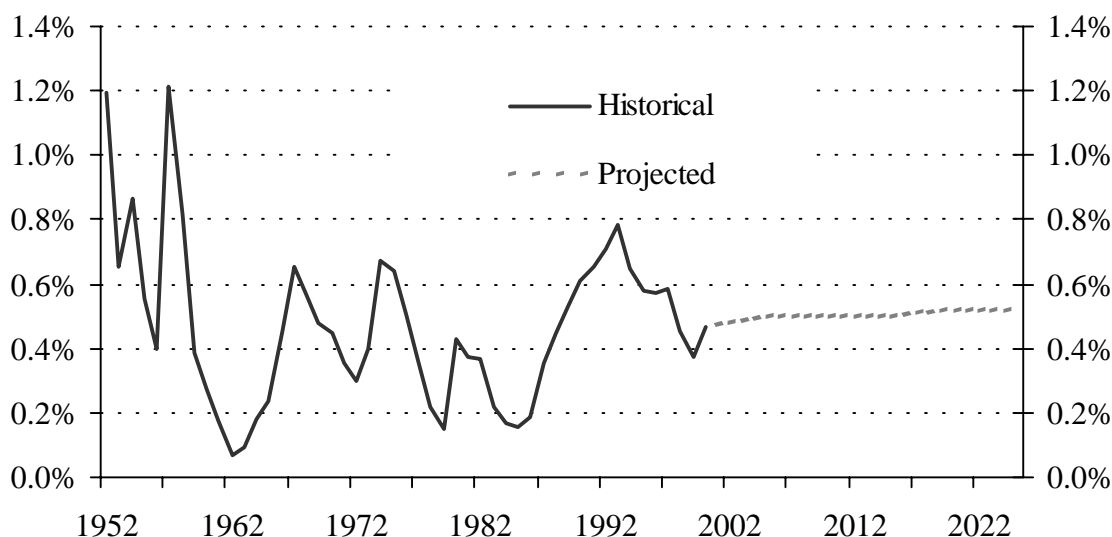
D. Migration

Immigration and emigration are generally recognized to be volatile parameters of future population growth, since they are subject to a variety of demographic, economic, social and political factors. During the period from 1972 to 2000, annual immigration to Canada has varied from 84,000 to 265,000, annual emigration from Canada is estimated to have fluctuated between 40,000 and 83,000, and the annual numbers of returning Canadians have fluctuated between 19,000 and 39,000. Chart 9 below shows the net migration experience of the last half-century.

For purposes of this report, net migration to Canada is assumed to start from its initial level of 143,000 for 2000, which is about 0.47% of the total Canadian population. This initial ratio of 0.47% is then gradually increased until 2005 to a level of 0.50%, which is the average experienced over the last 20 years. For 2005 to 2015, the 0.50% assumption is maintained. From 2015 to 2020, the ratio is gradually increased from 0.50% to 0.52% to take into account the expected labour shortage and is then kept at that level thereafter. The ultimate level of 0.52% is the average of the last 15 years.

The distributions of immigrants, emigrants and returning Canadians by age and sex used for the demographic projections were taken from Statistics Canada data averaged over the period 1996 to 2000.

Chart 9 Net Migration as % of Population



E. Projected Population and its Characteristics

The population of Canada in 2001 is estimated at 31.0 million. Table 19 presents the projected population at 1 July of each year. Chart 10 shows the evolution of the total population for Canada and of those aged 20 to 64 from 1971 up to 2075. Table 20 below shows the variations in the relative size of the various age groups throughout the projection period. The proportion of people aged 65 and over is expected to almost double over the projection period. The number of people aged 65 and over as a proportion of people aged 20 to 64 more than doubles over the same period. This proportion significantly affects the ratio of benefits to GDP.

Over the next 20 years the population is projected to grow at about 0.8% per year. The annual growth slows to about 0.5% between 2020 and 2040 and to 0.3% thereafter. The population is expected to reach 43.3 million by 2075. Table 21 below shows the components of population growth, namely the projected number of births plus net migrants less the expected deaths for each year to 2075. Chart 11 below presents these figures graphically until 2050.

Table 19 Population by Age
(thousands)

Year	0-17	18-69	70+	0-19	20-64	65+	Total
2001	7,084	21,155	2,776	7,914	19,189	3,913	31,015
2002	7,059	21,387	2,835	7,892	19,417	3,971	31,281
2003	7,033	21,627	2,888	7,872	19,642	4,034	31,548
2004	7,011	21,872	2,932	7,852	19,862	4,102	31,816
2005	6,997	22,112	2,977	7,833	20,081	4,172	32,085
2006	6,986	22,345	3,024	7,817	20,286	4,252	32,355
2007	6,966	22,592	3,066	7,809	20,477	4,338	32,624
2008	6,931	22,850	3,112	7,804	20,647	4,441	32,892
2009	6,897	23,100	3,163	7,789	20,822	4,549	33,160
2010	6,867	23,343	3,215	7,758	21,007	4,660	33,425
2015	6,842	24,273	3,612	7,673	21,570	5,485	34,728
2020	7,033	24,633	4,323	7,829	21,718	6,441	35,989
2025	7,161	24,849	5,135	7,983	21,626	7,537	37,145
2030	7,214	24,878	6,037	8,060	21,506	8,563	38,129
2050	7,419	25,809	7,358	8,283	22,568	9,736	40,587
2075	7,816	27,192	8,252	8,739	23,779	10,742	43,260

Chart 10 Population
(millions)

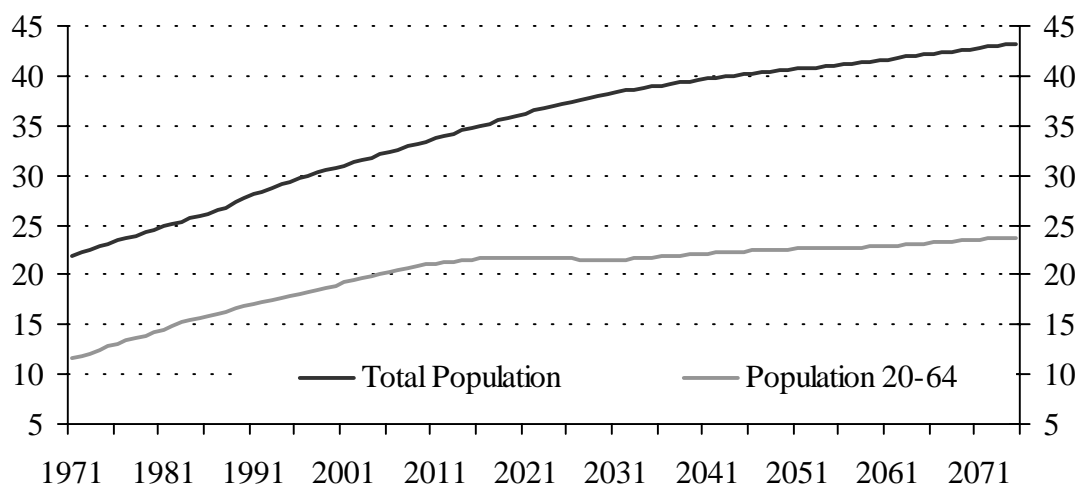


Table 20 Analysis of Population

Year	% of Total Population			% of Total Population			Ages 65 + as % of Ages 20-64
	Ages 0-17	Ages 18-69	Ages 70+	Ages 0-19	Ages 20-64	Ages 65+	
2001	22.8	68.2	9.0	25.5	61.9	12.6	20.4
2002	22.6	68.4	9.1	25.2	62.1	12.7	20.5
2003	22.3	68.6	9.2	25.0	62.3	12.8	20.5
2004	22.0	68.7	9.2	24.7	62.4	12.9	20.7
2005	21.8	68.9	9.3	24.4	62.6	13.0	20.8
2006	21.6	69.1	9.3	24.2	62.7	13.1	21.0
2007	21.4	69.3	9.4	23.9	62.8	13.3	21.2
2008	21.1	69.5	9.5	23.7	62.8	13.5	21.5
2009	20.8	69.7	9.5	23.5	62.8	13.7	21.8
2010	20.5	69.8	9.6	23.2	62.8	13.9	22.2
2015	19.7	69.9	10.4	22.1	62.1	15.8	25.4
2020	19.5	68.4	12.0	21.8	60.3	17.9	29.7
2025	19.3	66.9	13.8	21.5	58.2	20.3	34.8
2030	18.9	65.2	15.8	21.1	56.4	22.5	39.8
2050	18.3	63.6	18.1	20.4	55.6	24.0	43.1
2075	18.1	62.9	19.1	20.2	55.0	24.8	45.2

Chart 11 Components of Population Growth
(thousands)

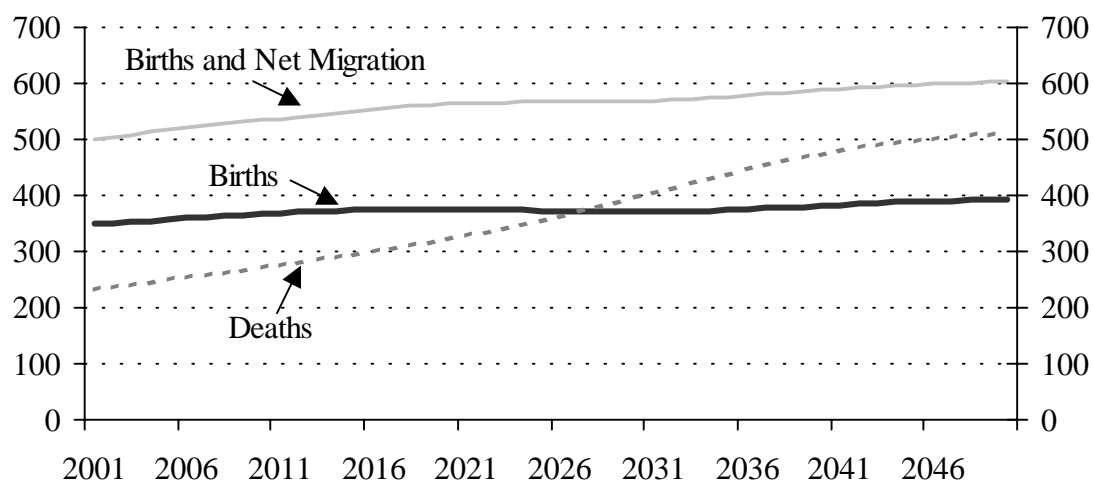


Table 21 Births, Net Migrants and Deaths
(thousands)

Year	Population on 1 July	Births	Net Migrants	Deaths	Increase in Population	Rate of Change in Population		
						20-64 (%)	65+ (%)	Total (%)
2001	31,015	349	149	232	266	1.2	1.5	0.9
2002	31,281	351	152	236	267	1.2	1.6	0.9
2003	31,548	352	156	240	268	1.1	1.7	0.9
2004	31,816	354	159	244	270	1.1	1.7	0.8
2005	32,085	357	161	248	269	1.0	1.9	0.8
2006	32,355	360	162	253	269	0.9	2.0	0.8
2007	32,624	362	163	257	269	0.8	2.4	0.8
2008	32,892	364	165	261	267	0.8	2.4	0.8
2009	33,160	365	166	266	266	0.9	2.4	0.8
2010	33,425	367	167	270	264	0.8	2.8	0.8
2015	34,727	374	177	294	257	0.4	3.2	0.7
2020	35,989	376	187	321	242	(0.0)	3.3	0.7
2025	37,145	373	193	354	212	(0.2)	3.0	0.6
2030	38,129	370	198	395	173	0.1	1.6	0.5
2050	40,587	393	211	508	95	0.1	0.4	0.2
2075	43,260	412	225	519	117	0.2	0.4	0.3

III. Economic Assumptions

The list of assumptions required to make projections of the various economic indices, benefit expenditures and cost measurement bases is quite extensive. The following sections cover the more important of these assumptions. The economic outlook rests on the assumed evolution of the labour market, i.e. labour force participation, employment, unemployment rate, increase in average employment earnings, increase in GDP and the inflation rate. All these factors must be considered together and form part of an overall economic perspective.

Because the projected expenditures presented in this report are also expressed as cost ratios relative to three different measurement bases, GDP, combined CPP/QPP contributory earnings and total employment earnings, the average employment earnings, the proportion of persons with earnings and the proportion of CPP contributors are required and were assumed exactly as under the Eighteenth CPP Actuarial Report as at 31 December 2000. For calculation purposes, they were assumed to apply to Canada as opposed to Canada less Québec. Adjustments were then made in the projection of GDP, combined CPP/QPP contributory earnings, and total employment earnings to reflect historical differences between Québec and the rest of Canada.

A. Economic Perspective

The future expenditures and cost measurement bases depend on many demographic and economic factors. It is important to define the individual economic assumptions in the context of a long-term overall economic perspective. For this report, an initial economic slowdown followed by a recovery period has been assumed. Thereafter, a moderate but sustainable growth in the economy will persist throughout the projection period.

The current actuarial examination involves the projection of expenditures and cost measurement bases over a long period of time. Our best judgement regarding future economic trends was used but does not take into account all of the social or technological changes that may occur over the projection period. There will always exist a certain degree of uncertainty. The projected aging of the population combined with the retirement of the baby boom generation over the next decades will certainly create significant social and economic changes. It is possible that the evolution of the working-age population, especially the active population, will be quite different than what has been historically observed.

1. Active Population

The labour force participation rates (i.e. the active population expressed as a proportion of the population aged 15 and over) from 1976 to 1999 clearly show a narrowing of the gap between male and female rates. The increase in the participation rates of females aged 25 and over has been significant over recent years. In 1976 male participation was at 77.6% versus only 45.7% for females, leaving a gap of 31.9%. This gap had

narrowed to 13.6% by 1999 with male and female participation at 72.5% and 58.9%, respectively. It is assumed that females will continue to narrow the gap in participation rates but at a slower pace. It is assumed that the gap will gradually reduce to about 10% by 2030 and remain constant thereafter.

Table 22 shows the projected active population. Over the next few years it is assumed that females aged 50 and over will continue to increase their overall labour force participation. In fact, the currently observed higher labour force participation of women aged less than 50 is assumed to continue as this cohort ages.

Table 22 Active Population

Year	Population Aged 15 and Over ¹		Active Population		Labour Force Participation Rates	
	Males	Females	Males	Females	Males	Females
	(thousands)		(thousands)		(%)	(%)
2001	12,045	12,454	8,778	7,405	72.9	59.5
2002	12,187	12,594	8,837	7,456	72.5	59.2
2003	12,327	12,733	8,892	7,504	72.1	58.9
2004	12,474	12,878	8,990	7,595	72.1	59.0
2005	12,629	13,029	9,092	7,690	72.0	59.0
2006	12,782	13,178	9,189	7,780	71.9	59.0
2007	12,933	13,325	9,275	7,860	71.7	59.0
2008	13,077	13,466	9,355	7,935	71.5	58.9
2009	13,217	13,602	9,434	8,009	71.4	58.9
2010	13,355	13,735	9,514	8,082	71.2	58.8
2015	13,932	14,296	9,777	8,320	70.2	58.2
2020	14,460	14,815	9,937	8,491	68.7	57.3
2025	14,951	15,312	10,026	8,637	67.1	56.4
2030	15,379	15,760	10,141	8,838	65.9	56.1
2050	16,404	16,865	10,611	9,234	64.7	54.8
2075	17,577	17,946	11,226	9,754	63.9	54.4

¹ Adjusted to the basis used by Statistics Canada in its labour force survey.

The aging of the population exerts downward pressures on the overall labour force participation rate in Canada. The overall participation rate would fall from the current 65.6% to 55.1% by 2050 if the 1999 participation rates by age and sex were to apply throughout the projection period. This can be explained by the recent significant decrease in participation among people aged 50 to 64 and the projected increase in the proportion of people in that age group as well as the increase in the proportion of people aged 65 and over.

Individuals of the baby boom generation who were born between 1945 and 1955, will be aged 55 to 65 over the next decade; this highly active cohort will put upward pressure on the current low participation rate for age group 55-64. It is assumed that over the next decade the labour force participation rate of the latter age group will increase slightly to levels somewhat higher than those experienced in the 1990s but lower than those experienced in the 1970s and 1980s. This results in a labour force participation rate for those aged 15-69 for 2010 of 78.0% and 66.4% for males and females, respectively.

From 2010 to 2020, baby boomers born between 1956 and 1965, who are more numerous than the previous baby boomers, will be reaching the ages of 55 to 65 during that period. It was thus assumed that those aged 55-65 during this period would be participating more because of the increased employment opportunities due to the expected labour shortage. This change in work pattern might be expected since this generation of workers is more adaptable, flexible and better educated to prolong their work life. It was thus assumed that participation rates for those aged less than 55 would increase. This results in a labour force participation rate for those aged 15-69 for 2020 of 77.2% and 66.3% for males and females, respectively.

From 2020 to 2030, both baby boom generations will have reached the normal retirement age. This, combined with the projected low growth in the population, leads to downward pressures on the ratio of active to working-age persons. For this reason, the participation rates of those aged 55 and over, especially those aged 60 to 64, are increased to partially offset the decrease in the overall participation rate. Consequently there is a slight increase in the active population over that period. This results in a labour force participation rate for those aged 15-69 for 2030 of 77.2% and 67.7% for males and females, respectively. Finally for 2031 and thereafter, the participation rates are kept constant. This causes the active population to increase at a low rate of 0.2% per annum.

2. Employment

In Canada the annual average rate of increase in employment has been about 1.8% since 1976. However, this rate has varied greatly, having averaged 2.2% from 1976 to 1989 but only 1.1% from 1990 to 1999. It is assumed that the net job creation rate would be 0.5% in 2001, based on the most recent experience. Thereafter, the annual job creation rate is assumed to decrease to 0.3% in 2002 and to be around 1.2% for 2003 to 2008 and

then decreasing gradually to 0.2% over the long term as the increase in the active population reduces the pressure on the unemployment rate. Table 23 shows the projected number of employed persons.

If the job creation rate remained constant at the current level throughout the projection period, it would result in the elimination of unemployment in the context of the projected demographic situation. The unemployment rate is not expected to fall below the natural rate of unemployment without creating inflationary pressures. The natural rate of unemployment represents an equilibrium state in the labour market in the long run. In this report, it is assumed that the natural unemployment rate would be about 7.0% up to 2010. Thereafter, the slower growth in the active population would further reduce the natural unemployment rate. For this reason, the natural unemployment rate is assumed to decrease to a level of 6.5% for 2015 and thereafter.

Table 23 Employment of Population Ages 15 to 69

Year	Population		Average Employed		Employment Rate	
	Males	Females	Males	Females	Males	Females
	(thousands)		(thousands)		(%)	(%)
2001	11,240	11,157	8,041	6,848	71.5	61.4
2002	11,355	11,272	8,059	6,868	71.0	60.9
2003	11,472	11,388	8,140	6,936	71.0	60.9
2004	11,599	11,515	8,248	7,035	71.1	61.1
2005	11,735	11,648	8,349	7,128	71.2	61.2
2006	11,868	11,779	8,443	7,216	71.1	61.3
2007	12,001	11,910	8,530	7,297	71.1	61.3
2008	12,126	12,034	8,609	7,371	71.0	61.3
2009	12,244	12,150	8,681	7,439	70.9	61.2
2010	12,359	12,262	8,753	7,505	70.8	61.2
2015	12,758	12,654	9,014	7,736	70.7	61.1
2020	12,972	12,851	9,134	7,868	70.4	61.2
2025	13,113	12,968	9,183	7,971	70.0	61.5
2030	13,154	12,986	9,250	8,118	70.3	62.5
2050	13,639	13,450	9,644	8,452	70.7	62.8
2075	14,397	14,158	10,184	8,916	70.7	63.0

B. Annual Increase in Prices (Inflation Rate)

The inflation rate assumption is needed to determine the increase in benefits during any given calendar year. It is also used in the determination of the annual nominal increase in average employment earnings.

Price increases, as measured by changes in the Consumer Price Index (CPI), tend to fluctuate from year to year. Over the last 50 years, the trend was generally upward through the early 1980s and downward since then. For example, the average annual increase in the CPI for the 50-, 25- and 10-year periods ending in 2000 were 4.2%, 4.9% and 2.0%. Going forward, the Bank of Canada has reaffirmed its objective of keeping the inflation rate within a target range of 1% to 3% up to the end of 2005.

For 2001, the inflation rate has been assumed to be 2.8%. Then, until 2005, it is assumed that the Bank of Canada will maintain its inflation target policy and so the assumption was set at 2%. This corresponds to the average forecast from various economists and falls in the middle of the Bank of Canada target. On the other hand, the ultimate assumption for price increases for 2015 and thereafter has been set at 3%. This is higher than the experience of the last decade but is the maximum of the current Bank of Canada target range. The main reasons for the choice of an ultimate assumption of 3% are as follows:

- The Bank of Canada long-term monetary policy is known only until the end of 2005. Compared to the 75-year projection period of the actuarial report, the monetary policy of the Bank of Canada could be viewed as short-term.
- The expected upward pressures on real wages due to the labour shortage may create upward pressures on prices.
- There is uncertainty about future energy costs.
- In Canadian history, the longest consecutive periods with an average inflation rate of 2% are 1990-2000 and 1955-1965. New economic studies show that the optimum inflation rate that would minimize unemployment is about 3%.

Finally, from 2005 to 2015 the price increase assumption is assumed to rise gradually from 2% to 3% by increments of 0.1% each year.

C. Average Employment Earnings Increase

The assumed nominal annual increase in average employment earnings is used to project the average annual earnings from one year to the next. The real-wage differential is simply calculated by subtracting the inflation rate from the assumed nominal annual increase in average annual employment earnings.

Historically, the real-wage differential has fluctuated significantly from year to year. The trend was generally downward through the late 1980s, with some improvements

since then, e.g. the 10-year average annual real-wage differential was -0.23% for the period ending in 1990 and 0.16% for the period ending in 2000. Over the longer term, the average annual real-wage differential averaged 1.4% for the 50-year period ending in 2000. Many factors have influenced real rates of wage increase, including general productivity, labour demand, the move to a service economy and decreases in the average hours worked. More specifically, labour demand has a significant impact on real-wage increases. Real wages are subject to downward pressures as the demand for workers decreases. On the other hand, one could expect upward pressures on wages if the size of the labour force fails to keep up with a growing economy.

Due to the expected economic slowdown, the real increase in average annual employment earnings is assumed at 0.0% for year 2002. From 2003 the real increase in average annual earnings is then assumed to gradually increase to 1.1% by 2015 and then remain at that level. The assumption is based on the expected labour shortage starting in 2015, as moderated by higher participation rates at older ages and gains in productivity.

D. Total Employment Earnings

Total employment earnings for any given year are obtained by applying the Canada less Québec proportion of earners and average employment earnings (both as determined under the Eighteenth CPP Actuarial Report as at 31 December 2000) to the entire population of Canada. Total employment earnings estimated in this manner were compared with historical statistics, from Statistics Canada, of total employment earnings for Canada. These estimates are on average for 1996 to 2000 about 5% higher than the corresponding experience data. For this reason projected employment earnings for Canada have been multiplied by an experience adjustment factor, which is graded from its 2000 actual-to-expected ratio to the ultimate level over five years. The ultimate factor of 95.9% corresponds to the actual-to-expected ratio over the most recent five years.

E. Gross Domestic Product (GDP)

Gross domestic product (GDP) is perhaps the most suitable basis for comparison of costs since benefits are financed through general revenues and not on the basis of employment earnings. Historical GDP was compared to historical total employment earnings for the period 1966 to 2000 and was found to be about 2.1 times as much. For this reason GDP was projected as total employment earnings multiplied by an experience adjustment factor, which is graded from its 2000 level to the ultimate level over five years. The ultimate factor of 2.2 corresponds to the ratio over the most recent five years.

F. Combined CPP and QPP Contributory Earnings

The combined CPP and QPP contributory earnings were obtained by applying the CPP proportion of contributors and average contributory earnings (both as determined under

the Eighteenth CPP Actuarial Report as at 31 December 2000) to the entire population of Canada. Total contributory earnings obtained in this manner were then compared to actual combined CPP and QPP contributory earnings for the period 1966 to 2000. Such validation reveals that, on average, this approach produces combined contributory earnings about 5% higher than the actual figures. For this reason, projected contributory earnings for Canada have been multiplied by an experience adjustment factor, which is graded from the 2000 actual-to-expected ratio to the ultimate level over five years. The ultimate factor of 95.5% corresponds to the actual-to-expected ratio over the most recent five years.

IV. Recipient Rates and Distribution by Level of Benefit

Since benefits are computed for age-sex cohorts of persons as opposed to individual persons, recipient rates by type of benefit and amount are required. Data received from Human Resources and Development Canada for each type of benefit consist of the number of beneficiaries at June of each year (1983 to 2001) by sex, age and six levels of benefit as a percentage of the maximum benefit (0-19%, 20-39%, 40-59%, 60-79%, 80-99%, and 100% and over). The actual recipient rate for a benefit in each of the cells described above is obtained by dividing the number of beneficiaries in that cell by the total population of Canada of the cell. Assumed recipient rates for a benefit for the projection period are then determined as follows.

A. Basic Pension

The historical recipient rates of sex-distinct cohorts for the basic pension were studied to determine the best-estimate assumption. The ultimate basic pension recipient rates are the smoothed average of the experience for years 2000 and 2001.

For males, the ultimate recipient rates are assumed to increase gradually from 93% at age 65 to 99.5% at ages 70 and over. For females, the ultimate recipient rates are assumed to increase from 93.5% at age 65 to 98.5% at ages 75 and over. The projected 1% difference between the ultimate recipient rates of males and females is consistent with the historical gap between the sexes. Table 24 below presents the basic pension recipient rates by age, sex and level of benefit.

Table 24 Basic Pension Recipient Rates (%)

Age	2002			2020+		
	Partial	Full	Total	Partial	Full	Total
Males						
65	3.0	90.0	93.0	4.4	88.6	93.0
70	6.4	93.1	99.5	9.3	90.2	99.5
75	7.1	92.4	99.5	11.6	88.0	99.5
80	7.0	92.5	99.5	13.0	86.5	99.5
85	6.3	93.2	99.5	12.3	87.2	99.5
90+	5.2	90.4	95.6	11.3	88.2	99.5
Females						
65	3.8	89.7	93.5	6.6	86.9	93.5
70	6.0	91.5	97.5	10.4	87.1	97.5
75	6.4	92.1	98.5	10.8	87.7	98.5
80	5.6	92.9	98.5	10.1	88.4	98.5
85	4.9	93.6	98.5	9.4	89.1	98.5
90+	4.1	94.4	98.5	8.5	90.0	98.5

The 2001 distribution of the overall recipient rate for a basic pension by level of benefit as a percentage of the maximum benefit was projected for pivotal ages 65, 70, 75, 80, 85, and 90+ based on historical trends over the last five years. A linear interpolation between pivotal ages was subsequently used for intermediate ages. This approach takes into account the introduction of partial benefits in 1977 and the enactment of the claw-back provision in 1989. Charts 12 and 13 show the evolution of the male and female distribution of recipient rates by level of benefit for the years 2001 and 2050.

Chart 12 Beneficiaries by Level of Benefit (Basic Pension – Males Aged 65+)

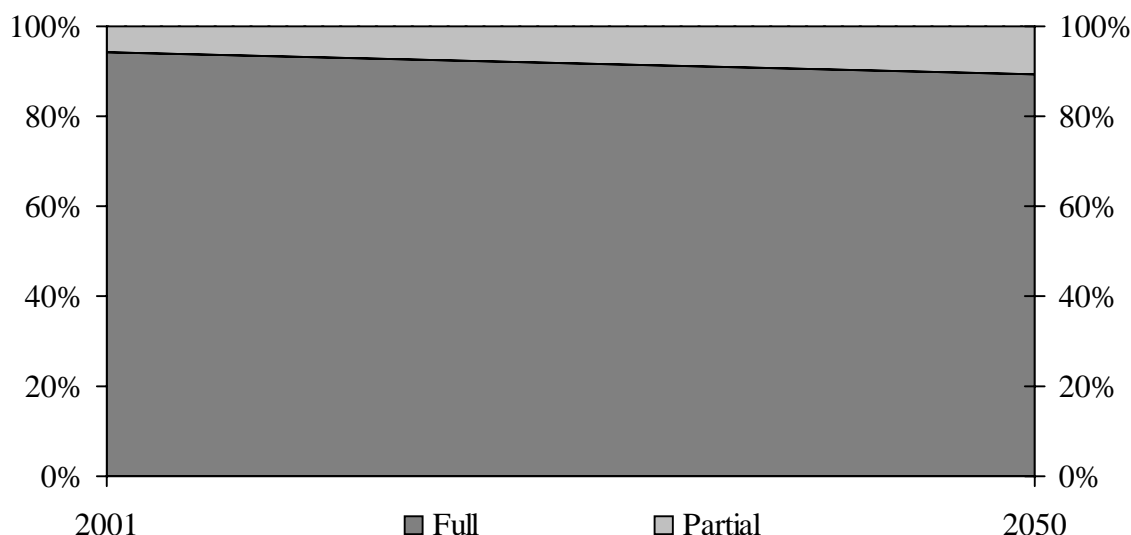
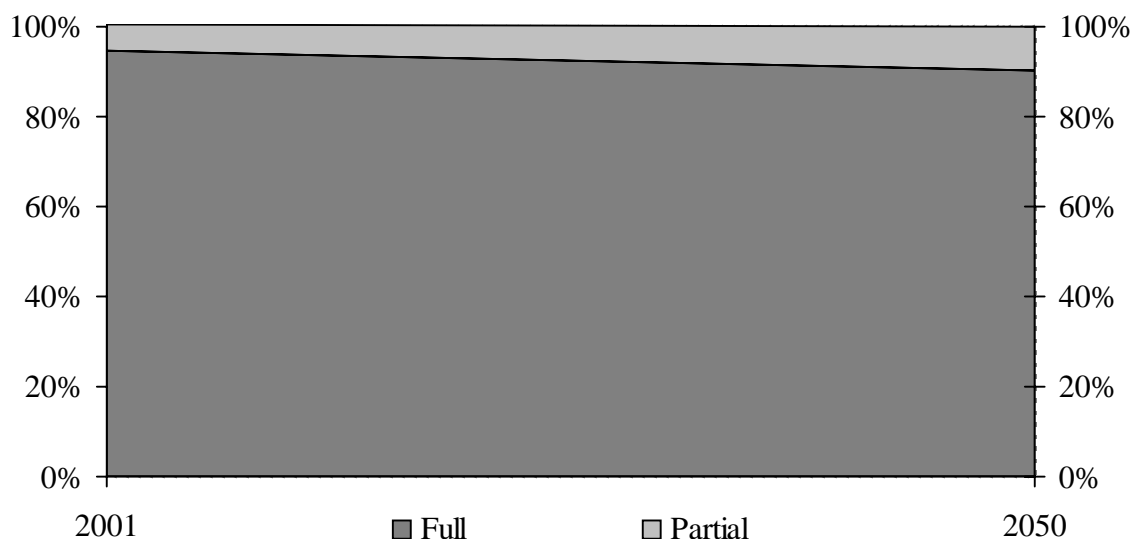


Chart 13 Beneficiaries by Level of Benefit (Basic Pension – Females Aged 65+)



B. GIS and Allowance

The actual 2001 recipient rates for GIS and Allowance for each age, sex, type and level of benefit are used as the starting point for determining the best-estimate assumption.

The previous actuarial report introduced a formula for the projection of GIS and Allowance recipient rates. The formula is based on the assumption that each new cohort of beneficiaries will be somewhat wealthier than the preceding one and thus fewer members will be beneficiaries.

For this report, experience adjustment factors were introduced in the projection formula. The factors were developed to adjust the formula so that characteristics and trends of historical recipient rates by age, sex, type and level of benefit observed over the last five years would be reproduced more closely. The factors were used for the first 10 years of the projection period. Given the additive nature of the experience adjustment factors, minimum values of recipient rates were set in order to eliminate the possibility of negative recipient rates. Minimum recipient rates were set by type of benefit in relation to the lowest prevailing recipient rates in year 2001 at the benefit level category for a given type of benefit.

The change in the assumed distribution by level of benefit is also automatically taken into account by the formula, as is the increasing pattern of recipient rates by age.

Table 25 presents the projected GIS and Allowance recipient rates by age, sex and type and level of benefit. Charts 14 through 17 present recipient rates by year of birth. Charts 18 and 19 present the distribution of recipient rates by level of benefit for years 2001 and 2050.

Table 25 GIS and Allowance Recipient Rates
(%)

Age	2001			2025			2050		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
GIS - Males									
65	21.0	4.5	25.5	16.9	3.9	20.8	11.7	2.9	14.6
70	23.2	4.3	27.5	18.3	4.1	22.4	13.0	3.0	16.0
75	23.6	4.3	27.9	17.6	3.8	21.4	12.4	2.7	15.1
80	23.4	4.4	27.8	17.2	3.8	21.0	12.1	2.6	14.7
85	31.2	5.0	36.2	19.5	3.9	23.4	13.5	2.6	14.1
90+	39.1	6.1	45.2	25.8	2.9	28.7	18.3	2.0	20.3
All Ages	24.5	4.5	29.0	18.2	3.9	22.1	13.1	2.8	15.9
GIS - Females									
65	23.6	5.1	28.7	18.2	4.6	22.8	12.1	3.2	15.3
70	27.3	5.9	33.3	22.0	5.4	27.4	15.9	3.9	19.8
75	30.8	6.9	37.7	23.6	6.0	29.6	17.5	4.5	22.0
80	36.1	7.3	43.4	28.2	5.8	34.0	21.0	4.4	25.4
85	45.0	9.3	54.3	34.7	5.9	40.6	26.3	4.5	30.8
90+	48.5	14.6	63.1	44.1	7.2	51.3	35.4	5.8	41.2
All Ages	32.8	7.2	40.0	25.5	5.6	31.1	20.8	4.3	25.1
Allowance - Males									
60	0.4	0.1	0.5	0.2	0.1	0.3	0.2	0.1	0.3
61	0.7	0.1	0.8	0.5	0.1	0.6	0.3	0.1	0.4
62	1.1	0.1	1.2	0.6	0.0	0.6	0.4	0.0	0.4
63	1.6	0.1	1.7	1.0	0.1	1.1	0.5	0.0	0.5
64	2.5	0.1	2.6	1.4	0.1	1.5	0.7	0.0	0.7
All Ages	1.2	0.1	1.3	0.7	0.1	0.8	0.4	0.1	0.5
Allowance - Females									
60	6.9	0.6	7.5	4.2	0.5	4.7	2.3	0.4	2.7
61	9.7	0.7	10.4	6.3	0.7	7.0	3.6	0.5	4.1
62	12.7	0.8	13.5	8.2	0.6	8.8	4.5	0.4	4.9
63	15.4	0.9	16.3	9.8	0.7	10.5	5.3	0.5	5.8
64	18.4	1.0	19.4	11.8	0.7	12.5	6.3	0.5	6.8
All Ages	12.4	0.8	13.2	8.0	0.6	8.6	4.4	0.4	4.8

Chart 14 GIS Single Recipient Rates (Males)

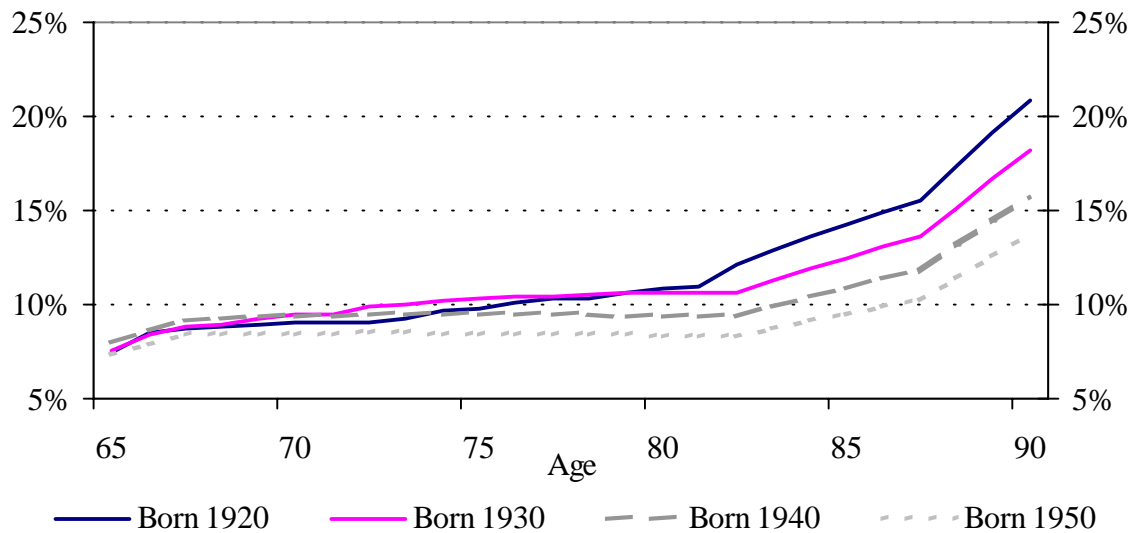


Chart 15 GIS Single Recipient Rates (Females)

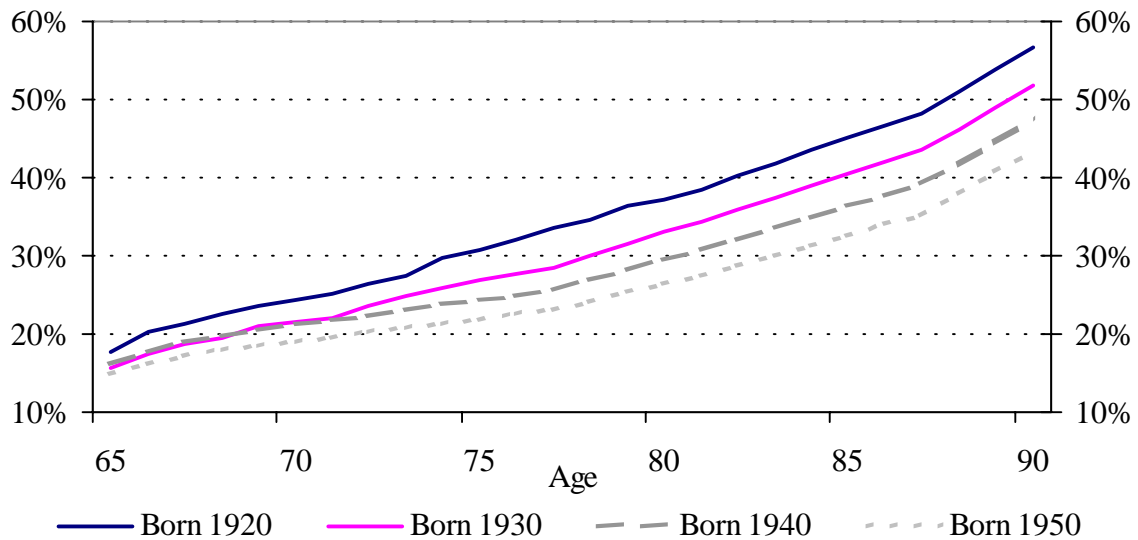


Chart 16 Allowance Recipient Rates (Males)

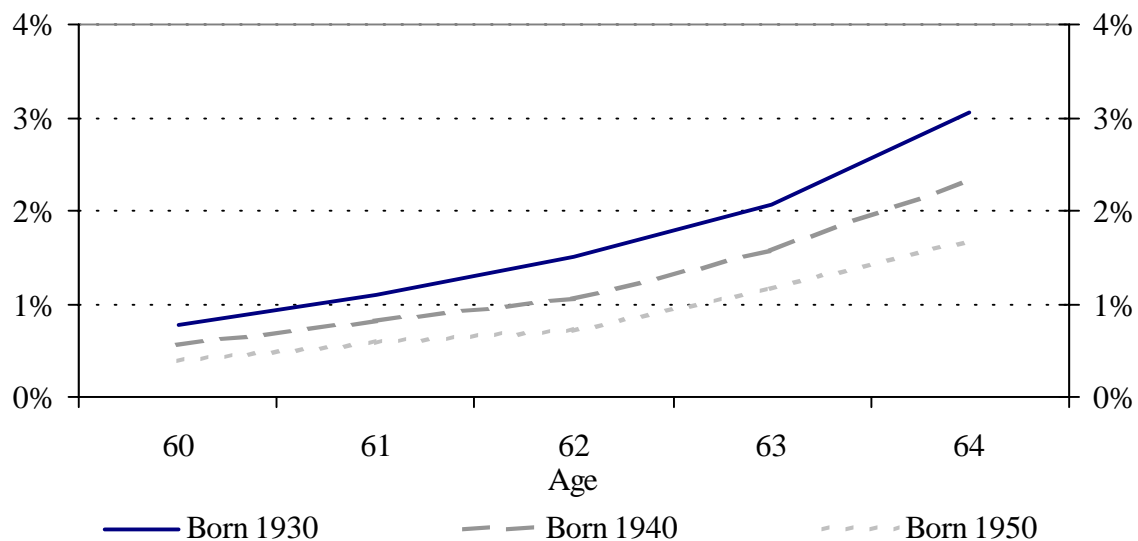


Chart 17 Allowance Recipient Rates (Females)

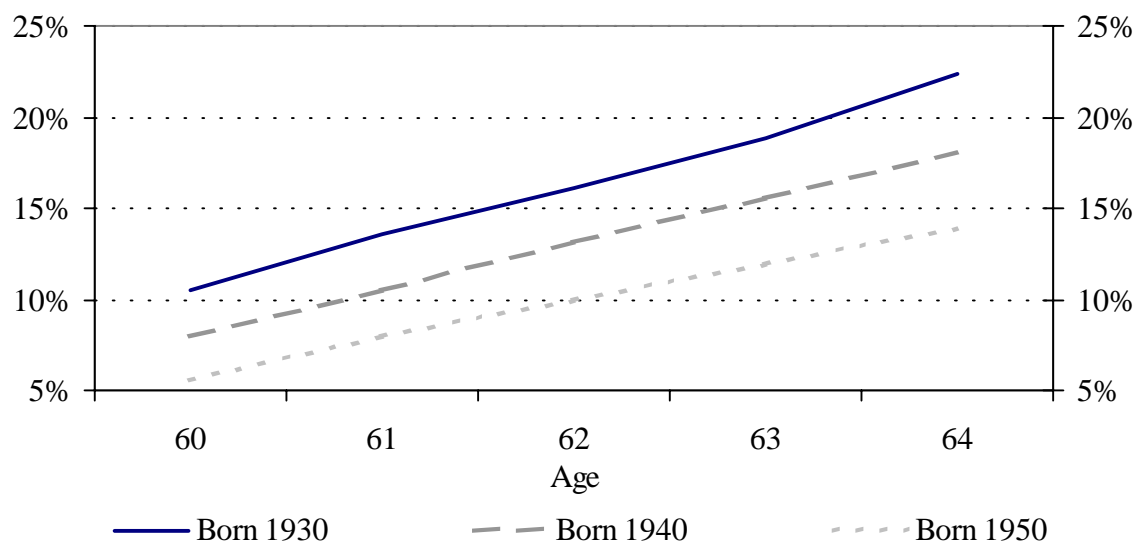


Chart 18 GIS Recipient Rates by Level of Benefit

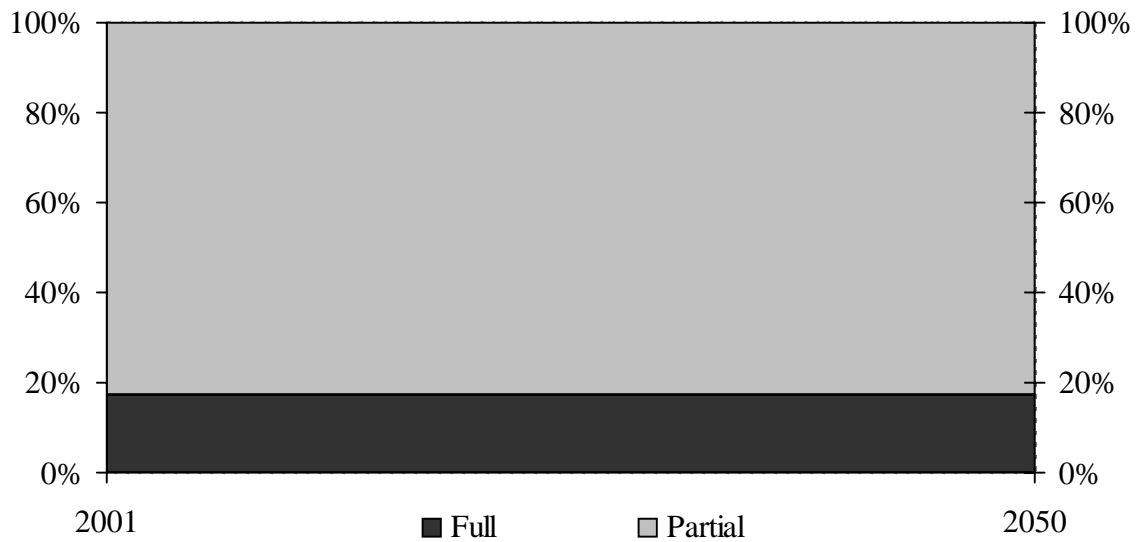
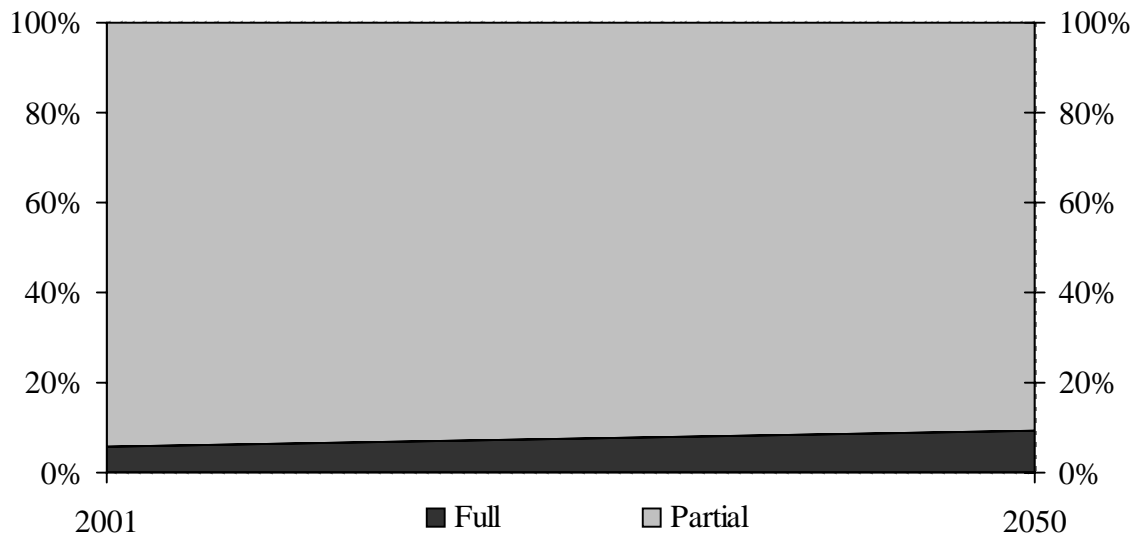


Chart 19 Allowance Recipient Rates by Level of Benefit



C. Average Benefit in Relation to Maximum Benefits

For each cell, determined by age group, sex, type of benefit and amount category, the average benefit paid was compared to the maximum benefit rate. In most cases, the averages were close to the midpoint of the amount category and did not vary significantly from year to year.

Therefore, except for the “100% and over” category for GIS, it was assumed that these averages would remain constant in future years, in accordance with their average levels over the most recent five-year period.

For GIS it is possible for a beneficiary to receive more than 100% of the maximum benefit if receiving a partial basic pension. In these cases, the maximum GIS benefit is increased by the difference between the full and partial basic pension. For this purpose, it was assumed that the average benefit as a percentage of the maximum would be kept at the 1997-2001 levels throughout the projection period. Table 26 presents the projected maximum benefits by type, while Table 27 presents the assumed benefit as a percentage of the maximum for each of the level and type of benefit.

Table 26 Projected Maximum Monthly Benefits

Year (1 July)	OAS (\$)	GIS		Allowance	
		Single (\$)	Married (\$)	Regular (\$)	Survivor (\$)
2001	436.55	518.82	337.94	774.49	855.05
2002	446.43	530.56	345.59	792.02	874.40
2003	455.36	541.17	352.50	807.86	891.89
2004	464.47	552.00	359.55	824.02	909.73
2005	473.76	563.04	366.74	840.50	927.92
2006	483.55	574.68	374.32	857.87	947.10
2007	494.03	587.13	382.43	876.46	967.63
2008	505.23	600.44	391.10	896.33	989.56
2009	517.18	614.65	400.36	917.55	1,012.99
2010	529.94	629.81	410.24	940.18	1,037.98
2015	607.43	721.90	470.22	1,077.65	1,189.74
2020	704.18	836.88	545.11	1,249.29	1,379.24
2025	816.33	970.18	631.94	1,448.27	1,598.92
2030	946.36	1,124.70	732.59	1,678.94	1,853.58
2050	1,709.22	2,031.33	1,323.13	3,032.36	3,347.77
2075	3,578.73	4,253.16	2,770.35	6,349.08	7,009.49

Table 27 Average Benefits as Percentage of Maximum Rates

	Males					
	0-19%	20-39%	40-59%	60-79%	80-99%	100% ¹
OAS	10.5	26.8	49.3	68.6	88.1	100.0
GIS-Single	11.5	30.9	50.1	69.9	90.7	118.0
GIS-Spouse a pensioner	11.3	30.3	49.8	68.9	89.4	169.1
GIS-Spouse not a pensioner	11.2	28.7	50.0	69.7	89.9	117.7
GIS-Spouse with Allowance	0.0	0.0	45.5	69.9	89.8	120.2
Allowance-Regular	10.4	30.0	47.5	69.6	90.5	100.0
Allowance-Survivor	11.3	31.0	48.8	69.8	90.5	100.0
	Females					
	0-19%	20-39%	40-59%	60-79%	80-99%	100% ¹
OAS	9.6	26.6	49.3	68.5	88.0	100.0
GIS-Single	11.7	30.8	50.7	69.8	90.7	119.0
GIS-Spouse a pensioner	11.2	30.3	49.8	68.9	89.4	167.1
GIS-Spouse not a pensioner	11.0	29.0	50.9	70.7	92.0	112.0
GIS-Spouse with Allowance	0.0	0.0	45.4	70.0	89.5	111.7
Allowance-Regular	10.7	30.1	47.3	69.4	90.5	100.0
Allowance-Survivor	11.5	31.1	48.2	69.6	90.6	100.0

¹ The proportion exceeds 100% for GIS benefits because the GIS maximum is raised for individuals receiving a partial OAS pension, to the extent that such pension falls short of a full OAS pension.

V. Expenditures

A. Benefits

The expenditure for each year for a given type of benefit was computed as the sum, over all relevant population cells, of the product of:

- the population as at 1 July (by age and sex);
- the recipient rates (varies by type of benefit, level of benefit, age, sex and calendar year);
- the average benefit of those in the level-of-benefit cell as a percentage of the maximum benefit (varies by type of benefit, age, sex and calendar year); and
- 12 times the maximum benefit as at 1 July.

As part of the methodology validation process, the number of beneficiaries and amounts of total annual benefits computed as above were compared to the actual results for 1983 through 2000. Based on these comparisons, as described below, adjustments were made to the projected results.

The comparisons revealed that the actual numbers of beneficiaries tend to be slightly higher than the calculated numbers. Therefore, the numbers of beneficiaries projected as described above were multiplied by experience adjustment factors. These factors were graded from the 2000 actual-to-expected ratios to ultimate levels over five years. The ultimate experience adjustment factor of 1.0013 for the basic pension corresponds approximately to the historical actual-to-expected ratio over the most recent five years, while factors of 0.9962 and 0.9958 reflect the experience over the last three years for GIS and Allowance respectively.

Furthermore, even after adjusting the numbers of beneficiaries calculated for past years by the ultimate experience adjustment factors, the calculated total annual benefits were tended to be lower than the actual expenditures. Therefore, the projected amounts of benefits were multiplied by experience adjustment factors. These factors were graded from the 2000 actual-to-expected ratios to ultimate levels over five years. The ultimate benefit experience adjustment factor of 1.0061, for the basic pension, correspond approximately to the historical actual-to-expected ratio over the most recent five years, while factors of 1.0093 and 0.9781 correspond to the experience of the last three years for GIS and Allowance respectively.

As a result total benefits are ultimately adjusted by a factor of 1.0074, 1.0055 and 0.9740 for the basic pension, GIS and Allowance respectively.

Detailed tables for the projected number of beneficiaries and total expenditures by sex, type and level of benefits are presented in Appendix E.

B. Administrative expenses

Historically, annual administrative expenses have averaged about 0.45% of total annual benefit payments. This has been assumed to continue throughout the projection period.

Appendix C – Sensitivity Tests

This actuarial report is based on the projection of expenditures and cost measurement bases over a long period of time. The information required by statute, which is presented in Section IV of this report, has been derived using best-estimate assumptions regarding future demographic and economic trends. The key best-estimate assumptions, i.e. those for which changes within a reasonable range have the most significant impact on the long-term financial results, are described in Section III of this report.

Both the length of the projection period and the number of assumptions required ensure that actual future experience will not develop precisely in accordance with the best-estimate assumptions. For this purpose, individual sensitivity tests have been performed, consisting of projections of financial results using alternative assumptions.

The sensitivity tests were performed by varying each of the nine key assumptions individually with the remaining assumptions being maintained at their best-estimate levels. Two tests were performed with respect to each of the assumptions. The alternative assumptions selected are intended to represent a wide range of potential long-term experience. However, the results cannot properly be combined because a change in any particular assumption may impact on another to various degrees.

Each of these sensitivity tests was categorized as either a low-cost scenario or a high-cost scenario. In the low-cost scenarios, the alternative assumptions have the effect of reducing the ratios of expenditures to GDP. Conversely, in the high-cost scenarios, the assumptions would increase the cost ratios. Table 28 summarises the alternative assumptions used in the sensitivity tests. It is followed by a brief discussion of each assumption and the impact its variation has on the results.

Table 28 Sensitivity-Test Assumptions

		Low-Cost	Best-Estimate	High-Cost
I.	Fertility rate	1.90	1.64	1.40
II.	Net migration rate	0.65%	0.52%	0.35%
III.	Mortality rates	No improvements after 2020	1990-92 Life Tables for Canada, with improvements	200% of best-estimate improvement rates
IV.	Unemployment rate	4.5%	6.5%	8.5%
V.	Participation rates (2030)	Ages 15-69: 81%	Ages 15-69: 72%	Ages 15-69: 68%
VI.	Real-wage differential	1.6%	1.1%	0.6%
VII.	Price increases	4.0%	3.0%	2.0%
VIII.	Recipient rates (GIS-Allowance)	<u>2050</u> GIS: 16.7% Allowance: 2.1%	<u>2050</u> GIS: 20.8% Allowance: 2.6%	<u>2050</u> GIS: 25.0% Allowance: 3.2%
IX.	Benefit indexation	CPI less 1%	CPI	CPI plus 60% of the real-wage differential

I. Fertility Rate

The best-estimate assumption is that the total fertility rate will increase slightly from its 1997 level of 1.55 to an ultimate level of 1.64 in 2007. This lies between the medium and high assumptions adopted by Statistics Canada for its most recent population projections.

The low-cost assumption has the fertility rate increasing to an ultimate level of 1.90 in 2007. This is consistent with Statistics Canada's high assumption and represents a return to the levels typical of the early 1970s. Under this scenario, the population grows to a level in 2050 that is 11% higher than under the best-estimate assumption.

The high-cost assumption has the fertility rate decreasing to an ultimate level of 1.40 in 2007. This is consistent with Statistics Canada's low assumption and represents a continuation of the historical trend of decreases. Under this scenario, the population grows much more slowly, to a level in 2050 that is 9% lower than under the best-estimate assumption. Changes in the fertility rate have a small short-term impact on the financial status of the Old Age Security Program; however, the long-term impact may be significant.

II. Net Migration Rate

Net migration to Canada was 0.47% of population in 2000. Based on a continuation of these migration levels, an ultimate best-estimate assumption of 0.52% has been established for 2020 and thereafter. This level is reached in two steps; first a level of 0.50% is reached in 2005 and kept constant until 2015, and then the ultimate level of 0.52% is reached in 2020. This is consistent with experience over the last 15 to 25 years and with the ultimate migration level between the medium and high Statistics Canada population projections.

The low-cost assumption has net migration increasing to an ultimate level of 0.65% of population in 2005. This is consistent with Statistics Canada's high assumption. Under this scenario, the population grows to a level in 2050 that is 9% higher than under the best-estimate assumption.

The high-cost assumption has net migration decreasing to an ultimate level of 0.35% of population in 2005. This is consistent with Statistics Canada's low assumption. Under this scenario, the population grows much more slowly, to a level in 2050 that is 10% lower than under the best-estimate assumption.

III. Mortality Rates

Mortality improvements are expected to continue in the future. The best-estimate ultimate rates of improvement were established by adjusting the results of a detailed study prepared by the United States Social Security Administration actuaries regarding trends in mortality by age, sex and cause of death to reflect, in part, historical differences in mortality improvements between Canada and the United States. Rates of improvement were assumed to grade down from their recent levels to the ultimate by 2021.

For the low-cost scenario, mortality is assumed to improve less rapidly. Rates of improvement were assumed to grade down from recent levels to zero by 2021. Under this scenario, the population grows to a level in 2050 that is 3% lower than under the best-estimate assumption.

For the high-cost scenario, mortality is assumed to improve more rapidly. Rates of improvement were assumed to grade down from recent levels to 200% of the best-estimate ultimate levels by 2021. Under this scenario, the population grows to a level in 2050 that is 3% higher than under the best-estimate assumption. The different rates of improvement would result in the life expectancies shown in Table 29 below.

Table 29 Life Expectancy in 2050 Under Alternative Assumptions¹

		Low-Cost	Best -Estimate	High-Cost
At Birth	Males	77.7	80.4	83.1
	Females	82.3	84.5	86.7
At Age 65	Males	17.3	19.1	21.1
	Females	20.5	22.1	23.8

¹ Calculated as if the mortality rates assumed for 2050 were applicable in all subsequent years.

IV. Unemployment Rate

Employment levels are reflected in the actuarial projection model through the assumptions made regarding the level of the labour force and job creation rates, by year, age and sex. These rates vary not only with the rate of unemployment, but also reflect trends in increased workforce participation by women, longer periods of formal education among young adults and the trends in retirement patterns of older workers. The ultimate level of unemployment assumed to apply in 2015 and thereafter is 6.5%.

For the low-cost scenario, the net job creation rates are assumed to increase more rapidly, which results in an ultimate level of unemployment rate of 4.5% in 2015.

For the high-cost scenario, the net job creation rates are assumed to increase more slowly, which results in an ultimate level of unemployment rate of 8.5% in 2015.

V. Participation Rates

Participation rates are used to estimate the active population. Under the best-estimate scenario, the labour force participation rates in 2030 for ages 15 to 69 are 77.2% and 67.7% for males and females respectively. The overall participation rate is 72%.

For the low-cost scenario, male participation rates are assumed to reach their highest historical level by 2030 and females are assumed over the same period to reach the level of males. This result in an overall participation rate of 81% for those aged 15 to 69 in 2030.

For the high-cost scenario, male and female participation rates are assumed constant after 1999. This result in an overall participation rate of 68% for those aged 15 to 69 in 2030.

VI. Real-Wage Differential

Wage increases impact the financial balance of the Old Age Security program in two ways. In the short term, an increase in the average wage translates into higher employment earnings, GDP and combined CPP/QPP contributory earnings, with little immediate impact on benefits. Accordingly, this will result in lower cost ratios relative to these measurement bases. Over the longer term, higher average earnings may be expected to result in higher incomes among the retiree population and reduce the amounts of income-tested benefits.

The long-term projected financial position of the Old Age Security program is more dependent on the differential between the assumed annual rates of earnings increases and price increases (the real-wage differential) than on the absolute level of wage increases assumed. An ultimate real-wage differential of 1.1% has been assumed in years 2015 and thereafter for the best-estimate projections. Combined with the best-estimate price increase assumption of 3.0%, it results in assumed nominal annual increases in wages of 4.1% in 2015 and thereafter. During the initial years of the projection period, the real-wage differential is assumed to increase uniformly from 0.0% in 2002 to its ultimate level.

For the low-cost scenario, the assumed real-wage differential increases from 0.0% in 2002 to an ultimate level of 1.6% in 2015. This corresponds to the highest outlook from a series of economic forecasts we have studied and is much higher than recent experience.

For the high-cost scenario, the assumed real-wage differential increases from 0.0% in 2002 to an ultimate level of 0.6% in 2004. While much lower than the long-term historical averages, it nevertheless represents an improvement from shorter-term historical averages.

VII. Price Increases

An ultimate annual rate of price increase of 3% has been assumed for the best-estimate projections. The rate of price increase is assumed at 2.8% in 2001, 2% for 2002 to 2005 and is assumed to increase uniformly thereafter to its ultimate level of 3% in 2015.

For the low-cost scenario, the annual rate of price increase is assumed to rise to an ultimate level of 4% in 2015. This level of inflation is comparable to long-term historical averages. Although a higher rate of increase in prices results in higher OAS expenditures, it also results in higher employment earnings, GDP and combined CPP/QPP contributory earnings (this is because the same real-wage differential is added to a higher base of inflation, producing a higher nominal rate of wage increase). The net effect is a decrease in the cost ratios.

For the high-cost scenario, the annual rate of price increase is assumed to be 2% for years 2002 and thereafter. This level of inflation is comparable to that of the 1960s and 1990s.

VIII. Recipient Rates

The best-estimate projection uses a formula described in Appendix B to project GIS and Allowance recipient rates. For the low-cost scenario, the same formula is used except that a one-fifth reduction is applied to the resulting recipient rates for GIS and Allowance. The reduction is phased in over three years and is maintained thereafter. It results in total GIS and Allowance benefits that are about 20% lower than in the best-estimate scenario.

For the high-cost scenario, the same formula is used except that a one-fifth increase is applied to the resulting recipient rates for total GIS and Allowance. The increase is phased in over three years and is maintained thereafter. It results in total GIS and Allowance benefits that are about 20% higher than in the best-estimate scenario.

IX. Benefit Indexation

The best-estimate projections are based on the plan provision for benefit rates to be indexed quarterly in accordance with price increases. Over time, indexing benefit rates more slowly than the rate of growth in average employment earnings means that benefits will replace a decreasing share of individuals' pre-retirement earnings. In the past, this issue has been addressed through occasional legislation providing ad hoc increases in the benefit rates.

For the low-cost scenario, the benefit indexation is assumed at CPI minus 1%.

For the high-cost scenario, the benefit rates are increased to partially reflect the growth in real wages. The assumption made for this test is that benefit rates would be indexed at rates equal to the assumed rate of growth in prices plus 60% of the assumed real-wage differential. Accordingly, the ultimate annual benefit indexation rate is assumed to be 3.7% instead of 3.0% under the best-estimate assumptions. Over the medium term, say 30 years, the overall impact of this indexation formula on costs is roughly comparable to the indexation basis inherent in the CPP and QPP, which provide benefits based on wage increases prior to retirement and price increases thereafter.

X. Results

Table 30 summarizes the projected impact on the cost ratios under each of the alternative sets of assumptions.

Table 30 Sensitivity-Test Results

Assumption		Scenario	Expenditures as Percentage of GDP			
			2010	2025	2050	2075
		Best-Estimate	2.41	3.00	2.71	2.10
I.	Fertility rate	Low	2.41	2.96	2.49	1.83
		High	2.41	3.04	2.95	2.42
II.	Migration rate	Low	2.39	2.91	2.59	2.01
		High	2.43	3.11	2.87	2.23
III.	Mortality rates	Low	2.40	2.94	2.50	1.83
		High	2.42	3.06	2.92	2.37
IV.	Unemployment rate	Low	2.37	2.94	2.66	2.06
		High	2.43	3.06	2.77	2.14
V.	Participation rates (2030)	Low	2.41	2.83	2.43	1.88
		High	2.45	3.15	2.87	2.22
VI.	Real-wage differential	Low	2.41	2.78	2.20	1.50
		High	2.45	3.32	3.45	3.04
VII.	Price increases	Low	2.40	3.00	2.71	2.11
		High	2.41	3.01	2.71	2.09
VIII.	Recipient rates (GIS- Allowance)	Low	2.30	2.89	2.63	2.05
		High	2.52	3.11	2.79	2.15
IX.	Benefit indexation	Low	2.15	2.26	1.58	0.95
		High	2.51	3.51	3.82	3.52

Appendix D - Reconciliation With Previous Report

The results presented in this report differ from those presented in the previous report for a variety of reasons. Differences between the actual experience from 1998 through 2000 and that projected in the fourth actuarial report are addressed in section I below. Since historical results provide the starting point for the projections shown in this report, these historical differences also have an effect on projected future experience. The impacts of the experience update and the other factors that have significantly changed the projected results are addressed in section II below.

I. Financial Results - 1998 to 2000

The financial results from 1998 through 2000 are summarized in Table 31.

Table 31 Financial Results - 1998 to 2000
(\$ billion)

	Actual	Expected	Difference	Ratio
Expenditures:				
OAS	54.0	54.1	(0.1)	1.00
GIS	14.7	15.1	(0.4)	0.97
Allowance	1.2	1.2	0.0	1.00
Administrative Expenses	0.3	0.3	0.0	1.00
Total Expenditures	70.2	70.7	(0.5)	0.99
Gross Domestic Product	2,947.1	2,765.6	181.5	1.07
Expenditures as % of GDP	2.4	2.6	(0.2)	0.93

Expenditures during the period were about \$0.5 billion less than projected. For the most part, this was because the number of GIS beneficiaries was somewhat lower than projected. The average benefit per person was also slightly lower than projected, due to relatively stable price levels.

Total GDP over the period was 7% higher than projected, due to the higher-than-projected growth in the economy. Overall, expenditures in relation to GDP were about 7% lower than projected, being 2.4% of GDP instead of the expected 2.6%.

II. Changes in Projected Results - 2001 to 2075

The ratio of expenditures to GDP in a given year is an important measure of the cost of the program. One way of understanding the differences between the best-estimate projections in this report and those presented in the fourth actuarial report is by looking at the effects of various factors on these cost ratios. The most significant effects are identified in the reconciliation presented in Table 32 below.

Table 32 Reconciliation of Costs as Percentage of GDP
(OAS, GIS and Allowance combined)

	2001	2025	2050	2075
Fourth Report Rates	2.52	3.08	2.84	2.21
I. Improvements in Methodology	(0.01)	(0.03)	-	(0.01)
II. Experience Update (1998-2000)				
Demographic	(0.04)	0.02	0.04	(0.02)
Economic	(0.01)	(0.01)	(0.02)	(0.03)
Benefits	(0.13)	(0.06)	(0.06)	(0.04)
Subtotal:	(0.18)	(0.05)	(0.04)	(0.09)
III. Changes in Assumptions				
Fertility	-	-	0.02	0.06
Net migration	0.01	(0.04)	(0.01)	-
Mortality	-	(0.01)	0.01	0.01
Employment	(0.02)	(0.01)	(0.05)	0.02
Real-wage differential	(0.01)	0.08	(0.01)	(0.07)
Price increases	0.01	-	(0.01)	(0.01)
Recipient Rates	0.01	0.03	0.01	(0.01)
Other assumptions	(0.01)	(0.05)	(0.03)	(0.02)
Subtotal:	(0.01)	-	(0.07)	(0.02)
Total of I to III	(0.18)	(0.08)	(0.12)	(0.11)
Fifth Report Rates	2.34	3.00	2.71	2.10

The methodology described in Appendix B reflects a number of improvements from that employed in the previous report. Overall, these refinements had minimal impact on the ultimate cost ratios.

The primary variations in experience during 1998 to 2000 were discussed above. Overall, the effect of the experience update was a reduction in the cost ratio of about 7% in 2001 and an ultimate reduction of about 4% ultimately.

Key assumptions, and changes made from the previous report, are outlined in Section III of the report. The effects of these changes may be summarized as follows:

- The decrease in the ultimate fertility rate increases the long-term cost ratios because its effect in slowing the growth in GDP outweighs the ultimate reductions in expenditures.
- Conversely, the marginally higher assumed level of net migration slightly decreases the cost ratios, as the higher levels of GDP outweigh the ultimate increases in expenditures.

- The revised mortality assumption has minimal impact on the cost ratios.
- The increase in the assumed proportions of earners in the population decreases the cost ratios since it results in higher levels of projected GDP.
- The assumption that the real-wage differential will increase to an ultimate level of 1.1% produced a small decrease in the cost ratios, as the projected GDP is somewhat higher.
- The reduction in the assumed rate of price increases between 2001 and 2015 results in almost no change in the cost ratios, because the savings due to lower increases in benefits in payment are offset by the slower growth in GDP.
- Changes to the recipient rates assumptions have the effect of decreasing the ultimate cost ratios.

Some of the less significant assumptions, which are described in Appendix B, were also changed. For example, the experience adjustment factors applied in the projection of earnings and GDP were revised to reflect more recent experience. Overall, the changes in these other assumptions had the effect of increasing projected GDP and thereby decreasing the projected cost ratios.

Appendix E – Detailed Projections of Beneficiaries and Expenditures

Table 33 Beneficiaries (Basic Pension)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	99	1,556	1,655	119	2,074	2,193	217	3,631	3,848
2002	105	1,579	1,683	126	2,092	2,218	231	3,671	3,901
2003	111	1,604	1,715	134	2,115	2,249	245	3,719	3,964
2004	118	1,631	1,749	142	2,140	2,282	260	3,771	4,031
2005	125	1,659	1,783	151	2,166	2,317	275	3,825	4,100
2010	166	1,857	2,023	201	2,353	2,554	368	4,210	4,577
2015	227	2,196	2,424	275	2,686	2,961	502	4,883	5,385
2025	340	3,058	3,398	397	3,608	4,006	737	6,666	7,403
2050	461	3,937	4,398	510	4,675	5,186	971	8,613	9,583
2075	519	4,398	4,917	556	5,105	5,661	1,075	9,503	10,579

Table 34 Expenditures (Basic Pension)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	162	8,206	8,368	197	10,937	11,135	359	19,144	19,503
2002	174	8,512	8,686	213	11,280	11,493	387	19,792	20,178
2003	188	8,819	9,007	230	11,631	11,861	418	20,450	20,868
2004	203	9,146	9,349	249	12,002	12,251	452	21,148	21,600
2005	220	9,487	9,707	269	12,389	12,657	489	21,876	22,365
2010	329	11,880	12,209	403	15,055	15,458	732	26,935	27,666
2015	519	16,108	16,627	635	19,701	20,336	1,154	35,809	36,963
2025	1,038	30,136	31,174	1,225	35,563	36,788	2,263	65,699	67,962
2050	2,836	81,252	84,088	3,223	96,483	99,706	6,059	177,735	183,794
2075	6,642	190,015	196,657	7,328	220,585	227,914	13,970	410,600	424,571

Table 35 GIS Beneficiaries (Total)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	410	76	486	733	160	894	1,143	236	1,379
2002	414	80	494	743	162	906	1,157	243	1,400
2003	419	83	503	754	164	918	1,173	247	1,421
2004	425	86	511	764	166	930	1,189	252	1,441
2005	431	88	519	774	168	942	1,205	256	1,461
2010	462	99	561	818	176	994	1,281	275	1,555
2015	516	111	627	882	191	1,073	1,398	302	1,699
2025	624	135	758	1,040	229	1,269	1,663	364	2,027
2050	581	122	702	1,095	229	1,324	1,676	350	2,026
2075	465	98	563	915	191	1,106	1,380	289	1,669

Table 36 GIS Expenditures (Total)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	1,112	512	1,624	2,451	1,175	3,627	3,563	1,688	5,251
2002	1,149	555	1,704	2,529	1,217	3,746	3,679	1,772	5,451
2003	1,185	586	1,770	2,611	1,255	3,866	3,796	1,841	5,637
2004	1,222	616	1,839	2,696	1,294	3,989	3,918	1,910	5,828
2005	1,261	647	1,908	2,781	1,333	4,114	4,042	1,980	6,022
2010	1,515	804	2,319	3,273	1,560	4,833	4,788	2,364	7,152
2015	1,950	1,024	2,974	4,041	1,939	5,980	5,991	2,963	8,954
2025	3,196	1,672	4,868	6,434	3,137	9,571	9,630	4,809	14,439
2050	6,364	3,178	9,542	14,927	6,535	21,462	21,290	9,713	31,003
2075	10,894	5,304	16,199	26,629	11,406	38,034	37,523	16,710	54,233

Table 37 GIS Beneficiaries (Single)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	152	25	177	547	128	674	699	152	851
2002	155	27	183	555	129	683	710	156	866
2003	158	28	186	564	129	692	722	156	878
2004	161	28	189	572	129	701	733	157	890
2005	164	28	192	580	130	710	744	158	902
2010	179	30	209	615	134	748	794	164	958
2015	201	34	236	660	145	805	861	179	1,040
2025	251	42	293	786	175	961	1,037	218	1,254
2050	262	41	303	901	187	1,088	1,163	228	1,391
2075	222	34	256	775	160	935	997	194	1,191

Table 38 GIS Expenditures (Single)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	555	185	740	2,067	956	3,023	2,621	1,141	3,762
2002	580	207	787	2,136	984	3,119	2,715	1,190	3,906
2003	600	214	814	2,207	1,006	3,212	2,807	1,219	4,026
2004	622	220	842	2,280	1,029	3,309	2,901	1,250	4,151
2005	644	227	872	2,353	1,054	3,407	2,997	1,282	4,279
2010	786	273	1,059	2,775	1,215	3,990	3,561	1,488	5,049
2015	1,018	351	1,369	3,420	1,510	4,930	4,437	1,861	6,298
2025	1,713	584	2,297	5,468	2,463	7,931	7,181	3,047	10,228
2050	3,705	1,206	4,911	13,288	5,431	18,719	16,993	6,637	23,630
2075	6,619	2,105	8,725	24,042	9,699	33,741	30,661	11,804	42,465

Table 39 GIS Beneficiaries (Spouse a Pensioner)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	168	25	193	168	25	193	337	50	386
2002	164	26	190	168	26	195	333	52	385
2003	165	28	193	170	28	198	335	56	391
2004	166	29	195	171	29	201	337	59	396
2005	167	31	197	173	31	203	339	61	400
2010	170	34	205	180	34	214	350	69	419
2015	182	36	219	195	37	232	377	73	451
2025	218	44	261	222	43	265	440	87	526
2050	196	40	236	162	31	193	358	71	429
2075	145	30	174	111	21	133	256	51	307

Table 40 GIS Expenditures (Spouse a Pensioner)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	315	171	486	315	171	486	630	342	972
2002	314	184	497	320	184	504	633	368	1,001
2003	320	200	520	327	199	526	647	399	1,046
2004	327	215	542	335	213	549	662	428	1,090
2005	333	230	563	343	227	570	676	457	1,133
2010	376	290	666	395	284	680	772	574	1,346
2015	462	350	812	491	351	842	953	701	1,654
2025	742	567	1,309	753	547	1,300	1,495	1,114	2,610
2050	1,413	1,093	2,506	1,161	837	1,998	2,574	1,930	4,504
2075	2,197	1,698	3,895	1,674	1,204	2,878	3,871	2,902	6,773

Table 41 GIS Beneficiaries (Spouse Not a Pensioner)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	48	10	58	15	6	20	63	16	79
2002	53	11	64	16	6	21	69	16	85
2003	54	11	65	16	6	22	70	17	87
2004	56	12	67	16	6	22	72	17	89
2005	57	12	69	17	5	22	74	17	91
2010	63	13	76	19	6	24	82	19	100
2015	71	15	86	20	6	26	91	21	112
2025	77	16	93	24	7	31	101	24	125
2050	55	11	66	25	8	33	80	19	99
2075	37	7	44	22	7	29	59	14	74

Table 42 GIS Expenditures (Spouse Not a Pensioner)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	142	76	217	60	40	100	202	116	317
2002	153	82	236	63	41	104	217	123	339
2003	159	86	245	66	41	107	225	127	352
2004	164	91	255	69	41	111	233	132	366
2005	170	95	265	72	42	114	242	137	379
2010	206	119	325	88	47	135	294	166	460
2015	265	152	417	109	60	168	374	212	585
2025	392	227	620	178	97	275	570	324	894
2050	597	326	923	416	212	628	1,013	538	1,551
2075	857	456	1,312	798	400	1,197	1,654	856	2,510

Table 43 GIS Beneficiaries (Spouse with Allowance)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	41	16	57	4	2	6	45	18	63
2002	41	16	58	4	2	6	46	18	64
2003	42	17	59	4	2	6	46	19	65
2004	43	17	60	5	2	7	47	19	67
2005	44	18	61	5	2	7	48	20	68
2010	50	21	71	5	2	8	56	23	79
2015	62	25	87	6	3	9	68	28	96
2025	78	32	110	8	4	11	86	36	121
2050	69	29	98	7	3	10	76	32	107
2075	62	26	88	6	3	9	68	29	97

Table 44 GIS Expenditures (Spouse with Allowance)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	101	81	181	10	8	18	110	89	199
2002	102	82	185	11	9	20	113	91	205
2003	106	86	192	11	9	21	117	96	213
2004	110	90	200	11	10	21	121	100	221
2005	114	94	208	12	10	22	126	105	230
2010	146	122	269	15	13	28	161	136	297
2015	205	171	376	21	18	40	226	189	416
2025	348	293	642	35	31	65	383	324	707
2050	648	553	1,201	62	55	117	710	608	1,318
2075	1,221	1,045	2,266	115	103	218	1,337	1,148	2,485

Table 45 Allowance Beneficiaries (Total)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	8	1	8	82	5	87	90	6	95
2002	8	1	8	85	5	90	93	6	99
2003	8	1	9	88	6	94	96	6	103
2004	8	1	9	92	6	98	100	7	107
2005	9	1	9	96	6	102	104	7	112
2010	10	1	11	115	8	123	125	9	134
2015	10	1	11	114	8	122	124	9	133
2025	10	1	11	106	8	115	116	9	125
2050	5	1	6	55	6	61	61	6	67
2075	3	-	4	33	4	38	37	5	41

Table 46 Allowance Expenditures (Total)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	30	6	36	313	52	365	343	57	400
2002	32	6	37	331	56	387	363	62	424
2003	33	6	39	353	60	413	386	67	452
2004	35	7	42	375	65	441	410	72	482
2005	37	7	44	399	70	469	436	77	513
2010	49	10	59	539	99	638	588	109	696
2015	56	12	68	622	118	740	678	130	807
2025	74	17	90	800	160	959	873	176	1,049
2050	85	24	108	935	222	1,158	1,020	246	1,265
2075	114	40	155	1,270	353	1,623	1,384	393	1,776

Table 47 Allowance Beneficiaries (Regular)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	5	-	6	56	2	57	61	2	63
2002	6	-	6	59	2	60	64	2	66
2003	6	-	6	62	2	64	68	2	70
2004	6	-	6	65	2	67	71	2	73
2005	6	-	6	68	2	70	74	2	76
2010	7	-	8	81	2	84	89	3	91
2015	7	-	7	79	2	81	86	3	89
2025	6	-	7	70	2	72	76	2	78
2050	3	-	3	31	1	32	34	1	35
2075	2	-	2	15	-	15	16	1	17

Table 48 Allowance Expenditures (Regular)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	18	2	20	178	14	193	197	16	213
2002	19	2	21	192	16	208	211	18	229
2003	20	2	22	206	17	223	226	19	246
2004	21	2	24	221	18	239	242	21	263
2005	22	3	25	236	20	256	258	22	281
2010	29	3	33	316	27	343	345	31	376
2015	33	4	37	352	30	382	385	34	419
2025	41	5	45	418	36	453	458	41	499
2050	39	5	44	387	33	420	426	39	464
2075	44	10	54	392	34	426	436	44	480

Table 49 Allowance Beneficiaries (Survivor)
(thousands)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	2	-	3	26	4	30	28	4	32
2002	2	-	3	26	4	30	28	4	32
2003	2	-	3	27	4	31	29	4	33
2004	2	-	3	27	4	31	30	5	34
2005	2	-	3	28	4	32	30	5	35
2010	3	1	3	33	6	39	36	6	43
2015	3	1	4	35	6	41	38	7	45
2025	3	1	4	37	6	43	40	7	47
2050	2	-	3	25	5	29	27	5	32
2075	2	-	2	19	4	22	20	4	24

Table 50 Allowance Expenditures (Survivor)
(\$ million)

Year	Males			Females			Both Sexes		
	Partial	Full	Total	Partial	Full	Total	Partial	Full	Total
2001	12	4	16	134	38	172	146	41	187
2002	12	4	16	139	40	179	152	44	196
2003	13	4	17	147	43	190	160	47	207
2004	13	4	18	155	47	201	168	51	219
2005	14	5	19	164	50	214	178	55	233
2010	19	7	26	223	71	295	243	78	321
2015	23	8	32	270	87	358	293	96	389
2025	33	12	45	382	124	506	415	136	551
2050	46	18	64	548	189	737	594	207	802
2075	71	30	101	878	319	1,197	948	349	1,297

Appendix F – Acknowledgements

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