Office of the Superintendent of Financial Institutions Canada
Office of the Chief Actuary

Bureau du surintendant des institutions financières Canada
Bureau de l´actuaire en chef

Actuarial Report 32nd

on the Canada Pension Plan

as at 31 December 2024

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14 November 2025

The Honourable François-Philippe Champagne, P.C., M.P.
Minister of Finance and National Revenue
House of Commons
Ottawa, Canada
K1A 0A6

Dear Minister:

In accordance with section 115 of the *Canada Pension Plan*, which provides that an actuarial report shall be prepared every three years for purposes of the financial state review by the Minister of Finance and the ministers of the Crown from the provinces, I am pleased to submit the Thirty-Second Actuarial Report on the Canada Pension Plan, prepared as at 31 December 2024.

Yours sincerely,

Assia Billig

Digitally signed by Assia Billig
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Table of contents

Page

1 Highlights of the report 10
2 Introduction 13
2.1 Purpose of the report 13
2.2 Recent amendments 14
2.3 Subsequent events 14
2.4 Independent peer review process 14
2.5 Scope of the report 15
3 Methodology 16
4 Best-estimate assumptions 18
4.1 Introduction 18
4.2 Demographic assumptions 19
4.3 Economic and investment assumptions 24
4.4 Other assumptions 28
5 Results - base CPP 30
5.1 Overview 30
5.2 Contributions 31
5.3 Expenditures 33
5.4 Financial projections with statutory contribution rate 39
5.5 Financial projections with minimum contribution rate 45
6 Results – additional CPP 48
6.1 Overview 48
6.2 Contributions 49
6.3 Expenditures 50
6.4 Financial projections with statutory additional contribution rates 56
6.5 Financial projections with additional minimum contribution rates 61
7 Reconciliation with previous triennial report 64
7.1 Base CPP 64
7.2 Additional CPP 66
8 Actuarial opinion 69
Appendix - A Summary of plan provisions 70
Appendix - B Data, assumptions and methodology 86
Appendix - C Financing the Canada Pension Plan 170
Appendix - D Detailed reconciliation with previous triennial report 183
Appendix – E Uncertainty of results 188
Appendix – F Adjustment factors 211

List of tables

Page

Table 1 Best-estimate assumptions from 32nd report compared with 31st report - Canada 19
Table 2 Population of Canada less Quebec 24
Table 3 Economic assumptions 28
Table 4 Contributions - base CPP 33
Table 5 Beneficiaries - base CPP 34
Table 6 Beneficiaries by sex - base CPP 35
Table 7 Expenditures - base CPP 36
Table 8 Expenditures - base CPP, year 2025 constant dollars 37
Table 9 Expenditures as percentage of contributory earnings - base CPP 38
Table 10 Historical results - base CPP 40
Table 11 Financial projections - base CPP, statutory contribution rate of 9.9% 41
Table 12 Financial projections - base CPP, statutory contribution rate of 9.9%, year 2025 constant dollars 42
Table 13 Sources of revenues and funding of expenditures - base CPP, statutory contribution rate of 9.9% 44
Table 14 Financial projections - base CPP, minimum contribution rate of 9.21% for 2028 to 2033, 9.19% for 2034+ 46
Table 15 Progression of minimum contribution rate over time – base CPP 47
Table 16 Contributions - additional CPP 50
Table 17 Beneficiaries - additional CPP 52
Table 18 Beneficiaries by sex – additional CPP 53
Table 19 Expenditures - additional CPP 54
Table 20 Expenditures – additional CPP, year 2025 constant dollars 55
Table 21 Historical results - additional CPP 56
Table 22 Financial projections - additional CPP, statutory first and second additional contribution rates of 2.0% and 8.0% 57
Table 23 Financial projections - statutory first and second additional contribution rates of 2.0% and 8.0%, year 2025 constant dollars 58
Table 24 Sources of revenues - additional CPP, statutory first and second additional contribution rates of 2.0% and 8.0% 60
Table 25 Financial projections - additional CPP, first and second additional minimum contribution rates of 2.01% and 8.04% 62
Table 26 Progression of additional minimum contribution rates over time 63
Table 27 Change in assets - 31 December 2021 to 31 December 2024 - base CPP 65
Table 28 Summary of expenditures – 2022 to 2024 – base CPP 65
Table 29 Reconciliation of changes in minimum contribution rate 66

Table 30 Change in assets - 31 December 2021 to 31 December 2024 - additional CPP 67
Table 31 Summary of expenditures – 2022 to 2024 – additional CPP 67
Table 32 Reconciliation of changes in additional minimum contribution rates 68
Table 33 Scheduled contribution rates as per legislation 73
Table 34 Projected maximum additional CPP retirement benefit 77
Table 35 Projected maximum additional CPP disability benefit 80
Table 36 Projected maximum additional CPP survivor's benefit, survivor under age 65 82
Table 37 Projected maximum additional CPP survivor's benefit, survivor age 65 or over 83
Table 38 Data Sources 87
Table 39 Cohort fertility rates by age and year of birth 90
Table 40 Annual fertility rates by age group 91
Table 41 Assumed annual mortality improvement rates for Canada 93
Table 42 Mortality rates for Canada 94
Table 43 Life expectancies for Canada, without mortality improvements after the year shown 96
Table 45 Population of Canada by age 101
Table 46 Population of Canada less Quebec by age 102
Table 47 Analysis of population of Canada less Quebec by age 103
Table 48 Births, net migrants, and deaths for Canada less Quebec 104
Table 49 Active and employed populations (Canada, ages 15 and over) 106
Table 50 Labour force participation, employment, and unemployment rates (Canada, ages 15 and over) 107
Table 51 Labour force participation rates (Canada) 107
Table 52 Employment of population (Canada, ages 18 to 69) 110
Table 53 Active and employed populations (Canada less Quebec, ages 15 and over) 111
Table 54 Labour force participation rates (Canada less Quebec) 111
Table 55 Employment of population and proportion of earners (Canada less Quebec, ages 18 to 69) 112
Table 56 Real wage increase and related components 115
Table 57 Average annual earnings (Canada less Quebec, by age group) 116
Table 58 Total earnings (Canada less Quebec, ages 18 to 69) 117
Table 59 Average pensionable earnings up to YMPE (Canada less Quebec) 118
Table 60 Average pensionable earnings up to YAMPE (Canada less Quebec) 118
Table 61 Proportion of contributors to the CPP, by age group 119
Table 62 Total adjusted contributory earnings for pensionable earnings up to YMPE 120
Table 63 Total adjusted contributory earnings for pensionable earnings up to YAMPE 121
Table 64 Net assets as at 31 December 2024 122
Table 65 Initial asset mix as at 31 December 2024 for base and additional CPP 124

Table 66 Real rates of return by asset type (before investment expenses and allocation for rebalancing and diversification) 130
Table 67 Asset mix, portfolio risk, and expected rates of return (before investment expenses) 132
Table 68 Additional CPP pool structure 133
Table 69 Asset mix, portfolio risk, and expected rates of return (before investment expenses) 133
Table 70 Ultimate rates of return on base and additional CPP assets (2042+) 135
Table 71 Annual rates of return on CPP assets 135
Table 72 Benefits payable as at 31 December 2024 – base and additional CPP 136
Table 73 Benefit eligibility rates by type of benefit (percentages) 139
Table 74 Average earnings-related benefit as percentage of maximum benefit - base CPP 141
Table 75 Average additional earnings-related benefit as percentage of maximum additional benefit - additional CPP 142
Table 76 Retirement pension take-up rates (cohort aged 65 in 2031+) 145
Table 77 New retirement beneficiaries and pensions - base CPP 146
Table 78 New retirement beneficiaries and pensions - additional CPP 147
Table 79 Mortality rates of retirement beneficiaries 148
Table 80 Life expectancies of retirement beneficiaries, with improvements after the year shown 148
Table 81 CPP working beneficiaries who are contributors as a proportion of retirement beneficiaries (2025+) 149
Table 82 Average contributory earnings of working beneficiaries with pensionable earnings up to the YMPE 150
Table 83 Average contributory earnings of working beneficiaries with pensionable earnings up to the YAMPE 151
Table 84 Working beneficiaries - contributors, contributions, and post-retirement benefits 152
Table 85 Ultimate disability incidence rates (2029+) 155
Table 86 Number of new disability beneficiaries 156
Table 87 New disability pensions and post-retirement disability benefits 157
Table 88 Disability termination rates in 2025 and 2035 (ultimate), by age, sex, and duration of disability 158
Table 89 Assumed proportion of contributors married or in a common-law relationship at time of death (2026+) 159
Table 90 Number of new survivor beneficiaries - base CPP 160
Table 91 Number of new survivor beneficiaries - additional CPP 161
Table 92 Average new monthly survivor's pension - base CPP 162
Table 93 Average new survivor pension - additional CPP 163
Table 94 Mortality rates of survivor beneficiaries 164
Table 95 Life expectancies of survivor beneficiaries, with improvements after the year shown 164
Table 96 Number of death benefits 165

Table 97 New children's benefits 166
Table 98 Operating expenses – base CPP 168
Table 99 Operating expenses - additional CPP 169
Table 100 Full funding rates in respect of the amendments to the base CPP 175
Table 101 Additional CPP balance sheet (open group basis) 177
Table 102 Base CPP balance sheet (open group basis) 181
Table 103 Additional CPP balance sheet (open group basis) 182
Table 104 Reconciliation of changes in minimum contribution rate - base CPP 185
Table 105 Reconciliation of changes in additional minimum contribution rates 187
Table 106 Base CPP MCR as at December 31, 2024 based on different levels of starting assets 189
Table 107 Probability distribution of MCR as at 31 December 2027 based on 2025-2027 intervaluation investment experience 190
Table 108 Additional CPP FAMCR as at December 31, 2045 based on different levels of starting assets 191
Table 109 Probability distribution of FAMCR as at 31 December 2048 based on 2046-2048 investment returns experience 192
Table 110 Individual sensitivity test assumptions - Canada 193
Table 111 Sensitivity of base CPP minimum contribution rate 195
Table 112 Sensitivity of additional CPP minimum contribution rates 196
Table 113 Higher and lower economic growth sensitivity scenarios 199
Table 114 Assumed annual nominal wage increase by category of earners and scenario (2025-2055) 201
Table 115 Impact on the base CPP MCR of different earners and earnings distributions 202
Table 116 Climate change impact on economic and investment assumptions 209
Table 117 Climate change impact on base CPP MCR 210
Table 118 Alternative assumptions – Changes relative to CPP32 best-estimate assumptions 213
Table 119 Adjustment factors 214
Table 120 Cumulative adjustments from adjustment factors on the retirement pension by age 215

List of charts

Page

Chart 1 Historical and projected total and cohort fertility rates for Canada 91
Chart 2 Life expectancies at birth for Canada, without mortality improvements after the year shown 95
Chart 3 Life expectancies at age 65 for Canada, without mortality improvements after the year shown 95
Chart 4 Net migration rate (Canada) 99
Chart 5 Age distribution of the population of Canada less Quebec 100
Chart 6 Population of Canada less Quebec 103
Chart 7 Components of the labour market 105
Chart 8 Illustrative two-pool investment structure of the CPPIB 123
Chart 9 Historical and projected retirement pension take-up rates for males at ages 60, 65 and 70 144
Chart 10 Historical and projected retirement pension take-up rates for females at ages 60, 65 and 70 144
Chart 11 Historical disability incidence rates 153
Chart 12 Assets/Expenditures ratio – base CPP (statutory and minimum contribution rates) 179
Chart 13 Assets/Expenditures ratio – additional CPP (statutory and additional minimum contribution rates) 180
Chart 14 Scenario impact on distribution of earners categories relative to best estimate 201
Chart 15 Downside risk scenarios – cumulative real GDP impact for Canada and the U.S. relative to NGFS baseline scenario (physical and transition risks) 207
Chart 16 Delayed transition scenarios – cumulative real GDP impact for Canada and the U.S. relative to NGFS baseline scenario (physical and transition risks) 208
Chart 17 Annual impact on Canada real policy rates relative to NGFS baseline scenario (transition risk only) 209

1 Highlights of the report

Main findings – 32nd CPP Actuarial Report

	BASE CPP	ADDITIONAL CPP
Contributions	➢ The number of CPP contributors is expected to grow from 16.1 million in 2025 to 19.3 million in 2050	
	Under the statutory contribution rate of 9.9% for year 2025 and thereafter:	Under the statutory first and second additional contribution rates of 2.0% and 8.0% respectively for year 2025 and thereafter:
	➢ Contributions are expected to increase from $73 billion in 2025 to $177 billion in 2050.	➢ Contributions are expected to increase from $19 billion in 2025 to $46 billion in 2050.
	➢ Contributions are projected to be higher than expenditures up to and including the year 2030.	➢ Contributions are projected to be higher than expenditures up to and including the year 2057.
Expenditures	➢ The number of retirement beneficiaries is expected to increase from 6.4 million in 2025 to 9.5 million in 2050.	➢ The number of retirement beneficiaries is expected to increase from 1.5 million in 2025 to 8.6 million in 2050.
	➢ Total expenditures are projected to grow from $68 billion in 2025 to $197 billion in 2050.	➢ Total expenditures are projected to grow from $0.6 billion in 2025 to $29 billion in 2050.
Assets	➢ Total assets are projected to grow from $651 billion at the end of 2024 to $963 billion by 2030 and $2.9 trillion by 2050.	➢ Total assets are projected to grow from $54 billion at the end of 2024 to $214 billion by 2030 and $1.4 trillion by 2050.
	➢ In 2050, investment income is projected to represent 48% of revenues.	➢ In 2050, investment income is projected to represent 62% of revenues.
Minimum contribution rates needed to sustain the CPP	➢ The minimum contribution rate as a percentage of contributory earnings is 9.21% for years 2028 to 2033 and 9.19% for year 2034 and thereafter.	➢ The first additional minimum contribution rate as a percentage of contributory earnings is 2.01% for year 2028 and thereafter. ➢ The second additional minimum contribution rate as a percentage of contributory earnings above the YMPE up to the YAMPE is 8.04% for year 2028 and thereafter.
	➢ **The base minimum contribution rate is lower than the statutory contribution rate. Although the additional minimum contribution rates are above the statutory contribution rates, they still fall within permitted deviations. The respective minimum contribution rates for the base and additional Plan are therefore sufficient to sustain them over the long term. In the absence of specific action by the federal and provincial Ministers of Finance, the statutory contribution rates will remain as scheduled.**	

Uncertainty – 32nd CPP Actuarial Report (1), (2)

	BASE CPP	ADDITIONAL CPP
Real rate of return assumption	The 32nd CPP Actuarial Report is based on an assumed 75-year average annual real rate of return of 4.05% for the base CPP and 3.53% for the additional CPP.	
	If lower average returns are assumed (2.45% for the base CPP and 2.33% for the additional CPP), this would result in:	
	➢ The MCR increasing from 9.19% to 11.38%.	➢ The FAMCR increasing from 2.01% to 2.97%.
	If higher average returns are assumed (5.65% for the base CPP and 4.73% for the additional CPP), this would result in:	
	➢ The MCR decreasing from 9.19% to 7.10%.	➢ The FAMCR decreasing from 2.01% to 1.33%.
Mortality assumption	The 32nd CPP Actuarial Report is based on the assumption that mortality will continue to improve but at a slower pace than over the last few decades.	
	If longevity were to improve faster than assumed (projected life expectancies at age 65 in 2050 that are approximately 2.5 years higher), this would result in:	
	➢ The MCR increasing from 9.19% to 9.69%.	➢ The FAMCR increasing from 2.01% to 2.21%.
	If longevity were to improve slower than assumed (projected life expectancies at age 65 in 2050 that are approximately 2.5 years lower), this would result in:	
	➢ The MCR decreasing from 9.19% to 8.63%	➢ The FAMCR decreasing from 2.01% to 1.76%.
Economic growth	The 32nd CPP Actuarial Report is based on the assumption of moderate and sustained economic growth.	
	If lower economic growth is assumed with total employment earnings in 2035 being 11% lower, this would result in:	
	➢ The MCR increasing from 9.19% to 9.58% .	➢ The FAMCR decreasing from 2.01% to 1.73%.
	If higher economic growth is assumed with total employment earnings in 2035 being 16% higher, this would result in:	
	➢ The MCR decreasing from 9.19% to 8.88%.	➢ The FAMCR increasing from 2.01% to 2.37%.
	The impacts are in the opposite direction for the base and additional Plans due to the different financing approaches of the two components of the CPP.	

(1) Unless specified otherwise, the MCR quoted in the table is for year 2034 and thereafter. The FAMCR is for year 2028 and thereafter.
(2) The SAMCR is equal to four times the FAMCR.

Scenario analysis – 32nd CPP Actuarial Report – Base CPP (1)

The 32nd CPP Actuarial Report includes a section that uses scenario analysis to assess and illustrate relevant risks to the funding of the base CPP. Since the additional CPP is still at its early stages, it is not included in this section. The scenarios presented are not meant to represent forecasts or predictions and should be interpreted with caution.

Earnings distribution	The 32nd CPP Actuarial Report assumes the same increase in earnings at each earnings level.
	The pattern of increase in earnings by earnings level may change as new technologies, automatization, immigration patterns, population aging and skills requirements evolve. These changes could affect the future funding of the CPP. Two scenarios were analyzed and their impacts on the MCR relative to the best estimate are as follows: ➢ Scenario 1 – Benefit to middle earners: Higher wage increases for middle earners relative to higher earners which results in a MCR of 8.98%, a decrease of 0.21 percentage points compared to the best estimate. ➢ Scenario 2 – Benefit to higher earners: Higher wage increases for higher earners relative to middle earners which results in a MCR of 9.61%, an increase of 0.42 percentage points compared to the best estimate.
Acute economic event	The 32nd CPP Actuarial Report is based on the assumption of sustained moderate economic growth.
	A scenario was developed to illustrate the impact of an acute, relatively short-term economic event that unfolds over a period of 4 years starting in 2026. This scenario results in higher inflation and unemployment, and lower growth in real wages and real rates of return. This hypothetical acute economic event scenario would result in: ➢ The MCR increasing to 9.55%, which is an increase of 0.36 percentage points compared to the best estimate.
Climate scenarios	Climate change can affect the CPP through various channels given its potential impact on the future demographic, economic, and investment environments. However, there is a lot of uncertainty on the direction and magnitude of these potential impacts, and the risk is evolving constantly.
	Two sets of scenarios from the Network of Central Banks and Supervisors for Greening the Financial System were used to illustrate potential climate risk and outcomes. The first set consists of downside risk scenarios (most severe risk levels for damage and temperature functions) for three different scenario narratives: net zero 2050, delayed transition, and current policies. The second set focuses on the delayed transition scenario narrative and illustrates a range of potential outcomes by varying risk levels for the damage function. ➢ Based on the downside risk scenarios, the MCR could vary between 9.34% and 10.68% depending on the scenario narrative. ➢ Based on the delayed transition scenarios, the MCR could vary between 8.95% and 9.43% depending on the risk level for the damage function.

(1) Unless specified otherwise, the MCR quoted in the table is for year 2034 and thereafter.

2 Introduction

2.1 Purpose of the report

This is the 32nd Actuarial Report on the Canada Pension Plan since the inception of the Canada Pension Plan (CPP or the Plan) in 1966. The valuation date is 31 December 2024. This report has been prepared in compliance with the timing and information requirements of the *Canada Pension Plan*. Section 113.1 of the *Canada Pension Plan* provides that the Minister of Finance and ministers of the Crown from the provinces shall review the financial state of the CPP once every three years and may consequently make recommendations to change the benefits or contribution rates, or both. Section 113.1 identifies the factors the ministers consider in their review, including information to be provided by the Chief Actuary.

The CPP retirement pension is subject to adjustment factors for early (pre-65) or late (post-65) commencement. In accordance with subsection 115(1.11) of the *Canada Pension Plan*, in the first actuarial report prepared after 2015 and in every third report that follows, the Chief Actuary is required to specify the adjustment factors as calculated according to a methodology that they deem appropriate. The relevant material is presented in Appendix - F. The Minister of Finance and ministers of the Crown from the provinces shall, as part of their triennial review, review the adjustment factors specified by the Chief Actuary and may make recommendations as to whether the scheduled adjustment factors should be changed. This 32nd CPP Actuarial Report as at 31 December 2024 is the second report for which the Chief Actuary is required to specify the factors in accordance with the legislation.

Since 1 January 2019, the CPP has two components: the base and additional Plans. The CPP consisted only of the base Plan (or base CPP) prior to 2019, and this component continues. The additional Plan (or additional CPP) is the enhancement to the CPP as of 2019. When not qualified, the term “CPP” or the “Plan” used in this report refers to the entire CPP, that is, to both its components.

An important purpose of the report is to inform contributors and beneficiaries of the current and projected financial states of the base and additional CPP. The report provides information to evaluate the financial sustainability of the base and additional Plans over a long period, assuming that the legislation remains unchanged. Such information facilitates a better understanding of the financial states of the base and additional Plans and the factors that influence costs, and thus contributes to an informed public discussion of issues related to the finances of the two components of the CPP.

The previous triennial report was the 31st Actuarial Report on the Canada Pension Plan as at 31 December 2021, which was tabled in the House of Commons on 14 December 2022.

This 32nd CPP Actuarial Report takes into account all amendments to date regarding the CPP statute, with the most recent changes listed in the following section. It also takes into account recent demographic, economic, and investment experience data as described in section B.2 of Appendix - B. Additionally, the report is based on the Chief Actuary’s best-estimate assumptions,

which consider various forecasts from experts in these areas.

This report presents projections of CPP revenues and expenditures for both of its components, the base and additional CPP, over a long period of time. Given the length of the projection period and the number of assumptions required, it is unlikely that actual future experience will develop precisely in accordance with the best-estimate projections.

This 32nd CPP Actuarial Report is intended solely for the above purposes. It was prepared to meet those specific objectives and may not be suitable for any other purposes prior to obtaining approval from the Office of the Chief Actuary (OCA).

For any questions regarding the proper use of this report, please contact the OCA.

2.2 Recent amendments

The *Canada Pension Plan* was subject to amendments after 31 December 2021 as follows[1]:

- Under the *Budget Implementation Act, 2024, No. 1*, which received Royal Assent on 20 June 2024, a top-up to the death benefit is provided for certain individuals, a new children's benefit for part-time students is created for dependent children of disabled or deceased contributors, eligibility is extended for the disabled contributors' child's benefit after the disabled parent reaches ages 65, and entitlement to a survivor's pension is ended following a credit split. The amendments are all effective 1 January 2025 and are taken into account in this 32nd CPP Actuarial Report.

2.3 Subsequent events

For this 32nd CPP Actuarial Report, there were no subsequent events, i.e. events which became known to the Chief Actuary after the valuation date, but before the report date, and that were deemed to have an effect on the financial states of the base or additional CPP as at the valuation date or during the projection period.

The Canadian and global economies are going through a period of heightened uncertainty, due in part to escalating trade tensions, environmental risks, and geopolitical conflicts. The future impacts of these issues and risks on the financial state of the CPP are still uncertain and evolving, and as such, they have not been recognized as subsequent events for the purpose of this report.

2.4 Independent peer review process

As part of its policy of ensuring that it provides sound and relevant actuarial advice to Members of Parliament and to the Canadian population, and as was done for previous reports, the OCA has commissioned an external peer review of this actuarial report on the CPP. [2]

1 The amendments under the *Budget Implementation Act, 2022, No. 1*, as described in the 31st CPP Actuarial Report and included in that report's projections, are likewise included in the projections of this 32nd CPP Actuarial Report. The amendments have since received provincial approval.

2 More information on the CPP independent peer review process and the review of the previous triennial CPP actuarial report is available.

The external peer review is intended to ensure that the actuarial reports meet high professional standards and are based on reasonable methods and assumptions. Over the years, peer review recommendations have been carefully considered and many of them implemented.

2.5 Scope of the report

Section 3 presents a general overview of the methodology used in preparing the actuarial estimates included in this report, which are based on the best-estimate assumptions described in section 4. The results for the base Plan and additional Plan are presented separately in sections 5 and 6, respectively, and include for each component the projections of the revenues, expenditures, and assets over the next 75 years. Section 7 provides the reconciliation of the results for the base and additional Plans with those of the 31st CPP Actuarial Report, while section 8 provides the actuarial opinion.

The various appendices provide a summary of the Plan provisions, a description of the data, assumptions and methodology employed, supplemental information on the financing of the CPP, detailed reconciliations of the results with the previous report, and the uncertainty of results. In addition, Appendix F provides the adjustment factors for pre-65 and post-65 retirement pension take-up as calculated on the basis of this report and in accordance with subsection 115(1.11) of the *Canada Pension Plan*.

3 Methodology

The actuarial examination of the CPP involves projections of the revenues and expenditures of both components (base CPP and additional CPP) over a long period of time, so that the future impacts of historical and projected trends in demographic, economic, and investment factors can be properly assessed. The actuarial estimates in this report are based on the provisions of the *Canada Pension Plan* as at 31 December 2024,[3] historical experience data used for the starting point of the projections, and best-estimate assumptions regarding future demographic, economic and investment experience.

The revenues of the base and additional Plans include both contributions and investment income. The projection of contributions begins with a projection of the working-age population. This requires assumptions regarding demographic factors such as fertility, migration, and mortality. Total contributory earnings for each component of the Plan are derived by applying labour force participation and job creation rates to the projected population and by projecting future average employment earnings. This requires assumptions about various factors such as wage increases, earnings distributions, and unemployment rates. Contributions for each of the components of the CPP are obtained by applying the respective component's contribution rate(s) to the respective contributory earnings. Investment income is projected on the basis of the existing portfolios of assets for the base and additional CPP, the respective projected net cash flows (contributions less expenditures), and the respective assumptions regarding the future asset mix and rates of return on investments net of investment expenses. Since the assumptions regarding the future asset mix differ between the base and additional Plans, the resulting assumptions regarding investment returns differ as well.

Expenditures for each component of the Plan consist of the benefits paid out and operating expenses. Newly emerging benefits are projected by applying assumptions regarding retirement, disability, and death to the populations eligible for benefits, together with the benefit provisions and the earnings histories of cohorts (actual and projected). The projection of total benefits, which includes the continuation of benefits already in pay at the valuation date, requires further assumptions such as assumptions regarding the mortality rates of retirement beneficiaries. Operating expenses, excluding operating expenses relating to professional management of the CPP Fund by the Canada Pension Plan Investment Board (CPPIB), are projected by considering the historical and projected relationship between expenses and total employment earnings, while CPPIB operating expenses are considered in the determination of the rates of return.

The assumptions and results presented in the following sections make it possible to measure the financial states of the base and additional CPP separately in each projection year and to calculate the minimum contribution rates. The minimum contribution rates are determined separately for each component based on prescribed methodologies.

3 The *Budget Implementation Act, 2024, No. 1*, which received Royal Assent on 20 June 2024, contains amendments to the CPP statute. These amendments are reflected in this 32nd CPP Actuarial Report, as described in section 2.2.

For the base Plan, the minimum contribution rate (MCR) is the sum of two types of rates. The first rate is referred to as the “steady-state” contribution rate. The second type of rate that makes up the MCR is the full funding rate for increased or new benefits.

For the additional CPP, there are two additional minimum contribution rates (AMCRs), the first additional minimum contribution rate (FAMCR) and the second additional minimum contribution rate (SAMCR). The FAMCR is applicable to contributory earnings below the Year’s Maximum Pensionable Earnings (YMPE) and the SAMCR is applicable to contributory earnings between the YMPE and the Year’s Additional Maximum Pensionable Earnings (YAMPE).

Details of the methodologies used to determine the MCR and AMCRs are presented in Appendix - C.

A wide variety of factors influence both the current and projected financial states of the components of the CPP. Accordingly, the results shown in this report differ from those shown in previous reports. Likewise, future actuarial examinations will likely reveal results that differ from the projections included in this report.

4 Best-estimate assumptions

4.1 Introduction

The information required by statute, which is presented in sections 5 and 6 of this report, necessitates making numerous assumptions regarding future demographic, economic, and investment trends. The projections included in this report cover a long period of time (75 years).

The assumptions selected reflect the long projection period and the expectation that the CPP will continue indefinitely. The assumptions are determined by examining historical short- to long-term trends and applying judgment as to the extent these trends will continue in the future. These assumptions, which do not include any margins for adverse deviations, reflect the Chief Actuary's best judgment and are referred to in this report as the best-estimate assumptions. The assumptions were selected to be independently reasonable and appropriate in the aggregate, taking into account certain interrelationships between them.

The use of best-estimate assumptions is considered to be the most appropriate choice for projecting the long-term financial state of the CPP given the Plan's legislation. Under section 113.1 of the *Canada Pension Plan*, the Chief Actuary must determine the lowest constant contribution rates that, if maintained over the foreseeable future, achieve certain measures for the base and additional Plans. References to the 'lowest constant rate(s)' in section 113.1 justify using best-estimate assumptions without any adjustments for adverse deviations.

For this 32nd CPP Actuarial Report, there were no subsequent events, i.e. events which became known to the Chief Actuary after the valuation date, but before the report date, and that were deemed to have an effect on the financial states of the base or additional CPP as at the valuation date or during the projection period.

The Chief Actuary held a virtual seminar in September 2024 on the long-term demographic, economic, and investment outlook for Canada to obtain opinions from a wide range of individuals with relevant expertise. Experts in the fields of demographics, economics, and investments were invited to present their views. The topics discussed included short- to long-term perspectives on capital markets and risks, the labour market and the economy, as well as population projections with a separate session on immigration.

Among the participants at the seminar were representatives from the OCA, federal departments including Statistics Canada, Employment and Social Development Canada (ESDC), and the Department of Finance, representatives from provincial and territorial governments, as well as representatives from Retraite Québec, the CPPIB, the U.S. Office of the Chief Actuary of the Social Security Administration, and other organizations. Representatives of the OCA also attended workshops hosted by Retraite Québec in October 2024 to launch the actuarial valuation of the Quebec Pension Plan.

OCA staff also sought expert perspectives on demographic, economic, and investment-related

topics by attending various webinars, consulting numerous publications, and consulting with other experts. These expert perspectives were all considered in developing the best-estimate assumptions for this 32nd CPP Actuarial Report.

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

Table 1 Best-estimate assumptions from 32nd report compared with 31st report - Canada

Assumptions	32nd report (as at 31 December 2024)	31st report (as at 31 December 2021)
Total fertility rate	1.35 (2033+)	1.54 (2029+)
Mortality	Statistics Canada Life Tables (CLT 1-year table: 2019) with assumed future improvements (1), (2)	Statistics Canada Life Tables (CLT 1-year table: 2019) with assumed future improvements (2)
Canadian life expectancy for male at birth in 2025 (3)	87.8 years	86.9 years
Canadian life expectancy for female at birth in 2025 (3)	91.0 years	90.2 years
Canadian life expectancy for male at age 65 in 2025 (3)	21.6 years	21.5 years
Canadian life expectancy for female at age 65 in 2025 (3)	24.1 years	24.0 years
Net migration rate (including changes in non-permanent residents)	0.72% of population (for 2051+)	0.64% of population (for 2031+)
Non-permanent residents level	2.5% of population (for 2050+) (4)	N/A (5)
Participation rate (age group 18-69)	80.0% (2035)	80.0% (2035)
Employment rate (age group 18-69)	75.3% (2035)	75.3% (2035)
Unemployment rate (age group 18-69)	5.9% (2028+)	5.9% (2027+)
Rate of increase in prices	2.0% (2027+)	2.0% (2026+)
Real wage increase	0.8% (2025+)	0.9% (2026+)
Real rate of return (average 2025-2099) - base CPP assets	4.05%	4.01%
Real rate of return (average 2025-2099) - additional CPP assets	3.53%	3.57%
Retirement rates for cohort at age 60 - males	21.0% (2026+)	26.0% (2022+)
Retirement rates for cohort at age 60 - females	22.0% (2026+)	28.0% (2022+)
CPP disability incidence rates (per 1,000 eligible) - males	2.70 (2029+)	2.76 (2026+) (6)
CPP disability incidence rates (per 1,000 eligible) - females	3.40 (2029+)	3.48 (2026+) (6)

(1) Projected mortality rates match historical data available (2020 to 2023).
(2) The assumed ultimate future improvements in mortality for the 32nd CPP Actuarial Report are 1.0% per year for ages under 90, 0.6% per year for ages 90 to 94, and 0.2% per year for ages 95 and over, compared to 0.8%, 0.5% and 0.2%, respectively, in the 31st CPP Actuarial Report.
(3) These are cohort life expectancies that take into account assumed future improvements in mortality.
(4) The level of non-permanent residents is assumed to trend down linearly across these periods: from 7.3% observed in 2024 to 5% in 2026, 4.0% in 2035, and to an ultimate rate of 2.5% in 2050, remaining at that level thereafter.
(5) There was a methodology change for setting the non-permanent residents' assumption in the 32nd CPP Actuarial Report as a percentage of the population. There is no comparable assumption for the 31st CPP Actuarial Report.
(6) The ultimate disability incidence rates assumption of the 31st CPP Actuarial Report have been adjusted based on the 2024 eligible population in order to compare on the same basis with the assumption of the 32nd CPP Actuarial Report.

4.2 Demographic assumptions

The population projections start with the Canada and Quebec populations on 1 July 2024, to which are applied fertility, migration, and mortality assumptions. The relevant population for the Canada Pension Plan is the population of Canada less that of Quebec and is obtained by subtracting the projected results for Quebec from those for Canada. The population projections are essential in determining the future number of CPP contributors and beneficiaries.

The age distribution of the population has changed significantly since the inception of the Plan in 1966. The proportion of the Canadian population aged 65 and above has increased from 7.6% in 1966 to 12.1% in 1996, and reached 18.9% in 2024, which indicates an aging population. It is assumed that the population aging will continue in the future, albeit to a more modest extent.

4.2.1 Fertility

One of the causes of the aging of the Canadian population is the decline in the total fertility rate that has occurred since the late 1950s. The total fertility rate in Canada decreased rapidly from a level of about 4.0 children per woman in the late 1950s to 1.6 by the mid-1980s. The total fertility rate then hovered between 1.5 and 1.7 until 2008. Similar to the experience in other industrialized countries, Canada's total fertility rate has decreased since 2008, with steeper decreases since 2020. Canada, once in the middle of the pack amongst industrialized countries, is now positioned with Italy and Japan as one of the countries with lower fertility rates.

The total fertility rate for Canada stood at 1.41 in 2020, and decreased further to 1.26 in 2023, the lowest rate ever recorded. Although not identical, the total fertility rate in Quebec followed a similar pattern to that of Canada. In 2020, the Quebec fertility rate was 1.53 and then declined further to 1.39 in 2023.

The rapid decrease in the total fertility rate between the late 1950s and mid-1980s occurred as a result of changes in a variety of social, medical, economic, and environmental-related factors. It is unlikely that the rate will return to historical levels in the absence of significant societal changes. Decreases in the fertility rate since 2008 could be largely attributable to the 2008 economic downturn and continuing economic uncertainty. The housing crisis, the increase in the number of non-permanent residents which tend to have lower fertility, as well as increased anxiety and mental health issues can also help explain the steep decreases in recent years.

To project the fertility rates in Canada for most age groups, a 20-year period of data ending in 2023 was used to establish a trending model that provides the best fit using historical patterns and anticipated future movements. Some adjustments were made for age groups 25-29 and 30-34. Fertility rates for certain age groups were also adjusted upwards to account for expected effects from the Canada-Wide Early Learning and Child Care plan (CWELCC).

The assumed age-specific fertility rates lead to an assumed total fertility rate for Canada that will increase from its 2023 level of 1.26 children per woman to an ultimate level of 1.35 in 2033. It is assumed that the increase from 2023 levels will result from the positive impact of the CWELCC, as well as a renewed rise in fertility rates among the 30–39 age group, driven by delayed childbearing decisions.

For Quebec, the fertility rate for each age group is based on an analysis of historical differences with the Canada fertility rate. The assumed age-specific fertility rates for Quebec lead to a total fertility rate for the province that will slightly increase from its 2023 level of 1.39 to an ultimate level of 1.40 in 2033.

4.2.2 Mortality

Another element that has contributed to the aging of the population is the significant reduction in the age-specific mortality rates, especially at older ages. This can be measured by the increase in life expectancy at age 65, which directly affects how long retirement benefits will be paid to beneficiaries. Calendar year male life expectancy (without future mortality improvements) at age 65 increased by 43% between 1966 and 2023, rising from 13.6 to 19.5 years. For women, it increased by 31%, from 16.9 to 22.2 years over the same period. Although the overall gains in life expectancy at age 65 since 1966 are similar for males and females, 67% of the increase occurred after 1991 for males, while for females, 47% of the increase occurred during that period.

Although Statistics Canada life tables were available up to 2023, data for calendar years 2020 to 2023 were excluded from the analysis for purposes of setting long-term mortality rates. Mortality tables for these years reflect significant mortality increases related to COVID-19 and opioid-related deaths, which are assumed to be temporary. Long-term future mortality rates are therefore determined by applying assumed mortality improvement rates to Statistics Canada's 2019 life tables. The projected mortality improvement rates are assumed to gradually reduce from their 15-year average ending in 2019 to ultimate levels in 2039, which are for both sexes 1.0% per year for ages below 90, 0.6% per year for ages 90 to 94, and 0.2% per year for ages 95 and above.

The assumed ultimate mortality improvement rates are based on an analysis of the Canadian experience over the period 1954 to 2019 and the possible drivers of future mortality improvements. Consideration was also given to benchmarks from peers as well as educational notes and research published by the Canadian Institute of Actuaries, including the most recent Mortality Improvements Research paper published in April 2024.

Short-term adjustments are then applied to projected mortality rates to match historical data available (2020 to 2023) and to reflect the temporary continuing impacts of the COVID-19 pandemic and opioid crisis. The COVID-19 pandemic is assumed to have a residual effect on mortality in 2024 and 2025, followed by an assumed full recovery and reversion to the projected unadjusted mortality rates for year 2026 and onward. The short-term adjustments also reflect the expectation that the opioid crisis will be temporary, and that mortality for affected age groups will revert to unadjusted mortality rates by 2039.

Considering the above, cohort life expectancy (with assumed future mortality improvements) at age 65 in 2025 is projected to be 21.6 years for males, and 24.1 years for females.

The mortality improvement rates for Quebec were developed using a similar methodology as for Canada. However, given that Quebec is not as affected by the opioid crisis, no corresponding short-term adjustments were applied. Quebec's cohort life expectancy (with future improvements) at age 65 in 2025 is projected to be 21.9 years for males and 23.9 years for females.

To project CPP benefits, the mortality rates for CPP retirement, survivor, and disability beneficiaries reflect actual experience for those segments of the population. Specific mortality experience for CPP beneficiaries is discussed further in Appendix - B of this report.

4.2.3 Net migration

Net migration corresponds to the number of immigrants less the net number of emigrants (i.e. the number of emigrants less the number of returning Canadians) plus the net increase in the number of non-permanent residents (NPR).

To select the assumptions regarding the short-term and ultimate rates, the components of net migration were analyzed separately by considering trends in the historical data as well as qualitative factors that could influence future trends. Consideration was also given to the federal government's short-term immigration targets and to long-term perspectives of various experts regarding levels of future immigration and non-permanent residents. For this valuation, a new methodology was developed to estimate the annual levels of NPR as a proportion of the population, from which the net increase in NPR is then derived.

In line with the government's short-term immigration targets, the immigration rate is expected to decrease from 1.12% of the population in 2024 to 0.96% in 2025, 0.92% in 2026, and 0.88% in 2027. After that, it is projected to gradually decrease to an ultimate rate of 0.82% by 2034. The ultimate rate of 0.82% corresponds to the 20-year average ending in 2024, which was selected to give some weight to generally higher levels of immigration observed since 2016 while still reflecting longer term historical trends.

The historical net emigration rate has been relatively stable. The net emigration rate is expected to decrease slightly from 0.12% of the population in 2024 to 0.11% by 2026 and remain at that level thereafter.

In recent years, there has been a significant increase in the number of NPR. By the end of 2024, the number of NPR reached an unprecedented level, representing 7.3% of the population. By contrast, based on the 20-year average ending in 2024, NPR represented 2.7% of the population. In addition, for the first time ever, the government announced short-term target for NPR, which is set at 5% of the population by the end of 2026.

To address the higher levels and volatility of the number of NPR in recent years, a new method was developed for this report to project the number of NPR separately from the rest of the population. For this purpose, an assumption is made for each year of the projection period regarding the level of NPR as a percentage of the population. The resulting annual changes in NPR can then be determined and flow through the overall net migration rate.

Based on the new NPR method, the number of NPR as a percentage of the population is expected to decrease from 7.3% of the population in 2024 to 5% of the population by 2026 as per the government's short-term targets. It is further assumed that this proportion will decrease to 4% by

2035 and to an ultimate rate of 2.5% by 2050. The ultimate rate of 2.5% was selected to give some weight to recent higher levels of NPR, while still reflecting longer-term historical trends.

As a result of the above, the net migration rate for Canada, including net changes in the level of NPR, is projected to decrease from its 2024 level of 2.88% of the population[4] to -0.34% in 2025 and -0.29% in 2026, and is then assumed to increase to 0.82% in 2027. Thereafter, the net migration rate is assumed to gradually transition to an ultimate level of 0.72% of the population in 2051. The assumed short-term net migration rate varies from the ultimate rate of 0.72% due to the Government of Canada's short-term targets and the assumed changes in the net migration components as percentages of the population.

For the Quebec population, the ultimate net migration rate assumption is set at 0.45% in 2051 and thereafter. The net migration assumption varies in the short term like for Canada.

4.2.4 Population projections

Table 2 shows the population of Canada less Quebec for three age groups (0-19, 20-64, and 65 and over) throughout the projection period. The ratio of the number of people aged 20-64 to those aged 65 and over is a measure that approximates the ratio of the number of working-age people to retirees. Because of the aging population, this ratio is projected to drop from an estimated value of 3.2 in 2025 to 1.9 by 2080.

4 For 2024, the net migration rate of 2.88% is the net result of: 1.12% immigration rate, - 0.12% net emigration rate, and +1.88% net changes in NPR

Table 2 Population of Canada less Quebec [1]
(thousands)

Year	Total	Age 0-19	Age 20-64	Age 65 and over	Ratio of 20-64 to 65 and over
2025	32,182	6,698	19,368	6,116	3.2
2026	32,149	6,677	19,139	6,333	3.0
2027	32,483	6,705	19,234	6,544	2.9
2028	32,768	6,718	19,292	6,758	2.9
2029	33,054	6,731	19,359	6,963	2.8
2030	33,330	6,743	19,437	7,150	2.7
2031	33,600	6,757	19,535	7,307	2.7
2032	33,863	6,768	19,655	7,440	2.6
2033	34,123	6,777	19,780	7,567	2.6
2034	34,372	6,785	19,896	7,692	2.6
2035	34,615	6,788	20,013	7,815	2.6
2040	35,799	6,854	20,665	8,280	2.5
2045	36,878	7,022	21,227	8,628	2.5
2050	37,863	7,129	21,657	9,077	2.4
2055	38,997	7,247	22,103	9,647	2.3
2060	40,154	7,379	22,420	10,355	2.2
2065	41,374	7,514	22,883	10,976	2.1
2070	42,639	7,665	23,509	11,466	2.1
2075	43,907	7,843	24,020	12,044	2.0
2080	45,144	8,033	24,507	12,604	1.9
2085	46,347	8,221	25,040	13,087	1.9
2090	47,549	8,406	25,677	13,467	1.9
2095	48,803	8,594	26,276	13,933	1.9
2100	50,125	8,789	26,890	14,446	1.9

(1) Components may not sum to totals due to rounding.

4.3 Economic and investment assumptions

The main economic assumptions to project the CPP cash flows are labour force participation rates, job creation rates, unemployment rates, the rate of increase in prices, and real increases in average employment earnings. Real rates of return by asset class as well as other investment assumptions are used to project the assets.

The economic assumptions selected in this report are based on the overall expectation of sustained moderate economic growth. Furthermore, a key element underlying the best-estimate economic assumptions relates to the continued trend toward longer working lives. Older workers are expected to exit the workforce at a later age, which could alleviate the impact of the aging of the population on future labour force growth. However, despite the expected later exit ages, labour force growth is projected to weaken as the working-age population expands at a slower

pace and baby boomers continue to exit the labour force.

4.3.1 Labour force

Employment levels vary with the rate of unemployment and reflect trends in increased workforce participation by women, longer periods of formal education among young adults, changes in the age structure of the working-age population, as well as changing retirement patterns of older workers.

As the population ages, older age groups with lower labour force participation increase in size. As a result, the labour force participation rate for Canadians aged 15 and over is expected to decline from an estimated value of 65.2% in 2025 to 64.4% in 2035. A more useful measure of the working-age population is the participation rate of those aged 18 to 69, which is expected to increase from an estimated 77.3% in 2025 to 80.0% in 2035. The increase in the participation rate for those aged 18 to 69 reflects several trends.

For example, it is assumed that female participation rates will continue to grow at a faster pace than male participation rates until 2035, thereby continuing to reduce the gap in participation rates between males and females, albeit at a slower pace than in the past. A part of this projected reduction can be attributed to the continuing impact of the Canada-Wide Early Learning and Child Care plan on female labour force participation.

It is also assumed that participation rates for age groups 55 and over for both sexes will increase as a result of an expected continued trend toward longer working lives.

It is expected that the projected aging of the population will create upward pressure on future participation rates as a larger proportion of the population no longer in the workforce will require services from a relatively smaller working-aged population. The participation rates for all age groups are thus expected to increase in response to this demographic shift.

Overall, the male participation rate of those aged 18 to 69 is expected to be 81.0% in 2025 and to increase to 83.1% by 2035, while the female participation rate for the same age group is expected to be 73.5% in 2025 and to increase to 76.9% by 2035. As such, the difference between male and female participation rates for the age group 18 to 69 is projected to be 7.5% in 2025 and decrease to 6.2% by 2035. Thereafter, the gap between participation rates for males and females, age group 18 to 69, is projected to vary between 6.1 and 6.2 percentage points.

The job creation rate, measured by the annual change in employment, was on average 1.6% from 1976 to 2024. Future job creation rates will depend on changes in the unemployment rates and the rate of labour force growth.

The unemployment rate (ages 15+) is projected to rise from 6.3% in 2024 to 7.0% in 2025, and then gradually decline to 6.1% by 2028.

In 2025 and 2026, the labour force is expected to contract mainly due to a decline in the NPR population. This will contribute to negative job creation during those years. Stronger job creation

rates are expected in 2027 and 2028 at rates of 1.2% and 1.0% respectively, as labour force growth resumes and unemployment falls. Starting in 2029, job creation rates are assumed to align with labour force growth, averaging 0.8% annually until 2035 and 0.4% thereafter. The aging population is the primary factor behind this slower long-term growth.

4.3.2 Price increases

On December 13, 2021, the Bank of Canada and the federal Government renewed their commitment to keep inflation between 1% and 3% with a target at the mid-point of 2% until the end of 2026. They further noted that the Bank of Canada will use the flexibility of the 1% to 3% range to actively seek the maximum sustainable level of employment to an extent that is consistent with keeping medium-term inflation expectations at 2%.

Despite the mid-point target of 2%, price increases (inflation), as measured by changes in the Consumer Price Index (CPI), will fluctuate from year to year. For instance, global imbalances in supply and demand during the COVID-19 outbreak, pent-up demand following the lifting of restrictions in 2021 and 2022, as well as the war in Ukraine that commenced in February 2022, contributed to upward pressure on prices, resulting in inflation peaking at 8.1% in June 2022. As the pandemic became more manageable, fiscal stimulus wound down. This, combined with demand and supply returning to equilibrium, allowed the inflation rate to gradually align with the Bank's 2% target, which it hit in August 2024. On an annual basis, the average inflation rate in 2024 was 2.4%.

In this report, the inflation rate in Canada is assumed to be 2.2% for 2025, decreasing to 2.1% in 2026, and returning to the 2.0% target for 2027 and thereafter. These assumed price increases are based on short-term forecasts from various economists[5] as well as the expectation that the Bank of Canada and federal Government will continue to renew the inflation target of 2.0%, and that the Bank of Canada will be successful in keeping inflation at its mid-point target in the long term.

4.3.3 Real wage increases

Wage increases affect the financial state of the CPP in two ways. In the short term, an increase in the average wage translates into higher contribution income, with little immediate impact on benefits. Over the long term, higher average wages produce higher benefits. The difference between nominal wage increases and inflation represents increases in the real wage, which is also referred to in this report as the real wage increase.

Two wage measures are used in this report: the average annual earnings (AAE) and the average weekly earnings (AWE). The assumed increase in AAE is used to project the total employment earnings of CPP contributors, while the assumed increase in the AWE is used to project the increase in the YMPE from one year to the next. The two measures are assumed to grow at the

5 As of January 2025.

same pace over the projection period.

Real AAE and real AWE are projected to increase by 0.8% in 2025 and for every year thereafter. This assumption is developed taking into account historical trends and future views on labour productivity, average hours worked and other contributing factors. The ultimate real AAE and real AWE increase assumption combined with the ultimate price increase assumption results in an assumed increase in nominal AAE and nominal AWE of 2.8% in 2027 and thereafter.

4.3.4 Real rates of return on investments

Real rates of return on investments are the excess of the nominal rates of return over price increases and are required for the projection of revenue arising from investment income. A real rate of return is assumed for each year in the projection period and for each of the main asset categories in which the base and additional CPP assets are invested. The assumption for each asset class is based on a combination of analysis of historical data (yields, returns, spreads, premiums, etc.) and potential future drivers, as well as judgment on the extent to which past trends will continue in the future. Consideration is also given to forecasts from relevant experts.

The assumed long-term real rates of return on base and additional CPP assets take into account the assumed asset mixes of investments of each CPP component. The real rates of return on investments are net of all investment expenses, including the CPPIB operating expenses.

The ultimate annual real rates of return for the base and additional CPP are respectively 4.02% and 3.53%, and these are reached in 2042.

For the period 2025 to 2041, the projected annual real rates of return for the base CPP are higher than the assumed ultimate long-term rates beginning in 2042, mainly due to a greater allocation to equities and the use of leverage. The average real rates of return for the 10-year period 2025-2034 for the base and additional CPP are respectively 4.23% and 3.47%.

The 75-year average real rate of return on the assets over the 2025-2099 projection period is assumed to be 4.05% for the base CPP and 3.53% for the additional CPP.

Table 3 summarizes the main economic assumptions over the projection period.

Table 3 Economic assumptions
(percentages)

Year	Real increase average annual earnings	Real increase average weekly earnings (YMPE)	Price increase	Labour force (Canada, 15+)				Real rates of return on investments	
				Participation rate	Job creation rate	Unemployment rate	Labour force annual increase	Base CPP	Additional CPP
2025	0.8	0.8	2.2	65.2	(0.7)	7.0	0.0	4.2	3.3
2026	0.8	0.8	2.1	64.8	(0.4)	6.7	(0.7)	4.3	3.4
2027	0.8	0.8	2.0	64.7	1.2	6.4	0.9	4.3	3.5
2028	0.8	0.8	2.0	64.6	1.0	6.1	0.7	4.3	3.5
2029	0.8	0.8	2.0	64.5	0.7	6.1	0.7	4.3	3.5
2030	0.8	0.8	2.0	64.4	0.7	6.1	0.7	4.2	3.5
2031	0.8	0.8	2.0	64.3	0.8	6.1	0.8	4.2	3.5
2032	0.8	0.8	2.0	64.3	0.8	6.1	0.8	4.2	3.5
2033	0.8	0.8	2.0	64.3	0.8	6.1	0.8	4.2	3.5
2034	0.8	0.8	2.0	64.4	0.7	6.1	0.7	4.1	3.5
2035	0.8	0.8	2.0	64.4	0.7	6.1	0.7	4.1	3.5
2040	0.8	0.8	2.0	64.0	0.4	6.1	0.4	4.1	3.5
2045	0.8	0.8	2.0	63.7	0.4	6.1	0.4	4.0	3.5
2050	0.8	0.8	2.0	63.2	0.2	6.1	0.2	4.0	3.5
2055	0.8	0.8	2.0	62.7	0.3	6.1	0.3	4.0	3.5
2060	0.8	0.8	2.0	62.1	0.3	6.1	0.3	4.0	3.5
2065	0.8	0.8	2.0	61.6	0.4	6.1	0.4	4.0	3.5
2070	0.8	0.8	2.0	61.2	0.4	6.1	0.4	4.0	3.5
2075	0.8	0.8	2.0	60.8	0.4	6.1	0.4	4.0	3.5
2080	0.8	0.8	2.0	60.4	0.4	6.1	0.4	4.0	3.5
2085	0.8	0.8	2.0	60.2	0.4	6.1	0.4	4.0	3.5
2090	0.8	0.8	2.0	60.0	0.4	6.1	0.4	4.0	3.5
2095	0.8	0.8	2.0	59.8	0.4	6.1	0.4	4.0	3.5
2100	0.8	0.8	2.0	59.6	0.4	6.1	0.4	4.0	3.5

4.4 Other assumptions

This report is based on several other key assumptions, such as retirement pension take-up rates and disability incidence rates.

4.4.1 Retirement pension take-up rates

The retirement pension take-up rates are determined on a cohort basis and reflect the distribution of the age at which individuals are expected to take their retirement benefits, from ages 60 through 70. The sex-distinct take-up rate for a given age and year corresponds to the number of emerging (new) retirement beneficiaries divided by the total number of people eligible for retirement benefits.

Under the CPP, the unreduced pension age is 65. In 1987, the flexible retirement age provision became effective such that a person can choose to receive a reduced retirement pension as early as age 60, or an increased pension if deferred beyond age 65 up to age 70. This provision had the overall effect of lowering the average age at pension take-up to below age 65. In 1986, the average age at pension take-up was 65.2, compared to an average age of 62.7 over the decade ending in 2019. However, recent data suggest a reversal of this trend, with individuals increasingly opting to retire later. In 2024, the average age at benefit take-up was 64.0 for males and 63.8 for females.

The age 60 retirement pension take-up rates have decreased over the past decade. The take-up rates at age 60 in 2024 were 21.7% for males and 23.3% for females – the lowest levels observed since the introduction of the flexible retirement provisions in 1987. The trends of decreasing rates at lower ages are offset by increasing rates at higher ages. These trends will continue to be monitored for the next CPP valuation.

The assumption reflects the historical experience including recent trends. From 2030, the retirement benefit take-up rates at age 60 are assumed to be 21% for males and 22% for females. The rates are assumed to be 32% for both sexes at age 65 and 10% for both sexes at age 70. These assumptions result in a projected average retirement pension take-up age of 64.3 for both males and females. The same retirement pension take-up rate assumptions for the base CPP apply to the additional CPP.

4.4.2 Disability incidence rates - disability pension

The sex-distinct disability incidence rate in respect of the disability benefit at any given age is the number of new disability beneficiaries divided by the total number of people eligible for the disability benefit at that age. The disability incidence rates for the base Plan are the same as for the additional Plan.

Due to administrative changes to the disability program, disability incidence rates decreased significantly in the mid-1990s, and they have remained relatively stable until the late 2010s. However, the disability incidence rates have been decreasing overall since 2018.

The ultimate disability incidence rate assumptions of 2.70 per thousand eligible for males and 3.40 per thousand eligible for females were selected taking into account long-term historical trends, more recent trends, the consistent gap between female and male rates observed since 1996, and trends by causes of disability. The assumed ultimate disability incidence rates are reached gradually by 2029.

5 Results - base CPP

5.1 Overview

The key observations and findings of the actuarial projections of the financial state of the base CPP presented in this report are as follows.

- With the statutory contribution rate of 9.9%, contributions to the base CPP are projected to be more than sufficient to cover the expenditures over the period 2025 to 2030. Thereafter, a portion of investment income is required to make up the difference between contributions and expenditures. In 2031, about 1.0% of investment income will be required to pay for expenditures. This is expected to gradually increase to about 12% by 2050 and about 26% by 2070, after which it is expected to be fairly stable.
- With the statutory contribution rate of 9.9%, total assets of the base Plan are expected to grow over the projection period. The pace of growth is expected to gradually slow as positive net cash flows diminish and eventually turn negative, requiring an increasing share of investment income to pay for expenditures. Total assets are expected to increase from $651 billion at the end of 2024 to $963 billion by the end of 2030. Assets are then projected to reach $2.9 trillion by 2050 and $27.3 trillion by 2100. The ratio of assets to the following year's expenditures is projected to increase slightly from 9.7 to 10.4 between 2025 and 2030 and to continue to grow thereafter to values of 14.1 in 2050 and 20.7 in 2100.
- With the statutory contribution rate of 9.9%, investment income of the base Plan, which is expected to represent 37% of revenues (i.e. contributions and investment income) in 2025, is further projected to represent 39% of revenues in 2030, 48% of revenues in 2050, and 63% of revenues by 2100. This illustrates the importance of investment income as a source of revenues for the base Plan.
- The minimum contribution rate (MCR) to sustain the base Plan is 9.21% of contributory earnings for years 2028 to 2033 and 9.19% for the year 2034 and thereafter. The statutory contribution rate of 9.9% applies to the first three years after the valuation year, that is, to the current triennial review period of 2025-2027.
- The MCR consists of two separate components. First, the steady-state contribution rate, which is the lowest rate that results in the projected ratio of the assets to the following year's expenditures of the base Plan remaining generally constant over the long term, before consideration of any full funding of increased or new benefits, is 9.18% for the year 2028 and thereafter. The second component is the full funding rate that is required to fully fund the amendments made to the *Canada Pension Plan* under the *Budget Implementation Act, 2018, No. 1*. The full funding rate is 0.03% for years 2028 to 2033 and 0.01% for the year 2034 and thereafter. The amendments made to the *Canada Pension Plan* under the *Budget Implementation Act, 2024, No. 1* were determined not to require separate full funding and thus are financed entirely by the steady-state contribution rate.
- Under the MCR, the ratio of assets to the following year's expenditures is projected to increase from 10.1 in 2028 to 10.9 in 2037 and to be about the same fifty years later in 2087.

- The MCR determined for this report is lower than the MCR of 9.54% for year 2034 and thereafter determined under the 31st CPP Actuarial Report. Experience over the period 2022 to 2024 was better than expected overall, leading to a decrease in the MCR. The main contributing factor for this was better than expected investment experience, which lowers the MCR by 0.21 percentage points. Methodology changes, mainly to better reflect non-permanent residents, also led to a decrease in the MCR of 0.11 percentage points. The net result of all changes since the 31st CPP Actuarial Report is a decrease in the MCR of 0.35 percentage points for the year 2034 and thereafter.
- The MCR is less than the statutory rate of 9.9%, and thus the insufficient rates provisions do not apply. Therefore, in the absence of specific action by the federal and provincial Ministers of Finance, the statutory contribution rate will remain at 9.9% for the year 2025 and thereafter.
- Although the pay-as-you-go rate is expected to increase over time from 9.3% in 2025 to 13.9% by 2100 due to the retirement of the baby boom generation and the projected continued aging of the population, the statutory contribution rate of 9.9% is sufficient to finance the base Plan over the long term. The pay-as-you-go rate is the contribution rate that would need to be paid if there were no assets.
- The number of contributors to the CPP is expected to grow from 16.1 million in 2025 to 19.3 million in 2050 and 24.5 million by 2100. Under the statutory contribution rate of 9.9%, base CPP contributions are expected to increase from $73 billion in 2025 to $177 billion in 2050 and $905 billion by 2100.
- The number of base CPP retirement beneficiaries is expected to increase from 6.4 million in 2025 to 9.5 million in 2050 and 15.5 million by 2100.
- Total expenditures of the base Plan are expected to grow from approximately $68 billion in 2025 to $88 billion in 2030. Thereafter, total expenditures are projected to grow at a slower pace, reaching $197 billion in 2050 and $1.3 trillion by 2100.
- For the base CPP, as described in Appendix F, the adjustment factors calculated on the basis of this report and in accordance with subsection 115(1.11) of the Canada Pension Plan are 0.6% per month for pre-65 retirement pension take-up and 0.7% per month for post-65 retirement pension take-up. These adjustment factors are the same as the current legislated factors for pre-65 and post-65 retirement pension take-up.

5.2 Contributions

Projected contributions are the product of the contribution rate, the number of contributors, and the average contributory earnings. The contribution rate for the base CPP is set by law and is 9.9%. As of 1 January 2019, all contributors to the base CPP also contribute to the additional CPP.

Table 4 presents the projected number of CPP contributors, including CPP retirement beneficiaries who are working (i.e. “working beneficiaries”), their base CPP contributory earnings and contributions. The total number of contributors are directly linked to the assumed labour force participation rates applied to the projected working-age population and the job creation rates. Within this total, the number of

working beneficiaries who are contributors is based on the number of retirement beneficiaries in pay. Hence, the demographic, economic, and retirement-related assumptions all have an influence on the expected level of contributions.

In this report, the number of CPP contributors is expected to increase continuously throughout the projection period, from an estimated 16.1 million in 2025 to 17.0 million in 2030, 19.3 million in 2050, and 24.5 million by 2100. The future increase in the number of contributors is limited by the projected lower growth in the working-age population and labour force.

The growth in base CPP contributory earnings, which are derived by subtracting the Year's Basic Exemption (YBE) from pensionable earnings (up to the YMPE) is linked to the growth in average employment earnings through the assumption regarding annual increases in wages and is affected by the freeze on the YBE since 1998.

Contributions to the base CPP are expected to increase from an estimated $73 billion in 2025 to $88 billion in 2030, $177 billion in 2050, and to continue increasing thereafter, reaching $905 billion in 2100 as shown in Table 4. The projected YMPE is also shown, which is assumed to increase according to the increases in the average weekly earnings assumption. The YMPE is projected to increase from $71,300 in 2025 to $82,100 in 2030, $142,700 in 2050, and $567,600 by 2100.

Since the statutory contribution rate for the base CPP is constant at 9.9%, contributions to the base CPP increase at the same rate as total contributory earnings over the projection period.

Table 4 Contributions - base CPP

Year	Contribution rate (%)	YMPE ($)	Number of contributors (thousands)	Contributory earnings ($ million)	Contributions ($ million)
2025	9.9	71,300	16,114	733,218	72,589
2026	9.9	73,400	16,121	756,595	74,903
2027	9.9	75,600	16,424	794,101	78,616
2028	9.9	77,700	16,683	829,989	82,169
2029	9.9	79,900	16,825	861,449	85,283
2030	9.9	82,100	16,960	893,245	88,431
2031	9.9	84,400	17,108	927,034	91,776
2032	9.9	86,800	17,267	962,880	95,325
2033	9.9	89,200	17,429	999,736	98,974
2034	9.9	91,700	17,584	1,037,774	102,740
2035	9.9	94,300	17,740	1,077,475	106,670
2040	9.9	108,200	18,316	1,282,894	127,007
2045	9.9	124,300	18,843	1,521,171	150,596
2050	9.9	142,700	19,280	1,790,525	177,262
2055	9.9	163,800	19,749	2,108,774	208,769
2060	9.9	188,000	20,159	2,475,330	245,058
2065	9.9	215,900	20,626	2,912,278	288,316
2070	9.9	247,900	21,166	3,435,340	340,099
2075	9.9	284,600	21,698	4,047,374	400,690
2080	9.9	326,700	22,206	4,759,241	471,165
2085	9.9	375,100	22,738	5,599,158	554,317
2090	9.9	430,600	23,313	6,594,010	652,807
2095	9.9	494,400	23,904	7,766,468	768,880
2100	9.9	567,600	24,486	9,137,861	904,648

5.3 Expenditures

The projected number of base CPP beneficiaries by type of benefit is presented in Table 5, while Table 6 presents information for male and female beneficiaries separately. The number of retirement, disability, and survivor beneficiaries increases throughout the projection period. In particular, the number of retirement beneficiaries is expected to increase from an estimated 6.4 million in 2025 to 7.3 million by 2030, a 14% increase, due to the aging of the population and continued retirement of the baby boomers. By 2050, the number of retirement beneficiaries is projected to be 9.5 million and to then further increase to 15.5 million by 2100.

Table 5 Beneficiaries - base CPP [1]
(thousands)

Year	Retirement [2],[3],[4],[5]	Disability [4],[6]	Survivor [5],[6]	Children	Death [7]
2025	6,433	350	1,476	235	185
2026	6,615	352	1,501	241	189
2027	6,804	357	1,528	245	195
2028	6,991	360	1,555	250	201
2029	7,172	362	1,583	255	207
2030	7,343	366	1,611	260	212
2031	7,500	371	1,639	264	218
2032	7,641	377	1,668	267	224
2033	7,774	384	1,696	270	230
2034	7,900	391	1,724	272	237
2035	8,020	397	1,752	274	243
2040	8,499	436	1,878	280	275
2045	8,926	479	1,975	288	300
2050	9,458	512	2,036	296	318
2055	10,192	531	2,070	300	328
2060	11,033	535	2,091	303	333
2065	11,772	547	2,120	307	339
2070	12,434	573	2,173	310	351
2075	13,087	591	2,249	313	370
2080	13,674	603	2,330	316	391
2085	14,131	618	2,396	320	410
2090	14,519	640	2,433	324	421
2095	14,958	659	2,447	329	426
2100	15,464	677	2,458	333	433

(1) Numbers of beneficiaries by sex in Table 6 may not sum to total numbers of beneficiaries shown in Table 5 due to rounding.
(2) The number given for retirement beneficiaries includes working beneficiaries.
(3) The number given for retirement beneficiaries does not take into account that the retirement pension can be shared between spouses.
(4) A beneficiary who receives concurrently a retirement and post-retirement disability benefit is counted in each of the retirement and disability benefit categories.
(5) A beneficiary who receives concurrently a retirement and a survivor's benefit is counted in each category.
(6) A beneficiary who receives concurrently a disability and survivor's benefit is counted in each category.
(7) This is the number of deceased contributors whose estates or persons or institutions as prescribed are entitled to the death benefit during the given year. The number of deceased contributors includes those eligible to the death benefit top-up, as described in Appendix - A of this report.

Table 6 Beneficiaries by sex - base CPP [1]
(thousands)

	Males				Females			
Year	Retirement[2],[3],[4],[5]	Disability[4],[6]	Survivor[5],[6]	Death[7]	Retirement[2],[3],[4],[5]	Disability[4],[6]	Survivor[5],[6]	Death[7]
2025	3,063	154	310	107	3,369	196	1,165	78
2026	3,147	154	320	109	3,468	198	1,182	80
2027	3,233	156	329	112	3,570	201	1,199	83
2028	3,319	157	338	115	3,672	203	1,217	86
2029	3,400	158	347	117	3,772	204	1,236	89
2030	3,475	159	356	120	3,868	206	1,255	92
2031	3,543	162	365	123	3,957	209	1,275	96
2032	3,603	164	373	125	4,038	213	1,295	99
2033	3,659	167	381	128	4,115	216	1,315	102
2034	3,710	170	389	131	4,189	220	1,335	106
2035	3,759	173	397	134	4,260	224	1,355	109
2040	3,949	190	428	147	4,550	246	1,451	127
2045	4,125	210	447	157	4,801	269	1,528	143
2050	4,370	225	456	163	5,088	287	1,580	154
2055	4,731	233	460	167	5,461	298	1,610	161
2060	5,156	233	464	169	5,878	302	1,627	165
2065	5,522	237	472	172	6,250	309	1,648	167
2070	5,839	249	484	179	6,595	324	1,689	172
2075	6,145	257	497	189	6,942	334	1,752	181
2080	6,414	262	506	199	7,260	341	1,825	192
2085	6,619	269	509	208	7,513	349	1,886	202
2090	6,796	279	509	213	7,723	361	1,924	208
2095	7,007	287	509	215	7,951	371	1,938	211
2100	7,253	296	509	218	8,211	381	1,949	215

(1) Numbers of beneficiaries by sex in Table 6 may not sum to total numbers of beneficiaries shown in Table 5 due to rounding.
(2) The number given for retirement beneficiaries includes working beneficiaries.
(3) The number given for retirement beneficiaries does not take into account that the retirement pension can be shared between spouses.
(4) A beneficiary who receives concurrently a retirement and post-retirement disability benefit is counted in each of the retirement and disability benefit categories.
(5) A beneficiary who receives concurrently a retirement and a survivor's benefit is counted in each category.
(6) A beneficiary who receives concurrently a disability and survivor's benefit is counted in each category.
(7) This is the number of deceased contributors whose estates or persons or institutions as prescribed are entitled to the death benefit during the given year. The number of deceased contributors includes those eligible to the death benefit top-up, as described in Appendix - A of this report.

Table 7 shows the amount of projected base CPP expenditures by type. Total expenditures of the base Plan are expected to grow from approximately $68 billion in 2025 to $88 billion in 2030. Thereafter, total expenditures are projected to grow at a slower pace, reaching $197 billion in 2050 and $1.3 trillion by 2100. Table 8 shows the same information but in millions of year 2025 constant dollars.

Table 9 shows the projected base CPP expenditures by type expressed as a percentage of contributory earnings. These are referred to as the pay-as-you-go (or "PayGo") rates. A pay-as-you-go rate corresponds to the contribution rate that would need to be paid to cover expenditures if there were no assets. Although the total pay-as-you-go rate is expected to increase significantly from approximately 9.3% in 2025 to 13.9% by the end of the projection period in 2100, the statutory contribution rate of 9.9% is sufficient to finance the base Plan over the projection period.

Table 7 Expenditures - base CPP
($ million)

Year	Retirement [1]	Disability [2]	Survivor	Children	Death	Operating expenses [3]	Total
2025	55,700	4,829	5,664	673	500	754	68,119
2026	58,951	4,953	5,810	706	510	750	71,679
2027	62,432	5,077	5,967	737	523	784	75,521
2028	66,079	5,197	6,133	768	537	818	79,532
2029	69,877	5,328	6,318	799	552	847	83,720
2030	73,728	5,484	6,521	830	566	877	88,006
2031	77,592	5,682	6,743	860	580	908	92,365
2032	81,436	5,905	6,983	888	594	941	96,747
2033	85,290	6,153	7,239	914	609	974	101,179
2034	89,184	6,403	7,509	939	625	1,009	105,669
2035	93,129	6,670	7,795	965	641	1,045	110,244
2036	97,121	6,938	8,094	990	656	1,080	114,878
2037	101,131	7,236	8,407	1,014	671	1,117	119,576
2038	105,177	7,561	8,732	1,039	687	1,154	124,350
2039	109,304	7,909	9,070	1,063	704	1,192	129,242
2040	113,559	8,264	9,418	1,091	719	1,232	134,283
2041	117,955	8,640	9,776	1,121	733	1,273	139,497
2042	122,484	9,034	10,141	1,149	746	1,315	144,869
2043	127,167	9,439	10,513	1,178	759	1,358	150,414
2044	132,052	9,853	10,892	1,209	772	1,403	156,181
2045	137,187	10,274	11,277	1,240	783	1,450	162,211
2046	142,601	10,699	11,666	1,271	793	1,497	168,526
2047	148,303	11,126	12,057	1,303	802	1,546	175,137
2048	154,325	11,555	12,452	1,336	811	1,596	182,074
2049	160,713	11,990	12,849	1,370	819	1,647	189,387
2050	167,546	12,421	13,249	1,402	826	1,699	197,144
2051	174,872	12,858	13,651	1,434	833	1,755	205,403
2052	182,649	13,302	14,054	1,467	838	1,813	214,122
2053	190,857	13,752	14,458	1,501	843	1,872	223,283
2054	199,574	14,189	14,865	1,535	848	1,933	232,943
2055	208,917	14,593	15,276	1,569	851	1,994	243,200
2060	263,009	16,633	17,439	1,752	862	2,334	302,028
2065	325,973	19,223	20,043	1,959	876	2,731	370,805
2070	397,355	22,763	23,358	2,184	905	3,207	449,772
2075	481,077	26,534	27,605	2,429	952	3,769	542,366
2080	578,548	30,604	32,718	2,709	1,005	4,421	650,004
2085	688,396	35,431	38,503	3,031	1,051	5,188	771,599
2090	813,460	41,521	44,754	3,392	1,078	6,095	910,299
2095	962,961	48,354	51,560	3,792	1,089	7,167	1,074,924
2100	1,143,791	56,224	59,342	4,237	1,106	8,422	1,273,123

(1) Retirement expenditures include expenditures related to post-retirement benefits for working beneficiaries.
(2) Disability expenditures include expenditures related to post-retirement disability benefits for disabled retirement beneficiaries.
(3) Plan operating expenses exclude CPPIB operating expenses, which are accounted for separately in the investment expenses assumption.

Table 8 Expenditures - base CPP, year 2025 constant dollars [1]
($ millions)

Year	Retirement [2]	Disability [3]	Survivor	Children	Death	Operating expenses [4]	Total
2025	55,700	4,829	5,664	673	500	754	68,119
2026	57,738	4,851	5,691	691	499	734	70,205
2027	59,949	4,875	5,730	708	502	753	72,517
2028	62,207	4,893	5,774	723	506	770	74,872
2029	64,492	4,917	5,831	737	509	782	77,269
2030	66,713	4,962	5,900	751	512	793	79,631
2031	68,832	5,040	5,982	763	514	805	81,937
2032	70,825	5,136	6,073	772	517	818	84,142
2033	72,723	5,246	6,172	779	519	831	86,270
2034	74,552	5,352	6,277	785	522	843	88,333
2035	76,324	5,466	6,388	791	525	856	90,350
2036	78,034	5,575	6,503	795	527	868	92,302
2037	79,663	5,700	6,622	798	529	879	94,193
2038	81,226	5,839	6,744	802	531	891	96,033
2039	82,758	5,988	6,867	804	533	903	97,853
2040	84,293	6,135	6,991	810	533	915	99,677
2041	85,840	6,288	7,114	816	533	926	101,517
2042	87,388	6,445	7,235	820	532	938	103,358
2043	88,950	6,602	7,353	824	531	950	105,211
2044	90,556	6,757	7,469	829	529	962	107,102
2045	92,233	6,907	7,582	834	526	975	109,056
2046	93,993	7,052	7,689	838	522	987	111,081
2047	95,834	7,190	7,791	842	518	999	113,175
2048	97,770	7,320	7,889	846	514	1,011	115,350
2049	99,821	7,447	7,981	851	509	1,023	117,631
2050	102,025	7,564	8,068	854	503	1,035	120,048
2051	104,398	7,676	8,150	856	497	1,048	122,624
2052	106,902	7,785	8,225	859	491	1,061	125,323
2053	109,516	7,891	8,296	861	484	1,074	128,123
2054	112,272	7,982	8,363	864	477	1,087	131,045
2055	115,224	8,048	8,425	865	470	1,100	134,132
2060	131,383	8,309	8,712	875	431	1,166	150,875
2065	147,485	8,697	9,068	886	396	1,236	167,769
2070	162,834	9,328	9,572	895	371	1,314	184,314
2075	178,558	9,849	10,246	902	353	1,399	201,307
2080	194,493	10,288	10,999	911	338	1,486	218,515
2085	209,605	10,788	11,723	923	320	1,580	234,939
2090	224,336	11,451	12,342	935	297	1,681	251,043
2095	240,531	12,078	12,879	947	272	1,790	268,497
2100	258,767	12,720	13,425	959	250	1,905	288,026

(1) For a given year, the value in year 2025 constant dollars is equal to the corresponding value in current dollars divided by the cumulative projected increases in prices since 2025.
(2) Retirement expenditures include expenditures related to post-retirement benefits for working beneficiaries.
(3) Disability expenditures include expenditures related to post-retirement disability benefits for disabled retirement beneficiaries.
(4) Plan operating expenses exclude CPPIB operating expenses, which are accounted for separately in the investment expenses assumption.

Table 9 Expenditures as percentage of contributory earnings - base CPP
(pay-as-you-go rates) (%)

Year	Retirement [1]	Disability [2]	Survivor	Children	Death	Operating expenses [3]	Total
2025	7.60	0.66	0.77	0.09	0.07	0.10	9.29
2026	7.79	0.65	0.77	0.09	0.07	0.10	9.47
2027	7.86	0.64	0.75	0.09	0.07	0.10	9.51
2028	7.96	0.63	0.74	0.09	0.06	0.10	9.58
2029	8.11	0.62	0.73	0.09	0.06	0.10	9.72
2030	8.25	0.61	0.73	0.09	0.06	0.10	9.85
2031	8.37	0.61	0.73	0.09	0.06	0.10	9.96
2032	8.46	0.61	0.73	0.09	0.06	0.10	10.05
2033	8.53	0.62	0.72	0.09	0.06	0.10	10.12
2034	8.59	0.62	0.72	0.09	0.06	0.10	10.18
2035	8.64	0.62	0.72	0.09	0.06	0.10	10.23
2036	8.71	0.62	0.73	0.09	0.06	0.10	10.30
2037	8.75	0.63	0.73	0.09	0.06	0.10	10.35
2038	8.79	0.63	0.73	0.09	0.06	0.10	10.39
2039	8.82	0.64	0.73	0.09	0.06	0.10	10.43
2040	8.85	0.64	0.73	0.09	0.06	0.10	10.47
2041	8.88	0.65	0.74	0.08	0.06	0.10	10.50
2042	8.91	0.66	0.74	0.08	0.05	0.10	10.54
2043	8.94	0.66	0.74	0.08	0.05	0.10	10.58
2044	8.98	0.67	0.74	0.08	0.05	0.10	10.62
2045	9.02	0.68	0.74	0.08	0.05	0.10	10.66
2046	9.07	0.68	0.74	0.08	0.05	0.10	10.72
2047	9.13	0.68	0.74	0.08	0.05	0.10	10.78
2048	9.19	0.69	0.74	0.08	0.05	0.10	10.84
2049	9.27	0.69	0.74	0.08	0.05	0.09	10.92
2050	9.36	0.69	0.74	0.08	0.05	0.09	11.01
2051	9.45	0.69	0.74	0.08	0.04	0.09	11.10
2052	9.55	0.70	0.73	0.08	0.04	0.09	11.19
2053	9.66	0.70	0.73	0.08	0.04	0.09	11.30
2054	9.77	0.69	0.73	0.08	0.04	0.09	11.41
2055	9.91	0.69	0.72	0.07	0.04	0.09	11.53
2060	10.63	0.67	0.70	0.07	0.03	0.09	12.20
2065	11.19	0.66	0.69	0.07	0.03	0.09	12.73
2070	11.57	0.66	0.68	0.06	0.03	0.09	13.09
2075	11.89	0.66	0.68	0.06	0.02	0.09	13.40
2080	12.16	0.64	0.69	0.06	0.02	0.09	13.66
2085	12.29	0.63	0.69	0.05	0.02	0.09	13.78
2090	12.34	0.63	0.68	0.05	0.02	0.09	13.80
2095	12.40	0.62	0.66	0.05	0.01	0.09	13.84
2100	12.52	0.62	0.65	0.05	0.01	0.09	13.93

(1) Retirement expenditures include expenditures related to post-retirement benefits for working beneficiaries.
(2) Disability expenditures include expenditures related to post-retirement disability benefits for disabled retirement beneficiaries.
(3) Plan operating expenses exclude CPPIB operating expenses, which are accounted for separately in the investment expenses assumption.

5.4 Financial projections with statutory contribution rate

5.4.1 Market value of assets as at 31 December 2024

Since 1999, the excess cash flows of the Plan (contributions less Plan expenditures) have been invested in the capital markets. Those assets, as is usually the case for private pension plans, are valued at market. The market value of base CPP assets is $651 billion as at 31 December 2024.

5.4.2 Projected financial state

Table 10 presents the historical results of the base CPP, while Table 11 and Table 12 present the projected financial state of the base CPP using the statutory contribution rate of 9.9% in current dollars and in year 2025 constant dollars, respectively. The projected financial state of the base CPP using the minimum contribution rate of 9.21% for years 2028-2033, and 9.19% for 2034 and thereafter is discussed in the next section 5.5.

The rate of increase in base CPP assets is expected to gradually slow as positive net cash flows diminish and eventually turn negative, requiring an increasing share of investment income to pay for expenditures. As shown in Table 10, the base CPP assets as at 31 December 2024 are $651 billion. As shown in Table 11, base CPP assets are projected to increase to $963 billion in 2030, $2.9 trillion in 2050, and $27 trillion by 2100.

The investment performance of the base Plan from 2022 to 2024 was significantly better than expected. As a result, the projected assets of the base CPP are substantially higher than projected under the previous triennial actuarial report (the 31st CPP Actuarial Report as at 31 December 2021).

Table 10 Historical results - base CPP

Year	PayGo rate (%)	Contribution rate (%)	Contributions ($ million)	Expenditures ($ million)	Net cash flows ($ million)	Net investment income [1] ($ million)	Assets at 31 Dec. [2] ($ million)	Yield/Return [1] (%)	Assets/ expenditures ratio
1966	0.05	3.6	531	8	523	2	525	0.7	52.5
1970	0.45	3.6	773	97	676	193	3,596	6.2	24.1
1975	1.42	3.6	1,426	561	865	607	9,359	7.2	11.5
1980	2.72	3.6	2,604	1,965	639	1,466	18,433	8.7	7.6
1985	4.31	3.6	4,032	4,826	(794)	3,113	31,130	10.8	5.7
1986	4.20	3.6	4,721	5,503	(782)	3,395	33,743	10.9	4.7
1987	5.02	3.8	5,393	7,130	(1,737)	3,654	35,660	10.9	4.3
1988	5.41	4.0	6,113	8,272	(2,159)	3,886	37,387	11.0	4.0
1989	5.89	4.2	6,694	9,391	(2,697)	4,162	38,852	11.3	3.7
1990	5.82	4.4	7,889	10,438	(2,549)	4,386	40,689	11.4	3.5
1991	6.31	4.6	8,396	11,518	(3,122)	4,476	42,043	11.2	3.2
1992	7.07	4.8	8,883	13,076	(4,193)	4,497	42,347	11.0	3.0
1993	7.79	5.0	9,166	14,273	(5,107)	4,480	41,720	10.9	2.7
1994	8.33	5.2	9,585	15,362	(5,777)	4,403	40,346	11.0	2.5
1995	7.91	5.4	10,911	15,986	(5,075)	4,412	39,683	11.3	2.4
1996	8.71	5.6	10,757	16,723	(5,966)	4,177	37,894	11.0	2.2
1997	8.67	6.0	12,165	17,570	(5,405)	3,971	36,460	10.8	2.0
1998	8.11	6.4	14,473	18,338	(3,865)	3,940	36,535	10.9	1.9
1999	8.23	7.0	16,052	18,877	(2,825)	764	42,783	24.6	2.2
2000	7.69	7.8	19,977	19,683	294	4,446	47,523	9.9	2.3
2001	7.85	8.6	22,469	20,515	1,954	3,154	52,631	6.2	2.4
2002	8.16	9.4	24,955	21,666	3,289	187	56,107	0.3	2.5
2003	8.19	9.9	27,454	22,716	4,738	6,769	67,614	11.1	2.8
2004	8.29	9.9	28,459	23,833	4,626	6,475	78,715	8.9	3.2
2005	8.37	9.9	29,539	24,976	4,563	11,083	94,361	13.2	3.6
2006	8.33	9.9	31,000	26,080	4,920	14,300	113,581	14.4	4.1
2007	8.15	9.9	33,621	27,691	5,930	3,269	122,780	2.7	4.2
2008	8.03	9.9	36,053	29,259	6,794	(18,350)	111,224	(14.2)	3.6
2009	8.16	9.9	37,492	30,901	6,591	9,021	126,836	7.6	4.0
2010	8.83	9.9	35,885	32,023	3,862	11,804	142,502	8.9	4.2
2011	8.73	9.9	38,202	33,691	4,511	8,057	155,070	5.4	4.3
2012	8.84	9.9	40,682	36,321	4,361	15,664	175,095	9.7	4.7
2013	8.73	9.9	42,632	37,575	5,057	23,887	204,039	13.2	5.3
2014	8.70	9.9	44,181	38,808	5,373	32,136	241,548	15.2	5.9
2015	8.79	9.9	46,026	40,883	5,143	38,667	285,358	15.6	6.7
2016	9.06	9.9	46,492	42,561	3,931	12,244	301,533	4.2	6.8
2017	9.17	9.9	48,139	44,596	3,543	35,257	340,333	11.4	7.3
2018	9.30	9.9	49,594	46,591	3,003	28,364	371,700	8.2	7.6
2019	9.27	9.9	52,166	48,844	3,322	47,041	422,063	12.4	8.2
2020	9.62	9.9	52,833	51,322	1,511	51,320	474,894	12.0	9.0
2021	9.46	9.9	55,535	53,045	2,490	66,341	543,725	13.8	9.8
2022	8.98	9.9	61,133	55,433	5,700	(27,359)	522,066	(5.0)	8.7
2023	8.96	9.9	66,567	60,213	6,354	33,585	562,005	6.3	8.7
2024	8.98	9.9	71,347	64,711	6,636	81,975	650,616	14.3	9.5

(1) Rates of return and investment income are net of all investment expenses of the CPPIB for the year 1999 and thereafter.
(2) Results for years 1966 to 1998 are on a cost basis, while results for years 1999 to 2024 are presented on a market value basis. If assets were shown at market value at the end of 1998, total assets would be $44,864 million instead of $36,535 million.

Table 11 Financial projections - base CPP, statutory contribution rate of 9.9%

Year	PayGo rate (%)	Contribution rate (%)	Contributory earnings ($ million)	Contributions ($ million)	Expenditures ($ million)	Net cash flows ($ million)	Net investment income [2] ($ million)	Assets at 31 Dec. ($ million)	Net rate of return [1], [2] (%)	Assets/ expenditures ratio
2025	9.29	9.9	733,218	72,589	68,119	4,470	42,313	697,399	6.41	9.7
2026	9.47	9.9	756,595	74,903	71,679	3,224	45,139	745,762	6.39	9.9
2027	9.51	9.9	794,101	78,616	75,521	3,095	47,753	796,610	6.32	10.0
2028	9.58	9.9	829,989	82,169	79,532	2,636	50,734	849,980	6.29	10.2
2029	9.72	9.9	861,449	85,283	83,720	1,563	53,843	905,387	6.27	10.3
2030	9.85	9.9	893,245	88,431	88,006	426	56,999	962,811	6.23	10.4
2031	9.96	9.9	927,034	91,776	92,365	(589)	60,308	1,022,530	6.21	10.6
2032	10.05	9.9	962,880	95,325	96,747	(1,422)	63,802	1,084,909	6.19	10.7
2033	10.12	9.9	999,736	98,974	101,179	(2,205)	67,400	1,150,105	6.16	10.9
2034	10.18	9.9	1,037,774	102,740	105,669	(2,929)	71,233	1,218,409	6.15	11.1
2035	10.23	9.9	1,077,475	106,670	110,244	(3,574)	75,223	1,290,057	6.13	11.2
2036	10.30	9.9	1,115,651	110,449	114,878	(4,429)	79,450	1,365,078	6.12	11.4
2037	10.35	9.9	1,155,755	114,420	119,576	(5,156)	83,811	1,443,732	6.10	11.6
2038	10.39	9.9	1,197,087	118,512	124,350	(5,839)	88,364	1,526,258	6.08	11.8
2039	10.43	9.9	1,239,659	122,726	129,242	(6,515)	93,147	1,612,889	6.07	12.0
2040	10.47	9.9	1,282,894	127,007	134,283	(7,277)	98,265	1,703,877	6.06	12.2
2041	10.50	9.9	1,328,216	131,493	139,497	(8,004)	103,645	1,799,519	6.05	12.4
2042	10.54	9.9	1,374,507	136,076	144,869	(8,792)	108,886	1,899,613	6.02	12.6
2043	10.58	9.9	1,421,930	140,771	150,414	(9,643)	114,927	2,004,897	6.02	12.8
2044	10.62	9.9	1,470,877	145,617	156,181	(10,564)	121,271	2,115,604	6.02	13.0
2045	10.66	9.9	1,521,171	150,596	162,211	(11,615)	127,936	2,231,924	6.02	13.2
2046	10.72	9.9	1,572,061	155,634	168,526	(12,892)	134,933	2,353,965	6.02	13.4
2047	10.78	9.9	1,624,757	160,851	175,137	(14,286)	142,272	2,481,950	6.02	13.6
2048	10.84	9.9	1,678,961	166,217	182,074	(15,856)	149,964	2,616,058	6.02	13.8
2049	10.92	9.9	1,734,294	171,695	189,387	(17,692)	158,019	2,756,385	6.02	14.0
2050	11.01	9.9	1,790,525	177,262	197,144	(19,882)	166,441	2,902,944	6.02	14.1
2051	11.10	9.9	1,850,791	183,228	205,403	(22,175)	175,236	3,056,005	6.02	14.3
2052	11.19	9.9	1,912,875	189,375	214,122	(24,748)	184,416	3,215,673	6.02	14.4
2053	11.30	9.9	1,976,617	195,685	223,283	(27,598)	193,987	3,382,063	6.02	14.5
2054	11.41	9.9	2,041,750	202,133	232,943	(30,810)	203,954	3,555,207	6.02	14.6
2055	11.53	9.9	2,108,774	208,769	243,200	(34,431)	214,317	3,735,093	6.02	14.7
2060	12.20	9.9	2,475,330	245,058	302,028	(56,971)	272,193	4,738,499	6.02	15.0
2065	12.73	9.9	2,912,278	288,316	370,805	(82,489)	341,535	5,941,545	6.02	15.4
2070	13.09	9.9	3,435,340	340,099	449,772	(109,673)	425,589	7,401,960	6.02	15.8
2075	13.40	9.9	4,047,374	400,690	542,366	(141,676)	528,332	9,188,015	6.02	16.3
2080	13.66	9.9	4,759,241	471,165	650,004	(178,839)	654,255	11,378,526	6.02	16.9
2085	13.78	9.9	5,599,158	554,317	771,599	(217,282)	810,104	14,094,189	6.02	17.7
2090	13.80	9.9	6,594,010	652,807	910,299	(257,492)	1,005,73	17,508,093	6.02	18.6
2095	13.84	9.9	7,766,468	768,880	1,074,924	(306,043)	1,253,15	21,827,616	6.02	19.6
2100	13.93	9.9	9,137,861	904,648	1,273,123	(368,474)	1,566,03	27,290,800	6.02	20.7

(1) Rates of return are nominal (include inflation).
(2) Rates of return and investment income are net of all investment expenses.

Table 12 Financial projections - base CPP, statutory contribution rate of 9.9%, year 2025 constant dollars [1]
($ millions)

Year	PayGo rate (%)	Contribution rate (%)	Contributory earnings ($ million)	Contributions ($ million)	Expenditures ($ million)	Net cash flows ($ million)	Net investment income [2] ($ million)	Assets at 31 Dec. ($ million)
2025	9.29	9.9	733,218	72,589	68,119	4,470	42,313	697,399
2026	9.47	9.9	741,033	73,362	70,205	3,158	44,210	730,423
2027	9.51	9.9	762,517	75,489	72,517	2,972	45,854	764,927
2028	9.58	9.9	781,351	77,354	74,872	2,482	47,761	800,171
2029	9.72	9.9	795,066	78,712	77,269	1,443	49,694	835,618
2030	9.85	9.9	808,247	80,016	79,631	385	51,575	871,193
2031	9.96	9.9	822,374	81,415	81,937	(522)	53,499	907,088
2032	10.05	9.9	837,424	82,905	84,142	(1,237)	55,489	943,554
2033	10.12	9.9	852,429	84,390	86,270	(1,880)	57,469	980,642
2034	10.18	9.9	867,512	85,884	88,333	(2,449)	59,546	1,018,511
2035	10.23	9.9	883,039	87,421	90,350	(2,929)	61,648	1,057,260
2036	10.30	9.9	896,398	88,743	92,302	(3,559)	63,836	1,096,806
2037	10.35	9.9	910,412	90,131	94,193	(4,062)	66,019	1,137,258
2038	10.39	9.9	924,481	91,524	96,033	(4,509)	68,242	1,178,691
2039	10.43	9.9	938,587	92,920	97,853	(4,933)	70,525	1,221,171
2040	10.47	9.9	952,276	94,275	99,677	(5,402)	72,941	1,264,766
2041	10.50	9.9	966,586	95,692	101,517	(5,825)	75,426	1,309,568
2042	10.54	9.9	980,660	97,085	103,358	(6,273)	77,686	1,355,303
2043	10.58	9.9	994,602	98,466	105,211	(6,745)	80,389	1,402,372
2044	10.62	9.9	1,008,666	99,858	107,102	(7,244)	83,163	1,450,793
2045	10.66	9.9	1,022,702	101,247	109,056	(7,809)	86,013	1,500,550
2046	10.72	9.9	1,036,192	102,583	111,081	(8,498)	88,938	1,551,568
2047	10.78	9.9	1,049,927	103,943	113,175	(9,232)	91,937	1,603,850
2048	10.84	9.9	1,063,680	105,304	115,350	(10,046)	95,008	1,657,364
2049	10.92	9.9	1,077,192	106,642	117,631	(10,989)	98,148	1,712,026
2050	11.01	9.9	1,090,311	107,941	120,048	(12,107)	101,351	1,767,701
2051	11.10	9.9	1,104,911	109,386	122,624	(13,238)	104,615	1,824,417
2052	11.19	9.9	1,119,583	110,839	125,323	(14,485)	107,937	1,882,096
2053	11.30	9.9	1,134,206	112,286	128,123	(15,836)	111,312	1,940,668
2054	11.41	9.9	1,148,609	113,712	131,045	(17,332)	114,737	2,000,020
2055	11.53	9.9	1,163,052	115,142	134,132	(18,990)	118,203	2,060,017
2060	12.20	9.9	1,236,521	122,416	150,875	(28,459)	135,971	2,367,060
2065	12.73	9.9	1,317,651	130,447	167,769	(37,322)	154,526	2,688,233
2070	13.09	9.9	1,407,785	139,371	184,314	(44,943)	174,404	3,033,286
2075	13.40	9.9	1,502,239	148,722	201,307	(52,585)	196,098	3,410,260
2080	13.66	9.9	1,599,936	158,394	218,515	(60,121)	219,944	3,825,172
2085	13.78	9.9	1,704,853	168,780	234,939	(66,159)	246,664	4,291,452
2090	13.80	9.9	1,818,498	180,031	251,043	(71,011)	277,363	4,828,387
2095	13.84	9.9	1,939,930	192,053	268,497	(76,444)	313,015	5,452,162
2100	13.93	9.9	2,067,312	204,664	288,026	(83,362)	354,294	6,174,159

(1) For a given year, the value in year 2025 constant dollars is equal to the corresponding value in current dollars divided by the cumulative projected increases in prices since 2025.
(2) Investment income is net of all investment expenses.

Over the period 2025 to 2030, contributions are projected to exceed expenditures for the base CPP. Thereafter, a small but increasing portion of investment income is required to cover the shortfall. This causes the total revenues (contributions and investment income) to continue to be higher than expenditures but to a lesser extent over the long term, which causes the assets to grow at a slower pace.

Table 13 shows in more detail the sources of the revenues required to cover the expenditures, from which the following observations can be made:

- From 2031 onward, a portion of investment income is required to fund net cash outflows. It is projected that in 2050, 12% of investment income will be required to pay for expenditures.
- Investment income, which is expected to represent 37% of revenues in 2025, is projected to represent 48% of revenues in 2050. This clearly underscores the growing importance of investment income as a source of revenue for the base Plan.

Table 13 Sources of revenues and funding of expenditures - base CPP, statutory contribution rate of 9.9%

Year	Contributions ($ million)	Net investment income [1] ($ million)	Total revenues ($ million)	Net investment income as % of total revenues (%)	Expenditures ($ million)	Expenditures as % of total revenues (%)	Net cash flows (contributions less expenditures) ($ million)	% of net investment income needed to pay expenditures (%)
2025	72,589	42,313	114,902	36.8	68,119	59.3	4,470	0.0
2026	74,903	45,139	120,041	37.6	71,679	59.7	3,224	0.0
2027	78,616	47,753	126,369	37.8	75,521	59.8	3,095	0.0
2028	82,169	50,734	132,903	38.2	79,532	59.8	2,636	0.0
2029	85,283	53,843	139,126	38.7	83,720	60.2	1,563	0.0
2030	88,431	56,999	145,430	39.2	88,006	60.5	426	0.0
2031	91,776	60,308	152,084	39.7	92,365	60.7	(589)	1.0
2032	95,325	63,802	159,127	40.1	96,747	60.8	(1,422)	2.2
2033	98,974	67,400	166,374	40.5	101,179	60.8	(2,205)	3.3
2034	102,740	71,233	173,973	40.9	105,669	60.7	(2,929)	4.1
2035	106,670	75,223	181,893	41.4	110,244	60.6	(3,574)	4.8
2036	110,449	79,450	189,899	41.8	114,878	60.5	(4,429)	5.6
2037	114,420	83,811	198,230	42.3	119,576	60.3	(5,156)	6.2
2038	118,512	88,364	206,876	42.7	124,350	60.1	(5,839)	6.6
2039	122,726	93,147	215,873	43.1	129,242	59.9	(6,515)	7.0
2040	127,007	98,265	225,271	43.6	134,283	59.6	(7,277)	7.4
2041	131,493	103,645	235,138	44.1	139,497	59.3	(8,004)	7.7
2042	136,076	108,886	244,963	44.5	144,869	59.1	(8,792)	8.1
2043	140,771	114,927	255,698	44.9	150,414	58.8	(9,643)	8.4
2044	145,617	121,271	266,888	45.4	156,181	58.5	(10,564)	8.7
2045	150,596	127,936	278,532	45.9	162,211	58.2	(11,615)	9.1
2046	155,634	134,933	290,567	46.4	168,526	58.0	(12,892)	9.6
2047	160,851	142,272	303,123	46.9	175,137	57.8	(14,286)	10.0
2048	166,217	149,964	316,182	47.4	182,074	57.6	(15,856)	10.6
2049	171,695	158,019	329,714	47.9	189,387	57.4	(17,692)	11.2
2050	177,262	166,441	343,703	48.4	197,144	57.4	(19,882)	11.9
2051	183,228	175,236	358,464	48.9	205,403	57.3	(22,175)	12.7
2052	189,375	184,416	373,791	49.3	214,122	57.3	(24,748)	13.4
2053	195,685	193,987	389,672	49.8	223,283	57.3	(27,598)	14.2
2054	202,133	203,954	406,087	50.2	232,943	57.4	(30,810)	15.1
2055	208,769	214,317	423,086	50.7	243,200	57.5	(34,431)	16.1
2060	245,058	272,193	517,250	52.6	302,028	58.4	(56,971)	20.9
2065	288,316	341,535	629,850	54.2	370,805	58.9	(82,489)	24.2
2070	340,099	425,589	765,688	55.6	449,772	58.7	(109,673)	25.8
2075	400,690	528,332	929,022	56.9	542,366	58.4	(141,676)	26.8
2080	471,165	654,255	1,125,419	58.1	650,004	57.8	(178,839)	27.3
2085	554,317	810,104	1,364,421	59.4	771,599	56.6	(217,282)	26.8
2090	652,807	1,005,739	1,658,546	60.6	910,299	54.9	(257,492)	25.6
2095	768,880	1,253,150	2,022,031	62.0	1,074,924	53.2	(306,043)	24.4
2100	904,648	1,566,036	2,470,685	63.4	1,273,123	51.5	(368,474)	23.5

(1) Investment income is net of all investment expenses.

5.5 Financial projections with minimum contribution rate

The results presented in Table 14 are based on the best-estimate assumptions, but use the MCR of 9.21% for years 2028-2033 and 9.19% thereafter as opposed to the statutory contribution rate of 9.9% for 2025 and thereafter.[6] The determination of the MCR is described in Appendix - C of this report.

Under the MCR (including full funding), the ratio of assets to the following year's expenditures is projected to increase from 10.1 in 2028 to 10.9 in 2037 and to 10.8 fifty years later in 2087. Excluding full funding (i.e. under the steady-state contribution rate only), the ratio of assets to the following year's expenditures is projected to be 10.9 in 2037 and to be the same fifty years later in 2087.

In the case that the MCR, as determined for an actuarial report, exceeds the statutory contribution rate, the insufficient rates provisions of the CPP statute would result in adjustments to the base CPP statutory contribution rate and possibly to the indexation of benefits in pay if the federal and provincial Ministers of Finance make no recommendation to either increase the statutory rate or maintain it. In respect of this 32nd CPP Actuarial Report, the MCR is less than the statutory rate of 9.9%, and thus the insufficient rates provisions do not apply. Therefore, in the absence of specific action by the federal and provincial Ministers of Finance, the statutory contribution rate will remain as scheduled at 9.9% for the year 2025 and thereafter.

6 The financial projections of the base Plan under the statutory rate of 9.9% were previously presented in Table 11.

Table 14 Financial projections - base CPP, minimum contribution rate of 9.21% for 2028 to 2033, 9.19% for 2034+

Year	PayGo rate (%)	Contribution rate (%)	Contributory earnings ($ million)	Contributions ($ million)	Expenditures ($ million)	Net cash flows ($ million)	Net investment income [1] ($ million)	Assets at 31 Dec. ($ million)	Assets/ expenditures ratio
2025	9.29	9.90	733,218	72,589	68,119	4,470	42,313	697,399	9.7
2026	9.47	9.90	756,595	74,903	71,679	3,224	45,139	745,762	9.9
2027	9.51	9.90	794,101	78,616	75,521	3,095	47,753	796,610	10.0
2028	9.58	9.21	829,989	76,442	79,532	(3,090)	50,535	844,054	10.1
2029	9.72	9.21	861,449	79,339	83,720	(4,381)	53,267	892,940	10.1
2030	9.85	9.21	893,245	82,268	88,006	(5,738)	56,012	943,214	10.2
2031	9.96	9.21	927,034	85,380	92,365	(6,985)	58,875	995,104	10.3
2032	10.05	9.21	962,880	88,681	96,747	(8,066)	61,882	1,048,920	10.4
2033	10.12	9.21	999,736	92,076	101,179	(9,103)	64,952	1,104,768	10.5
2034	10.18	9.19	1,037,774	95,371	105,669	(10,298)	68,200	1,162,671	10.5
2035	10.23	9.19	1,077,475	99,020	110,244	(11,224)	71,552	1,222,998	10.6
2036	10.30	9.19	1,115,651	102,528	114,878	(12,350)	75,084	1,285,732	10.8
2037	10.35	9.19	1,155,755	106,214	119,576	(13,362)	78,697	1,351,067	10.9
2038	10.39	9.19	1,197,087	110,012	124,350	(14,338)	82,444	1,419,173	11.0
2039	10.43	9.19	1,239,659	113,925	129,242	(15,317)	86,357	1,490,212	11.1
2040	10.47	9.19	1,282,894	117,898	134,283	(16,385)	90,528	1,564,356	11.2
2041	10.50	9.19	1,328,216	122,063	139,497	(17,434)	94,889	1,641,810	11.3
2042	10.54	9.19	1,374,507	126,317	144,869	(18,551)	99,069	1,722,328	11.5
2043	10.58	9.19	1,421,930	130,675	150,414	(19,739)	103,920	1,806,509	11.6
2044	10.62	9.19	1,470,877	135,174	156,181	(21,007)	108,982	1,894,484	11.7
2045	10.66	9.19	1,521,171	139,796	162,211	(22,415)	114,267	1,986,335	11.8
2046	10.72	9.19	1,572,061	144,472	168,526	(24,054)	119,778	2,082,059	11.9
2047	10.78	9.19	1,624,757	149,315	175,137	(25,822)	125,521	2,181,758	12.0
2048	10.84	9.19	1,678,961	154,297	182,074	(27,777)	131,498	2,285,479	12.1
2049	10.92	9.19	1,734,294	159,382	189,387	(30,005)	137,711	2,393,185	12.1
2050	11.01	9.19	1,790,525	164,549	197,144	(32,595)	144,156	2,504,745	12.2
2051	11.10	9.19	1,850,791	170,088	205,403	(35,315)	150,830	2,620,260	12.2
2052	11.19	9.19	1,912,875	175,793	214,122	(38,329)	157,735	2,739,666	12.3
2053	11.30	9.19	1,976,617	181,651	223,283	(41,632)	164,868	2,862,902	12.3
2054	11.41	9.19	2,041,750	187,637	232,943	(45,306)	172,222	2,989,818	12.3
2055	11.53	9.19	2,108,774	193,796	243,200	(49,403)	179,787	3,120,201	12.3
2060	12.20	9.19	2,475,330	227,483	302,028	(74,546)	220,439	3,819,093	12.1
2065	12.73	9.19	2,912,278	267,638	370,805	(103,166)	265,750	4,597,484	11.9
2070	13.09	9.19	3,435,340	315,708	449,772	(134,064)	316,464	5,469,002	11.7
2075	13.40	9.19	4,047,374	371,954	542,366	(170,412)	373,184	6,442,509	11.4
2080	13.66	9.19	4,759,241	437,374	650,004	(212,630)	435,874	7,517,029	11.2
2085	13.78	9.19	5,599,158	514,563	771,599	(257,036)	505,167	8,705,475	10.9
2087	13.80	9.19	5,976,884	549,276	824,632	(275,357)	535,091	9,219,037	10.8
2090	13.80	9.19	6,594,010	605,989	910,299	(304,310)	582,662	10,035,399	10.7
2095	13.84	9.19	7,766,468	713,738	1,074,924	(361,185)	669,229	11,518,211	10.4
2100	13.93	9.19	9,137,861	839,769	1,273,123	(433,353)	763,620	13,128,645	10.0

(1) Investment income is net of all investment expenses.

Table 15 shows the progression of the MCR over time under the best-estimate assumptions of this report. As shown in Table 15, the MCR is projected to be relatively stable and remain below the statutory contribution rate of 9.9% over the next four triennial valuation reports, if the best-estimate assumptions of this report are realized. Thus, the current statutory contribution rate is projected to be sufficient over subsequent reports as long as the best-estimate assumptions remain the same and base Plan experience does not deviate materially from the assumptions.

Table 15 Progression of minimum contribution rate over time – base CPP

Valuation year [1]	Steady-state target years [2]	Steady-state target A/E ratio [3]	Steady-state contribution rate [4]	Full funding rate [5]		Minimum contribution rate (MCR) [6]		Average PayGo rate over target years period
				Prior to 2034	2034+	Prior to 2034	2034+	
2024	2037 and 2087	10.9	9.18%	0.03%	0.01%	9.21%	9.19%	12.2
2027	2040 and 2090	11.5	9.18%	0.02%	0.01%	9.20%	9.19%	12.4
2030	2043 and 2093	12.1	9.20%	N/A	N/A [7]	N/A	9.20%	12.6
2033	2046 and 2096	12.7	9.20%	N/A	N/A	N/A	9.20%	12.8
2036	2049 and 2099	13.3	9.19%	N/A	N/A	N/A	9.19%	13.0

(1) Reports are prepared as at 31 December of the valuation year.
(2) Target years refer to the beginning and end of the 50-year interval over which the assets/expenditures (A/E) are compared. The steady-state contribution rate is the lowest level rate that results in the A/E ratio being the same in the two target years. For a given triennial review period of the Plan, the target years are 13 and 63 years after the valuation year. For this report, the valuation year is 2024 and thus the target years are 2037 and 2087.
(3) The steady-state target A/E ratio is the ratio obtained in the target years relating to the determination of the corresponding steady-state contribution rate.
(4) The steady-state contribution rate determined by a valuation is effective following the corresponding triennial review period. That is, for the current valuation as at 31 December 2024, the corresponding triennial review period is 2025-2027, and the steady-state rate applies from 2028 onward.
(5) The full funding rate, in respect of amendments to the *Canada Pension Plan* that introduce or increase benefits, is determined by a valuation such that the rate is effective following the corresponding triennial review period, or as at the effective date of the amendments if later. For the current valuation, the full funding rate is in respect of the amendments to the CPP statute under the *Budget Implementation Act, 2018, No. 1*, and the rate applies from 2028 onward. The amendments to the CPP statute under the *Budget Implementation Act, 2024, No. 1* were determined not to require separate full funding and thus are financed entirely by the steady-state contribution rate.
(6) The minimum contribution rate equals the sum of the rounded steady-state contribution rate and the rounded full funding rate.
(7) The full funding rate for the 2030 valuation applies for the year 2034 and onward and as such consists only of the permanent rate with the temporary rate no longer applying, since the amortization of benefit improvements under the *Budget Implementation Act, 2018, No. 1* in respect of past Plan participation ends in 2033. The permanent full funding rate is determined to be 0.01%, which falls below the de minimis rate of 0.02% as set out in the regulations. As such, the rate is deemed to equal 0%, the benefit improvements of the *Budget Implementation Act, 2018, No. 1* in respect of future Plan participation are financed entirely by the steady-state contribution rate, and the MCR for 2034 and onward equals the steady-state contribution rate.

6 Results – additional CPP

6.1 Overview

The key observations and findings of the actuarial projections of the financial state of the additional CPP presented in this report are as follows.

- With the statutory first and second additional contribution rates of 2.0% and 8.0%, respectively, contributions to the additional CPP are projected to be higher than expenditures up to and including the year 2057. Thereafter, a portion of investment income is required to make up the difference between contributions and expenditures.
- With the statutory first and second additional contribution rates of 2.0% and 8.0%, respectively, total assets are expected to increase rapidly over the first several decades as contributions are projected to exceed expenditures. The additional CPP assets are projected to grow from $54 billion at the end of 2024 to $214 billion by 2030, $1.4 trillion by 2050, and $11 trillion by 2100. As the additional CPP is in its early stages, the ratio of assets to the following year's expenditures is high and is projected to increase from 99.7 in 2025 to 102.4 in 2026. The ratio will decrease after that, and as the additional CPP matures and more benefits are paid out, the ratio is projected to stabilize at about 24 by 2085 and remain close to that level for the years following up to 2100.
- As it matures, investment income will become the major source of revenues of the additional Plan. With the statutory first and second additional contribution rates of 2.0% and 8.0%, respectively, investment income of the additional Plan is expected to represent 16% of revenues (contributions and investment income) in 2025, and by 2040, it is expected to represent more than 50% of revenues. This proportion is expected to continue increasing to about 62% of revenues by 2050 and 72% of revenues by 2100.
- The first additional minimum contribution rate (FAMCR) applicable to pensionable earnings between the YBE and YMPE is 2.01% for the year 2028 and thereafter. The second additional minimum contribution rate (SAMCR) applicable to pensionable earnings above the YMPE up to the YAMPE is 8.04% for the year 2028 and thereafter.
- Under the FAMCR and SAMCR of 2.01% and 8.04%, respectively, for 2028 and thereafter, the additional CPP open group assets represent 104.3% of its open group actuarial obligations as at 31 December 2024, and the ratio of invested assets to expenditures stabilizes at a value of 24.5 for the target years 2088 and 2098.
- The AMCRs determined for this report are higher than the AMCRs of 1.97% and 7.88% determined under the 31st CPP Actuarial Report due to changes in assumptions.
- The AMCRs determined for this report are higher than the statutory rates. However, as per the *Additional Canada Pension Plan Sustainability Regulations*, the AMCRs fall within a range that requires no immediate action. Therefore, in the absence of specific action by the federal and provincial Finance Ministers, the statutory additional contribution rates will remain as scheduled at 2.0% and 8.0%.

- The number of contributors to the additional CPP is the same as to the base CPP, since an individual cannot contribute to the additional Plan without also contributing to the base Plan. Under the statutory first and second additional contribution rates of 2.0% and 8.0%, respectively, additional contributions are expected to increase from $19 billion in 2025 to $23 billion in 2030, $46 billion in 2050, and $232 billion by 2100.
- The number of beneficiaries of additional retirement benefits is expected to increase from 1.5 million in 2025 to 3.0 million in 2030, 8.6 million in 2050, and 15.5 million by 2100.
- Total additional CPP expenditures are expected to steadily grow over time as the additional Plan matures and individuals accrue benefits. Total additional CPP expenditures are projected to increase from approximately $609 million in 2025 to $1.9 billion in 2030, $29 billion in 2050, and $458 billion by 2100.
- For the additional CPP, as described in Appendix F, the adjustment factors calculated on the basis of this report and in accordance with subsection 115(1.11) of the *Canada Pension Plan* are 0.4% per month for pre-65 retirement pension take-up and 0.5% per month for post-65 retirement pension take-up. These adjustment factors are 20 basis points lower than the current legislated adjustment factors for both pre-65 and post-65 pension take-up.

6.2 Contributions

Projected additional contributions are the product of the additional contribution rates, the number of contributors, and the average first and second additional contributory earnings. The first and second additional contribution rates for the additional CPP are set by law and are 2.0% and 8.0%, respectively.

Table 16 presents the projected number of contributors to the additional CPP, including CPP retirement beneficiaries who are working (i.e. working beneficiaries), their additional contributory earnings, and additional contributions.

As all contributors to the additional Plan are contributors to the base Plan, the number of contributors to the additional Plan is linked to the same assumed labour force participation rates applied to the working-age population and the same assumed job creation rates as for the base Plan. The number of working beneficiaries who are contributors is derived from the number of retirement beneficiaries in pay.

The additional contributory earnings relating to the first tier of the additional CPP are the same as the base CPP contributory earnings (pensionable earnings between the YBE and YMPE). As such, the projected total first additional contributory earnings shown in Table 16 are the same as the projected total base CPP contributory earnings shown in Table 4.

The second additional contributory earnings relating to pensionable earnings above the YMPE up to the YAMPE are based on the assumed annual increases in wages and the assumed proportion of individuals with pensionable earnings between the YMPE and YAMPE.

As shown in Table 16, total contributions to the additional CPP are expected to be $19 billion in

2025. Thereafter, total contributions to the additional Plan are projected to continue increasing, reaching $23 billion in 2030, $46 billion in 2050, and $232 billion by 2100.

The projected YMPE and YAMPE are also shown, which are assumed to increase according to increases in the average weekly earnings assumption, with the YAMPE equal to 114% of the YMPE (rounded down to the nearest $100). The YAMPE is projected to increase from $81,200 in 2025 to $93,500 in 2030, $162,600 in 2050, and $647,000 by 2100.

The first and second additional contributions to the additional CPP increase at the same rate as the first and second additional contributory earnings, respectively, throughout the projection period. This growth is reflected in the projected total additional contributions.

Table 16 Contributions - additional CPP

Year	First Additional contribution rate (%)	Second additional contribution rate (%)	YMPE ($)	YAMPE ($)	Number of contributors (thousands)	First additional contributory earnings ($ million)	Second additional contributory earnings ($ million)	Additional contributions ($ million)
2025	2.0	8.0	71,300	81,200	16,114	733,218	52,385	18,855
2026	2.0	8.0	73,400	83,600	16,121	756,595	53,969	19,449
2027	2.0	8.0	75,600	86,100	16,424	794,101	56,427	20,396
2028	2.0	8.0	77,700	88,500	16,683	829,989	58,964	21,317
2029	2.0	8.0	79,900	91,000	16,825	861,449	61,069	22,114
2030	2.0	8.0	82,100	93,500	16,960	893,245	63,245	22,925
2031	2.0	8.0	84,400	96,200	17,108	927,034	65,942	23,816
2032	2.0	8.0	86,800	98,900	17,267	962,880	68,157	24,710
2033	2.0	8.0	89,200	101,600	17,429	999,736	70,480	25,633
2034	2.0	8.0	91,700	104,500	17,584	1,037,774	73,299	26,619
2035	2.0	8.0	94,300	107,500	17,740	1,077,475	76,126	27,640
2040	2.0	8.0	108,200	123,300	18,316	1,282,894	89,652	32,830
2045	2.0	8.0	124,300	141,700	18,843	1,521,171	105,887	38,894
2050	2.0	8.0	142,700	162,600	19,280	1,790,525	123,730	45,709
2055	2.0	8.0	163,800	186,700	19,749	2,108,774	145,479	53,814
2060	2.0	8.0	188,000	214,300	20,159	2,475,330	170,294	63,130
2065	2.0	8.0	215,900	246,100	20,626	2,912,278	199,427	74,200
2070	2.0	8.0	247,900	282,600	21,166	3,435,340	234,485	87,466
2075	2.0	8.0	284,600	324,400	21,698	4,047,374	275,391	102,979
2080	2.0	8.0	326,700	372,400	22,206	4,759,241	323,260	121,046
2085	2.0	8.0	375,100	427,600	22,738	5,599,158	379,598	142,351
2090	2.0	8.0	430,600	490,800	23,313	6,594,010	445,680	167,535
2095	2.0	8.0	494,400	563,600	23,904	7,766,468	524,601	197,297
2100	2.0	8.0	567,600	647,000	24,486	9,137,861	616,027	232,039

6.3 Expenditures

Under the additional CPP, there are only earnings-related benefits. As such, for the additional CPP, there are only retirement, disability, and survivor beneficiaries.

The projected number of additional CPP beneficiaries by type of benefit is given in Table 17, while Table 18 presents information for male and female beneficiaries separately. The number of additional retirement beneficiaries increases over time as the number of contributors reaching age 60 (earliest retirement age) and older with at least one valid contribution to the additional CPP increases.

The total number of retirement beneficiaries receiving additional retirement benefits is projected to increase from an estimated 1.5 million in 2025 to 3.0 million in 2030, 8.6 million in 2050, and 15.5 million by 2100.

The total number of disability and survivor beneficiaries receiving additional benefits increases over time as well. Since eligibility to these benefits is harmonized between the base and additional CPP, all new disability and survivor beneficiaries of the base CPP are also entitled to additional benefits if they (in the case of disability beneficiaries) and their deceased partners (in the case of survivor beneficiaries) had made at least one contribution to the additional Plan. The total number of disability beneficiaries receiving additional benefits is projected to increase from an estimated 160,000 in 2025 to 267,000 in 2030, 500,000 in 2050, and 666,000 by 2100. The total number of survivor beneficiaries receiving additional benefits is projected to increase from about 184,000 in 2025 to 369,000 in 2030, 1.6 million in 2050, and 2.5 million by 2100.

Table 17 Beneficiaries - additional CPP [1]
(thousands)

Year	Retirement [2],[3],[4]	Disability [5]	Survivor [4],[5]
2025	1,535	160	184
2026	1,814	186	216
2027	2,105	209	251
2028	2,402	230	287
2029	2,700	249	327
2030	3,005	267	369
2031	3,312	284	414
2032	3,618	300	462
2033	3,930	316	513
2034	4,245	330	568
2035	4,557	344	625
2040	5,999	407	941
2045	7,330	462	1,280
2050	8,593	500	1,583
2055	9,809	521	1,807
2060	10,900	526	1,956
2065	11,738	538	2,058
2070	12,428	564	2,147
2075	13,087	581	2,239
2080	13,674	594	2,327
2085	14,131	608	2,395
2090	14,519	630	2,433
2095	14,958	648	2,447
2100	15,464	666	2,458

(1) Numbers of beneficiaries by sex in Table 18 may not sum to total numbers of beneficiaries shown in Table 17 due to rounding.
(2) The number given for retirement beneficiaries includes working beneficiaries.
(3) The number given for retirement beneficiaries does not take into account that the retirement pension can be shared between spouses.
(4) A beneficiary who receives concurrently a retirement and a survivor's benefit is counted in each category.
(5) A beneficiary who receives concurrently a disability and survivor's benefit is counted in each category.

Table 18 Beneficiaries by sex – additional CPP [1]
(thousands)

	Males			Females		
Year	Retirement[2],[3],[4]	Disability[5]	Survivor[4],[5]	Retirement[2],[3],[4]	Disability[5]	Survivor[4],[5]
2025	794	74	56	741	86	128
2026	936	85	66	878	101	150
2027	1,083	95	76	1,022	114	174
2028	1,231	103	87	1,170	126	200
2029	1,379	111	99	1,321	137	228
2030	1,527	119	111	1,477	148	258
2031	1,675	126	124	1,637	158	290
2032	1,821	133	137	1,798	167	325
2033	1,967	139	151	1,963	176	362
2034	2,113	145	166	2,132	185	402
2035	2,257	151	181	2,299	193	444
2040	2,911	178	257	3,088	229	683
2045	3,501	202	328	3,830	260	952
2050	4,056	219	384	4,537	281	1,199
2055	4,605	228	421	5,205	293	1,386
2060	5,116	229	446	5,784	297	1,510
2065	5,513	233	465	6,225	305	1,593
2070	5,838	245	481	6,590	319	1,665
2075	6,145	252	496	6,941	329	1,743
2080	6,414	258	505	7,260	336	1,822
2085	6,619	264	509	7,513	344	1,885
2090	6,796	274	509	7,723	356	1,923
2095	7,007	282	509	7,951	366	1,938
2100	7,253	290	509	8,211	376	1,949

(1) Numbers of beneficiaries by sex in Table 18 may not sum to total numbers of beneficiaries shown in Table 17 due to rounding.
(2) The number given for retirement beneficiaries includes working beneficiaries.
(3) The number given for retirement beneficiaries does not take into account that the retirement pension can be shared between spouses.
(4) A beneficiary who receives concurrently a retirement and a survivor's benefit is counted in each category.
(5) A beneficiary who receives concurrently a disability and survivor's benefit is counted in each category.

Table 19 shows the amount of projected additional CPP expenditures by type. Projected additional benefit expenditures are low over the first few years as additional benefits are in the early phase of accrual after the start of the additional Plan in 2019. As higher additional benefits become payable to a greater number of beneficiaries over time, projected additional expenditures will increase to reach $1.9 billion in 2030, $29 billion in 2050, and $458 billion by 2100. Table 20 presents the same information but in year 2025 constant dollars.

Table 19 **Expenditures - additional CPP**
($ million)

Year	Retirement [1]	Disability	Survivor	Operating expenses [2]	Total
2025	311	20	6	273	609
2026	444	33	9	277	763
2027	619	49	13	290	971
2028	844	69	19	302	1,234
2029	1,119	94	26	313	1,551
2030	1,434	121	34	324	1,914
2031	1,801	152	45	336	2,333
2032	2,223	186	57	348	2,814
2033	2,711	224	71	360	3,367
2034	3,268	266	89	373	3,996
2035	3,893	312	109	386	4,700
2036	4,587	361	132	399	5,480
2037	5,353	414	159	413	6,339
2038	6,194	473	189	427	7,282
2039	7,122	536	224	441	8,322
2040	8,149	604	263	456	9,472
2041	9,283	676	308	471	10,738
2042	10,528	753	358	486	12,126
2043	11,894	835	415	502	13,646
2044	13,395	921	478	519	15,314
2045	15,046	1,012	550	536	17,144
2046	16,861	1,106	629	554	19,149
2047	18,847	1,203	716	572	21,339
2048	21,018	1,303	813	590	23,725
2049	23,392	1,407	920	609	26,328
2050	25,994	1,512	1,038	628	29,172
2051	28,848	1,618	1,166	649	32,282
2052	31,949	1,726	1,307	670	35,652
2053	35,299	1,834	1,459	692	39,284
2054	38,923	1,941	1,624	715	43,203
2055	42,862	2,044	1,802	738	47,446
2060	66,710	2,519	2,910	863	73,002
2065	95,490	2,994	4,431	1,010	103,925
2070	127,473	3,607	6,419	1,186	138,685
2075	163,550	4,281	8,928	1,394	178,154
2080	204,045	5,008	11,940	1,635	222,628
2085	248,061	5,884	15,352	1,919	271,215
2090	296,226	7,007	18,978	2,254	324,465
2095	352,041	8,289	22,700	2,651	385,681
2100	418,658	9,780	26,634	3,115	458,188

(1) Retirement expenditures include expenditures related to post-retirement benefits for working beneficiaries.

(2) Plan operating expenses exclude CPPIB operating expenses, which are accounted for separately in the investment expenses assumption.

Table 20 Expenditures – additional CPP, year 2025 constant dollars [1]
($ millions)

Year	Retirement [2]	Disability	Survivor	Operating expenses [3]	Total
2025	311	20	6	273	609
2026	435	32	9	271	747
2027	594	47	12	278	932
2028	795	65	18	284	1,162
2029	1,033	87	24	289	1,431
2030	1,298	109	31	293	1,732
2031	1,598	135	40	298	2,070
2032	1,933	162	50	303	2,447
2033	2,312	191	61	307	2,871
2034	2,732	222	74	312	3,340
2035	3,190	256	89	316	3,852
2036	3,686	290	106	321	4,403
2037	4,217	326	125	325	4,993
2038	4,783	365	146	330	5,624
2039	5,392	406	170	334	6,301
2040	6,049	448	195	338	7,031
2041	6,756	492	224	343	7,814
2042	7,511	537	255	347	8,651
2043	8,320	584	290	351	9,545
2044	9,186	632	328	356	10,502
2045	10,116	680	370	360	11,526
2046	11,114	729	415	365	12,622
2047	12,179	777	463	370	13,789
2048	13,316	825	515	374	15,031
2049	14,529	874	571	378	16,353
2050	15,829	921	632	382	17,764
2051	17,222	966	696	387	19,272
2052	18,699	1,010	765	392	20,867
2053	20,255	1,052	837	397	22,542
2054	21,897	1,092	914	402	24,304
2055	23,640	1,127	994	407	26,168
2060	33,324	1,258	1,454	431	36,467
2065	43,204	1,355	2,005	457	47,021
2070	52,238	1,478	2,630	486	56,832
2075	60,704	1,589	3,314	517	66,124
2080	68,595	1,684	4,014	550	74,842
2085	75,531	1,792	4,674	584	82,581
2090	81,693	1,932	5,234	622	89,481
2095	87,934	2,070	5,670	662	96,336
2100	94,715	2,213	6,026	705	103,659

(1) For a given year, the value in 2025 constant dollars is equal to the corresponding value in current dollars divided by the cumulative projected increases in prices since 2025.
(2) Retirement expenditures include expenditures related to post-retirement benefits for working beneficiaries.
(3) Plan operating expenses exclude CPPIB operating expenses, which are accounted for separately in the investment expenses assumption.

6.4 Financial projections with statutory additional contribution rates

Table 21 presents the historical results of the additional CPP, while Table 22 and Table 23 present the projected financial state of the additional CPP using the statutory first and second additional contribution rates of 2.0% and 8.0% in current dollars and in year 2025 constant dollars, respectively. The projected financial state of the additional CPP using the FAMCR and SAMCR of 2.01% and 8.04%, respectively, for year 2028 and thereafter is discussed in the next section 6.5.

As shown in Table 21, the market value of the additional CPP assets is $54 billion as at 31 December 2024. Additional contributions are projected to be higher than additional expenditures up to and including the year 2057. Over that period, as shown in Table 22, the additional assets are therefore projected to grow rapidly, from $54 billion at the end of 2024 to $214 billion by 2030, $1.4 trillion by 2050, and $11 trillion by 2100.

Table 21 Historical results - additional CPP

Year	First and second additional contribution rates [1] (%)	Contributions ($ million)	Expenditures ($ million)	Net cash flows ($ million)	Net investment income [3] ($ million)	Assets at 31 Dec. ($ million)	Net rate of return [2], [3] (%)	Assets/ expenditures ratio
2019	0.3	1,601	130	1,471	62	1,533	7.6	8.1
2020	0.6	3,198	189	3,009	370	4,912	11.6	24.5
2021	1.0	5,688	201	5,488	645	11,045	8.1	36.6
2022	1.5	9,310	302	9,008	(893)	19,160	(5.5)	44.6
2023	2.0	13,430	430	13,000	1,699	33,859	6.4	70.3
2024	2.0 and 8.0	16,334	482	15,853	4,525	54,237	10.6	89.1

(1) The statutory first additional contribution rate of 2.0% was phased-in over the 5-year period 2019 to 2023. The statutory second additional contribution rate is applicable from the year 2024 onward.
(2) Rates of return are nominal (i.e., inflation included). They were estimated based on assumed cash flow timing and may not match the rates of return published by the CPPIB.
(3) Rates of return and investment income are net of all investment expenses.

Table 22 Financial projections - additional CPP, statutory first and second additional contribution rates of 2.0% and 8.0%

Year	First and second additional contribution rates (%)	First additional contributory earnings ($ million)	Second additional contributory earnings ($ million)	Contributions ($ million)	Expenditures ($ million)	Net cash flows ($ million)	Net investment income [2] ($ million)	Assets at 31 Dec. ($ million)	Net rate of return [1], [2] (%)	Assets/ expenditures ratio
2025	2.0 and 8.0	733,218	52,385	18,855	609	18,246	3,549	76,031	5.51	99.7
2026	2.0 and 8.0	756,595	53,969	19,449	763	18,687	4,727	99,445	5.47	102.4
2027	2.0 and 8.0	794,101	56,427	20,396	971	19,425	6,038	124,908	5.47	101.2
2028	2.0 and 8.0	829,989	58,964	21,317	1,234	20,082	7,463	152,453	5.48	98.3
2029	2.0 and 8.0	861,449	61,069	22,114	1,551	20,563	9,027	182,043	5.50	95.1
2030	2.0 and 8.0	893,245	63,245	22,925	1,914	21,010	10,668	213,721	5.50	91.6
2031	2.0 and 8.0	927,034	65,942	23,816	2,333	21,483	12,430	247,634	5.50	88.0
2032	2.0 and 8.0	962,880	68,157	24,710	2,814	21,896	14,329	283,859	5.51	84.3
2033	2.0 and 8.0	999,736	70,480	25,633	3,367	22,266	16,350	322,475	5.51	80.7
2034	2.0 and 8.0	1,037,774	73,299	26,619	3,996	22,623	18,515	363,614	5.52	77.4
2035	2.0 and 8.0	1,077,475	76,126	27,640	4,700	22,940	20,818	407,371	5.53	74.3
2036	2.0 and 8.0	1,115,651	78,372	28,583	5,480	23,103	23,307	453,781	5.54	71.6
2037	2.0 and 8.0	1,155,755	81,179	29,609	6,339	23,270	25,893	502,945	5.54	69.1
2038	2.0 and 8.0	1,197,087	83,970	30,659	7,282	23,377	28,624	554,946	5.54	66.7
2039	2.0 and 8.0	1,239,659	86,745	31,733	8,322	23,410	31,492	609,848	5.54	64.4
2040	2.0 and 8.0	1,282,894	89,652	32,830	9,472	23,358	34,553	667,760	5.54	62.2
2041	2.0 and 8.0	1,328,216	92,423	33,958	10,738	23,221	37,774	728,755	5.54	60.1
2042	2.0 and 8.0	1,374,507	95,907	35,163	12,126	23,037	41,107	792,899	5.53	58.1
2043	2.0 and 8.0	1,421,930	98,851	36,347	13,646	22,701	44,656	860,256	5.53	56.2
2044	2.0 and 8.0	1,470,877	102,364	37,607	15,314	22,293	48,381	930,929	5.53	54.3
2045	2.0 and 8.0	1,521,171	105,887	38,894	17,144	21,750	52,286	1,004,966	5.53	52.5
2046	2.0 and 8.0	1,572,061	108,996	40,161	19,149	21,012	56,372	1,082,349	5.53	50.7
2047	2.0 and 8.0	1,624,757	112,531	41,498	21,339	20,159	60,641	1,163,149	5.53	49.0
2048	2.0 and 8.0	1,678,961	116,091	42,866	23,725	19,141	65,095	1,247,385	5.53	47.4
2049	2.0 and 8.0	1,734,294	120,203	44,302	26,328	17,974	69,736	1,335,095	5.53	45.8
2050	2.0 and 8.0	1,790,525	123,730	45,709	29,172	16,536	74,562	1,426,194	5.53	44.2
2051	2.0 and 8.0	1,850,791	128,018	47,257	32,282	14,976	79,574	1,520,743	5.53	42.7
2052	2.0 and 8.0	1,912,875	132,358	48,846	35,652	13,194	84,771	1,618,708	5.53	41.2
2053	2.0 and 8.0	1,976,617	136,174	50,426	39,284	11,142	90,150	1,720,000	5.53	39.8
2054	2.0 and 8.0	2,041,750	141,171	52,129	43,203	8,926	95,710	1,824,636	5.53	38.5
2055	2.0 and 8.0	2,108,774	145,479	53,814	47,446	6,368	101,447	1,932,451	5.53	37.1
2060	2.0 and 8.0	2,475,330	170,294	63,130	73,002	(9,872)	132,601	2,516,678	5.53	31.9
2065	2.0 and 8.0	2,912,278	199,427	74,200	103,925	(29,725)	167,776	3,175,424	5.53	28.7
2070	2.0 and 8.0	3,435,340	234,485	87,466	138,685	(51,219)	207,457	3,918,974	5.53	26.8
2075	2.0 and 8.0	4,047,374	275,391	102,979	178,154	(75,175)	252,446	4,762,156	5.53	25.5
2080	2.0 and 8.0	4,759,241	323,260	121,046	222,628	(101,583)	303,564	5,720,612	5.53	24.7
2085	2.0 and 8.0	5,599,158	379,598	142,351	271,215	(128,864)	362,177	6,821,173	5.53	24.2
2090	2.0 and 8.0	6,594,010	445,680	167,535	324,465	(156,930)	430,420	8,104,553	5.53	24.1
2095	2.0 and 8.0	7,766,468	524,601	197,297	385,681	(188,383)	510,710	9,615,313	5.53	24.1
2100	2.0 and 8.0	9,137,861	616,027	232,039	458,188	(226,148)	605,248	11,393,815	5.53	24.0

(1) Rates of return are nominal (include inflation).
(2) Rates of return and investment Income are net of all investment expenses.

Table 23 Financial projections - statutory first and second additional contribution rates of 2.0% and 8.0%, year 2025 constant dollars ($ millions) (1)

Year	First / second additional contribution rates (%)	First additional contributory earnings ($ million)	Second additional contributory earnings ($ million)	Contributions ($ million)	Expenditures ($ million)	Net cash flows ($ million)	Net investment income (2) ($ million)	Assets at 31 Dec. ($ million)
2025	2.0 and 8.0	733,218	52,385	18,855	609	18,246	3,549	76,031
2026	2.0 and 8.0	741,033	52,859	19,049	747	18,302	4,630	97,400
2027	2.0 and 8.0	762,517	54,183	19,585	933	18,652	5,798	119,940
2028	2.0 and 8.0	781,351	55,508	20,068	1,162	18,906	7,026	143,520
2029	2.0 and 8.0	795,066	56,363	20,410	1,432	18,979	8,331	168,015
2030	2.0 and 8.0	808,247	57,227	20,743	1,732	19,011	9,652	193,384
2031	2.0 and 8.0	822,374	58,498	21,127	2,070	19,058	11,026	219,676
2032	2.0 and 8.0	837,424	59,276	21,491	2,448	19,043	12,462	246,874
2033	2.0 and 8.0	852,429	60,095	21,856	2,871	18,985	13,941	274,959
2034	2.0 and 8.0	867,512	61,274	22,252	3,340	18,912	15,478	303,958
2035	2.0 and 8.0	883,039	62,388	22,652	3,852	18,800	17,061	333,859
2036	2.0 and 8.0	896,398	62,970	22,966	4,403	18,563	18,727	364,602
2037	2.0 and 8.0	910,412	63,947	23,324	4,993	18,331	20,397	396,180
2038	2.0 and 8.0	924,481	64,848	23,677	5,624	18,054	22,106	428,571
2039	2.0 and 8.0	938,587	65,677	24,026	6,301	17,725	23,844	461,736
2040	2.0 and 8.0	952,276	66,547	24,369	7,031	17,339	25,648	495,670
2041	2.0 and 8.0	966,586	67,259	24,712	7,814	16,898	27,489	530,338
2042	2.0 and 8.0	980,660	68,426	25,087	8,651	16,436	29,329	565,704
2043	2.0 and 8.0	994,602	69,144	25,424	9,545	15,878	31,236	601,726
2044	2.0 and 8.0	1,008,666	70,197	25,789	10,501	15,288	33,177	638,393
2045	2.0 and 8.0	1,022,702	71,189	26,149	11,526	14,623	35,152	675,651
2046	2.0 and 8.0	1,036,192	71,842	26,471	12,622	13,849	37,156	713,408
2047	2.0 and 8.0	1,049,927	72,718	26,816	13,789	13,027	39,186	751,633
2048	2.0 and 8.0	1,063,680	73,547	27,157	15,031	12,127	41,240	790,262
2049	2.0 and 8.0	1,077,192	74,660	27,517	16,353	11,164	43,314	829,244
2050	2.0 and 8.0	1,090,311	75,343	27,834	17,764	10,070	45,403	868,458
2051	2.0 and 8.0	1,104,911	76,426	28,212	19,272	8,940	47,505	907,874
2052	2.0 and 8.0	1,119,583	77,467	28,589	20,867	7,722	49,615	947,411
2053	2.0 and 8.0	1,134,206	78,138	28,935	22,542	6,393	51,729	986,957
2054	2.0 and 8.0	1,148,609	79,417	29,326	24,304	5,021	53,843	1,026,469
2055	2.0 and 8.0	1,163,052	80,236	29,680	26,168	3,512	55,951	1,065,805
2060	2.0 and 8.0	1,236,521	85,068	31,536	36,467	(4,931)	66,239	1,257,176
2065	2.0 and 8.0	1,317,651	90,230	33,571	47,021	(13,449)	75,910	1,436,710
2070	2.0 and 8.0	1,407,785	96,091	35,843	56,832	(20,989)	85,015	1,605,976
2075	2.0 and 8.0	1,502,239	102,215	38,222	66,124	(27,902)	93,699	1,767,541
2080	2.0 and 8.0	1,599,936	108,672	40,692	74,842	(34,150)	102,051	1,923,125
2085	2.0 and 8.0	1,704,853	115,581	43,344	82,581	(39,237)	110,277	2,076,936
2090	2.0 and 8.0	1,818,498	122,910	46,203	89,481	(43,278)	118,701	2,235,076
2095	2.0 and 8.0	1,939,930	131,036	49,282	96,336	(47,055)	127,567	2,401,739
2100	2.0 and 8.0	2,067,312	139,367	52,496	103,658	(51,163)	136,929	2,577,690

(1) For a given year, the value in year 2025 constant dollars is equal to the corresponding value in current dollars divided by the cumulative projected increases in prices since 2025.

(2) Investment income is net of all investment expenses.

Table 24 shows in more detail the sources of the revenues (contributions and investment income) required to cover the additional CPP expenditures. With the growth in the additional assets, the importance of the investment income increases rapidly. By 2080, investment income is projected to represent about 71% of revenues of the additional CPP.

The additional CPP relies more heavily on investment income as a source of revenues than the base CPP. This results in the additional contribution rates being more sensitive to financial market environments than is the case for the base CPP. The sensitivity of the base and additional CPP to investment experience is examined in Appendix - E of this report.

Table 24 also shows the projected additional CPP expenditures as a percentage of total additional revenues. This percentage is projected to increase as the additional Plan matures from about 3% in 2025 to 10% in 2035. It continues to grow but at a decreasing pace and stabilizes at about 54% by 2085.

Table 24 Sources of revenues - additional CPP, statutory first and second additional contribution rates of 2.0% and 8.0%

Year	Contributions ($ million)	Net investment income [1] ($ million)	Total revenues ($ million)	Net investment income as % of revenues (%)	Expenditures ($ million)	Expenditures as % of revenues (%)	Net cash flows (contributions less expenditures) ($ million)	% of net investment income needed to pay expenditures (%)
2025	18,855	3,549	22,404	15.8	609	2.7	18,246	0.0
2026	19,449	4,727	24,176	19.6	763	3.2	18,687	0.0
2027	20,396	6,038	26,434	22.8	971	3.7	19,425	0.0
2028	21,317	7,463	28,780	25.9	1,234	4.3	20,082	0.0
2029	22,114	9,027	31,141	29.0	1,551	5.0	20,563	0.0
2030	22,925	10,668	33,592	31.8	1,914	5.7	21,010	0.0
2031	23,816	12,430	36,246	34.3	2,333	6.4	21,483	0.0
2032	24,710	14,329	39,040	36.7	2,814	7.2	21,896	0.0
2033	25,633	16,350	41,983	38.9	3,367	8.0	22,266	0.0
2034	26,619	18,515	45,135	41.0	3,996	8.9	22,623	0.0
2035	27,640	20,818	48,458	43.0	4,700	9.7	22,940	0.0
2036	28,583	23,307	51,890	44.9	5,480	10.6	23,103	0.0
2037	29,609	25,893	55,503	46.7	6,339	11.4	23,270	0.0
2038	30,659	28,624	59,283	48.3	7,282	12.3	23,377	0.0
2039	31,733	31,492	63,225	49.8	8,322	13.2	23,410	0.0
2040	32,830	34,553	67,383	51.3	9,472	14.1	23,358	0.0
2041	33,958	37,774	71,732	52.7	10,738	15.0	23,221	0.0
2042	35,163	41,107	76,270	53.9	12,126	15.9	23,037	0.0
2043	36,347	44,656	81,003	55.1	13,646	16.8	22,701	0.0
2044	37,607	48,381	85,987	56.3	15,314	17.8	22,293	0.0
2045	38,894	52,286	91,180	57.3	17,144	18.8	21,750	0.0
2046	40,161	56,372	96,533	58.4	19,149	19.8	21,012	0.0
2047	41,498	60,641	102,139	59.4	21,339	20.9	20,159	0.0
2048	42,866	65,095	107,962	60.3	23,725	22.0	19,141	0.0
2049	44,302	69,736	114,038	61.2	26,328	23.1	17,974	0.0
2050	45,709	74,562	120,271	62.0	29,172	24.3	16,536	0.0
2051	47,257	79,574	126,831	62.7	32,282	25.5	14,976	0.0
2052	48,846	84,771	133,617	63.4	35,652	26.7	13,194	0.0
2053	50,426	90,150	140,576	64.1	39,284	27.9	11,142	0.0
2054	52,129	95,710	147,839	64.7	43,203	29.2	8,926	0.0
2055	53,814	101,447	155,261	65.3	47,446	30.6	6,368	0.0
2060	63,130	132,601	195,731	67.7	73,002	37.3	(9,872)	7.4
2065	74,200	167,776	241,976	69.3	103,925	42.9	(29,725)	17.7
2070	87,466	207,457	294,923	70.3	138,685	47.0	(51,219)	24.7
2075	102,979	252,446	355,425	71.0	178,154	50.1	(75,175)	29.8
2080	121,046	303,564	424,610	71.5	222,628	52.4	(101,583)	33.5
2085	142,351	362,177	504,528	71.8	271,215	53.8	(128,864)	35.6
2090	167,535	430,420	597,955	72.0	324,465	54.3	(156,930)	36.5
2095	197,297	510,710	708,007	72.1	385,681	54.5	(188,383)	36.9
2100	232,039	605,248	837,288	72.3	458,188	54.7	(226,148)	37.4

(1) Investment income is net of all investment expenses.

6.5 Financial projections with additional minimum contribution rates

The results presented in Table 25 are based on the best-estimate assumptions, but use the FAMCR of 2.01% and SAMCR of 8.04% for year 2028 and thereafter as opposed to the statutory first and second additional contribution rates of 2.0% and 8.0%, respectively, for 2025 and thereafter.[7] The determination of the AMCRs is described in Appendix - C of this report.

Under the AMCRs, the additional CPP open group assets represent 104.3% of its open group actuarial obligations as at 31 December 2024, and the ratio of invested assets to expenditures stabilizes at a value of 24.5 for the target years 2088 and 2098.

In the event that the AMCRs, as determined under a CPP actuarial report, deviate to a certain extent from their respective statutory additional rates and the federal and provincial Ministers of Finance do not reach an agreement on how to address such deviation, certain provisions of the *Additional Canada Pension Plan Sustainability Regulations* would be activated. In respect of this 32nd CPP Actuarial Report, the AMCRs do not deviate materially from their respective statutory rates, and thus the provisions under the sustainability regulations do not apply. Therefore, in the absence of specific action by the federal and provincial Finance Ministers, the statutory additional contribution rates will remain as scheduled at 2.0% and 8.0% for the year 2025 and thereafter.

[7] The financial projections of the additional Plan under the statutory first and second additional contribution rates of 2.0% and 8.0%, respectively, were previously presented in Table 22.

Table 25 Financial projections - additional CPP, first and second additional minimum contribution rates of 2.01% and 8.04%

Year	First / second additional contribution rates (%)	First additional contributory earnings ($ million)	Second additional contributory earnings ($ million)	Contributions ($ million)	Expenditures ($ million)	Net cash flows ($ million)	Net investment income [1] ($ million)	Assets at 31 Dec. ($ million)	Assets/ expenditures ratio
2025	2.0 and 8.0	733,218	52,385	18,855	609	18,246	3,549	76,031	99.7
2026	2.0 and 8.0	756,595	53,969	19,449	763	18,687	4,727	99,445	102.4
2027	2.0 and 8.0	794,101	56,427	20,396	971	19,425	6,038	124,908	101.2
2028	2.01 and 8.04	829,989	58,964	21,423	1,234	20,189	7,466	152,563	98.4
2029	2.01 and 8.04	861,449	61,069	22,225	1,551	20,674	9,036	182,273	95.2
2030	2.01 and 8.04	893,245	63,245	23,039	1,914	21,125	10,684	214,082	91.8
2031	2.01 and 8.04	927,034	65,942	23,935	2,333	21,602	12,453	248,137	88.2
2032	2.01 and 8.04	962,880	68,157	24,834	2,814	22,019	14,361	284,517	84.5
2033	2.01 and 8.04	999,736	70,480	25,761	3,367	22,394	16,390	323,301	80.9
2034	2.01 and 8.04	1,037,774	73,299	26,753	3,996	22,756	18,565	364,623	77.6
2035	2.01 and 8.04	1,077,475	76,126	27,778	4,700	23,078	20,878	408,579	74.6
2036	2.01 and 8.04	1,115,651	78,372	28,726	5,480	23,246	23,378	455,203	71.8
2037	2.01 and 8.04	1,155,755	81,179	29,757	6,339	23,418	25,977	504,598	69.3
2038	2.01 and 8.04	1,197,087	83,970	30,813	7,282	23,530	28,720	556,849	66.9
2039	2.01 and 8.04	1,239,659	86,745	31,891	8,322	23,569	31,602	612,020	64.6
2040	2.01 and 8.04	1,282,894	89,652	32,994	9,472	23,523	34,678	670,221	62.4
2041	2.01 and 8.04	1,328,216	92,423	34,128	10,738	23,390	37,916	731,527	60.3
2042	2.01 and 8.04	1,374,507	95,907	35,339	12,126	23,213	41,266	796,006	58.3
2043	2.01 and 8.04	1,421,930	98,851	36,528	13,646	22,882	44,833	863,722	56.4
2044	2.01 and 8.04	1,470,877	102,364	37,795	15,314	22,481	48,578	934,781	54.5
2045	2.01 and 8.04	1,521,171	105,887	39,089	17,144	21,945	52,505	1,009,231	52.7
2046	2.01 and 8.04	1,572,061	108,996	40,362	19,149	21,212	56,614	1,087,058	50.9
2047	2.01 and 8.04	1,624,757	112,531	41,705	21,339	20,366	60,908	1,168,332	49.2
2048	2.01 and 8.04	1,678,961	116,091	43,081	23,725	19,356	65,388	1,253,076	47.6
2049	2.01 and 8.04	1,734,294	120,203	44,524	26,328	18,195	70,058	1,341,329	46.0
2050	2.01 and 8.04	1,790,525	123,730	45,937	29,172	16,765	74,914	1,433,008	44.4
2051	2.01 and 8.04	1,850,791	128,018	47,494	32,282	15,212	79,958	1,528,178	42.9
2052	2.01 and 8.04	1,912,875	132,358	49,090	35,652	13,438	85,190	1,626,806	41.4
2053	2.01 and 8.04	1,976,617	136,174	50,678	39,284	11,394	90,606	1,728,807	40.0
2054	2.01 and 8.04	2,041,750	141,171	52,389	43,203	9,187	96,206	1,834,199	38.7
2055	2.01 and 8.04	2,108,774	145,479	54,083	47,446	6,637	101,984	1,942,820	37.3
2060	2.01 and 8.04	2,475,330	170,294	63,446	73,002	(9,556)	133,395	2,531,953	32.1
2065	2.01 and 8.04	2,912,278	199,427	74,571	103,925	(29,354)	168,921	3,197,417	28.9
2070	2.01 and 8.04	3,435,340	234,485	87,903	138,685	(50,782)	209,080	3,950,116	27.0
2075	2.01 and 8.04	4,047,374	275,391	103,494	178,154	(74,660)	254,717	4,805,695	25.7
2080	2.01 and 8.04	4,759,241	323,260	121,651	222,628	(100,977)	306,710	5,780,866	24.9
2085	2.01 and 8.04	5,599,158	379,598	143,063	271,215	(128,153)	366,498	6,903,882	24.5
2088	2.01 and 8.04	6,176,285	417,917	157,744	302,443	(144,699)	407,019	7,666,004	24.5
2090	2.01 and 8.04	6,594,010	445,680	168,372	324,465	(156,093)	436,316	8,217,335	24.5
2095	2.01 and 8.04	7,766,468	524,601	198,284	385,681	(187,397)	518,708	9,768,264	24.5
2098	2.01 and 8.04	8,562,613	577,340	218,527	427,693	(209,166)	575,166	10,830,853	24.5
2100	2.01 and 8.04	9,137,861	616,027	233,200	458,188	(224,988)	616,049	11,600,288	24.5

(1) Investment income is net of all investment expenses.

Table 26 shows the progression of the AMCRs over time under the best-estimate assumptions of this report. As shown in Table 26, if the best-estimate assumptions of this report are realized, the FAMCR and SAMCR will remain at 2.01% and 8.04%, respectively, for each of the next four triennial reports, which are above but within permitted ranges of the statutory additional contribution rates of 2.0% and 8.0%. Thus, the current statutory additional contribution rates are projected to be sufficient over subsequent reports as long as the best-estimate assumptions remain the same and additional Plan experience does not deviate materially from the assumptions.

Table 26 Progression of additional minimum contribution rates over time

Valuation year [1]	Target years [2]	Target A/E ratio [3]	Additional minimum contribution rates	Years additional minimum contribution rates applicable [4]	Assets as a % of obligations on an open group basis [5]
2024	2088 and 2098	24.5	2.01% and 8.04%	2028+	104.3%
2027	2088 and 2098	24.4	2.01% and 8.04%	2031+	104.0%
2030	2088 and 2098	24.4	2.01% and 8.04%	2034+	103.7%
2033	2088 and 2098	24.4	2.01% and 8.04%	2037+	103.4%
2036	2089 and 2099	24.4	2.01% and 8.04%	2040+	103.1%

(1) Reports are prepared as at 31 December of the valuation year.
(2) Target years refer to the beginning and end of the 10-year interval over which the assets/expenditures (A/E) are compared. The FAMCR and SAMCR are determined as the lowest level rates that result in the assets/expenditures (A/E) ratio being the same in the two target years. For a given triennial review period of the Plan, the target years are 53 and 63 years after the valuation year, but occurring no earlier than 2088 and 2098. For this report and all reports with valuation years before 2036, the target years are 2088 to 2098. The AMCRs must also satisfy a full funding condition as described in note (5) below.
(3) The target A/E ratio is the ratio obtained in the target years relating to the determination of the corresponding AMCRs.
(4) The statutory first and second additional contribution rates apply to the current triennial review period 2025-2027. More generally, the statutory first and second additional contribution rates apply for each triennial review period following a valuation year.
(5) The AMCRs must satisfy the condition that the present value of projected additional expenditures is less than or equal to the projected additional assets and present value of projected additional contributions. In other words, the total assets must equal or be greater than 100% of the obligations of the additional Plan. As shown, this condition is projected to be met over successive valuations, under the best-estimate assumptions of this report.

7 Reconciliation with previous triennial report

7.1 Base CPP

7.1.1 Introduction

The results presented in this report differ from those previously projected for a variety of reasons. Differences between the actual experience for 2022 through 2024 and that projected in the 31st CPP Actuarial Report are addressed in section 7.1.2 below. Since historical results provide the starting point for the projections shown in this report, these historical differences between actual and projected experience over the period 2022-2024 have an effect on the projections. The impact of experience since the previous triennial valuation of the base Plan and changes in the assumptions and methodology on the base CPP minimum contribution rate are addressed in section 7.1.3. A detailed reconciliation of the projected minimum contribution rate is presented in Appendix - D.

7.1.2 Experience update – 31 December 2021 to 31 December 2024

The major components of the change in the base CPP assets from 31 December 2021 to 31 December 2024 are summarized in Table 27.

Contributions during the period 2022 to 2024 were $6.4 billion more than projected, mainly as a result of higher than anticipated net migration, which led to higher growth in total employment earnings.

Expenditures during the period were $2.7 billion lower than expected. The difference between actual and expected expenditures is mainly due to lower retirement benefits resulting from lower than assumed take-up rates over the intervaluation period, as well as lower than expected operating expenses. The details by type of expenditure are given in Table 28.

Due to the stronger than expected investment performance over the period (actual average annual nominal rate of return of 4.9% compared to the anticipated 0.7%), investment income on base CPP assets was $76 billion higher than expected.

The resulting base CPP assets as at 31 December 2024 are about $85 billion higher than projected under the 31st CPP Actuarial Report.

Table 27 Change in assets - 31 December 2021 to 31 December 2024 - base CPP [1]
(cost accrual basis, $ million)

	Actual	Expected [2]	Difference: Actual – expected
Assets at 31 December 2021	543,725	543,725	0
+ Contributions	199,047	192,618	6,429
- Expenditures	180,357	183,022	(2,665)
+ Investment income	88,201	12,124	76,077
Change in assets	106,891	21,720	85,171
Assets at 31 December 2024	650,616	565,445	85,171

(1) Components may not sum to totals due to rounding.
(2) Expected contributions, expenditures, and investment income shown are as per the projections of the 31st CPP Actuarial Report as at 31 December 2021.

Table 28 Summary of expenditures – 2022 to 2024 – base CPP [1]
($ million)

	Actual [2]	Expected [3]	Difference: Actual – expected
Retirement	145,725	147,902	(2,177)
Disability	13,672	13,816	(143)
Survivors	15,849	15,826	23
Children	1,684	1,836	(152)
Death	1,395	1,344	51
Operating expenses	2,032	2,299	(266)
Total expenditures	180,357	183,022	(2,665)

(1) Components may not sum to totals due to rounding.
(2) The actual amounts for benefit expenditures include an adjustment for total overpayments of $427 million.
(3) Expected expenditures shown are as per the projections of the 31st CPP Actuarial Report as at 31 December 2021.

7.1.3 Changes in the minimum contribution rate

Table 29 presents the main elements of the change in the base Plan MCR since the 31st CPP Actuarial Report and shows an overall decrease in the rate.

Experience over the period 2022 to 2024 was better than anticipated overall. The main contributing factor for this was better than expected investment experience, which lowers the MCR by 0.21 percentage points. Methodology changes, mainly to better reflect non-permanent residents, also led to a decrease in MCR of 0.11 percentage points. Overall, changes made to the assumptions increased the MCR by 0.05 percentage points. A more detailed reconciliation of changes in the MCR is provided in Table 104 in Appendix - D of this report.

Table 29 Reconciliation of changes in minimum contribution rate [1]
(% of base CPP contributory earnings)

	Steady-state rate	Full funding rates [2]		MCR	
		2028-2033	2034+	2028-2033	2034+
31st CPP Actuarial Report - after rounding	**9.53**	**0.03**	**0.01**	**9.56**	**9.54**
31st CPP Actuarial Report - before rounding	**9.526**	**0.035**	**0.009**	**9.560**	**9.535**
Improvements in methodology	(0.111)	0.000	0.001	(0.111)	(0.110)
Experience (2022 to 2024)	(0.277)	(0.006)	0.000	(0.283)	(0.277)
Changes in demographic assumptions	0.016	0.001	0.000	0.017	0.016
Changes in benefit assumptions	0.046	0.001	0.001	0.046	0.047
Changes in economic assumptions	0.090	(0.001)	(0.001)	0.089	0.089
Changes in investment assumptions	(0.070)	0.000	0.000	(0.071)	(0.070)
Changes in other assumptions	(0.032)	(0.001)	0.000	(0.032)	(0.032)
Change in funding target from 2034-2084 to 2037-2087	(0.007)	(0.002)	0.000	(0.009)	(0.007)
Rate before rounding	**9.180**	**0.026**	**0.010**	**9.206**	**9.190**
Rounded rate, in accordance with the *Calculation of Contribution Rates Regulations, 2021*	**9.18**	**0.03**	**0.01**	**9.21**	**9.19**
32nd CPP Actuarial Report	**9.18**	**0.03**	**0.01**	**9.21**	**9.19**

(1) Components may not sum to totals due to rounding.
(2) Under the *Budget Implementation Act, 2018, No. 1*, amendments to the CPP statute took effect 1 January 2019. The full funding rates in respect of the amendments were first determined for the 29th CPP Actuarial Report. The amendments under the *Budget Implementation Act, 2024, No. 1* were determined not to require separate full funding and thus are financed entirely by the steady-state contribution rate.

7.2 Additional CPP

7.2.1 Introduction

The results presented in this report differ from those previously projected for a variety of reasons. Differences between the actual experience for 2022 through 2024 and that projected in the 31st CPP Actuarial Report are addressed in section 7.2.2 below. Since historical results provide the starting point for the projections shown in this report, these historical differences between actual and projected experience over the period 2022-2024 have an effect on the projections. The impact of experience since the previous triennial valuation of the additional Plan and changes in the assumptions and methodology on the additional CPP first and second additional minimum contribution rates are addressed in section 7.2.3. Detailed reconciliations of the additional minimum contribution rates are presented in Appendix - D.

7.2.2 Experience update – 31 December 2021 to 31 December 2024

The major components of the change in the additional CPP assets from 31 December 2021 to 31 December 2024 are summarized in Table 30.

Contributions during the period 2022 to 2024 were $1.3 billion higher than expected, mainly as a result of higher than anticipated net migration, which led to higher growth in total employment earnings.

Expenditures during the period were higher than expected. The difference between actual and expected expenditures is due to higher additional retirement benefits, in particular higher additional post-retirement benefits than expected, as well as higher than expected additional CPP operating expenses. The details by type of expenditure are given in Table 31.

Due to the stronger than expected investment performance over the period (actual average annual nominal rate of return of 3.6% compared to the anticipated 0.5%), investment income on the additional CPP assets was $3.3 billion higher than expected.

The resulting additional CPP assets as at 31 December 2024, are $4.5 billion higher than projected under the 31st CPP Actuarial Report.

Table 30 Change in assets - 31 December 2021 to 31 December 2024 - additional CPP (1)
(cost accrual basis, $ million)

	Actual	Expected (2)	Difference: Actual – expected
Assets at 31 December	11,045	11,045	0
+ Contributions	39,074	37,803	1,271
- Expenditures	1,213	1,165	48
+ Investment income	5,332	2,048	3,283
Change in assets	43,192	38,686	4,507
Assets at 31 December	54,237	49,730	4,507

(1) Components may not sum to totals due to rounding.
(2) Expected contributions, expenditures, and investment income shown are as per the projections of the 31st CPP Actuarial Report as at 31 December 2021.

Table 31 Summary of expenditures – 2022 to 2024 – additional CPP (1)
($ million)

	Actual (2)	Expected (3)	Difference: Actual – expected
Retirement	415	387	28
Disability	10	18	(8)
Survivors	3	6	(2)
Operating expenses	785	755	30
Total expenditures	1,213	1,165	48

(1) Components may not sum to totals due to rounding.
(2) The actual amounts for benefit expenditures include an adjustment for total overpayments of $2 million.
(3) Expected expenditures shown are as per the projections of the 31st CPP Actuarial Report as at 31 December 2021.

7.2.3 Changes in the additional minimum contribution rates

Table 32 presents the main elements of change in the first and second additional minimum contribution rates (FAMCR, SAMCR) since the 31st CPP Actuarial Report and shows an overall increase in the rates.

The overall experience from 2022 to 2024 decreased the AMCRs. Changes made to the economic assumptions also decreased the AMCRs. These decreases were offset by increases in the AMCRs due to changes in the demographic, benefit, and investment assumptions. The net result of all

changes since the 31st CPP Actuarial Report is an increase in the FAMCR of 0.04 percentage points (from 1.97% to 2.01%) and corresponding increase in the SAMCR of 0.16 percentage points (from 7.88% to 8.04%).

A more detailed reconciliation of changes in the AMCRs is provided in Table 105 in Appendix - D of this report.

Table 32 Reconciliation of changes in additional minimum contribution rates (1)
(% of additional CPP contributory earnings)

	First additional minimum contribution rate	Second additional minimum contribution rate
31st CPP Actuarial Report - after rounding	**1.97**	**7.88**
31st CPP Actuarial Report - before rounding	**1.970**	**7.879**
Improvements in methodology	0.004	0.014
Experience (2022 to 2024)	(0.020)	(0.082)
Changes in demographic assumptions	0.026	0.105
Changes in benefit assumptions	0.025	0.101
Changes in economic assumptions	(0.037)	(0.149)
Changes in investment assumptions	0.049	0.197
Changes in other assumptions	(0.006)	(0.025)
Rate before rounding	**2.010**	**8.041**
Rounded rate, in accordance with the *Calculation of Contribution Rates Regulations, 2021*	**2.01**	**8.04**
32nd CPP Actuarial Report	**2.01**	**8.04**

(1) Components may not sum to totals due to rounding.

8 Actuarial opinion

In our opinion, considering that this 32nd Actuarial Report on the Canada Pension Plan as at 31 December 2024 was prepared pursuant to the *Canada Pension Plan*:

- the data on which this report is based are sufficient and reliable for the purposes of this report;
- the assumptions used are, individually and in aggregate, reasonable and appropriate for the purposes of this report; and
- the methods employed are appropriate for the purposes of this report.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada, in particular, the General Standards and the Practice-Specific Standards for Social Security Programs of the Standards of Practice of the Canadian Institute of Actuaries.

As of the date of the signing of this report, we have not learned of any events that would have a material impact on the financial states of the base or additional CPP as at 31 December 2024.

Assia Billig

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Assia Billig, FCIA, FSA
Chief Actuary

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Ottawa, Canada
14 November 2025

Appendix - A Summary of plan provisions

A.1 Introduction

The *Canada Pension Plan* came into force on 1 January 1966. Since its inception, the CPP has been amended a number of times. The amendments include an enhancement of the CPP (the additional CPP) such that, effective 1 January 2019, the CPP consists of two components: the base CPP and additional CPP.

The most recent amendments to the *Canada Pension Plan* are the following:

The *Budget Implementation Act, 2024, No. 1*, which received Royal Assent on 20 June 2024, amends the CPP statute such that the following amendments are effective 1 January 2025:

- New child's benefit for dependent children, aged 18 to 24, of disabled or deceased contributors for those dependent children who are attending a recognized educational institution on a part-time basis. The child's benefit payable in such cases is 50 percent of the amount paid by the CPP to full-time students who qualify for a child's benefit ($150.89 in 2025). Part-time students must meet a minimum school attendance level to qualify for the new child's benefit.
- New top-up to the death benefit for deceased CPP contributors who had not yet started their retirement pension, had never received a disability pension, and who leave behind no surviving spouse or common-law partner. The child's benefit for dependent children of deceased contributors is unaffected and still payable. The new top-up is $2,500, which is added to the existing death benefit of $2,500 for a total amount of $5,000.
- Extension of eligibility for the disabled contributor's child's benefit when the disabled parent reaches age 65. For dependent children younger than age 25, who receive the disabled contributor's child's benefit, the benefit remains payable after the disabled parent reaches age 65 and the parent's own disability benefit ceases (due to either the disability pension being automatically converted to a retirement pension or the post-retirement disability benefit stopping).
- Ending entitlement to a survivor's pension for separated couples who had a credit split in January 2025 or later (see section A.12 in this appendix for a description of credit splitting). Separated couples who received a credit split are no longer eligible to later receive a survivor's pension upon the death of one of the ex-partners, even if the former couple was still legally married and there was no new common-law partner of the deceased at the time of death. This amendment thus treats such couples the same way as divorced or former common-law partners. Separated couples with credit splits, who subsequently reconcile and are living together at the time of death of one of the partners, regain eligibility for the survivor's pension.

In addition, the CPP statute was also amended under the *Budget Implementation Act, 2024, No. 1* such that eligibility to retroactive disability benefits for incapacitated individuals is now extended

to payment of the disabled contributor's child's benefit to dependent children. As well, amendments were made to clarify decision-making responsibility in respect of children and application for children's benefits.

This 32nd CPP Actuarial Report takes into account all the above listed amendments and regulations.

This appendix presents a summary of the provisions of the Plan inclusive of all amendments. In the event of any inconsistency, the legislation takes precedence over this summary.

A.2 Participation

The CPP includes virtually all members of the labour force in Canada, including both employees and self-employed persons between the ages of 18 and 70 with employment earnings, other than those covered by the Quebec Pension Plan (QPP). The main exceptions are persons with annual earnings lower than $3,500 (the Year's Basic Exemption, defined below), members of certain religious groups, and other persons who qualify under excepted employment. It should be noted that the CPP covers all members of the Canadian Forces and the Royal Canadian Mounted Police, including those residing in the province of Quebec. The persons to whom a CPP disability benefit is payable are not required to contribute.

A.3 Definitions

A.3.1 Base and additional CPP

The base CPP or base Plan refers to that component of the CPP other than the component relating to the additional CPP. Prior to 1 January 2019, the CPP consisted only of the base Plan.

The additional CPP or additional Plan refers to the enhancement to the CPP introduced in *An Act to Amend the Canada Pension Plan, the Canada Pension Plan Investment Board Act and the Income Tax Act*. The additional CPP was implemented as of 1 January 2019. The additional CPP has two (first and second) parts or tiers, and the corresponding first and second additional contribution rates and pensionable earnings on which contributions are made are phased in over the seven-year period 2019 to 2025, as described below.

Since 1 January 2019, the CPP comprises the base and additional Plans.

A.3.2 Year's maximum pensionable earnings (YMPE) and year's additional maximum pensionable earnings (YAMPE)

The YMPE for a calendar year is the limit to which employment and self-employment earnings are subject to contributions and first additional contributions for purposes of the base Plan and additional Plan, respectively. The YMPE increases each year to the extent warranted by the percentage increase, as at 30 June of the preceding year, in the 12-month average of the average weekly earnings of the Industrial Aggregate (as published by Statistics Canada). If the amount so calculated is not a multiple of $100, the next lower multiple of $100 is used. The YMPE is set at $71,300 in 2025.

The YAMPE for a calendar year is the limit to which employment and self-employment earnings are subject to second additional contributions above the YMPE for the purposes of the additional Plan. The YAMPE was introduced in the year 2024. The YAMPE was first set at 107% of the YMPE in 2024, and is set at 114% of the YMPE in 2025 and thereafter. The YAMPE is thus set to increase in tandem with the YMPE after 2025. If the YAMPE so calculated is not a multiple of $100, the next lower multiple of $100 is used. The YAMPE is set at $81,200 in 2025.

A.3.3 Year's basic exemption (YBE)

The YBE for a calendar year is the minimum employment earnings required to participate in the Plan. As well, contributions are waived on earnings up to the YBE. The YBE is $3,500 in 2025.

A.3.4 Contributory period and additional contributory periods of the CPP

The contributory period is in respect of the base CPP and is the number of months from attainment of age 18 or from 1 January 1966, if later, to the earliest of the month in which the contributor dies, the month before the one in which the retirement pension commences and the month before the one in which the contributor reaches 70 years of age, less the number of months during which the contributor received a CPP or QPP disability benefit (including the three-month waiting period), or during which the contributor had at least one eligible child under seven years of age and had earnings for that year lower than the YBE. The contributory period excludes periods on or after 1 January 2012 during which beneficiaries contribute while in receipt of a retirement pension.

The first additional contributory period in respect of the additional CPP is the number of months from attainment of age 18 or from 1 January 2019, if later, to the earliest of the month in which the contributor dies, the month before the one in which the retirement pension commences and the month before the one in which the contributor reaches 70 years of age.

The second additional contributory period in respect of the additional CPP is the number of months from attainment of age 18 or from 1 January 2024, if later, to the earliest of the month in which the contributor dies, the month before the one in which the retirement pension commences and the month before the one in which the contributor reaches 70 years of age.

A.3.5 Pension Index

The Pension Index for a given calendar year is equal to the Consumer Price Index averaged over the 12-month period ending with October of the preceding year; however, the Pension Index of a given year may not be less than the previous year's Pension Index.

A.4 Contribution rate and additional contribution rates of the CPP

In respect of the base CPP, from 1966 to 1986, the annual contribution rate applicable to contributory earnings was 1.8% for employees (and the same amount for their employers) and 3.6% in respect of self-employed earnings. This combined employee-employer contribution rate of 3.6% was subject to an annual increase of 0.2 percentage points from 1987 to 1996, attaining

5.6% in the last year of that period. From 1997 to 2003, the combined employee-employer contribution rate for the base CPP then increased in steps to reach a rate of 9.9% by 2003, with no subsequent increases scheduled thereafter.

The first additional contribution rate of the additional CPP applies to earnings between the YBE and the YMPE. The first additional combined employee-employer contribution rate was phased in over the 5-year period 2019 to 2023 and is equal to 2.0% from the year 2023 onward. The first additional contribution rate during the phase-in period from 2019 to 2023 is shown in Table 33.

The second additional contribution rate of the additional CPP applies to earnings between the YMPE and YAMPE starting in the year 2024. The second additional combined employee-employer contribution rate is equal to 8.0% for the year 2024 and thereafter.

Employees and employers pay equal shares of the base and additional contribution rates of the CPP, and the self-employed pay the full rates.

Table 33 shows the statutory (scheduled) contribution rates for the CPP.

Table 33 Scheduled contribution rates as per legislation
(self-employed and combined employer-employee) (percentages)

	Pensionable earnings above YBE up to YMPE		Pensionable earnings above YMPE up to YAMPE
Year	Base contribution rate	First additional contribution rate	Second additional contribution rate
2003 to 2018	9.9	–	–
2019	9.9	0.3	–
2020	9.9	0.6	–
2021	9.9	1.0	–
2022	9.9	1.5	–
2023	9.9	2.0	–
2024 and later	9.9	2.0	8.0

The CPP statute gives the federal and provincial Ministers of Finance the authority to make changes to the Plan's contribution rates through regulation, in connection with a triennial review. However, year-over-year rate increases cannot exceed 0.2 percentage points; beyond that, legislation is required.

For the base Plan, if a triennial CPP actuarial report projects a minimum contribution rate in excess of the statutory rate and the Finance Ministers do not make a recommendation to either increase the statutory rate or maintain it, the insufficient rates provisions of the *Canada Pension Plan* would apply. The base CPP contribution rate would then be increased in stages and a possible temporary freeze on inflation adjustments to benefits in pay would apply.

For the additional Plan, if a triennial CPP actuarial report projects that the additional minimum contribution rates deviate to a certain extent from their respective statutory additional rates and the Finance Ministers do not agree on how to address the deviation, then the *Additional Canada*

Pension Plan Sustainability Regulations would provide the actions to take: changes to benefits and possibly the additional contribution rates.

A.5 Retirement pension

A.5.1 Eligibility requirements

A person aged 60 or over becomes eligible for a base CPP retirement pension provided contributions have been made during at least one calendar year. Further, an individual must apply for a retirement pension in order to receive it. However, since 1 January 2020, the requirement to apply is waived for an eligible person if they are aged 70 or older and are in receipt of another benefit from the CPP, OAS program, or a provincial plan and/or had an income tax return filed in respect of the year before the year in which granting the waiver is considered.

Prior to 2012, a work cessation test applied in order for a retirement pension to become payable before age 65. This test required individuals who applied to take their CPP retirement benefit early (i.e. before age 65) to either stop working or materially reduce their earnings both in the month immediately preceding and the month of benefit take-up. In the month following the start of pension payment, an individual could return to work and/or earn more without affecting the eligibility for or amount of the benefit. However, no further contributions to the CPP were allowed once benefits started being paid. There was no work cessation test for those aged 65 or older.

Since 1 January 2012, the work cessation test no longer applies, and individuals younger than 65 who choose to work in Canada outside of Quebec while receiving a CPP or QPP retirement pension are required, along with their employers, to contribute to the CPP. Working beneficiaries aged 65 or older are given the option of continuing to contribute to the Plan; however, employers of those opting to do so are also required to contribute. The contributions from working beneficiaries are applied toward providing post-retirement benefits from the base and additional CPP and do not affect eligibility for other CPP benefits, except the post-retirement disability benefit. Upon attaining age 70, contributions are no longer permitted under the Plan.

The eligibility requirements for the additional retirement benefit are those of the base CPP. That is, a contributor is deemed eligible for the additional CPP retirement benefit if they are eligible for the base CPP retirement benefit.

A.5.2 Amount of retirement pension

The initial amount of the monthly retirement pension payable to a contributor under the CPP is equal to the sum of their retirement benefits payable under the base and additional Plans.

A.5.2.1 Base CPP

The initial monthly retirement pension payable under the base Plan is based on the contributor's entire history of pensionable earnings during the contributory period. The retirement pension under the base Plan is equal to 25% of the average of the YMPE for the year of retirement and

the four previous years, referred to as the Maximum Pensionable Earnings Average (MPEA), adjusted to take into account the contributor's pensionable earnings. For this purpose, the contributor's pensionable earnings for any given month are indexed by the ratio of the MPEA for the year of retirement to the YMPE for the year to which the given month belongs.

Some periods with low pensionable earnings may be excluded from the calculation of benefits by reason of pensions commencing after age 65, disability, child-rearing for a child less than seven years of age, and the general drop-out provision.

The general drop-out provision allows for a number of years with low or zero earnings to be dropped from the calculation of the retirement benefit. For example, for someone who started their retirement benefit at age 65 in 2025, the provision allows for 17% of the number of months with the lowest earnings (up to a maximum of about eight years) to be dropped from the calculation of the benefit. The general drop-out percentage was 15% from 1966 to 2011, 16% in 2012 and 2013, and has been 17% since 2014. As a result, the maximum number of years of low or zero earnings that may be dropped from the calculation of the retirement benefit for those contributors who take their benefit at age 65 has increased from about seven to eight years. The actual drop-out percentage that applies is based on the year of benefit take-up. The increase in the general drop-out provision increases the retirement pension, as well as the CPP disability and survivor pensions, since the determination of these benefits depends on the retirement pension.

The maximum retirement pension payable under the base CPP at age 65 in 2025 is $1,387.08 per month or $16,644.96 per year.

A.5.2.2 Additional CPP

The calculation of the additional CPP retirement benefit is based on the first and second additional monthly pensionable earnings. The first additional monthly pensionable earnings are equal to the total of the highest 480 months or the total number of months, if lower, in the first additional contributory period of monthly adjusted pensionable earnings up to the YMPE divided by 480. Similarly, the second additional monthly pensionable earnings are equal to the total of the highest 480 or total number of months, if lower, in the second additional contributory period of monthly adjusted pensionable earnings between the YMPE and the YAMPE divided by 480. These calculations provide for a monthly accrual of 1/480 of the total additional retirement benefit.

The additional monthly retirement benefit is calculated as the sum of 8.33% of the first additional monthly pensionable earnings and 33.33% of the second additional monthly pensionable earnings.

The pensionable earnings used for the calculation of additional retirement benefits are adjusted to the date of retirement in the same way as for the base CPP, that is, by indexing by the ratio of the MPEA to the YMPE as described above. Further, to account for the lower first additional contribution rates during the first four years of the phase-in period (from 2019 to 2022), the monthly adjusted pensionable earnings up to the YMPE are multiplied by 0.15 in 2019, 0.30 in 2020, 0.50 in 2021, and 0.75 in 2022.

Unlike the base CPP, there are no drop-out provisions for the additional Plan. However, there are "drop-in" provisions for the additional CPP to protect the additional benefits from periods of low pensionable earnings resulting from disability or child-rearing for a child less than seven years of age.

Specifically, for individuals who become disabled after 1 January 2019, an imputed income is assigned to those disability periods of low or zero earnings for the purpose of calculating the additional CPP retirement (and survivor) benefits. The drop-in amount is equal to 70 per cent of an individual's average earnings in the six years prior to the onset of the disability.

The disability drop-in amount is calculated based on months of earnings after 2018 and prior to the onset of disability. If, however, there are fewer than 72 months (6 years) of such earnings, then the drop-in is calculated based on the actual number of earnings months after 2018, prior to the onset of disability.

For parents of children under the age of seven on or after 1 January 2019, an imputed income is assigned to child-rearing periods of low or zero earnings on or after 1 January 2019 for the purpose of calculating additional CPP benefits. The drop-in amount is equal to the parent's average earnings during the five years prior to the birth or adoption of the child if that amount is higher than their actual earnings during the period the child was younger than age seven.

The child-rearing drop-in amount is calculated based on months of earnings after 2018 and prior to birth or adoption of a child. If, however, there are fewer than 60 such months (5 years), then the drop-in is calculated based on the actual number of earnings months, but not lower than 36. If there are less than 36 such months of earnings, the drop-in is calculated using imputed earnings of 40% of the YMPE for the number of months missing from the minimum of 36.

Additional CPP retirement benefits are initially low in the early years of the additional Plan due to the lower accrual rates during the phase-in period and few years of contributions. Contributions made over time to the additional CPP allow individuals to accrue partial additional benefits. Full additional retirement benefits are accrued after about 40 years of making contributions.

The maximum additional retirement benefit at age 65 in January 2025 is $45.92 per month or $551.04 per year, and is projected to increase over time.

The projected maximum additional retirement benefits are shown in Table 34. An individual, with pensionable earnings at or above the YAMPE, who contributed to the additional Plan for at least 40 years starting in the year 2025 or later, would receive the maximum additional retirement benefit payable of $720 per month or $8,644 per year, in year 2025 wage-adjusted dollars.[8] Table 34 accounts for the phase-in period of the additional Plan from 2019 to 2025. The maximum additional CPP retirement benefit will represent, in 40 years, an increase of 52% over the maximum base CPP retirement pension.

8 For a given year, the value in year 2025 wage-adjusted dollars is equal to the corresponding value in current dollars divided by the cumulative projected increase in the nominal wage since 2025.

Table 34 Projected maximum additional CPP retirement benefit

Pensionable earnings at or above YMPE before 2024, YAMPE thereafter
All amounts in year 2025 wage-adjusted dollars
Maximum basic CPP retirement benefit in 2025: $16,645 per year ($1,387.08 per month)

Start retirement pension at Age 65 on January 1	Number of years of contributions to additional CPP [1]	Additional CPP retirement benefit	
Year		Monthly ($)	Annual ($)
2025	6	46	551
2029	10	118	1,414
2044	25	388	4,654
2065	46 [2]	720	8,644

(1) All years starting from 2019 to year before retirement.
(2) 40 years of contributions at the maximum.

A.5.3 Adjustment for early or postponed retirement benefit

The CPP retirement pension is subject to an actuarial adjustment that depends on the year and contributor's age at commencement of the pension. Currently, the same adjustment is applied to the base and additional retirement benefit.

The retirement pension is permanently adjusted downward or upward by a factor for each month respectively before or after age 65 and the age when the pension commences or, if earlier, age 70. Prior to 2011, the adjustment factor for both pre-65 and post-65 pension take-up was 0.5% per month. Starting in 2011, the adjustment factors were changed. For contributors who take their retirement benefit early (before age 65), the adjustment factor gradually increased to 0.6% per month over the five-year period 2012 to 2016. For those who take their benefit after age 65, the factor gradually increased to 0.7% per month over the three-year period 2011 to 2013.

The downward pension adjustment factor of 0.6% per month, applicable for the year 2016 and thereafter, results in a pension that is reduced by 36% for pension take-up at age 60. The upward adjustment factor of 0.7% per month, applicable for 2013 and thereafter, results in a pension increased by 42% for pension take-up at age 70.

In accordance with subsection 115(1.11) of the *Canada Pension Plan*, the Chief Actuary shall calculate the pension adjustment factors and specify them in every third triennial CPP actuarial report, starting with the CPP Actuarial Report as at 31 December 2015. The Chief Actuary may also, if deems it necessary, specify the factors in any CPP actuarial report after 2015.

The first CPP actuarial report to specify the pension adjustment factors was the 27th CPP Actuarial Report as at 31 December 2015, which was tabled in the House of Commons on 27 September 2016.

This 32nd CPP Actuarial Report as at 31 December 2024 is the second report for which the Chief Actuary is required to specify the factors in accordance with the legislation. The factors and further details are provided in Appendix - F of this report.

The adjustment factors will next be specified no later than in the CPP Actuarial Report as at 31 December 2033.

A.5.4 Working beneficiaries – post-retirement benefit

Prior to 2012, those who received a CPP retirement pension and then returned to work (i.e. working beneficiaries) did not pay contributions and therefore did not continue to build their CPP pension. Commencing 1 January 2012, individuals under the age of 65 who receive either a CPP or QPP retirement pension and continue to work in Canada outside of Quebec are required, along with their employers, to contribute to the CPP. Working beneficiaries aged 65 to 69 are not required to contribute, but are given the option to do so. Employers of those working beneficiaries opting to contribute are also required to contribute.

The contributions paid by working beneficiaries provide for a post-retirement benefit. The total post-retirement benefit is equal to the sum of the benefits earned during retirement under the base and additional Plans.

The post-retirement benefit is earned at a rate of 1/40 of the maximum retirement pension per year of post-retirement contributions and is adjusted for the applicable earnings level and age of the contributor.

For both the base and additional CPP, contributions paid by working beneficiaries toward accruing a post-retirement benefit do not affect eligibility for other CPP benefits, except the post-retirement disability benefit described below. Pensionable earnings and additional pensionable earnings of working beneficiaries do not qualify for credit splitting.

A post-retirement benefit becomes payable the year following the year in which contributions are made, and multiple post-retirement benefits may accumulate over time. The total pension payable resulting from the combination of the retirement pension and post-retirement benefits may be greater than the maximum CPP or QPP retirement pension payable. As for the CPP retirement pension, the post-retirement benefit is payable for a beneficiary's lifetime.

The maximum base and additional CPP post-retirement benefits at age 65 in January 2025 for a working beneficiary who started their retirement pension at age 64 are, respectively, $34.68 and $14.71 per month for a total post-retirement benefit of $49.39 per month or $592.68 per year.

A.6 Disability pension

A.6.1 Eligibility requirements

A person is considered disabled if they are suffering from a severe and prolonged mental or physical disability. A disability is considered severe if by reason of it the person is regularly incapable of pursuing any substantially gainful occupation; a disability is considered prolonged if it is likely to be long-continuing and of indefinite duration or likely to result in death.

A person who becomes disabled prior to age 65 and is not receiving a CPP retirement pension is eligible for a disability pension provided that contributions have been made, at the time of

disablement, for at least four of the previous six calendar years, counting years included wholly or partly in the contributory period. Contributions must be on earnings that are not less than 10% of the YMPE rounded, if necessary, to the next lower multiple of $100. Since 2008, contributors with 25 or more years of contributions to the Plan can meet the eligibility requirement with contributions in three of the last six years.

The eligibility requirements for the additional disability pension are those of the base CPP. That is, a contributor is deemed to be eligible for the additional CPP disability pension if they are eligible for the base CPP disability pension.

A.6.2 Amount of disability pension

The initial amount of the monthly disability pension payable is the sum of the disability benefits payable under the base and additional Plans.

The initial base CPP monthly disability pension is the sum of a flat-rate portion payable ($598.49 per month in 2025) depending only on the year in which the benefit is payable and an earnings-related portion equal to 75% of the base CPP retirement pension that would be payable at the onset of disability if the contributory period ended on that date and no actuarial adjustment applied.

The initial amount of the additional CPP monthly disability pension is strictly earnings-related and is equal to 75% of the additional retirement pension that would be payable at the onset of disability if the first and second additional contributory periods ended on that date and no actuarial adjustment applied.

The automatic conversion of the CPP disability pension into a retirement pension at age 65 is determined by base and additional pensionable earnings at the time of disablement and price-indexed to age 65. In other words, the indexing from the time of disablement to age 65, which determines the initial rate of the CPP retirement pension, is in line with increases in prices rather than wages.

The maximum base and additional monthly CPP disability pensions payable in January 2025 are, respectively, $1,638.80 and $34.44, for a total of $1,673.24 per month or $20,078.88 for the year.

The additional CPP disability benefits are initially low in the early years of the additional Plan due to the lower accrual rates during the phase-in period and few years of contributions. The projected maximum additional CPP disability benefits, in year 2025 wage-adjusted dollars, are shown in Table 35. The table accounts for the phase-in period of the additional Plan from 2019 to 2025. The maximum additional disability benefit payable is $6,483 per year or $540 per month, in year 2025 wage-adjusted dollars.

Table 35 Projected maximum additional CPP disability benefit

Pre-disability pensionable earnings at or above YMPE before 2024, YAMPE thereafter
All amounts in year 2025 wage-adjusted dollars

Year (as at January 1)	Number of years of contributions to additional CPP [1]	Additional CPP disability benefit	
		Monthly ($)	Annual ($)
2025	6	34	413
2029	10	88	1,060
2044	25	291	3,491
2065+	46 [2]	540	6,483

(1) All years starting from 2019 to year before disability.
(2) 40 years of contributions at the maximum.

A.6.3 Post-retirement disability benefit (base CPP only)

Prior to 2019, base CPP retirement beneficiaries who were deemed disabled after the start of their retirement pension could not receive the CPP disability pension, even if they were still under age 65 and otherwise met eligibility requirements. Commencing 1 January 2019, a post-retirement disability benefit equal to the flat-rate portion of the disability pension ($598.49 per month in 2025) is payable under the base CPP to retirement beneficiaries who are deemed disabled while under age 65. Contributions paid by working beneficiaries toward post-retirement benefits are used in determining eligibility for the post-retirement disability benefit. Eligible disabled retirement beneficiaries receive the post-retirement disability benefit in addition to their retirement pension, and the dependent children of disabled retirees receive children's benefits.

The post-retirement disability benefit pertains only to the base Plan. There is no additional post-retirement disability benefit payable under the additional Plan.

A.7 Survivor's pension

A.7.1 Eligibility requirements

A person who was married to a contributor or was a common-law partner of a contributor at the time of the contributor's death is considered to be a survivor of the deceased contributor. The survivor is eligible for a survivor's pension if the following conditions are met as at the date of the contributor's death:

- The deceased contributor must have made contributions during the lesser of: (i) ten calendar years, or (ii) one-third of the total number of years included wholly or partly in their contributory period, but not for less than three years.
- If the survivor is the separated spouse of the deceased contributor, there must be no cohabiting common-law partner of the contributor at the time of death. If the survivor is the common-law partner of the deceased contributor, the couple must have cohabited for not less than one year immediately before the death of the contributor. If the common-law partner is of the same sex as the deceased contributor, the death must have occurred on or after 17 April 1985.
- Prior to 2019, the surviving spouse or common-law partner must have had dependent

children, been disabled, or been at least 35 years of age. As of 1 January 2019, these conditions no longer apply.

- As of 1 January 2025, individuals who are separated and who request a credit split (see section A.12 below) will no longer be eligible to receive a survivor's pension for their ex-partner, thereby treating such former couples as divorced or former common-law partners. Eligibility to the survivor's pension is restored for separated couples who reconcile and are living together at the time of death.

The eligibility requirements for the additional survivor's pension are those of the base CPP. That is, a person is eligible for an additional CPP survivor's pension if they are eligible for the base CPP survivor's pension.

A.7.2 Amount of survivor's pension

The initial amount of the monthly survivor's pension payable under the CPP is equal to the sum of the survivor's benefits payable under the base and additional Plans.

Prior to 2019, survivors who were not disabled and did not have dependent children had their survivor's pension reduced by 10 per cent for each year they were under the age of 45 when their spouse or common-law partner died. This reduction lasted until age 65, when the survivor's pension was then recalculated. This meant that survivors under the age of 35 who were not disabled and did not have dependent children did not receive a survivor's pension until age 65.

As of 1 January 2019, reductions are no longer applied to the survivor's pension for survivors under age 45 who are neither disabled nor have dependent children. A surviving spouse and common-law partner of any CPP contributor who has made sufficient contributions will receive an unreduced survivor's pension.

The amount of the pension changes depending on whether the survivor is younger or older than age 65 as described below. Additional survivor's benefits regardless of age will initially be low in the early years of the additional Plan due to the lower accrual rates during the phase-in period and few years of additional contributions previously made by the deceased contributor.

A.7.2.1 New survivor under age 65

The initial monthly survivor's pension payable until the surviving spouse or common-law partner attains age 65 is the sum of a base CPP flat-rate benefit and base and additional CPP earnings-related benefits. There is no additional CPP flat-rate benefit.

The base CPP flat-rate survivor's benefit depends only on the year in which the survivor's benefit is payable ($233.50 per month in 2025).

The earnings-related benefits payable under the base and additional CPP depend initially only on the contributor's record of pensionable and additional pensionable earnings, respectively as at the date of death. The initial earnings-related survivor's benefit is equal to 37.5% of either the retirement pension of the deceased contributor if they had been receiving a pension, or the

retirement pension that would have been payable to the deceased contributor if the contributory and additional contributory periods had ended at the time of death, with no actuarial adjustment in either case.

The maximum base and additional monthly CPP earnings-related survivor's benefit for new survivors under age 65 are, respectively, $520.16 and $17.22 in January 2025. In total, including the base CPP flat-rate amount above, the maximum CPP survivor's pension payable in January 2025 for new survivors under age 65 is $770.88 per month or $9,250.56 for the year.

Additional CPP survivor benefits are initially low in the early years of the additional Plan due to the lower accrual rates during the phase-in period and few years of contributions. The projected maximum additional CPP survivor's benefits, in year 2025 wage-adjusted dollars, are shown in Table 36. The table accounts for the phase-in period of the additional Plan from 2019 to 2025. The maximum additional survivor's benefit payable for survivors younger than age 65 is $3,241 per year or $270 per month, in 2025 wage-adjusted dollars.

Table 36 Projected maximum additional CPP survivor's benefit, survivor under age 65
Prior earnings of deceased contributor at or above YMPE before 2024, YAMPE thereafter
All amounts in year 2025 wage-adjusted dollars

Year (as at January 1)	Number of years of prior contributions by deceased contributor to additional CPP [1]	Additional CPP survivor's benefit	
		Monthly ($)	Annual ($)
2025	6	17	207
2029	10	44	530
2044	25	145	1,745
2065+	46 [2]	270	3,241

(1) All years starting from 2019.
(2) 40 years of contributions at the maximum.

A.7.2.2 Survivor age 65 or over

At age 65, or upon becoming widowed at a later age, an eligible surviving spouse or common-law partner is entitled to a monthly survivor's benefit equal to 60% of either the retirement pension of the deceased contributor if they had been receiving a pension, or the retirement pension that would have been payable to the deceased contributor if the contributory and additional contributory periods had ended at the time of death, with no actuarial adjustment in either case.

The maximum base and additional monthly CPP survivor's pensions payable in January 2025 for new survivors aged 65 or older are, respectively, $832.25 and $27.55, for a total of $859.80 per month or $10,317.60 for the year.

Survivor benefits for those age 65 and older are initially low in the early years of the additional Plan due to the lower accrual rates during the phase-in period and few years of contributions. The projected additional CPP survivor's benefits, in year 2025 wage-adjusted dollars, are shown in Table 37. The table accounts for the phase-in period of the additional Plan from 2019 to 2025. The maximum additional survivor's benefit payable for survivors aged 65 or older is $5,186 per

year or $432 per month, in 2025 wage-adjusted dollars.

Table 37 Projected maximum additional CPP survivor's benefit, survivor age 65 or over

Prior earnings of deceased contributor at or above YMPE before 2024, YAMPE thereafter
All amounts in year 2025 wage-adjusted dollars

Year (as at January 1)	Number of years of prior contributions by deceased contributor to additional CPP (1)	Additional CPP survivor's benefit	
		Monthly ($)	Annual ($)
2025	6	28	331
2029	10	71	848
2044	25	233	2,793
2065+	46 (2)	432	5,186

(1) All years starting from 2019.
(2) 40 years of contributions at the maximum.

A.8 Death benefit (base CPP only)

A lump sum benefit is payable to the estate of a deceased contributor if the eligibility rules for the survivor's benefit are met. Prior to 2019, the amount of the death benefit was equal to six times the monthly amount of the CPP retirement pension accrued or payable in the year of death, adjusted to exclude any actuarial adjustments, and subject to a maximum of ten percent of the YMPE for the year of death prior to 1998, and $2,500 thereafter. As of 1 January 2019, the death benefit equals the flat-rate amount of $2,500.

As of 1 January 2025, there is a top-up to the death benefit for CPP contributors who die without ever having received a disability or retirement pension and who leave behind no surviving spouse or common-law partner. For such contributors, a top-up of $2,500 to the existing death benefit of $2,500 for a total benefit of $5,000 is payable to the estate.

The death benefit pertains only to the base CPP. There is no additional CPP death benefit.

A.9 Child's benefits (base CPP only)

Each child under age 18 and each full-time student aged 18 to 25 who is dependent on a contributor eligible for a CPP disability benefit (the disability pension or post-retirement disability benefit) or who was dependent on a deceased contributor who satisfied the requirements for a survivor's pension is entitled to a flat-rate monthly benefit ($301.77 in 2025). Furthermore, a child may receive more than one child's benefit simultaneously.

The child's benefits pertain only to the base CPP. There are no additional CPP child's benefits.

Prior to 2025, the disabled contributor's child's benefit would cease when the disabled parent's eligibility for a CPP disability pension ended at age 65, at which time a disability pension is automatically converted into a retirement pension. As of 1 January 2025, the disabled contributor's child's benefit continues uninterrupted when the disabled contributor parent reaches age 65.

As of 1 January 2025, eligibility for children's benefits in respect of disabled or deceased contributors is extended to students aged 18 to 25 who attend school part-time and meet a minimum school attendance level. The children's benefits paid are equal to 50% of the children's benefits paid to full-time students ($150.89 in 2025).

A.10 Combined benefits

The combined benefits rules of the CPP regarding the simultaneous payment of disability and survivor's pensions or retirement and survivor's pensions are complex and involve calculations and comparisons of various amounts.

For combined benefits under the base CPP, if there are two flat-rate components, then the beneficiary receives the larger one. For the earnings-related components, the beneficiary receives the larger one and 60% of the smaller one.

As well, the total combined earnings-related component is limited to the maximum retirement pension at age 65 for combined survivor-retirement benefits and to the maximum disability pension for combined survivor-disability benefits. In the case of combined survivor-retirement benefits where the retirement pension is taken early (before age 65), the final retirement amount is actuarially adjusted.

The combined benefits under the additional CPP follow the same rules as for the base CPP, except that there are no flat-rate benefits payable, and the earnings-related amounts are not subject to limits.

A.11 Inflation adjustments

All monthly CPP benefits are indexed annually in accordance with inflation, as measured by the Pension Index. Benefits are multiplied on 1 January of each calendar year by the ratio of the Pension Index applicable for that calendar year to the Pension Index for the preceding year. As the Pension Index for a year is at least equal to the value of the previous year's Pension Index, benefits are either held constant or increased from one year to the next.

A.12 Credit splitting

Pensionable and additional pensionable earnings may be split (referred to as a 'credit split') between separated or divorced couples (legal spouses or common-law partners) for each month the couple lived together. Pensionable earnings (of the base CPP) are used to establish eligibility for CPP benefits, and both pensionable and additional pensionable earnings are used to calculate the amounts of benefits.

Contributors may obtain a credit split even if they have remarried. However, pensionable and additional pensionable earnings cannot be split for any year in which the total earnings of the former couple do not exceed twice the YBE. Credit splitting also does not apply for any period of cohabitation during which a former spouse or common-law partner received a CPP disability or retirement pension.

As described above, as of 1 January 2025, individuals who are separated and who request a credit split will no longer be eligible to receive a survivor's pension for their ex-partner.

A.13 Pension sharing

Couples (legal spouses or common-law partners) in an ongoing relationship may voluntarily (at the request of one of them) share their CPP retirement pensions corresponding to the number of years during which they cohabited. This pension sharing applies provided that both spouses have reached the minimum age requirement to receive a retirement pension. Sharing is possible even if only one of the spouses participated in the Plan. Pension sharing ceases upon separation, divorce, or death.

Appendix - B Data, assumptions and methodology

B.1 Introduction and context

This section describes the data, assumptions, and methodology that underlie the financial projections in the Results sections of this report.

Future cash flows for the base and additional Plans are projected over a long period of time, i.e. over more than 75 years, and depend on assumptions such as those regarding fertility, mortality, migration, labour force participation, job creation, unemployment, inflation, employment earnings, and investment returns. These assumptions form the basis for the projections of future income and expenditures of both components of the CPP.

Although the demographic, economic, and investment assumptions represent the Chief Actuary's best estimates, the resulting future financial states of the base and additional CPP presented in this report should be interpreted with caution. This information is not intended to be predictions, but rather projections of the future financial states of the base and additional CPP.

The future revenues and expenditures of the CPP depend on many economic factors. It is important to define the individual economic assumptions in the context of a long-term overall economic perspective. The Canadian and global economies are going through a period of heightened uncertainty, due in part to escalating trade tensions, environmental risks, and geopolitical conflicts.

Furthermore, the projected continued aging of the population in the future, albeit at a slower pace than observed in the past, combined with the continued retirement of the baby boom generation 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 from what has been historically observed and what has been assumed for the purpose of this report.

For this report, it is assumed that, despite the current uncertain outlook for major economies and the projected continued aging of the Canadian population, a moderate and sustained growth in the Canadian and global economies will persist throughout the projection period.

As all the above-mentioned events evolve, the economic, demographic, and investment environments continue to be subject to sustained volatility and unpredictability. The OCA will continue to monitor current and emerging trends and will adjust assumptions as needed in future reports.

B.2 Data

Table 38 lists the sources of data used for this report, categorized by major assumptions. The most recent years of data are also listed.

Table 38 Data Sources

Major Assumptions	Source of Data	Last Experience Year
Population - fertility	Statistics Canada, Institut de la statistique du Québec	2023
Population - migration	Statistics Canada	2024
Population - mortality	Statistics Canada Life Tables	2023 (1)
Population - Initial population	Statistics Canada	2024
Economic - CPI	Statistics Canada	2024
Economic - real wage increases	Statistics Canada	2024
	Records of earnings file from ESDC	2023
Economic - labour force (participation, employment, and unemployment rates)	Statistics Canada	2024
Economic - Total earnings and contributory earnings	Records of earnings file from ESDC	2023
Contributions	ESDC	2023
	Canada Revenue Agency	2023
Benefits	Administrative data from ESDC	2024
Assets and investment	CPPIB	2024
	Bank of Canada, Finance Canada, and Bloomberg L.P.	2024
Operating expenses	ESDC and CPPIB	2024

(1) Revisions to Mortality Life Tables from 2015 to 2022, as well as new Life Tables for 2023, published by Statistics Canada in December 2024, were taken into account.

In addition to the data sources listed above, other data and reference sources were consulted for the development of the assumptions used in this report, such as various economic and demographic forecasts.

B.3 Demographic assumptions

Both the historical and projected populations of Canada less Quebec are required for the calculation of future CPP contributions and benefits of the relevant cohorts of contributors and beneficiaries.

The populations of Canada and Quebec as at 1 July 2024 are used as a starting point. The populations are then projected by age and sex from one year to the next by adding births and net migrants and subtracting deaths. The annual numbers of births, net migrants (other than for non-permanent residents), and deaths are determined by applying the fertility, migration, and mortality assumptions to the starting population. For non-permanent residents (NPR), however, only fertility and migration assumptions are applied, mortality is not modeled. This reflects the stable demographic profile of this group: individuals frequently enter and exit the NPR population, but the overall composition of the group used for the population projection remains consistent from year to year. Specifically, the average age and sex distributions are held constant, as NPR are assumed to re-enter the population each year with the same characteristics. As a result, NPR are not aged forward in the same way as the rest of the population. The relevant population for the CPP, which is the population of Canada less Quebec, is obtained by subtracting the projected population of Quebec from the projected population of Canada.

The population covered by the CPP pertains to Canada less Quebec, but includes all members of the Canadian Forces (CF) and the Royal Canadian Mounted Police (RCMP). The approach used above to determine the CPP population does not make an explicit allowance for the members of the CF or RCMP residing in Quebec or outside Canada. However, a provision for this group is made implicitly through the development of the number of people with earnings and the proportion of contributors as described in section B.5 of this appendix.

B.3.1 Initial population as at 1 July 2024

The starting point for the demographic projections is based on the most recent Statistics Canada population estimates as at 1 July 2024 for Canada and Quebec, by age and sex. The estimates are based on the 2021 Census. These estimates are adjusted by ungrouping ages 100 and older into individual ages using the observed distribution in 2024 of Old Age Security program beneficiaries by age for ages 100 and older.

B.3.2 Fertility rates

There are two definitions for the fertility rate: the total fertility rate and the cohort fertility rate. The total (or synthetic) fertility rate corresponds to the average number of children born in a given calendar year. Specifically, it is the sum of the fertility rates by age group for women aged 15 to 49 in a given calendar year. In comparison, the cohort fertility rate is the average number of children born to a woman in her lifetime, for women born in a specific year. It gives an idea of trends and variations between different generations over time.

The total fertility rate in Canada has declined significantly since the baby boom period, when the rate peaked at nearly 4.0 per woman in the late 1950s. The baby bust period that followed in the mid-1960s initiated a decline in total fertility rates, resulting in a then-record low of 1.6 children per woman by the mid-1980s. The total fertility rate rose slightly from the late 1980s to the early 1990s, but then generally declined further to a level of 1.5 by the year 2000. Starting in the 2000s, Canada was one of many industrialized countries that saw their total fertility rates increase. By 2008, the total fertility rate for Canada reached 1.7. However, in some industrialized countries, including Canada, the total fertility rate has decreased overall since 2008, which could be largely attributable to the 2008 economic downturn and continuing economic uncertainty. Since 2020, aside from a temporary increase in 2021, fertility rates followed a steep decline. Canada, once in the middle of the pack amongst industrialized countries, is now positioned with Italy and Japan as one of the countries with low fertility rates.

The total fertility rate for Canada stood at 1.41 in 2020. It increased slightly to 1.44 in 2021 but has decreased since then to 1.26 in 2023, which is the lowest rate ever recorded. The housing crisis, economic uncertainty, anxiety regarding climate change, and the general population's mental health are all factors that may have contributed to the steady decline in the fertility rate in recent years. As well, the increase in the number of non-permanent residents (NPR) may have had a downward effect on the Canadian fertility rate since NPR are less likely to have children during their non-permanent resident status.

Similar to Canada, the total fertility rate in Quebec fell from a high of about 4.0 children per woman in the 1950s; however, the Quebec fertility rate fell to a greater degree, reaching 1.4 by the mid-1980s. The Quebec fertility rate then recovered somewhat between the late 1980s and early 1990s to over 1.6 but then declined to below 1.5 by the late 1990s. Subsequently, Quebec fertility rates increased for certain age groups with the introduction of the Quebec Childcare Centres in 1997 and with the introduction of the Quebec Parental Insurance Plan (QPIP) in 2006. There was a significant increase in the Quebec fertility rate in the 2000s, with the rate reaching 1.76 in 2008. However, similar to Canada's fertility rate, the fertility rate for Quebec has decreased overall since 2008. In 2020, the Quebec fertility rate was 1.53 and then declined further to 1.39 in 2023.

Fertility rates are affected by many factors, including social attitudes, reproductive technologies, as well as economic and environmental conditions. Although there have been periods of growth in the total fertility rates in recent decades, it is unlikely that the rates will return to historical levels in the absence of significant societal changes.

In 2021, the Government of Canada worked with provinces and territories to establish a Canada-Wide Early Learning and Child Care (CWELCC) plan. Consistent with what was experienced in Quebec with the introduction of the Childcare Centers, the CWELCC plan could lead to an increase in fertility rates for certain age groups and hence was considered in setting the assumptions for this report. The effect on the fertility rates is assumed to occur over the first several years following the adoption of the system before levelling out.

To determine the ultimate total fertility rate for Canada, the historical fertility rate of each age group was studied and projected independently. For most age groups, a 20-year period of data was used to establish a trending model that provides the best fit using historical patterns and anticipated future movements. The age group 25-29 fertility rate is sensitive to data of recent years, and as such, only partial credibility was used for the most recent years. The age group 30-34 fertility rate does not align well with trending models. Its projection was therefore established based on professional judgment. Some age group rates were also adjusted upward to account for expected effects from the CWELCC plan.

Based on historical analysis and the factors mentioned above, it is assumed that the total fertility rate from 2033 onward for Canada will be 1.35 children per woman, which is lower than the ultimate rate of 1.54 assumed for the 31st CPP Actuarial Report.

For Quebec, the assumption was set by analyzing both the historical fertility rates as well as the difference between Canada's and Quebec's fertility rates for each age group. The difference in the rates is assumed to decrease as the effect of the QPIP fades and as the CWELCC plan continues to be implemented. It is therefore assumed that the difference in the rates will decrease until 2033 and remain stable thereafter. As a result, the total fertility rate from 2033 onward for Quebec is assumed to be 1.40 children per woman, which is lower than the assumed ultimate rate of 1.55 in the 31st CPP Actuarial Report.

Although the historical age group rates and resulting total fertility rates are used to set the

assumptions for the future, it is nonetheless useful and informative to consider the historical progression of the cohort fertility rates. Over time, the assumed age group rates lead to cohort fertility rates which converge to the total fertility rate assumption, as shown for Canada in Table 39.

The cohort fertility rates in both Canada and Quebec have declined over time. For females born in the year 1940, who reached the end of their childbearing years (turned age 49) in 1989, the cohort rates were 2.69 and 2.34 for Canada and Quebec, respectively. However, for females reaching the end of their childbearing years in 2023 (born in 1974), the Canada and Quebec cohort fertility rates were 1.83 and 1.84, respectively.

Table 39 Cohort fertility rates by age and year of birth
(Canada)

Year of birth of woman [1]	Annual fertility rates by age and year of birth (per 1,000 women) [2]							Cohort fertility rate per woman [2]
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
1940	59.7	231.6	152.6	70.5	20.3	3.1	0.1	2.69
1945	54.7	161.4	130.4	65.7	19.9	3.3	0.1	2.18
1950	45.0	118.9	126.2	67.6	23.3	4.2	0.2	1.93
1955	37.4	103.7	121.1	73.6	29.0	5.2	0.2	1.85
1960	31.3	91.3	117.5	86.1	32.6	6.1	0.4	1.83
1965	26.0	76.8	121.2	84.9	36.1	7.9	0.5	1.77
1970	22.7	76.5	104.7	91.2	48.6	10.7	0.8	1.78
1975	25.6	64.6	99.0	108.0	53.4	11.7	0.9	1.82
1980	20.0	54.5	102.0	108.5	57.1	12.7	1.1 *	1.78 *
1985	15.1	52.7	96.4	108.0	56.1	12.7 *	1.2 *	1.71 *
1990	13.9	44.7	87.3	98.0	58.6 *	13.2 *	1.3 *	1.59 *
1995	12.1	37.2	68.4	98.6 *	62.1 *	13.3 *	1.3 *	1.47 *
2000	7.8	25.2	65.7 *	104.0 *	62.8 *	13.3 *	1.3 *	1.40 *
2005	4.4	21.3 *	67.1 *	105.0 *	62.8 *	13.3 *	1.3 *	1.38 *
2007	4.0 *	20.3 *	67.4 *	105.0 *	62.8 *	13.3 *	1.3 *	1.37 *
2009	3.7 *	19.2 *	67.4 *	105.0 *	62.8 *	13.3 *	1.3 *	1.36 *
2011	3.4 *	18.2 *	67.4 *	105.0 *	62.8 *	13.3 *	1.3 *	1.36 *
2013	3.1 *	18.2 *	67.4 *	105.0 *	62.8 *	13.3 *	1.3 *	1.36 *
2015+	2.8 *	18.2 *	67.4 *	105.0 *	62.8 *	13.3 *	1.3 *	1.35 *

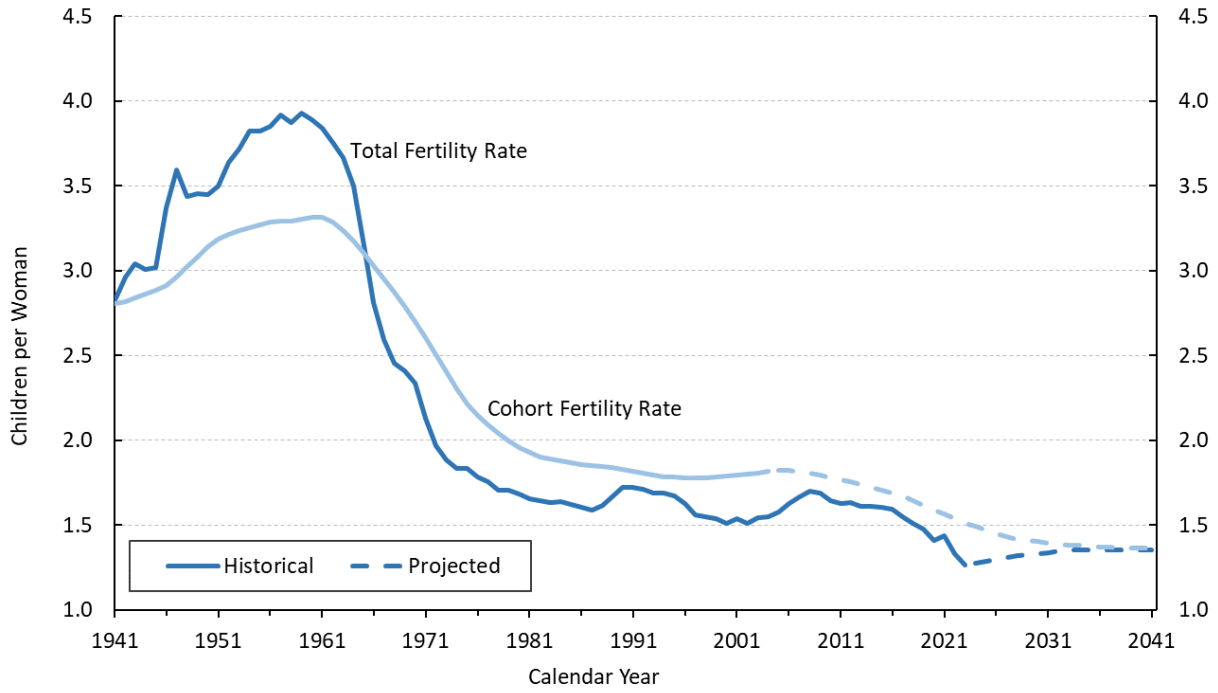
(1) Years of birth correspond to the midpoint of each age group. For example, in the first row of the table, 1940 is the year of birth for those aged 17, 22, 27, etc.
(2) Fertility rates below and to the right of the dotted line and marked with an asterisk are projected.

Table 40 below shows the assumed fertility rates of each age group and the resulting assumed total fertility rates by calendar year, while Chart 1 shows the historical and projected total and cohort fertility rates for Canada.

Table 40 Annual fertility rates by age group (per 1,000 women)

Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
2025	3.8	22.4	65.0	95.8	56.6	12.5	1.0	1.29
2026	3.7	21.8	65.4	97.2	57.6	12.6	1.0	1.30
2027	3.5	21.3	65.7	98.6	58.6	12.7	1.1	1.31
2028	3.4	20.8	66.0	100.1	59.6	12.8	1.1	1.32
2029	3.2	20.3	66.3	101.1	60.2	12.9	1.1	1.33
2030	3.1	19.8	66.5	102.0	60.9	13.0	1.2	1.33
2031	2.9	19.2	66.8	103.0	61.5	13.1	1.2	1.34
2032	2.8	18.7	67.1	104.0	62.1	13.2	1.2	1.35
2033+	2.6	18.2	67.4	105.0	62.8	13.3	1.3	1.35

Chart 1 Historical and projected total and cohort fertility rates for Canada(1)



(1) Cohort fertility rates are based on the age of a woman being 30 in a given calendar year. For instance, the cohort fertility rate for the year 2023 pertains to women born in 1993.

Finally, in accordance with the average experience over the last 10, 20, and 25 years, the assumed ratio of male to female newborns is 1.053, which is the same as for the 31st CPP Actuarial Report.

B.3.3 Mortality

Although Canada Life Tables (CLT) for years 2020 to 2023 from Statistics Canada were available in December 2024, they were excluded from the analysis for purposes of setting long-term mortality rates. Mortality tables for these years reflect significant mortality increases related to COVID-19 and opioid-related deaths, which are assumed to be temporary. For reference, 2023 life expectancies at birth (without any assumed future mortality improvements) were lower than those in 2019 by 0.6 years for males and 0.4 years for females.

Long-term future mortality rates are therefore determined by applying assumed mortality improvement rates to Statistics Canada's 2019 CLT. According to the updated 2019 CLT released in December 2024 by Statistics Canada, life expectancies at birth in 2019 without any assumed future improvements in mortality for males and females in Canada were 80.1 and 84.3 years, respectively, compared to 80.3 and 84.4 years under the 31st CPP Actuarial Report. At age 65 in 2019, life expectancies for males and females, respectively, were 19.5 and 22.3 years according to Statistics Canada, compared to 19.6 and 22.4 years under the 31st CPP Actuarial Report.[9]

The average annual mortality improvement rates experienced in Canada over the 15-year period from 2004 to 2019 by age and sex were used as the starting point for projecting annual mortality improvement rates from 2020 onward. Improvement rates by age and sex for years 2020 to 2039 were determined by cubic interpolation between:

- the 15-year average improvement rates ending in 2019; and
- the assumed ultimate improvement rates described below in respect of the period 2039 and thereafter.

For the year 2039 and thereafter for Canada, the assumed ultimate annual rates of mortality improvement vary by age only and not by sex or calendar year. The assumed ultimate mortality improvement rates are derived using a combination of backward- and forward-looking approaches. The analysis of the Canadian experience over the period from 1954 to 2019 was combined with an analysis of the possible drivers of future mortality improvements. Consideration was also given to benchmarks from peers as well as educational notes and research published by the Canadian Institute of Actuaries, including the most recent Mortality Improvements Research paper published in April 2024. Mortality improvement rates for males at most ages are currently higher than those for females but are assumed to decrease to the same level as female rates from 2039 onward. The mortality improvement rates for Quebec are assumed to be the same as for Canada.

The ultimate mortality improvement rate for both sexes for ages 0 to 89 is set at 1.0% per year from 2039 onward for Canada and Quebec. For ages above 89, the ultimate improvement rate is set to reduce from 0.6% for the age group 90-94 to 0.2% for those aged 95 and older. For comparison, under the 31st Actuarial Report, the rate was set at 0.8%, 0.5%, and 0.2% for ages 0-89, 90-94, and 95 and older, respectively, from 2039 onward.

Once the projected mortality rates were calculated using the assumed mortality improvement rates described above, the projected mortality rates were replaced with the actual values for years 2020 to 2023 from the Statistics Canada CLT, and additional adjustments were then applied in order to reflect expected additional increases in mortality rates due to the COVID-19 pandemic as well as to account for the impact of the opioid crisis. No adjustment was applied for Quebec regarding the opioid crisis.

[9] The 2019 life expectancies under the 31st CPP Actuarial Report and the 32nd CPP Actuarial Report differ, as Statistics Canada revised the values in their Life Tables dataset used for the current report relative to the one used in the previous report.

For the year 2024, the COVID-19 mortality adjustment factors by age group were determined using data on the number of COVID-19 deaths from both the Health Infobase of the Public Health Agency of Canada and Statistics Canada. These adjustment factors are phased out by 2026. The pandemic is therefore assumed to have a residual effect on mortality in 2024 and 2025, followed by an assumed full recovery and reversion to the projected unadjusted mortality rates for year 2026 and onward. The COVID-19 adjustments factors for 2024 and 2025 amount to overall increases in mortality rates of 1.5% and 0.5%, respectively.

Over the last decade, Canada has been faced with a significant increase in accidental drug poisoning deaths and the COVID-19 pandemic has exacerbated the issue. Opioid overdose is a subset of accidental drug poisoning deaths. It is more prevalent in the 20 to 49 age group and among men. Since 2021, there has been a plateau in the yearly opioid-related deaths. The duration and pace of the recovery remain highly uncertain. Thus, in order to reflect the impact of the opioid crisis in the future along with its uncertainty, the mortality rates for the age group 20 to 49 are projected as interpolated rates from the year 2023 actual mortality rates to the projected unadjusted 2039 mortality rates. This reflects the assumption that, over the next decade, the opioid crisis in Canada will subside gradually, due to several government initiatives to increase awareness and reduce opioid supply.

Table 41 shows the adjusted (2025), intermediate (2026 to 2038), and ultimate (2039+) assumed annual mortality improvement rates, including all assumed effects from COVID-19 and the opioid crisis, for Canada. The mortality improvement rates shown for the period 2026 to 2038 represent the average rates over that period.

Table 41 Assumed annual mortality improvement rates for Canada
(percentages)

	Males			Females		
Age	2025	2026 to 2038 (1)	2039+	2025	2026 to 2038 (1)	2039+
0	1.6	1.1	1.0	1.7	1.1	1.0
1-19	2.6	1.5	1.0	1.8	1.3	1.0
20-49	1.6	2.4	1.0	1.8	2.7	1.0
50-64	1.9	1.2	1.0	1.8	1.2	1.0
65-74	2.1	1.3	1.0	1.7	1.1	1.0
75-84	2.5	1.3	1.0	2.1	1.1	1.0
85-89	2.6	1.3	1.0	2.4	1.2	1.0
90-94	2.2	0.9	0.6	2.1	0.9	0.6
95+	1.3	0.3	0.2	1.3	0.4	0.2

(1) The mortality improvement rates shown for 2026-2038 represent average rates over these periods.

The resulting projected mortality rates in Table 42 indicate a continuous decrease in mortality rates over the long term. For example, the mortality rate at age 65 for males is expected to decrease from about 10 deaths per thousand people in 2025 to 6 deaths per thousand people by 2075. The gap in mortality rates between males and females at most ages is also expected to decrease over the projection period.

Chart 2 and Chart 3 show the historical and projected life expectancies at birth and age 65, respectively since the Plan's inception in 1966, based on each given year's mortality rates (i.e. without assumed future mortality improvements). Table 43 shows the projected Canadian life expectancies at various ages for the specified calendar years, also based on each given year's mortality rates (without future improvements). Table 44 is similar to Table 43, the only difference being that it takes into account the assumed mortality improvements after the specified calendar years (with future improvements).

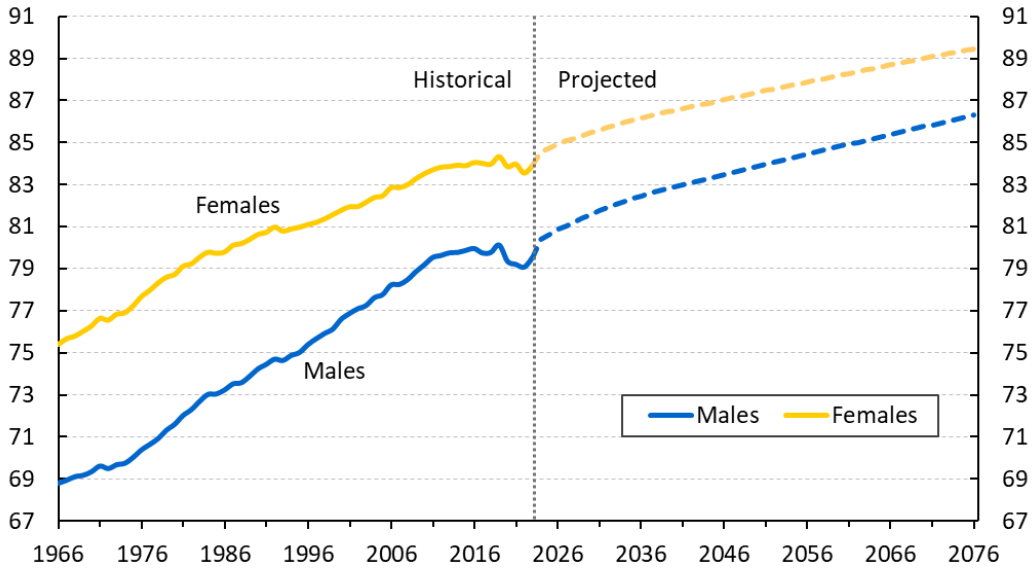
Table 42 Mortality rates for Canada
(annual deaths per 1,000 people)

	Males				Females			
Age	2025	2050	2075	2100	2025	2050	2075	2100
0	4.56	3.52	2.74	2.13	3.60	2.77	2.16	1.68
10	0.07	0.05	0.04	0.03	0.07	0.05	0.04	0.03
20	0.63	0.45	0.35	0.27	0.35	0.22	0.17	0.13
30	1.21	0.81	0.63	0.49	0.62	0.38	0.30	0.23
40	1.85	1.08	0.84	0.65	0.98	0.60	0.46	0.36
50	2.64	2.01	1.57	1.22	1.69	1.30	1.01	0.78
60	6.14	4.57	3.55	2.76	3.92	2.95	2.30	1.79
65	9.84	7.38	5.74	4.46	6.37	4.84	3.76	2.93
70	15.84	11.84	9.21	7.16	10.52	8.02	6.24	4.85
75	26.21	19.69	15.32	11.91	17.98	13.84	10.76	8.37
80	44.10	33.22	25.84	20.10	31.35	24.19	18.81	14.63
85	74.10	55.16	42.90	33.37	54.78	41.62	32.37	25.18
90	132.15	105.16	86.90	71.81	100.72	80.51	66.53	54.98
100	342.39	310.31	285.46	262.60	292.62	263.62	242.51	223.09

Given the continuing trend in increased longevity, Table 44 is considered to be more realistic than Table 43, especially for the older ages. At the same time, the extended length of the projection period increases the uncertainty of the results presented in Table 44 for younger ages.

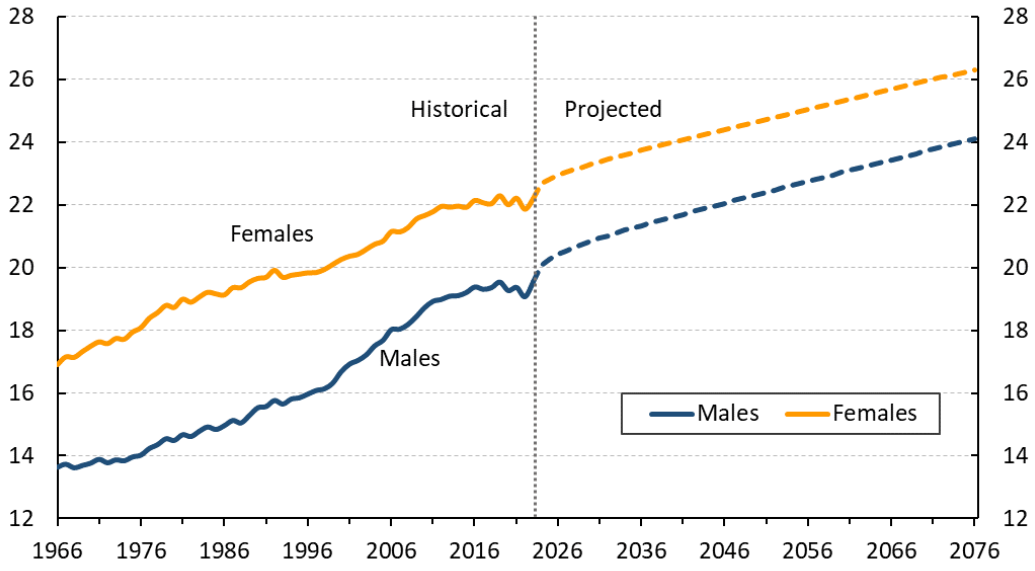
From 2025 to 2075, Canadian life expectancy at age 65 (with assumed future mortality improvements) is projected to grow from 21.6 to 25.1 years for males and from 24.1 to 27.3 years for females, as shown in Table 44.

Chart 2 Life expectancies at birth for Canada, without mortality improvements after the year shown(1)



(1) These are calendar year life expectancies based on the mortality rates of the given attained year.

Chart 3 Life expectancies at age 65 for Canada, without mortality improvements after the year shown(1)



(1) These are calendar year life expectancies based on the mortality rates of the given attained year.

Table 43 Life expectancies for Canada, without mortality improvements after the year shown (1)

	Males			Females		
Age	2025	2050	2075	2025	2050	2075
0	80.7	83.9	86.2	84.8	87.4	89.4
10	71.1	74.2	76.5	75.1	77.7	79.6
20	61.2	64.3	66.6	65.3	67.8	69.7
30	51.7	54.7	56.9	55.5	57.9	59.8
40	42.4	45.2	47.2	45.9	48.2	50.0
50	33.3	35.7	37.7	36.5	38.6	40.3
60	24.4	26.7	28.5	27.2	29.2	30.8
65	20.3	22.3	24.0	22.8	24.7	26.2
70	16.4	18.2	19.8	18.6	20.3	21.8
75	12.8	14.4	15.8	14.7	16.3	17.6
80	9.6	11.0	12.1	11.2	12.5	13.6
85	6.9	7.9	8.8	8.1	9.2	10.0
90	4.7	5.3	5.9	5.6	6.2	6.8
100	2.2	2.4	2.5	2.5	2.7	2.9

(1) These are calendar year life expectancies based on the mortality rates of the given attained year.

Table 44 Life expectancies for Canada, with mortality improvements after the year shown (1)

	Males			Females		
Age	2025	2050	2075	2025	2050	2075
0	87.8	89.9	91.8	91.0	92.8	94.4
10	77.4	79.5	81.4	80.7	82.5	84.0
20	66.6	68.8	70.8	70.0	71.9	73.5
30	56.1	58.4	60.4	59.5	61.4	63.0
40	45.8	48.0	50.0	49.0	50.9	52.6
50	35.8	37.8	39.8	38.7	40.6	42.3
60	26.1	28.0	29.8	28.8	30.6	32.2
65	21.6	23.4	25.1	24.1	25.7	27.3
70	17.3	19.0	20.6	19.6	21.1	22.6
75	13.5	15.0	16.3	15.4	16.8	18.1
80	10.0	11.3	12.5	11.7	12.9	14.0
85	7.1	8.1	9.0	8.4	9.3	10.2
90	4.8	5.4	6.0	5.7	6.3	6.9
100	2.2	2.4	2.5	2.5	2.7	2.9

(1) These are cohort life expectancies that take into account assumed future improvements in mortality of the general population and therefore differ from calendar year life expectancies, which are based on the mortality rates of the given attained year.

B.3.4 Net migration

Net migration refers to the number of immigrants less the number of net emigrants (i.e. the number of emigrants less the number of returning Canadians) plus the net increase in the number of non-permanent residents (NPR). Net migration is generally recognized as being a volatile

component of population growth since it is subject to a variety of demographic, economic, social and political factors. In more recent years, it has been even more volatile.

The level of net migration for Canada as a percentage of the population from 2000 to 2015 has varied between 0.5% and 0.8%. In 2016, net migration began accelerating, surpassing 0.8% in part due to the introduction of the Express Entry system by the Government of Canada. By 2019, net migration reached 1.19% of the population. Since then, net migration has been more volatile. In 2020 and 2021, there was a significant decrease in net migration as a percentage of the population, with the rate dropping to 0.86% and 0.39%, respectively in 2020 and 2021. The COVID-19 pandemic led to border closures making travel between countries difficult, which negatively impacted migration. In 2022, 2023 and 2024, net migration increased to historically high levels of 1.68%, 2.83% and 2.88% of the population, respectively. This was due in particular to the removal of various pandemic-related safety measures, such as Canadian borders fully reopening in October 2022, along with efforts to fill job vacancies in key sectors of the labour market by the admittance of a large number of NPR.

The level of NPR as a percentage of the population has increased steadily but remained considerably below 5% for the years prior to the COVID-19 pandemic. Since 2021, the number of international students and temporary workers with permits under the International Mobility Program has grown substantially. They represent the two largest groups within NPR, accounting for more than three quarters of NPR in each of the past 10 years. By the end of 2024, the number of NPR reached unprecedented levels, representing 7.3% of the population. By contrast, based on the 20-year average ending in 2024, NPR represented 2.7% of the population.

To select the assumptions regarding the short-term and ultimate net migration rates, the components of net migration were analyzed separately by considering trends in the historical data as well as qualitative factors that could influence future trends. Consideration was also given to the federal government's short-term immigration targets and to long-term perspectives of various experts regarding levels of future immigration and non-permanent residents.

In the 2024 Annual Report to Parliament on Immigration, the Government of Canada released details on its Immigration Levels Plan for 2025 to 2027. The target numbers of new immigrants are set at 395,000 in 2025, 380,000 in 2026, and 365,000 in 2027. Also, the government announced, for the first time ever, short-term targets for the level of NPR, specifically: NPR inflows subject to targets set for students and workers to achieve an NPR level (as % of the population) of 5.0% by the end of 2026.

Considering the historical experience and the immigration plan of the government, immigration as a percentage of the population is assumed in the short term to decelerate but remain above pre-COVID-19 levels due to the continuing need to fill skill shortages in the labour market and maintain a growing population. In the long term, it is assumed that higher sustained immigration will be necessary to maintain population and economic growth, aligning with forecasts from other experts.

The immigration rate is expected to decrease from 1.12% of the population in 2024 to 0.96% in 2025, 0.92% in 2026, and 0.88% in 2027. After that, it is projected to gradually decrease to an ultimate rate of 0.82% by 2034. The ultimate rate of 0.82% corresponds to the 20-year average ending in 2024, which was selected to give some weight to generally higher levels of immigration observed since 2016 while still reflecting longer term historical trends.

The historical net emigration rate has been relatively stable since the late 2000s. The ultimate assumption for that component is based on an 8-year average ending in 2024 considering that Statistics Canada revised its methodology for reporting emigration data in 2017. The net emigration rate is expected to decrease slightly from 0.12% of the population in 2024 to 0.11% by 2026 and remain at that level thereafter.

Regarding the assumed level of NPR, current government NPR targets are short-term, and there is limited consensus among other experts on future NPR trends. To address the higher levels and volatility of the number of NPR in recent years, a new method was developed for this report to project the number of NPR separately from the rest of the population. For this purpose, an assumption is made for each year of the projection period regarding the level of NPR as a percentage of the population. The resulting annual changes in the number of NPR can then be determined and flow through the overall net migration rate.

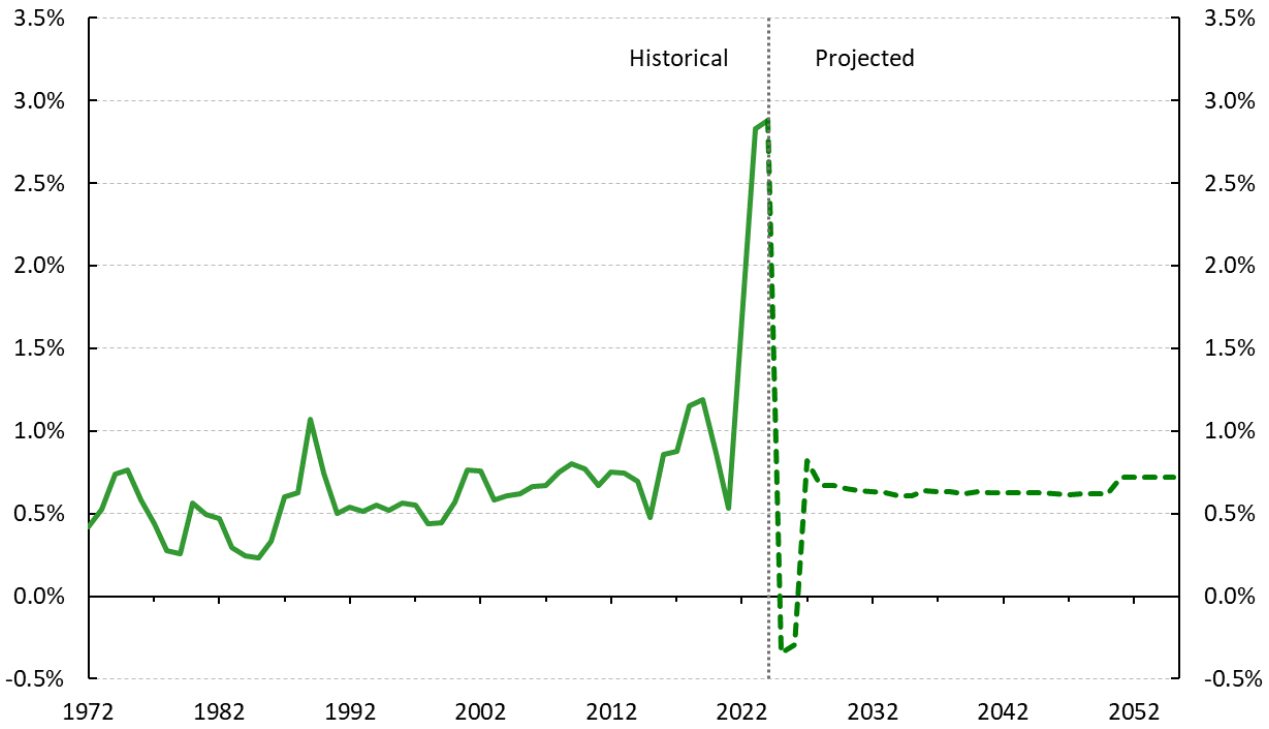
The NPR assumption is divided into three periods. The first period reflects government targets ending in 2027. The second period addresses demographic aging up to 2035, with the NPR level assumed to reduce but remain elevated. The third period, ending in 2050, assumes the level of NPR will return to levels that are more in line with longer term historical averages. As such, the level of NPR as a percentage of the population is assumed to trend down linearly across these periods: from 7.3% observed in 2024, to 5% in 2026, 4.0% in 2035, and then to an ultimate rate of 2.5% in 2050, remaining at that level thereafter. The ultimate rate of 2.5% was selected to give some weight to recent higher levels of NPR, while still reflecting longer-term historical trends.

Based on the foregoing, the actual net migration rate in 2024 of 2.88% of the Canadian population is assumed to decrease to -0.34% in 2025 and -0.29% in 2026, and is then assumed to increase to 0.82% in 2027. Thereafter, the net migration rate is assumed to gradually transition to an ultimate level of 0.72% of the population in 2051 (as shown in Chart 4).

Although the net migration rate represents the combined effect of all migration components, the largest fluctuations in the early projection years shown in Chart 4 are due to the Government of Canada's short-term targets and the assumed changes in net migration components as percentages of the population. Thereafter, the assumed changes in the immigration rate and NPR levels result in a decrease in the net migration rate until 2050, after which the net migration rate stabilizes at 0.72%.

Chart 4 shows the net migration experience since 1972 and the projected rates starting in 2025.

Chart 4 Net migration rate (Canada)



For the Quebec population, the same net migration components of immigration, net emigration, and net increase in the level of NPR are considered. An additional component consisting of the net interprovincial migration for Quebec is also included. The level of NPR for Quebec is assumed to trend down linearly across the following periods: from 6.5% observed in 2024 to 4.5% in 2026, 3.5% in 2035, and then to an ultimate rate of 2.0% in 2050, remaining at that level thereafter. From 2026 onward, the assumed NPR level as a percentage of the Quebec population is 0.5 percentage points lower than the NPR level for Canada.

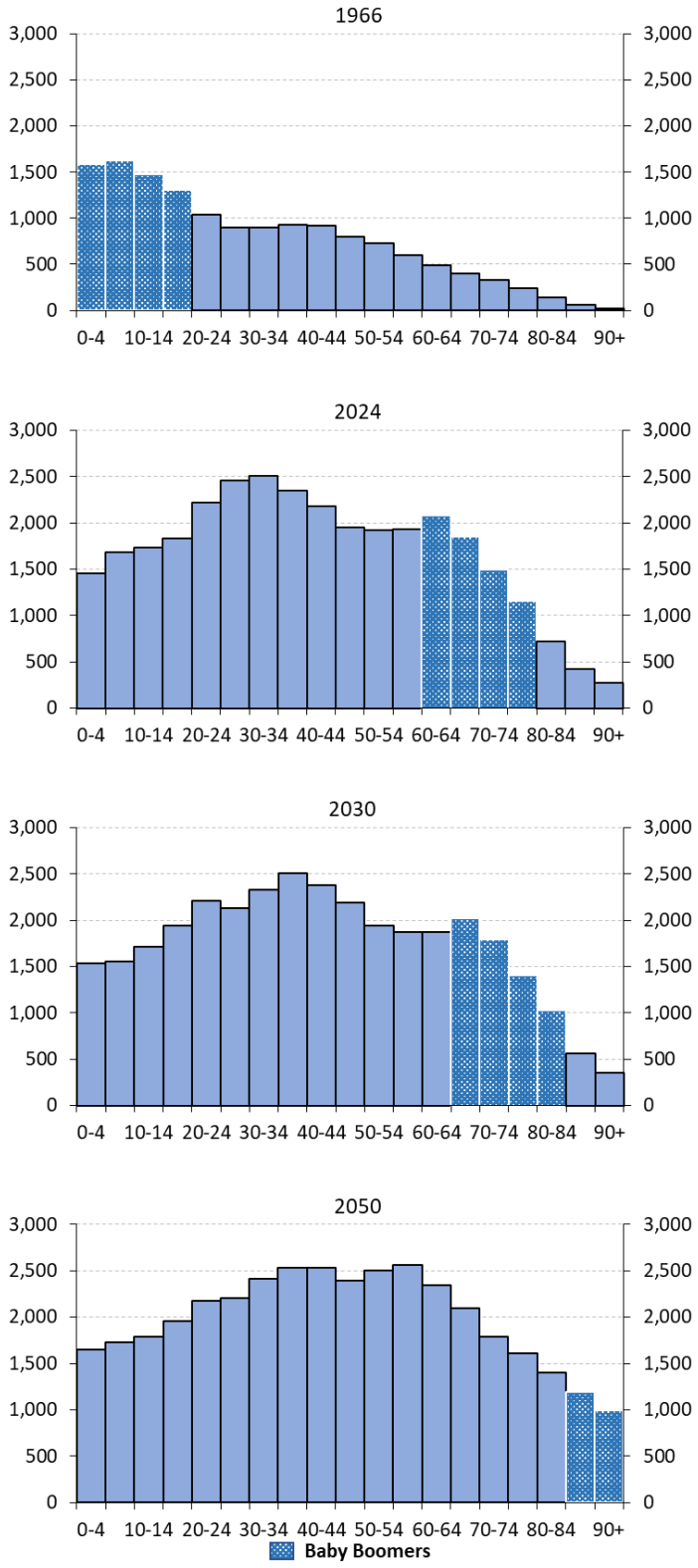
As a result of the component assumptions, the observed net migration rate of 2.31% for Quebec in 2024 is assumed to decrease gradually to an ultimate net migration rate of 0.45% in 2051 and thereafter.

For both Canada and Quebec, the distributions of immigrants, net emigrants, and NPR by age and sex used for the demographic projections are averaged over the historical 10-year period from 2010 to 2019 due to the significant volatility in more recent years.

B.3.5 Projected population and its characteristics

The historical and projected evolution of the Canada less Quebec population age distribution since the inception of the Plan is shown in Chart 5. One can easily observe that the triangular shape of the 1960s has become more rectangular over time. This is projected to continue and indicates an aging population. The chart also reveals that the number of people aged 85 and over is expected to increase dramatically over the coming decades.

Chart 5 Age distribution of the population of Canada less Quebec (thousands)



The population of Canada as at 1 July 2024 is 41.3 million, while the population of Canada less Quebec is 32.2 million. Table 45 and Table 46 present the projected populations of Canada and Canada less Quebec as at 1 July for selected age groups and years, while Chart 6 shows the evolution of the population of Canada less Quebec, split by ages groups 0 to 19, 20 to 64, and 65 and above, from 1975 to 2100. Table 47 shows the variations in the relative proportions of various age groups for Canada less Quebec throughout the projection period.

The proportion of people aged 65 and over for Canada less Quebec is expected to be 19.0% of the total population in 2025 and to increase significantly thereafter to 28.8% by 2100. The number of people aged 65 and older as a proportion of the number of people aged 20 to 64 also increases significantly over the same period, from a projected 31.6% in 2025 to 53.7% by 2100. This proportion affects the ratio of benefits to contributions under the CPP.

Table 45 Population of Canada by age
(thousands)

Year	0-17	18-69	70+	0-19	20-64	65+	Total
2025	7,527	28,082	5,597	8,552	24,571	8,083	41,206
2026	7,507	27,811	5,826	8,526	24,255	8,362	41,143
2027	7,513	27,960	6,061	8,554	24,351	8,629	41,534
2028	7,516	28,047	6,300	8,563	24,400	8,900	41,863
2029	7,523	28,130	6,535	8,568	24,464	9,157	42,188
2030	7,526	28,201	6,773	8,571	24,538	9,392	42,500
2031	7,526	28,267	7,010	8,576	24,641	9,586	42,803
2032	7,525	28,338	7,232	8,576	24,771	9,747	43,095
2033	7,521	28,404	7,456	8,574	24,910	9,897	43,381
2034	7,515	28,470	7,665	8,571	25,038	10,042	43,651
2035	7,514	28,547	7,852	8,564	25,166	10,184	43,914
2040	7,603	29,170	8,410	8,599	25,876	10,708	45,183
2045	7,756	29,835	8,722	8,762	26,423	11,128	46,313
2050	7,861	30,476	8,982	8,870	26,823	11,625	47,319
2055	7,972	31,157	9,375	8,993	27,286	12,225	48,504
2060	8,069	31,713	9,929	9,115	27,590	13,006	49,711
2065	8,163	32,140	10,690	9,230	28,093	13,671	50,993
2070	8,289	32,729	11,309	9,363	28,768	14,196	52,327
2075	8,449	33,471	11,740	9,536	29,267	14,856	53,659
2080	8,622	34,062	12,271	9,730	29,716	15,510	54,955
2085	8,790	34,624	12,798	9,922	30,223	16,066	56,211
2090	8,951	35,248	13,261	10,107	30,853	16,500	57,460
2095	9,110	35,994	13,656	10,290	31,456	17,013	58,760
2100	9,277	36,714	14,136	10,479	32,079	17,568	60,127

Table 46 Population of Canada less Quebec by age
(thousands)

Year	0-17	18-69	70+	0-19	20-64	65+	Total
2025	5,879	22,077	4,226	6,698	19,368	6,116	32,182
2026	5,867	21,880	4,403	6,677	19,139	6,333	32,149
2027	5,879	22,021	4,583	6,705	19,234	6,544	32,483
2028	5,889	22,113	4,766	6,718	19,292	6,758	32,768
2029	5,904	22,203	4,947	6,731	19,359	6,963	33,054
2030	5,916	22,282	5,132	6,743	19,437	7,150	33,330
2031	5,925	22,358	5,317	6,757	19,535	7,307	33,600
2032	5,934	22,436	5,493	6,768	19,655	7,440	33,863
2033	5,940	22,512	5,672	6,777	19,780	7,567	34,123
2034	5,944	22,588	5,840	6,785	19,896	7,692	34,372
2035	5,951	22,675	5,990	6,788	20,013	7,815	34,615
2040	6,062	23,265	6,472	6,854	20,665	8,280	35,799
2045	6,211	23,900	6,768	7,022	21,227	8,628	36,878
2050	6,308	24,569	6,986	7,129	21,657	9,077	37,863
2055	6,416	25,237	7,343	7,247	22,103	9,647	38,997
2060	6,527	25,764	7,863	7,379	22,420	10,355	40,154
2065	6,642	26,192	8,539	7,514	22,883	10,976	41,374
2070	6,782	26,744	9,113	7,665	23,509	11,466	42,639
2075	6,944	27,445	9,517	7,843	24,020	12,044	43,907
2080	7,113	28,055	9,976	8,033	24,507	12,604	45,144
2085	7,276	28,654	10,417	8,221	25,040	13,087	46,347
2090	7,439	29,299	10,812	8,406	25,677	13,467	47,549
2095	7,604	30,046	11,153	8,594	26,276	13,933	48,803
2100	7,777	30,759	11,590	8,789	26,890	14,446	50,125

Chart 6 Population of Canada less Quebec
(millions)

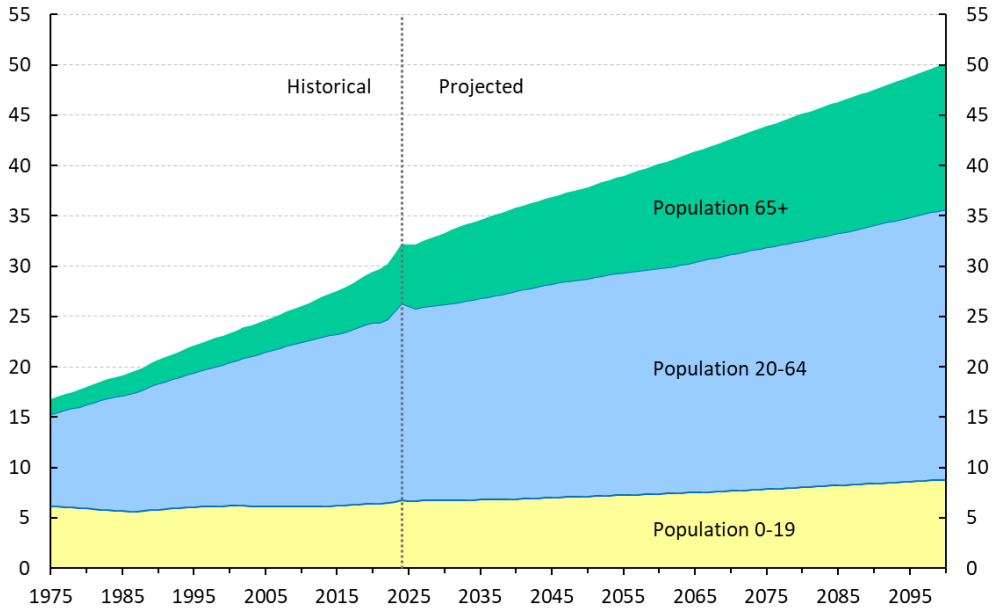


Table 47 Analysis of population of Canada less Quebec by age (% of total population) (1)

Year	0-17	18-69	70+	0-19	20-64	65+	Age 65 + as % of age 20-64
2025	18.3	68.6	13.1	20.8	60.2	19.0	31.6
2026	18.2	68.1	13.7	20.8	59.5	19.7	33.1
2027	18.1	67.8	14.1	20.6	59.2	20.1	34.0
2028	18.0	67.5	14.5	20.5	58.9	20.6	35.0
2029	17.9	67.2	15.0	20.4	58.6	21.1	36.0
2030	17.7	66.9	15.4	20.2	58.3	21.5	36.8
2031	17.6	66.5	15.8	20.1	58.1	21.7	37.4
2032	17.5	66.3	16.2	20.0	58.0	22.0	37.9
2033	17.4	66.0	16.6	19.9	58.0	22.2	38.3
2034	17.3	65.7	17.0	19.7	57.9	22.4	38.7
2035	17.2	65.5	17.3	19.6	57.8	22.6	39.0
2040	16.9	65.0	18.1	19.1	57.7	23.1	40.1
2045	16.8	64.8	18.4	19.0	57.6	23.4	40.6
2050	16.7	64.9	18.4	18.8	57.2	24.0	41.9
2055	16.5	64.7	18.8	18.6	56.7	24.7	43.6
2060	16.3	64.2	19.6	18.4	55.8	25.8	46.2
2065	16.1	63.3	20.6	18.2	55.3	26.5	48.0
2070	15.9	62.7	21.4	18.0	55.1	26.9	48.8
2075	15.8	62.5	21.7	17.9	54.7	27.4	50.1
2080	15.8	62.1	22.1	17.8	54.3	27.9	51.4
2085	15.7	61.8	22.5	17.7	54.0	28.2	52.3
2090	15.6	61.6	22.7	17.7	54.0	28.3	52.4
2095	15.6	61.6	22.9	17.6	53.8	28.5	53.0
2100	15.5	61.4	23.1	17.5	53.6	28.8	53.7

(1) Sum of components may not equal to 100% due to rounding.

Table 48 shows the projected components of population growth, which is defined as the projected number of births plus net migrants less the projected number of deaths, for Canada less Quebec from 2025 to 2100. For Canada less Quebec, the number of births is projected to exceed deaths until 2036. Thereafter, all population growth is expected to come from migration.

The population of Canada less Quebec is projected to decline by about 0.2% in 2025 and 0.1% in 2026, followed by an increase of 1.0% in 2027. Population growth is then projected to slowly decrease to about 0.6% by the early 2040s and around 0.5% by 2080. The population of Canada less Quebec is projected to reach 50.1 million by 2100.

Table 48 Births, net migrants, and deaths for Canada less Quebec (1)
(thousands)

Year	Population 1st July	Births	Net migrants	Deaths	Change in population	Annual % change		
						20-64	65+	Total
2025	32,182	289	(102)	238	(51)	(1.3)	3.5	(0.2)
2026	32,149	293	(83)	242	(32)	(1.2)	3.6	(0.1)
2027	32,483	294	286	248	333	0.5	3.3	1.0
2028	32,768	298	241	253	286	0.3	3.3	0.9
2029	33,054	300	244	259	285	0.3	3.0	0.9
2030	33,330	302	239	265	276	0.4	2.7	0.8
2031	33,600	303	238	271	270	0.5	2.2	0.8
2032	33,863	303	237	277	263	0.6	1.8	0.8
2033	34,123	304	240	284	260	0.6	1.7	0.8
2034	34,372	305	235	291	249	0.6	1.7	0.7
2035	34,615	305	236	297	243	0.6	1.6	0.7
2040	35,799	310	251	333	228	0.6	1.0	0.6
2045	36,878	318	256	365	208	0.5	0.9	0.6
2050	37,863	321	260	389	191	0.3	1.1	0.5
2055	38,997	324	306	404	226	0.3	1.5	0.6
2060	40,154	331	315	410	236	0.3	1.4	0.6
2065	41,374	340	324	414	249	0.5	1.0	0.6
2070	42,639	347	333	426	255	0.5	0.9	0.6
2075	43,907	355	342	446	252	0.4	1.0	0.6
2080	45,144	363	351	470	244	0.4	0.9	0.5
2085	46,347	371	359	491	239	0.5	0.6	0.5
2090	47,549	378	368	504	243	0.5	0.6	0.5
2095	48,803	387	377	508	256	0.5	0.7	0.5
2100	50,125	397	387	515	269	0.5	0.7	0.5

(1) Components may not sum to totals due to rounding.

B.4 Economic assumptions

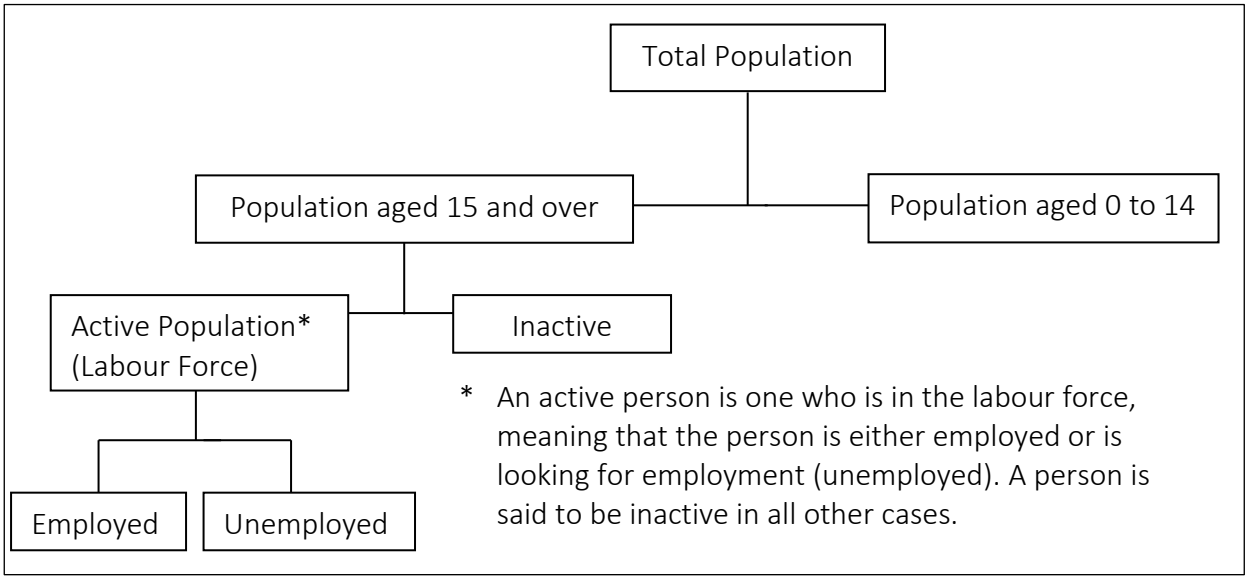
The list of assumptions required to project the various economic indices, as well as CPP contributions and expenditures is quite extensive. The following sections cover the main assumptions.

The economic outlook rests on the assumed evolution of the labour market, that is, labour force participation, employment, unemployment, inflation, and the increase in average employment earnings. Rates of return on CPP assets reflect the financial markets and are part of the investment assumptions described in section 0 of this appendix. All of these factors must be considered together and form part of an overall economic perspective.

B.4.1 Labour market

Chart 7 shows the main components of the labour market that are used to determine the number of earners and contributors by age, sex, and calendar year.

Chart 7 Components of the labour market



The number of earners is based on the number of employed and is defined as the number of persons who had earnings during a given calendar year. The earners become contributors if they have earnings during the year above the Year's Basic Exemption (YBE) and they are between the ages of 18 and 70.

The proportion of earners and contributors assumptions (described in this section and section B.5.1) rely on the projected active population of this report. These assumptions apply as well to working retirement beneficiaries.

B.4.1.1 Active population (Canada)

Table 49 to Table 51 provide projections of the active and employed populations and associated labour force participation, employment, and unemployment rates for Canada.

Table 49 Active and employed populations (Canada, ages 15 and over)
(thousands)

	Population [1]			Active population			Employed		
Year	Males	Females	Total	Males	Females	Total	Males	Females	Total
2025	16,884	17,102	33,986	11,707	10,438	22,144	10,848	9,746	20,594
2026	16,821	17,108	33,929	11,597	10,390	21,988	10,784	9,731	20,514
2027	17,003	17,299	34,301	11,695	10,493	22,188	10,911	9,857	20,768
2028	17,152	17,463	34,615	11,769	10,579	22,348	11,017	9,967	20,985
2029	17,298	17,627	34,926	11,845	10,668	22,513	11,089	10,051	21,140
2030	17,441	17,787	35,228	11,921	10,756	22,677	11,159	10,134	21,293
2031	17,579	17,942	35,521	12,000	10,848	22,847	11,233	10,221	21,454
2032	17,710	18,091	35,802	12,084	10,944	23,028	11,312	10,311	21,623
2033	17,835	18,235	36,070	12,168	11,041	23,209	11,391	10,403	21,793
2034	17,950	18,369	36,319	12,247	11,134	23,381	11,465	10,490	21,955
2035	18,058	18,497	36,555	12,322	11,228	23,550	11,535	10,578	22,113
2040	18,561	19,092	37,653	12,611	11,502	24,113	11,805	10,837	22,642
2045	19,026	19,630	38,657	12,868	11,742	24,611	12,047	11,063	23,110
2050	19,438	20,105	39,542	13,058	11,927	24,985	12,224	11,236	23,461
2055	19,955	20,636	40,591	13,296	12,146	25,442	12,447	11,444	23,890
2060	20,509	21,186	41,695	13,530	12,368	25,898	12,666	11,652	24,318
2065	21,085	21,762	42,847	13,789	12,608	26,397	12,909	11,877	24,786
2070	21,665	22,355	44,019	14,081	12,863	26,944	13,183	12,118	25,301
2075	22,225	22,942	45,167	14,362	13,104	27,466	13,446	12,345	25,791
2080	22,767	23,510	46,276	14,628	13,336	27,963	13,695	12,563	26,258
2085	23,293	24,059	47,352	14,906	13,582	28,488	13,955	12,795	26,750
2090	23,824	24,605	48,430	15,206	13,848	29,054	14,237	13,045	27,282
2095	24,387	25,174	49,561	15,524	14,127	29,651	14,534	13,308	27,842
2100	24,978	25,767	50,745	15,846	14,409	30,255	14,836	13,574	28,410

(1) Adjusted to the basis used by Statistics Canada in its Labour Force Survey.

Table 50 Labour force participation, employment, and unemployment rates (Canada, ages 15 and over) (percentages)

	Labour force participation rate			Employment rate			Unemployment rate		
Year	Males	Females	Total	Males	Females	Total	Males	Females	Total
2025	69.3	61.0	65.2	64.3	57.0	60.6	7.3	6.6	7.0
2026	68.9	60.7	64.8	64.1	56.9	60.5	7.0	6.3	6.7
2027	68.8	60.7	64.7	64.2	57.0	60.5	6.7	6.1	6.4
2028	68.6	60.6	64.6	64.2	57.1	60.6	6.4	5.8	6.1
2029	68.5	60.5	64.5	64.1	57.0	60.5	6.4	5.8	6.1
2030	68.3	60.5	64.4	64.0	57.0	60.4	6.4	5.8	6.1
2031	68.3	60.5	64.3	63.9	57.0	60.4	6.4	5.8	6.1
2032	68.2	60.5	64.3	63.9	57.0	60.4	6.4	5.8	6.1
2033	68.2	60.6	64.3	63.9	57.0	60.4	6.4	5.8	6.1
2034	68.2	60.6	64.4	63.9	57.1	60.5	6.4	5.8	6.1
2035	68.2	60.7	64.4	63.9	57.2	60.5	6.4	5.8	6.1
2040	67.9	60.2	64.0	63.6	56.8	60.1	6.4	5.8	6.1
2045	67.6	59.8	63.7	63.3	56.4	59.8	6.4	5.8	6.1
2050	67.2	59.3	63.2	62.9	55.9	59.3	6.4	5.8	6.1
2055	66.6	58.9	62.7	62.4	55.5	58.9	6.4	5.8	6.1
2060	66.0	58.4	62.1	61.8	55.0	58.3	6.4	5.8	6.1
2065	65.4	57.9	61.6	61.2	54.6	57.8	6.4	5.8	6.1
2070	65.0	57.5	61.2	60.8	54.2	57.5	6.4	5.8	6.1
2075	64.6	57.1	60.8	60.5	53.8	57.1	6.4	5.8	6.1
2080	64.2	56.7	60.4	60.2	53.4	56.7	6.4	5.8	6.1
2085	64.0	56.5	60.2	59.9	53.2	56.5	6.4	5.8	6.1
2090	63.8	56.3	60.0	59.8	53.0	56.3	6.4	5.8	6.1
2095	63.7	56.1	59.8	59.6	52.9	56.2	6.4	5.8	6.1
2100	63.4	55.9	59.6	59.4	52.7	56.0	6.4	5.8	6.1

Table 51 Labour force participation rates (Canada) (percentages)

	Males				Females			
Age group	2025	2035	2050	2075	2025	2035	2050	2075
15-19	46.7	52.0	52.0	52.0	49.1	54.0	54.0	54.0
20-24	77.2	80.0	80.0	80.0	76.1	78.0	78.0	78.0
25-29	89.5	92.0	92.0	92.0	86.3	89.0	89.0	89.0
30-34	93.2	94.0	94.0	94.0	85.3	87.0	87.0	87.0
35-39	93.6	94.0	94.0	94.0	84.6	88.0	88.0	88.0
40-44	93.4	94.0	94.0	94.0	86.0	89.0	89.0	89.0
45-49	92.3	93.0	93.0	93.0	86.4	89.0	89.0	89.0
50-54	90.5	91.0	91.0	91.0	83.5	87.0	87.0	87.0
55-59	83.1	84.0	84.0	84.0	73.7	76.0	76.0	76.0
60-64	65.4	66.0	66.0	66.0	51.8	53.0	53.0	53.0
65-69	35.1	37.0	37.0	37.0	24.0	26.0	26.0	26.0
70 and over	11.5	13.0	13.0	13.0	5.8	6.0	6.0	6.0
55-69	61.3	63.0	63.9	62.9	49.6	52.0	52.9	52.1
55 and over	41.4	37.9	39.4	36.6	30.8	28.0	28.8	26.9
18-69	81.0	83.1	82.5	82.1	73.5	76.9	76.3	75.9
15 and over	69.3	68.2	67.2	64.6	61.0	60.7	59.3	57.1

Despite the recent increases in immigration and projected long-term net migration inflow, the population is still expected to age over the projection period. Given that labour force participation rates are progressively lower for age groups over 50, the aging of the population will result in a larger proportion of the population in age groups with lower participation rates, and thus will decrease the overall participation rate throughout the projection period.

For the purpose of projecting the participation rates, the projection period has been divided into two periods: 2025 to 2035 and from 2035 onward. From 2025 to 2035, the projected participation rates are based on an analysis of historical data and expected trends for each age group and sex. From 2035 onward, the participation rates are held constant. This long-term assumption combined with a slower growth in the working-age population relative to the older age groups results in a rate of growth of approximately 0.4% for the Canadian active population (that is, the labour force) after 2035.

Some examples of the main trends that are taken into account in developing the projected participation rates are discussed below, namely, the narrowing of the male-female gap, longer working lives, and employment opportunities stemming from demographic shifts.

The overall labour force participation rates in Canada (the active population expressed as a proportion of the population aged 15 and over) from 1976 to 2024 clearly show a narrowing of the gap between male and female rates. Although the increase in participation rates of females aged 18 to 69 has slowed down since the mid-2000s, the increase was significant over the previous decades.

In 1976, overall male labour force participation (ages 15 and over) was about 78% compared to only 46% for females, which represents a gap of 32%. This gap has narrowed to 8.5% in 2024 (participation rates of 69.7% for males, 61.2% for females). It is assumed that females will continue to narrow the gap in participation rates but at a slower pace, with the gap gradually reducing to about 7.5% by 2035 (68.2% for males vs. 60.7% for females). A part of this reduction comes from an assumed sustained impact on the female labour force due to the Canada-Wide Early Learning and Child Care plan.

Although the participation rates of older age groups are lower compared to younger groups, the trend towards longer working lives is expected to continue, and as such, it is assumed that there will be further increases in participation rates for older age groups. Continued trends in increasing flexibility in work arrangements, the projected continued increases in life expectancy, and possible insufficient retirement savings are assumed to encourage older workers to delay their retirement and exit the labour force at a later age.

The participation rates for those aged 55 to 59 are assumed to increase from 83.1% to 84.0% for males and from 73.7% to 76.0% for females over the period 2025 to 2050. Over the same period, the participation rates for those aged 60 to 64 are assumed to increase from 65.4% to 66.0% and from 51.8% to 53.0% for males and females, respectively, and the participation rates for those aged 65 to 69 are assumed to increase from 35.1% to 37.0% and from 24.0% to 26.0% for males

and females, respectively.

In addition to the assumed future increase in participation rates of women and older workers, as well as an assumed continued reliance on skilled immigrant workers, it is expected that there will be upward pressure on labour force participation rates as the working-age population expands at a slower pace than the older sector of the population. The participation rates for all age groups are thus expected to increase due to the attractive employment opportunities resulting from the demographic shift as the population ages.

Although the participation rates of both men and women and all age groups are expected to increase over the projection period from their 2024 levels, these increases in participation rates are not sufficient to offset the projected decrease in the overall participation rate (ages 15 and over) due to the demographic shift from population aging.

B.4.1.2 Employment (Canada)

In Canada, the annual job creation rate (i.e. the change in the number of persons employed) has been on average about 1.6% since 1976. However, this rate has varied over time. It is assumed that the job creation rate will be -0.7% in 2025, -0.4% in 2026, 1.2% in 2027, 1.0% in 2028, 0.7% in 2029, and then trend lower thereafter.

The job creation rate is associated with the variation in assumed unemployment rates as well as Canada's labour force growth rate. The unemployment rate is assumed to increase from 6.3% in 2024 to 7.0% in 2025, 6.7% in 2026, and 6.4% in 2027, before reaching its ultimate rate of 6.1% in 2028. These rates are based on recent experience and various economic forecasts.

The negative job creation rate in 2025 and 2026 coincides with the projected decrease in the Canadian population attributable to the decrease in the level of NPR as well as the initial assumed increase in unemployment. The rebound in the job creation date from 2027 onward is associated with the decreasing unemployment rate as well as the projected return to growth in the Canadian population.

Over the long term, the job creation rate is projected to be the same as the labour force growth of 0.4%. This reflects the ultimate assumption for the unemployment rate of 6.1% for year 2028 and thereafter.

Table 52 shows the projected number of employed persons and the employment rate for those aged 18 to 69, in Canada.

Table 52 Employment of population (Canada, ages 18 to 69)

	Population (thousands)		Employed (thousands)		Employment rate (%)	
Year	Males	Females	Males	Females	Males	Females
2025	14,185	13,897	10,349	9,354	73.0	67.3
2026	14,017	13,794	10,266	9,329	73.2	67.6
2027	14,092	13,868	10,369	9,440	73.6	68.1
2028	14,131	13,916	10,452	9,538	74.0	68.5
2029	14,169	13,961	10,504	9,611	74.1	68.8
2030	14,201	14,000	10,554	9,684	74.3	69.2
2031	14,230	14,037	10,607	9,759	74.5	69.5
2032	14,260	14,077	10,666	9,841	74.8	69.9
2033	14,289	14,115	10,727	9,923	75.1	70.3
2034	14,318	14,153	10,783	10,003	75.3	70.7
2035	14,353	14,195	10,840	10,083	75.5	71.0
2040	14,652	14,517	11,091	10,335	75.7	71.2
2045	14,974	14,861	11,312	10,544	75.5	71.0
2050	15,281	15,196	11,475	10,708	75.1	70.5
2055	15,617	15,540	11,670	10,901	74.7	70.1
2060	15,887	15,826	11,849	11,089	74.6	70.1
2065	16,083	16,057	12,041	11,290	74.9	70.3
2070	16,371	16,358	12,276	11,512	75.0	70.4
2075	16,743	16,727	12,511	11,723	74.7	70.1
2080	17,039	17,024	12,724	11,920	74.7	70.0
2085	17,322	17,301	12,949	12,131	74.8	70.1
2090	17,641	17,607	13,199	12,361	74.8	70.2
2095	18,018	17,976	13,468	12,607	74.7	70.1
2100	18,381	18,333	13,736	12,854	74.7	70.1

B.4.1.3 Labour market (Canada less Quebec)

Given that the CPP covers the labour force in all provinces except Quebec, labour market assumptions were developed for Quebec, and the results for Canada less Quebec were derived. Table 53 and Table 54 show the projected active population, number of employed, and labour force participation rates for Canada less Quebec.

Table 53 Active and employed populations (Canada less Quebec, ages 15 and over)
(thousands)

	Population [1]			Active population			Employed		
Year	Males	Females	Total	Males	Females	Total	Males	Females	Total
2025	13,146	13,365	26,511	9,166	8,158	17,324	8,466	7,587	16,054
2026	13,100	13,377	26,477	9,089	8,130	17,219	8,431	7,591	16,022
2027	13,250	13,537	26,787	9,174	8,222	17,396	8,556	7,712	16,268
2028	13,374	13,679	27,053	9,241	8,301	17,542	8,656	7,816	16,472
2029	13,498	13,820	27,318	9,310	8,381	17,692	8,720	7,892	16,613
2030	13,619	13,959	27,578	9,380	8,462	17,842	8,785	7,968	16,754
2031	13,737	14,095	27,833	9,451	8,546	17,997	8,852	8,047	16,899
2032	13,852	14,227	28,079	9,527	8,634	18,161	8,923	8,130	17,053
2033	13,962	14,356	28,318	9,603	8,723	18,326	8,995	8,214	17,208
2034	14,064	14,478	28,542	9,676	8,809	18,484	9,063	8,294	17,357
2035	14,161	14,594	28,756	9,745	8,897	18,642	9,128	8,377	17,504
2040	14,622	15,141	29,763	10,021	9,159	19,180	9,386	8,624	18,010
2045	15,069	15,655	30,724	10,280	9,402	19,681	9,629	8,852	18,481
2050	15,477	16,122	31,599	10,482	9,597	20,079	9,818	9,036	18,854
2055	15,966	16,631	32,598	10,711	9,813	20,524	10,032	9,240	19,272
2060	16,483	17,152	33,635	10,934	10,026	20,960	10,240	9,441	19,681
2065	17,017	17,693	34,710	11,176	10,255	21,432	10,468	9,656	20,124
2070	17,558	18,250	35,808	11,453	10,505	21,958	10,727	9,891	20,619
2075	18,087	18,808	36,895	11,731	10,751	22,482	10,988	10,123	21,111
2080	18,602	19,354	37,956	12,003	10,993	22,996	11,243	10,351	21,594
2085	19,103	19,884	38,987	12,286	11,247	23,533	11,508	10,590	22,098
2090	19,608	20,410	40,018	12,587	11,514	24,101	11,789	10,841	22,630
2095	20,143	20,956	41,099	12,899	11,791	24,690	12,082	11,102	23,184
2100	20,707	21,528	42,235	13,216	12,071	25,287	12,379	11,366	23,745

(1) Adjusted to the basis used by Statistics Canada in its Labour Force Survey.

Table 54 Labour force participation rates (Canada less Quebec)
(percentages)

	Males				Females			
Age group	2025	2035	2050	2075	2025	2035	2050	2075
15-19	44.4	51.0	51.1	51.1	46.1	52.4	52.6	52.7
20-24	76.8	79.5	79.5	79.6	75.3	77.2	77.3	77.3
25-29	89.6	92.0	92.0	92.0	85.6	88.5	88.5	88.6
30-34	93.2	94.0	94.0	94.0	84.4	86.5	86.5	86.6
35-39	93.6	94.0	94.0	94.0	83.8	87.5	87.5	87.6
40-44	93.5	94.0	94.0	94.0	85.0	88.5	88.5	88.6
45-49	92.2	93.0	93.0	93.0	85.5	88.5	88.5	88.6
50-54	90.6	91.0	91.0	91.0	82.9	86.7	86.8	86.8
55-59	83.1	84.0	84.0	84.0	73.3	76.0	76.0	76.0
60-64	65.3	66.0	66.0	66.0	52.3	53.5	53.5	53.5
65-69	36.4	38.2	38.1	38.0	24.8	27.1	27.0	26.9
70 and over	11.9	13.3	13.3	13.2	6.1	6.3	6.3	6.2
55-69	61.8	63.3	64.5	63.3	50.2	52.4	53.6	52.6
55 and over	42.1	38.4	40.3	36.9	31.5	28.5	29.5	27.2
18-69	81.2	83.2	82.6	82.2	73.2	76.7	76.1	75.8
15 and over	69.7	68.8	67.7	64.9	61.0	61.0	59.5	57.2

B.4.1.4 Number of earners (Canada less Quebec)

The number of earners for any given year, namely anyone who had employment earnings during the year, is always more than the employed population and sometimes even close to the labour force because it includes all individuals who had earnings at any time during the year, whereas the employed population only indicates the average number of employed in any given year.

The projected number of earners is obtained by regressions based on a highly correlated historical relationship between the number of employed persons and the number of earners over periods within years 1998 to 2022. Table 55 shows the projected average number of employed persons and the projected number and proportion of earners (relative to the population) aged 18 to 69, for Canada less Quebec. The projected number and proportion of earners shown in Table 55 pertain to all earners, including those who are CPP retirement beneficiaries. The effect of CPP retirement beneficiaries with earnings, (i.e. working beneficiaries), is discussed more in detail in section B.7.5 of this appendix.

Table 55 Employment of population and proportion of earners (Canada less Quebec, ages 18 to 69)

	Population (thousands)		Employed (thousands)		Earners (thousands)		Proportion of earners (earners as % of population)	
Year	Males	Females	Males	Females	Males	Females	Males	Females
2025	11,127	10,950	8,088	7,290	8,941	8,214	80.4	75.0
2026	11,004	10,877	8,039	7,285	8,912	8,230	81.0	75.7
2027	11,074	10,947	8,143	7,394	9,061	8,379	81.8	76.5
2028	11,116	10,997	8,224	7,487	9,185	8,510	82.6	77.4
2029	11,157	11,046	8,273	7,554	9,240	8,585	82.8	77.7
2030	11,193	11,089	8,321	7,621	9,293	8,660	83.0	78.1
2031	11,228	11,130	8,371	7,690	9,347	8,737	83.3	78.5
2032	11,263	11,173	8,426	7,764	9,407	8,818	83.5	78.9
2033	11,297	11,214	8,482	7,840	9,465	8,900	83.8	79.4
2034	11,332	11,256	8,535	7,913	9,521	8,979	84.0	79.8
2035	11,372	11,302	8,589	7,988	9,576	9,060	84.2	80.2
2040	11,659	11,606	8,830	8,228	9,824	9,316	84.3	80.3
2045	11,969	11,930	9,051	8,438	10,063	9,551	84.1	80.1
2050	12,292	12,276	9,227	8,612	10,267	9,758	83.5	79.5
2055	12,620	12,617	9,417	8,803	10,491	9,984	83.1	79.1
2060	12,873	12,891	9,587	8,985	10,681	10,187	83.0	79.0
2065	13,070	13,123	9,769	9,178	10,875	10,400	83.2	79.3
2070	13,336	13,408	9,991	9,394	11,118	10,643	83.4	79.4
2075	13,685	13,760	10,224	9,610	11,381	10,891	83.2	79.1
2080	13,988	14,067	10,447	9,818	11,628	11,127	83.1	79.1
2085	14,289	14,365	10,682	10,037	11,886	11,372	83.2	79.2
2090	14,617	14,682	10,935	10,271	12,168	11,636	83.2	79.3
2095	14,994	15,052	11,203	10,516	12,466	11,915	83.1	79.2
2100	15,353	15,406	11,469	10,762	12,761	12,193	83.1	79.1

B.4.2 Annual increase in prices (inflation rate)

The increase in prices (inflation rate) assumption is needed to determine the Pension Index for any given calendar year. It is also used in the determination of the annual nominal increase in average employment earnings, the YMPE, YAMPE, and the nominal rates of return on investments.

Price increases, as measured by changes in the Consumer Price Index (CPI), fluctuate through time. Since the mid-1950s, the trend was generally upward through the early 1980s and then generally downward until the introduction of the inflation-control targets in the early 1990s, at which point inflation began to stabilize. The average annual increases in the CPI over the 50, 20 and 10-year periods ending in 2024 were 3.7%, 2.2% and 2.5%, respectively.

On December 13, 2021, the Bank of Canada and the Government renewed their commitment to keep inflation between 1% and 3% with a target at the mid-point of 2% until the end of 2026.[10]

They further noted that the Bank will use the flexibility of the 1% to 3% control range to actively seek the maximum sustainable level of employment to an extent that is consistent with keeping medium-term inflation expectations at 2%.

Despite the mid-point target of 2%, inflation, as measured by changes in the CPI, tends to fluctuate from year to year. For instance, supply disruptions during the COVID-19 outbreak, global imbalances in supply and demand, and pent-up demand following the lifting of restrictions in 2021 and 2022, as well as the war in Ukraine that commenced in February 2022, contributed to upward pressure on prices, resulting in inflation peaking at 8.1% in June 2022. As the pandemic became more manageable, fiscal stimulus diminished, and demand and supply returned to equilibrium, the inflation rate gradually aligned with the Bank's target. The inflation rate reached the target of 2% in August 2024. Price increase continued falling, reaching 1.8% in December 2024 partly due to the temporary GST/HST holidays on certain goods and services, which began on December 14, 2024. On an annual basis, the average inflation rate in 2024 was 2.4%.

The inflation rate in Canada is assumed to be 2.2% for 2025, decreasing to 2.1% in 2026 and returning to the 2% target by 2027. These assumed price increases are based on short-term forecasts from various economists[11] as well as the expectation that the Bank of Canada and federal Government will continue to renew the inflation target at 2.0% and that the Bank of Canada will be successful in keeping inflation at its mid-point target in the long term.

B.4.3 Real wage increases

Two wage measure are used in this report: the average annual earnings (AAE) and the average weekly earnings (AWE). The assumed increase in AAE is used to project the total employment earnings of CPP contributors, while the assumed increase in AWE is used to project the increase in

10 Joint Statement of the Government of Canada and Bank of Canada on the Renewal of the Policy Framework.
11 As of January 2025

the YMPE from one year to the next.

It should be noted that the historical AAE is based on administrative data, which includes a cap of $99,999 on employment earnings per employer. As average employment earnings have grown over time, the given employment earnings cap somewhat skews the full extent of AAE growth. This skewing effect will increase over time as the proportion of earners with earnings above the cap continues to grow. As well, although the cap is still above both the YMPE and YAMPE ($71,300 and $81,200 in 2025, respectively), the cap is projected to fall below the YAMPE within 10 years.

The effects of the $99,999 employment earnings cap per employer in the administrative data did not significantly affect the setting of the best-estimate assumptions or the results in this 32nd CPP Actuarial Report. However, as employment earnings grow over time, the earnings cap will present difficulties in setting the best-estimate assumptions regarding earnings. Furthermore, once the cap falls below the YAMPE, this will affect the results shown in the CPP actuarial reports.

The average difference between the real growth in AWE and AAE has been relatively small over the period 1966 to 2023. However, over shorter time periods, real AAE and real AWE can grow at different paces, especially in times of economic expansions and slowdowns. In times of economic slowdown, the AWE generally increases at a faster pace than the AAE, and the reverse occurs in times of economic expansion. This is because during economic slowdowns, individuals with lower earnings tend to lose their jobs, which increases the AWE (proportionally higher earners remain in the labour force and people work less weeks during the year). The reverse holds true in times of economic expansion, i.e. low earners get rehired and people work more weeks during the year.

For this report, increases in the real AAE and real AWE are assumed to be the same over the entire projection period, and are referred to as real wage increases. The real wage increase can be measured using the difference between the increases in the nominal average wage and the CPI. In this case, the nominal average wage is defined as the ratio of the total nominal earnings to total civilian employment in the Canadian economy as a whole.

The relationship between real wages and the labour markets and overall economy is complex. In general, real wages are subject to downward pressure as the demand for workers decreases. On the other hand, one could expect upward pressure on wages if the size of the labour force fails to keep pace with a growing economy.

For this report, it is assumed that real wages will grow at an annual rate of 0.8% from the year 2025 onward. For comparison, under the 31st CPP Actuarial Report, real wages were assumed to increase by 0.9% per year over the long term.

The real wage increase is related to the growth in total labour productivity plus the growth of various factors, as shown in Table 56. More detail on each factor is provided below the table.

Table 56 Real wage increase and related components [1]
(percentages)

	1961-2023 Average	2000-2023 Average	2010-2023 Average	Ultimate assumption
Labour productivity growth	1.51	0.79	0.76	0.95
+ Compensation ratio growth	(0.09)	(0.01)	(0.01)	0.00
+ Earnings ratio growth	(0.15)	(0.07)	(0.02)	(0.05)
+ Average hours worked growth	(0.31)	(0.26)	(0.13)	(0.10)
+ Price differential growth	0.09	0.14	(0.01)	0.00
Real wage increase	1.05	0.59	0.59	0.80

(1) Components may not sum to totals due to rounding.

Labour productivity in the above table is defined as the ratio of the real Gross Domestic Product (GDP) to total hours worked in the Canadian economy. As shown in Table 56, growth in labour productivity has decreased since the 1960s. However, long-term productivity is expected to increase as a result of continued technological advancements, government productivity boosting policies, and increases in capital stock investments. At the same time, a labour force reliance on immigration for future labour force growth and lower gains from increases in skills and education levels are expected to moderate productivity growth.

In addition, labour productivity could be affected by the timing and pace of Canada's transition to a green economy. There is substantial uncertainty surrounding the effect of this transition on the composition of Canada's economy.

Based on the foregoing, a labour productivity growth of 0.95 is assumed for the long term.

The compensation ratio is the ratio of the total compensation received by workers to the nominal GDP, thereby reflecting the extent to which changes in productivity are shared between capital and labour. While the ratio fluctuated during the last 25 years ending in 2023, it is assumed that there will be no change in the compensation ratio over the long term.

The earnings ratio is the ratio of total workers' earnings to total compensation. Changes in the earnings ratio reflect changes in the compensation structure offered to employees. The historical average decline in the earnings ratio of 0.15% per year from 1961 to 2023 has been primarily due to the faster growth in supplementary labour income, such as employer contributions to pension plans, health benefit plans, the CPP, and the Employment Insurance program, compared to earnings. Given that a significant portion of the historical decrease in the earnings ratio can be explained by the increase in CPP contributions resulting from the increase in the contribution rate from 3.6% in 1986 to 9.9% in 2003, the earnings ratio is not expected to decline as fast as it has in the past. However, it is expected that the cost of health programs will continue to increase in the future and exert downward pressure on the earnings ratio. Based on the foregoing, it is assumed that the long-term earnings ratio will decline by 0.05% per year.

The average hours worked is defined as the ratio of total hours worked to total employment in the Canadian economy. There was a decrease in the average hours worked between 1961 and

2023. In the future, the assumed steady increases in productivity and the higher participation rates of older workers, who generally work fewer hours, could continue to apply negative pressure on the average hours worked. It is assumed that in the long term, the average hours worked will decline by 0.10% per year.

Finally, the price differential or "labour's terms of trade" is the ratio of the GDP deflator (defined as the ratio of nominal to real GDP) to the CPI. Including this ratio is necessary because labour productivity is expressed in real terms by using real GDP, while current dollar earnings are converted to real earnings using the CPI. While the ratio has fluctuated in the past, it is assumed that the price differential will remain stable without change over the long term.

B.4.4 Average annual earnings, total earnings, and pensionable earnings

Average annual earnings are projected by taking into account past and expected structural demographic and labour market changes as well as the narrowing of the gap between average male and female employment earnings. As part of these projections, the average annual earnings of working beneficiaries are also taken into account. The ratio of female to male average employment earnings stood at about 48% in 1966 and was 81% in 2022. This ratio is projected to increase to 88% by 2050. Table 57 shows the projected average annual earnings by age group and sex for selected years.

Table 57 Average annual earnings (Canada less Quebec, by age group)
(dollars)

	Males			Females		
Age group	2025	2050	2075	2025	2050	2075
20-24	32,700	63,600	126,000	27,000	54,100	109,200
25-29	53,000	102,200	201,700	45,600	92,200	186,300
30-34	64,900	123,800	242,700	51,700	106,600	216,700
35-39	70,800	134,600	263,900	56,200	116,100	236,400
40-44	73,100	139,100	273,200	60,100	123,200	250,400
45-49	74,500	141,800	278,700	61,900	126,600	256,800
50-54	73,500	140,000	275,300	61,200	124,900	253,700
55-59	68,200	129,400	254,300	56,200	115,400	234,300
60-64	59,500	111,800	221,500	46,600	98,400	201,900
65-69	44,100	84,300	167,500	33,200	72,600	149,600
All ages	60,600	117,300	230,400	49,800	103,800	210,700

Total earnings are the product of average earnings and the number of earners. Table 58 shows the projected average earnings and number of earners for each sex, the resulting total earnings, and the annual percentage increase in total earnings for Canada less Quebec. The annual increase in total earnings is projected to be 2.3% in 2025 and is set to reach an ultimate value of about 3.3%. This nominal increase comprises an ultimate inflation rate of 2.0%, real wage growth of 0.8%, and employed population growth for the age group 18 to 69 of 0.5%.

Table 58 Total earnings (Canada less Quebec, ages 18 to 69)

Year	Average annual earnings ($)		Earners (thousands)		Total earnings ($ million)	Annual increase in total earnings (%)
	Males	Females	Males	Females		
2025	60,600	49,800	8,941	8,214	951,176	2.3
2026	62,300	51,400	8,912	8,230	977,974	2.8
2027	63,900	52,900	9,061	8,379	1,022,890	4.6
2028	65,600	54,600	9,185	8,510	1,066,861	4.3
2029	67,300	56,200	9,240	8,585	1,104,797	3.6
2030	69,100	57,900	9,293	8,660	1,143,892	3.5
2031	70,900	59,700	9,347	8,737	1,184,551	3.6
2032	72,800	61,500	9,407	8,818	1,227,167	3.6
2033	74,700	63,400	9,465	8,900	1,271,234	3.6
2034	76,700	65,300	9,521	8,979	1,316,390	3.6
2035	78,700	67,200	9,576	9,060	1,363,271	3.6
2040	89,900	77,800	9,824	9,316	1,607,423	3.3
2045	102,600	89,900	10,063	9,551	1,891,129	3.3
2050	117,300	103,800	10,267	9,758	2,216,592	3.2
2055	134,100	119,700	10,491	9,984	2,601,988	3.2
2060	153,400	138,100	10,681	10,187	3,044,557	3.2
2065	175,600	159,100	10,875	10,400	3,563,487	3.2
2070	201,100	183,100	11,118	10,643	4,184,605	3.3
2075	230,400	210,700	11,381	10,891	4,917,140	3.3
2080	264,200	242,200	11,628	11,127	5,767,565	3.2
2085	303,300	278,100	11,886	11,372	6,767,992	3.3
2090	348,200	319,300	12,168	11,636	7,952,072	3.3
2095	399,800	366,600	12,466	11,915	9,350,941	3.3
2100	459,000	420,800	12,761	12,193	10,987,955	3.3

The average pensionable earnings by age, sex, and calendar year correspond to the average portion of individual employment earnings below the YMPE for a cohort of earners earning more than the YBE. The average pensionable earnings are determined using average annual earnings and distributions of earners and earnings. For the additional CPP, the same methodology as mentioned above applies, but the average portion of individual employment earnings used goes up to the YAMPE.

In 2025, the YMPE and YBE are respectively $71,300 and $3,500. The YAMPE is set at 114% of the YMPE in 2025 and thereafter, as per the CPP statute. The YAMPE thus equals $81,200 in 2025. The YMPE and the YAMPE are increased annually based on the average weekly wages and salaries in Canada as published by Statistics Canada. The projected average pensionable earnings by age and sex for selected years up to the YMPE and YAMPE are shown in Table 59 and Table 60, respectively.

Table 59 Average pensionable earnings up to YMPE (Canada less Quebec)
(dollars)

	Males			Females		
Age group	2025	2050	2075	2025	2050	2075
20-24	33,300	63,100	123,000	28,500	55,000	108,800
25-29	47,700	91,800	180,300	43,500	85,500	169,400
30-34	53,700	104,100	204,600	46,800	92,700	184,200
35-39	56,300	109,500	215,700	49,100	97,500	194,000
40-44	57,300	111,600	220,200	51,200	101,700	202,500
45-49	57,900	112,900	223,000	52,200	103,800	206,700
50-54	57,600	112,100	221,200	51,900	103,000	205,100
55-59	55,200	106,700	209,700	49,300	97,400	193,200
60-64	51,800	98,600	193,000	44,900	88,900	175,500
65-69	47,300	89,700	174,600	39,500	79,100	156,300
All ages	51,100	99,500	195,200	45,300	90,300	179,000
YMPE	71,300	142,700	284,600	71,300	142,700	284,600
All ages / YMPE	0.72	0.70	0.69	0.64	0.63	0.63

Table 60 Average pensionable earnings up to YAMPE (Canada less Quebec)
(dollars)

	Males			Females		
Age group	2025	2050	2075	2025	2050	2075
20-24	34,000	64,300	125,400	28,800	55,700	110,100
25-29	50,300	96,500	189,400	45,200	89,100	176,800
30-34	57,800	111,500	219,000	49,400	98,200	195,400
35-39	61,100	118,400	233,000	52,200	104,000	207,300
40-44	62,400	121,100	238,800	54,700	108,800	217,000
45-49	63,100	122,800	242,200	55,800	111,100	221,600
50-54	62,700	121,700	239,900	55,400	110,100	219,700
55-59	59,800	115,100	226,100	52,300	103,600	205,800
60-64	55,800	105,900	207,100	47,200	94,000	185,900
65-69	50,700	96,100	186,900	41,300	83,200	164,400
All ages	54,900	106,800	209,300	47,800	95,600	190,000
YAMPE	81,200	162,600	324,400	81,200	162,600	324,400
All ages / YAMPE	0.68	0.66	0.65	0.59	0.59	0.59

B.5 Contributions

Contributions are determined by multiplying together the number of contributors, average contributory earnings, and the contribution rate. Contributions are determined separately for the base and additional Plans to account for the different contributory earnings (as of 2024) and different contribution rates of the two components of the CPP. The number of contributors is the same since a contributor to the additional Plan is necessarily a contributor to the base Plan.

B.5.1 Proportion of contributors

In order to be considered a contributor to the CPP in any given calendar year, one must have employment earnings exceeding the YBE. Accordingly, the proportion of contributors (in respect

of the population[12]) is determined by multiplying the proportion of the population who are earners by the proportion of earners earning more than the YBE. This last proportion is determined for each age, sex, and calendar year by expressing the YBE as a percentage of average employment earnings and using distributions of earners and their earnings. The proportion of contributors is adjusted to reflect working beneficiaries. Table 61 presents the proportion of contributors by selected age groups and years for males and females.

Table 61 Proportion of contributors to the CPP, by age group
(percentages)

	Males			Females		
Age group	2025	2050	2075	2025	2050	2075
20-24	78.8	83.7	85.6	78.0	83.4	85.6
25-29	84.5	91.3	91.6	81.3	89.2	90.0
30-34	86.0	90.6	91.4	79.1	85.7	87.2
35-39	86.4	90.4	90.8	79.1	86.2	87.2
40-44	85.3	89.0	89.8	80.3	86.8	87.9
45-49	84.4	88.0	88.1	80.3	86.0	86.5
50-54	84.1	87.6	88.4	78.3	85.2	86.3
55-59	77.3	81.2	81.9	69.9	75.5	76.6
60-64	61.0	65.8	67.0	50.7	56.0	57.4
65-69	28.9	32.8	32.9	21.2	25.9	26.2
All ages	76.0	80.6	81.0	70.0	76.3	77.1

B.5.2 Total contributory earnings

Contributory earnings for each given age, sex, and year are calculated as the product of the proportion of contributors, average contributory earnings, and the corresponding population. Average contributory earnings are determined for each age, sex, and year by subtracting the YBE from the average pensionable earnings shown in Table 59 and Table 60. Total contributory earnings for each year are obtained by summing contributory earnings for each age and sex in that year.

Total contributory earnings are then adjusted upward to take into account the non-refundable portion of employer contributions arising generally in respect of (1) employees with multiple employers during a given year, and (2) employees earning less than the YBE during a given year, including those who only work part of a year. The amount of non-refundable employer contributions increases total CPP contributions, which translates into higher underlying contributory earnings. As such, contributory earnings are adjusted only for the purpose of determining the correct amount of contributions, and not for the determination of benefits.

The records of earnings from Service Canada, statistics on contributors from the “The CPP & OAS Stats Book 2024”, published by ESDC, and information from the Canada Revenue Agency on base CPP contribution refunds were used to project the adjustments to contributory earnings up to the YMPE and YAMPE. The adjustment for earnings up to the YMPE is projected to be 1.54% in 2025 and decrease to 1.49% over the projection period to account for the YBE being frozen at $3,500.

12 Population of Canada less that of Quebec

The adjustment for earnings up to YAMPE is projected to be 1.50% in 2025 and decreases to 1.45% over the projection period also to account for the YBE being frozen at $3,500.

Annual contributions are equal to the product of adjusted contributory earnings and the contribution rates set by law. For the base Plan, the statutory contribution has been 9.9% since 2003. For the additional Plan, the statutory first additional contribution rate is 2.0% as of 2023 (phased in starting in 2019) and the statutory second additional contribution rate is 8.0% as of 2024. Table 62 and Table 63 present information on the total adjusted contributory earnings for pensionable earnings up to the YMPE and YAMPE, respectively.

Table 62 Total adjusted contributory earnings for pensionable earnings up to YMPE

	Unadjusted average contributory earnings ($)			Contributors (thousands)			
Year	Males	Females	YMPE ($)	Males	Females	Total adjusted contributory earnings ($ million)	Annual increase in total adjusted contributory earnings (%)
2025	47,600	41,800	71,300	8,454	7,660	733,218	3.2
2026	49,100	43,100	73,400	8,435	7,685	756,595	3.2
2027	50,500	44,500	75,600	8,587	7,837	794,101	5.0
2028	51,900	45,800	77,700	8,713	7,971	829,989	4.5
2029	53,400	47,200	79,900	8,773	8,053	861,449	3.8
2030	54,900	48,600	82,100	8,830	8,130	893,245	3.7
2031	56,400	50,100	84,400	8,892	8,216	927,034	3.8
2032	58,000	51,600	86,800	8,961	8,306	962,880	3.9
2033	59,700	53,100	89,200	9,031	8,398	999,736	3.8
2034	61,400	54,700	91,700	9,097	8,487	1,037,774	3.8
2035	63,100	56,300	94,300	9,162	8,578	1,077,475	3.8
2040	72,600	65,100	108,200	9,441	8,875	1,282,894	3.5
2045	83,600	75,200	124,300	9,700	9,143	1,521,171	3.4
2050	96,000	86,800	142,700	9,909	9,372	1,790,525	3.2
2055	110,200	100,000	163,800	10,134	9,615	2,108,774	3.3
2060	126,500	115,200	188,000	10,325	9,835	2,475,330	3.2
2065	145,300	132,600	215,900	10,548	10,078	2,912,278	3.3
2070	166,900	152,600	247,900	10,818	10,348	3,435,340	3.4
2075	191,700	175,500	284,600	11,088	10,610	4,047,374	3.3
2080	220,200	201,800	326,700	11,345	10,861	4,759,241	3.3
2085	253,000	231,800	375,100	11,616	11,122	5,599,158	3.3
2090	290,600	266,200	430,600	11,911	11,402	6,594,010	3.3
2095	333,900	305,800	494,400	12,214	11,690	7,766,468	3.3
2100	383,500	351,200	567,600	12,511	11,975	9,137,861	3.3

Table 63 Total adjusted contributory earnings for pensionable earnings up to YAMPE

Year	Unadjusted average contributory earnings ($)		YAMPE ($)	Contributors (thousands)		Total adjusted contributory earnings ($ million)	Annual increase in total adjusted contributory earnings (%)
	Males	Females		Males	Females		
2025	51,400	44,300	81,200	8,454	7,660	785,603	6.6
2026	53,000	45,700	83,600	8,435	7,685	810,564	3.2
2027	54,600	47,200	86,100	8,587	7,837	850,528	4.9
2028	56,100	48,600	88,500	8,713	7,971	888,952	4.5
2029	57,700	50,100	91,000	8,773	8,053	922,518	3.8
2030	59,300	51,600	93,500	8,830	8,130	956,490	3.7
2035	68,100	59,800	107,500	9,162	8,578	1,153,601	3.8
2040	78,300	69,100	123,300	9,441	8,875	1,372,546	3.5
2045	90,000	79,900	141,700	9,700	9,143	1,627,057	3.4
2050	103,300	92,100	162,600	9,909	9,372	1,914,255	3.2
2055	118,500	106,200	186,700	10,134	9,615	2,254,253	3.3
2060	136,000	122,300	214,300	10,325	9,835	2,645,624	3.2
2065	156,200	140,900	246,100	10,548	10,078	3,111,705	3.3
2070	179,300	162,100	282,600	10,818	10,348	3,669,825	3.4
2080	236,400	214,300	372,400	11,345	10,861	5,082,501	3.3
2090	311,900	282,700	490,800	11,911	11,402	7,039,690	3.3
2100	411,600	372,900	647,000	12,511	11,975	9,753,888	3.3

B.6 Investment assumptions

The total assets of the CPP at the end of any given year throughout the projection period are determined by adding the total assets at the end of the previous year to the projected investment income and contribution revenues of the given year, and then subtracting the projected benefits and operating expenses of the given year.

B.6.1 Net assets as at 31 December 2024

The actual value of the base CPP assets on a market-value accrual basis as at 31 December 2024 was $651 billion. This amount comprises the CPP Account ($204 million) and the assets invested by the CPPIB ($646 billion), and is further adjusted by the amounts receivable ($5 billion) minus amounts payable ($715 million).

The actual value of the additional CPP assets on a market-value accrual basis as at 31 December 2024 was $54 billion. This amount comprises the Additional CPP Account ($52 million) and the assets invested by CPPIB ($53 billion), and is further adjusted by the amounts receivable ($805 million) minus amounts payable ($9 million).

The CPP Account and Additional CPP Account were established in respect of the base Plan and additional Plan to record the contributions, interest, pensions, other benefits, and operating expenses. The two accounts also record the amounts transferred to and received from the CPPIB. The receivables include the contributions due but not yet deposited into the accounts, benefit overpayments, and net transfers between the CPP and the QPP for dual contributors. The amounts payable include operating expenses, pensions and other benefits, as well as amounts

due to the Canada Revenue Agency (CRA). Benefit and operating expenditures are described in detail in sections B.7 and B.8, respectively of this appendix.

Table 64 reconciles the assets of the base CPP and additional CPP as at 31 December 2024.

Table 64 Net assets as at 31 December 2024
($ million)

	Base CPP	Additional CPP
CPP Account and Additional CPP Account	204	52
Assets invested by CPPIB	646,165	53,391
Subtotal CPP Account and invested assets by CPPIB	646,369	53,443
Plus amounts receivable		
Contributions	4,609	747
Benefit overpayments	238	39
Net transfers due from QPP	116	19
Minus amounts payable	715	9
Net CPP assets	650,616	54,237

B.6.2 Investment strategy and two-pool structure

The CPPIB invests funds according to its own investment policies. For the purpose of this 32nd CPP Actuarial Report, the CPP invested assets have been grouped into three broad categories:

- Equities, consisting of public and private equities;
- Fixed income securities, consisting of fixed income (marketable bonds and non-marketable bonds), credit, and cash; and
- Real assets.

The foundation of the CPPIB's investment strategy is a two-asset portfolio called the "reference portfolio". [13] This portfolio sets how much risk the CPPIB is willing to take in accordance with its mandate. The reference portfolio comprises a global equity benchmark and a Canadian government nominal bonds benchmark. The higher the equity share, the higher the associated risk.

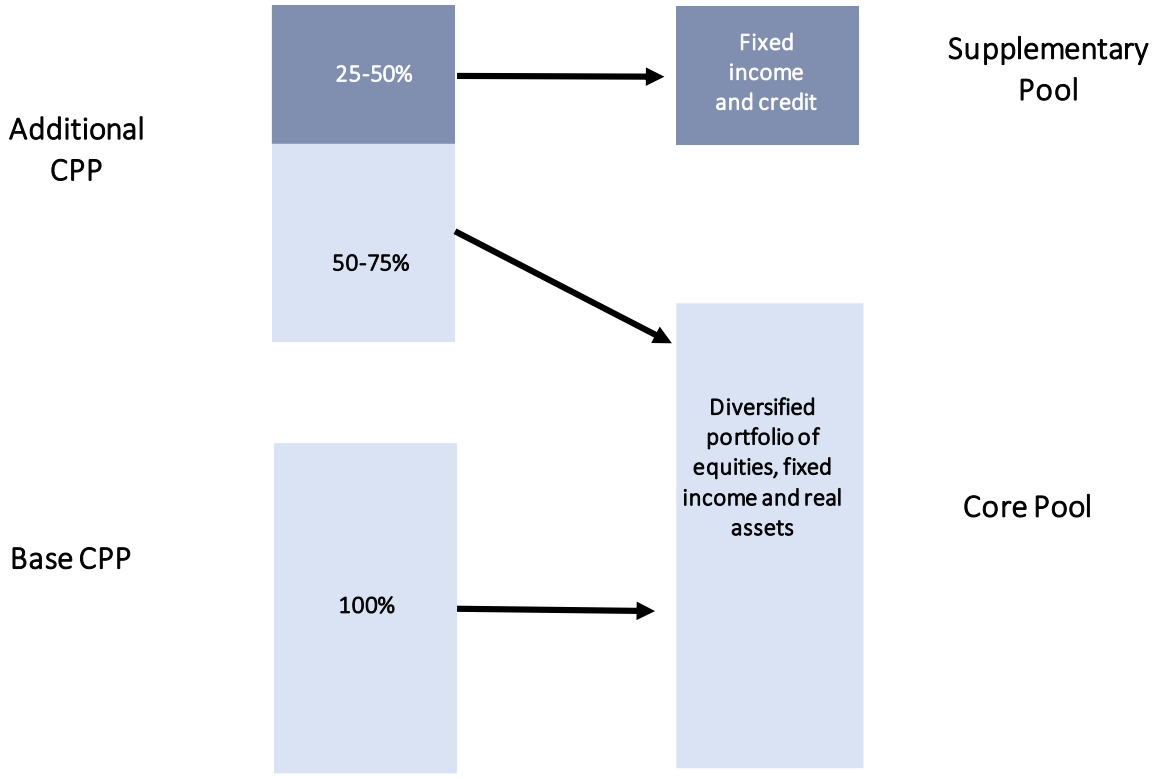
Recognizing the distinct natures of the base and additional CPP, the CPPIB approved a different reference portfolio for each component of the Plan. The reference portfolio applicable to the base CPP as at 31 December 2024 is maintained at 85% global equity and 15% Canadian government nominal bonds, whereas, the reference portfolio applicable to the additional CPP as at 31 December 2024 is maintained at 55% global equity and 45% Canadian government nominal bonds.

In order to invest the base and additional CPP funds according to their respective reference

13 The reference portfolio refers to the Market Risk Targets in the CPPIB Fiscal Year 2025 Annual report.

portfolios, the CPPIB designed a two-pool investment structure. The base CPP's actual assets as of 31 December 2024 constitute the Core pool and are invested according to the base CPP's investment policy. The additional CPP assets are invested in two pools: the Core pool and the Supplementary pool. The Supplementary pool solely comprises fixed income securities and credit. The share of the additional CPP's assets invested in each of the Core and Supplementary pools is determined such that the overall level of risk of the additional CPP is consistent with its reference portfolio. Chart 8 presents a schematic of the two-pool investment structure for the CPP invested assets.

Chart 8 Illustrative two-pool investment structure of the CPPIB



The CPPIB diversifies its holdings and thus sources of returns, while respecting the risk level of its reference portfolios. As a result, the base and additional CPP assets are invested in several types of assets. The portfolios capturing that diversification are called the strategic portfolios. The CPPIB uses the strategic portfolios to express its long-term goal for allocating assets by asset classes and geographic regions. In its Fiscal 2025 Annual Report, the CPPIB signaled its intention to continue increasing the CPP Fund's exposure to fixed income as part of their 2026 strategy.[14]

14 "How We Design and Execute Our Investment Approach" (page 16) from the CPPIB's 2025 Annual Report.

As at 31 December 2024, the asset mix of the base CPP consisted of 54% equities, 25% fixed income securities, and 21% real assets, while the asset mix of the additional CPP consisted of 34% equities, 52% fixed income securities, and 14% real assets. Table 65 further categorizes the actual assets under the CPPIB management into the asset classes identified at the beginning of this section, which correspond to the strategic portfolios' asset classes.

Table 65 Initial asset mix as at 31 December 2024 for base and additional CPP
(percentages)

	Equity		Fixed income securities				
Plan	Public equities	Private equities	Marketable bonds	Non-marketable bonds	Credit	Cash [1]	Real assets
Base	28	25	31	2	14	(22)	21
Additional	18	16	50	0	16	(14)	14

(1) A negative allocation to cash represents financial leverage. This indicates that funds are borrowed in order to increase the amounts invested in the other asset classes.

B.6.3 Investment income

In general, investment income from a given asset within a portfolio is the product of the market value of that asset and its projected nominal rate of return (which is obtained by adding the applicable projected real rate of return, as described in section B.6.4 below, to the projected inflation rate).

The investment income of the CPP is based on the assumed real rate of return applicable to each type of asset, projected inflation, and the projected asset mix and cash flows. In addition, the assumed real rate of return at the portfolio level includes an allowance for rebalancing and diversification (discussed in section B.6.5). Investment income is also adjusted downward to recognize investment expenses (discussed in section B.6.6).

B.6.4 Real rates of return

Real rates of return are required for the projection of revenue arising from investment income. They are assumed for each year of the projection period and for each of the main asset classes in which CPP assets are invested. All real rates of return described in this section are shown before reduction for assumed investment expenses and allowance for rebalancing and diversification.

The real rates of return were developed by looking at historical returns (expressed in Canadian dollars) and adjusting the returns upward or downward to reflect potential future trends and expectations that differ from the past. Consideration was also given to forecasts from other relevant experts. Both public market data and customized benchmarks prepared by the CPPIB were used to analyze the historical experience.

Future currency variations will impact the real rates of return over the projection period, creating gains and losses. However, as the projection period is over 75 years, these gains and losses are expected to offset each other over time. Thus, it is assumed that currency variations will have no impact on the real rates of return.

B.6.4.1 Fixed income securities

As at 31 December 2024, the CPPIB had 25% of the Core pool invested in fixed income securities, split between fixed income, credit, and cash (which includes leverage). Fixed income in the Core pool can be further divided into a non-marketable bond portfolio composed of bonds with various terms to maturity, representing loans made to the provinces, and a marketable bond portfolio consisting of foreign sovereign bonds and some domestic federal and provincial bonds. As of 1 January 2019, the CPPIB started investing part of the additional CPP's contributions in a Supplementary pool composed of fixed income securities and credit. In the case of the Supplementary pool, the fixed income comprises domestic federal and provincial bonds and developed market sovereign bonds.

B.6.4.1.1 Canadian fixed income

The nominal yield on long-term Government of Canada bonds is set for each year in the projection period. The real yield on long-term federal bonds is equal to the nominal yields less the assumed rate of inflation. The real yield on long-term Canadian federal bonds as at 31 December 2024 is 0.97% and is assumed to gradually increase to 2.0% by 2036 and remain at that level.

The real yields for long-term provincial bonds, as well as for federal and provincial bonds of shorter maturities (mid and short), are based on the real yield on long-term federal bonds adjusted based on long-term historical spreads. The initial spreads over the real yield on federal long-term bonds are based on spreads prevailing as at 31 December 2024 and reflect the current economic environment. Since the long-term federal bond yield is assumed to increase between 2025 and 2036 and only stabilize at the end of 2036, bond returns are lower for the first ten years of the projection.

For the core and supplementary pool marketable bond portfolios, the yields are determined in relation to yields for Canadian federal universe bonds. The yield for Canadian federal universe bonds is assumed to be represented by a diversified portfolio of Canadian federal bonds. The assumed average maturities of federal and provincial bonds are estimated based on market data at the beginning of 2025 and are assumed to remain constant throughout the projection period. The average maturity is set at 7.4 years for the Canadian federal bonds and 14.1 years for provincial bonds. The ultimate real yields on the Canadian federal bonds and provincial bonds are 1.3% and 2.2%, respectively.

B.6.4.1.2 Non-marketable bond portfolio and rollover rates (loans to provinces, core pool)

The non-marketable bond portfolio at the end of 2024 represented 2% of Core CPP assets. The provinces are allowed to roll over at maturity for a further 20-year term any bonds that were purchased prior to the 1997 CPP amendments (that came into effect on 1 January 1998). In lieu of exercising their statutory rollover right, an agreement between the provinces and the CPPIB permits each province to repay a bond and contract a replacement bond or bonds for a term of at least five years, with a total principal amount not exceeding the principal amount of the maturing bond and total successive terms of not more than 30 years. During the 20-year period 2005 to

2024, 76% of provincial bonds available for rollover were rolled over at or before maturity. The rollover proportion increases to 100% when considering the five-year period from 2020 to 2024. Using this rollover experience, it is assumed that the rollover rate will be 100% for 2025 and thereafter. The last non-marketable bond is expected to mature in 2049.

On the basis of the average short-, medium-, and long-term experience of the spread between the annual yields on federal and provincial bonds, the current outlook of the economy, and data on rollovers since 2000, a spread over the federal long-term yield was determined for each province. The initial spreads on rollover bonds are set at the actual market spreads at the end of 2024 for provincial bonds issued by the given province. The ultimate spreads, applicable from 2036 onward, are set at the average spreads of provincial bonds issued by a given province during the period 2000 to 2023. The weighted long-term average spread for all provinces is approximately 75 basis points. Therefore, an ultimate annual real yield of approximately 2.8% for provincial rollover bonds is assumed for 2036 and thereafter.

The real rate of return of the non-marketable bond portfolio is calculated by taking into consideration any coupon payments made throughout the year, as well as the change in the market value of the portfolio due to changes in the assumed yield rates and in the term to maturity of each bond. Coupons paid and redemption values of bonds at maturity are assumed to be reinvested in the marketable bond portfolio.

B.6.4.1.3 Marketable bond portfolio (core pool)

The Core pool's marketable bond portfolio consists mainly of foreign sovereign bonds (developed market and emerging market). As at 31 December 2024, the Core pool is composed of 13% Canadian bonds, 82% developed market sovereign bonds and 5% emerging market bonds, and it is expected to stay at that level over the projection period. Consistent with the last report (31st CPP Actuarial Report), it is assumed that corporate bond holdings of the CPPIB are part of the credit asset class (discussed in the subsequent section).

The returns for developed market sovereign bonds are derived from a blend of projected sovereign yields for the Euro Zone, the United States, the United Kingdom, Australia, and Asia. Based on historical data and forward-looking forecasts, the foreign sovereign yields are assumed to be 10 basis points lower than the projected yields of Canadian federal universe bonds. Thus, the ultimate real return for the developed market sovereign bonds is assumed to be 1.2%.

The returns for emerging market sovereign bonds are derived from a blend of projected local currency long term sovereign yields for Brazil, China, India, Indonesia, and Mexico.

These sovereign yields are obtained by adding a spread of 148 basis points to the projected yields of Canadian federal universe bonds. The ultimate real return for the emerging market sovereign bonds is assumed to be 2.8%.

The assumed ultimate real rate of return of the Core pool marketable bond portfolio is 1.4%.

B.6.4.1.4 marketable bond portfolio (supplementary pool)

The initial composition is based on data as of 31 December 2024 provided by the CPPIB, and consists of 41% Canadian federal, 35% provincial, and 24% developed markets sovereign bonds. The ultimate composition is based on information provided by the CPPIB, and is assumed to be 18% Canadian federal, 15% provincial, and 67% developed markets sovereign bonds.

The ultimate yields on the Canadian federal bonds, provincial bonds and developed markets sovereign bonds are 1.3%, 2.2% and 1.2% respectively. The ultimate real rate of return for the supplementary marketable bonds is therefore assumed to be 1.4%.

B.6.4.1.5 Credit (core and supplementary)

The credit asset class includes investments in corporate bonds, private debt, and private real estate debt. At the end of 2024, the CPPIB had approximately 14% of the base CPP and 16% of the additional CPP net assets invested in this asset class.

For the purpose of this report, the expected real rate of return on credit is the weighted average of the assumed returns on investment-grade (IG) and high yield (HY) global bonds, with the weights reflecting the risk characteristics of the CPPIB's actual holdings. The ultimate real return from 2036 onward is assumed to be 2.2% on the global IG portfolio and 3.8% on the global HY portfolio.

Both the Core and Supplementary pools allocate investments across IG and HY global bonds. According to data provided by CPPIB, the Core pool currently consists of approximately 18% IG and 82% HY bonds, while the Supplementary pool is fully allocated to HY bonds. These allocations are expected to gradually align with their long-term targets of 15% IG / 85% HY for the Core pool and 58% IG / 42% HY for the Supplementary pool by the year 2036.

For the Core pool, the ultimate real rate of return on credit assets is assumed to be 3.5% from 2036 onward. The assumed ultimate real rate of return for the Supplementary pool credit assets is 2.9% from 2036 onward.

B.6.4.1.6 CPP account, additional CPP account, and cash

The CPP Account is established in the accounts of Canada to record the transactions of the base Plan and amounts transferred to and from the CPPIB in respect of the base Plan. The balance in the CPP Account serves as a flow-through account with investments solely in short-term securities.

Similar to the CPP Account, the Additional CPP Account is a flow-through account that records the transactions of the additional Plan and amounts transferred to and from the CPPIB in respect of the additional Plan. The ultimate real rate of return on cash is assumed to be 0.5%.

The CPPIB uses financial leverage as part of its investment strategy. Financial leverage in the

context of portfolio management consists of borrowing money to invest in other assets with the expectation that the borrowing cost will be less than the return on the assets purchased. As at 31 December 2024, CPPIB's external debt and financing liability represented about 22% of its Core pool net assets. Similar to the previous actuarial report, there is an explicit recognition in this report for the amount of leverage in the asset allocation. The ultimate borrowing cost related to financial leverage is assumed to be 1.0%, which corresponds to the ultimate real rate of return on cash of 0.5% plus a premium of 0.5%.

B.6.4.2 Equity

The CPP assets invested in equities are currently diversified among public and private equities and across various geographies. In the derivation of the real rates of return for these equity investments, consideration was given to expected dividend yields, expected growth of the underlying economies and long-term risk premiums for various markets and geographies. No distinction is made between realized and unrealized capital gains. Public as well as custom equity benchmarks provided by the CPPIB were considered in the derivation of real rates of return for equities.

B.6.4.2.1 Public equities

Public equities comprise developed and emerging markets publicly traded equities. Various elements contribute to the return on an equity investment such as earnings, income paid to shareholders, fluctuation in valuation, and exchange rates for non-Canadian investments.

Over long periods, valuation changes and currency fluctuations are not expected to contribute significantly to the return on broad equity markets. Therefore, it is assumed that expectations regarding income and earnings growth are sufficient to project future equity returns, with additional adjustments for the riskiness of emerging market equities.

The income return derived from dividend and buyback yields on developed market equities is expected to be 3.1%. This is based on historical income return from dividend and buyback yields for developed market equities, adjusted to reflect current and expected economic environments. Growth in earnings is proxied using GDP growth per capita for developed markets; and it is expected to add 0.9% to the overall real return of developed market equities.

Hence, the expected real return on developed market equities is 4.0%, while due to their additional risk, emerging market equities are assumed to yield an additional 1.0%.

The portfolio assumes an ultimate allocation of approximately 85% to developed market equities and 15% to emerging market equities. The ultimate real rate of return for public equities is then projected to be 4.2%.

B.6.4.2.2 Private equities

Compared to public equities, private equities are less liquid, and their management necessitates a higher degree of expertise. Private equities may also provide institutional investors the

opportunity to invest at an earlier stage in the development of a company, which translates into additional risk and greater potential returns. As a result, the return structure of private equities is different compared to public equities. Private equities are expected to generate an additional return in exchange for the additional illiquidity risk and complex management.

In general, private investments have grown in popularity over the last decade. This increase in demand has not necessarily been matched by an increase in supply. Valuations are high and a significant amount of capital is waiting to be allocated at attractive prices. As more and more investors around the globe compete for private placements, it is assumed that the additional return from investing in private equities compared to public equities will be lower than historical levels.

Private equities are assumed to have a premium of 1.1% over developed market equities. In consequence, the ultimate real rate of return on private equities is projected to be 5.1%.

B.6.4.3 Real assets

Real assets comprise global investments in real estate, infrastructure, and sustainable energy assets. The expected real rate of return on real assets is the weighted average returns of the three subclasses.

The returns on real estate assets are derived from two components: income returns and capital growth. Each component references historical data and forward-looking adjustments which consider multiple factors such as real estate demand evolution, risk premium compression and projected per capita GDP growth rate. It is assumed the income return will be 3.1% while the growth assumption component is set at 0.9%, bringing the real return assumption for the real estate asset class to 4.0% throughout the projection period.

Like real estate, infrastructure returns are composed of income return and capital growth components. The income return component is set at 3.0% and the capital growth assumption, proxied by the projected per capita GDP growth rate is 0.9%. This yields a stable projection of 3.9% real return for infrastructure assets.

The sustainable energy group is a relatively new type of asset class for which the historical data on returns is limited. Therefore, the expected return for this asset class is assumed to be a weighted average of real estate and infrastructure, with weights determined by the CPPIB's allocations to those classes. The expected real return for sustainable energy assets is 3.9%.

Collectively, the ultimate real rate of return on real assets is projected to be 3.9%.

B.6.4.4 Summary of real rates of return by asset type

Table 66 summarizes the assumed real rates of return by asset type throughout the projection period, before any allowance for rebalancing and diversification and reduction for investment expenses. The rebalancing and diversification allowance is presented at the portfolio level in Table 67 for the base CPP and Table 69 for the additional CPP, while the reduction for investment

expenses and resulting real and nominal portfolio returns are presented in Table 70 and Table 71.

It is important to recognize that rates of return for most assets are volatile. The real rates of return presented in Table 66 represent expected trends and assumed levels of returns to be obtained over a long horizon. As such, limited emphasis should be put on individual projection years.

Table 66 Real rates of return by asset type (before investment expenses and allocation for rebalancing and diversification) (percentages)

	Equity		Fixed income securities						
Year	Public equities	Private equities	Marketable bonds (Core)	Marketable bonds (Supplementary)	Non-marketable bonds	Credit (Core)	Credit (Supplementary)	Cash	Real assets
2025	4.2	5.1	1.0	1.0	2.5	3.6	2.7	0.5	3.9
2026	4.2	5.1	1.1	1.0	1.7	3.7	2.9	0.3	3.9
2027	4.2	5.1	1.3	1.3	1.7	3.7	2.8	0.4	3.9
2028	4.2	5.1	1.3	1.3	2.0	3.7	2.7	0.5	3.9
2029	4.2	5.1	1.4	1.4	2.1	3.6	2.6	0.5	3.9
2030	4.2	5.1	1.4	1.5	2.4	3.6	2.6	0.5	3.9
2031	4.2	5.1	1.4	1.4	2.4	3.6	2.7	0.5	3.9
2032	4.2	5.1	1.4	1.4	2.4	3.6	2.7	0.5	3.9
2033	4.2	5.1	1.4	1.4	2.4	3.6	2.8	0.5	3.9
2034	4.2	5.1	1.4	1.4	2.2	3.6	2.8	0.5	3.9
2035	4.2	5.1	1.4	1.4	2.0	3.6	2.9	0.5	3.9
2040	4.2	5.1	1.4	1.4	1.3	3.5	2.9	0.5	3.9
2042+	4.2	5.1	1.4	1.4	0.8	3.5	2.9	0.5	3.9

B.6.5 Asset allocation and expected portfolio rates of return

This report provides projections of over 75 years. As such, long-term asset mix assumptions are required for the base and additional CPP. The long-term asset mix assumptions are consistent with the principles of the CPPIB's current investment framework. For the base CPP, the long-term asset mix is based on the assumption that the level of risk will gradually reduce over time. For the additional CPP, the long-term asset mix is based on the assumption that the level of risk will remain stable over time. More information is provided in the next sections.

For both the base and additional Plans, the expected portfolio real rates of return include an allowance for rebalancing and diversification of the assets. This allowance takes into account the beneficial effect of periodically rebalancing a diversified portfolio to maintain the desired relative assets allocation by asset classes. In other words, the expected return of a portfolio is greater than the weighted average of the expected return of its components. The size of the allowance depends on the asset mix and the risk characteristics of the individual assets.

B.6.5.1 Base CPP

As the base CPP continues to mature, the ratio of contributors to beneficiaries is projected to decrease, and the proportion of investment income required to pay benefits is projected to increase. Starting in 2031, it is expected that contributions will be insufficient to cover all

expenditures, and that a portion of investment income will be required to cover expenditures. The portion of investment income required to pay expenditures will be small at the beginning but is projected to increase over time. In addition, due to strong investment performance, the base CPP has become more sensitive to investment experience. The importance of investment income as a source of revenue has therefore grown for the base CPP, and is expected to continue to grow over time.

Consistent with the principles of the CPPIB's investment framework, it is assumed that the level of risk of the base CPP investment portfolio will decrease over time as reliance on investment income increases. As mentioned, the CPPIB sets its risk levels through its reference portfolios and diversifies its holdings while respecting the risk levels of its reference portfolios.

The methodology for setting the ultimate asset mix for the base CPP therefore involves setting an assumption for the reference portfolio in the future in terms of the equity/debt ratio and building a portfolio with the same risk level (volatility) as this reference portfolio.

For this report, it is assumed that the risk level of the CPPIB's current portfolio will gradually move to the risk level of a reference portfolio that is comprised of 70% equity and 30% fixed income by 2042. The volatility of this reference portfolio, as measured by the one-year standard deviation, is 10.7%.

The initial level of risk is based on the CPPIB's actual portfolio as at 31 December 2024 with an estimated one-year standard deviation of 12.1%. Therefore, the portfolio volatility is assumed to gradually decrease from 12.1% as at the valuation date to 10.7% by 2042.

Table 67 presents the projected asset allocation, the expected volatility of the portfolio, and the expected portfolio real rate of return before investment expenses for the base Plan. The assumed total real rate of return includes an allowance for rebalancing and diversification. At the portfolio level, this allowance is assumed to add 0.45% to the real rate of return annually over the projection period.

Table 67 Asset mix, portfolio risk, and expected rates of return (before investment expenses)
Base CPP (percentages)

	Equity		Fixed income securities						
Year	Public equities	Private equities	Marketable bonds	Non-marketable bonds	Credit	Cash	Real assets	Expected long-term volatility	Total real rate of return [1],[2]
2025	28	25	31	2	14	(22)	21	12.1	4.39
2026	28	25	32	2	14	(22)	21	12.1	4.47
2027	28	25	32	2	14	(22)	21	12.1	4.50
2028	28	25	31	2	14	(21)	21	11.9	4.47
2029	27	25	31	1	14	(19)	21	11.8	4.45
2030	27	24	31	1	14	(18)	20	11.6	4.41
2031	26	24	31	1	14	(17)	20	11.5	4.39
2032	26	24	31	1	14	(16)	20	11.4	4.37
2033	25	24	30	1	14	(15)	20	11.3	4.34
2034	25	24	30	1	14	(15)	20	11.2	4.33
2035	25	24	30	1	15	(14)	20	11.2	4.31
2040	24	23	30	0	15	(11)	19	10.9	4.24
2042+	23	23	30	0	15	(10)	19	10.7	4.20

(1) The assumed total real rate of return is shown before reduction for investment expenses. The assumed total real rate of return net of expenses is obtained by reducing the total real rate of return by 18 basis points. More information is provided in section B.6.6.
(2) The assumed total real rate of return includes an allowance for rebalancing and diversification. At the portfolio level, this allowance is assumed to add 0.45% to the real rate of return annually over the projection period.

B.6.5.2 Additional CPP

The additional CPP assets are invested in both the Core and Supplementary pools. The share of the additional CPP assets invested in each pool is selected to match the desired level of risk of the additional CPP's reference portfolio. To increase the total portfolio risk of the additional CPP, a higher allocation to the Core pool would be selected. Similarly, a lower allocation to the Core pool would lower the total portfolio risk for the additional Plan.

Consistent with the principles of the CPPIB's investment framework, it is assumed that the level of risk of the additional CPP will be kept constant over the projection period at a level corresponding to the current CPPIB reference portfolio of about 55% equity and 45% fixed income with an estimated volatility of 8.3%.

During the first few projection years, this level of risk is obtained by investing 64% of the additional CPP assets in the Core pool and 36% in the Supplementary pool. Because the level of risk of the Core pool investments is expected to decrease gradually, a higher share of the additional CPP assets is expected to be allocated to the Core pool to maintain the additional CPP portfolio volatility at 8.3%. It is assumed that 74% of the additional CPP assets will be allocated to the Core pool for the year 2042 and thereafter.

Table 68 presents the projected allocations of the additional CPP to the Core pool and the Supplementary pool, broken down by fixed income and credit asset classes. It is expected that the Supplementary pool will continue to be invested at 80% in fixed income and 20% in credit.

Table 69 presents the projected asset allocation, the expected volatility, and the expected real

rate of return before investment expenses for the additional CPP. The assumed total real rate of return includes an allowance for rebalancing and diversification. At the portfolio level, this allowance is assumed to add 0.45% to the real rate of return annually over the projection period.

Table 68 Additional CPP pool structure
(percentages)

Year	Core pool allocation	Supplementary pool allocation	
		Marketable bonds	Credit
2025	64	29	7
2026	65	29	7
2027	64	29	7
2028	65	28	7
2029	66	28	7
2030	66	27	7
2031	67	26	7
2032	68	26	6
2033	69	25	6
2034	70	24	6
2035	71	24	6
2040	73	21	5
2042+	74	21	5

Table 69 Asset mix, portfolio risk, and expected rates of return (before investment expenses)
Additional CPP (percentages)

Year	Equity		Fixed income securities				Real assets	Expected long-term volatility	Total real rate of return [1],[2]
	Public equities	Private equities	Marketable bonds	Non-marketable bonds	Credit	Cash			
2025	18	16	50	0	16	(14)	14	8.3	3.45
2026	18	16	50	0	16	(14)	14	8.3	3.51
2027	18	16	50	0	16	(14)	14	8.3	3.61
2028	18	16	50	0	16	(13)	14	8.3	3.62
2029	18	16	49	0	16	(13)	14	8.3	3.64
2030	18	16	48	0	16	(12)	14	8.3	3.64
2031	18	16	48	0	16	(11)	14	8.3	3.64
2032	18	16	47	0	16	(11)	14	8.3	3.65
2033	18	17	47	0	16	(11)	14	8.3	3.65
2034	18	17	46	0	16	(10)	14	8.3	3.66
2035	18	17	46	0	16	(10)	14	8.3	3.66
2040	17	17	44	0	16	(8)	14	8.3	3.68
2042+	17	17	43	0	16	(7)	14	8.3	3.67

(1) The assumed total real rate of return is shown before reduction for investment expenses. The assumed total real rate of return net of expenses is obtained by reducing the total real rate of return by 14 basis points (refer to section B.6.6).
(2) The assumed total real rate of return includes an allowance for rebalancing and diversification. At the portfolio level, this allowance is assumed to add 0.45% to the real rate of return annually over the projection period.

B.6.6 Investment expenses

The CPPIB's total investment expenses consist of operating expenses, transaction costs, and investment management fees. Over the last three fiscal years, total investment expenses have averaged approximately 1.05% of total assets, ranging from 0.97% to 1.15%. The majority of those

investment expenses were incurred through active management decisions. Considering how total investment expenses evolved over the last decade, it is assumed that, going forward, total investment expenses of the CPPIB will be 1.00% of the Core pool assets.

Active management is implemented to generate excess returns (after reduction for active management expenses). Thus, the additional returns from a successful active management program should equal at least the cost incurred to pursue active management. For the purpose of this report and in accordance with the Canadian Institute of Actuaries' guidance regarding the determination of best-estimate discount rates, it is assumed that the additional returns generated by active management will equal the additional expenses incurred from active management. These expenses are assumed to be the difference between total investment expenses and the assumed expenses that would be incurred for the passive management of the portfolios.

It is assumed that investment expenses of 0.18% would be incurred to passively manage the Core pool. Since the base CPP assets are invested only in the Core pool, the assumed investment expenses from passive management for the base CPP are 0.18%, and the resulting investment expenses for active management are 0.82%.

The passive management investment expenses from the Supplementary pool are assumed to be 0.01%. It is further assumed that there are no active management expenses associated with the Supplementary pool. The investment expenses of the additional CPP will depend on how much of the fund is invested in the Core pool versus the Supplementary pool, and the investment expenses associated with each of these pools. For year 2042 and thereafter, it is assumed that 74% of additional Plan assets are invested in the Core pool and 26% are invested in the Supplementary pool. Such allocation of the additional Plan results in total investment expenses for the additional Plan being 0.75% of total additional CPP assets (invested in both the Core and Supplementary pools), and the overall investment expenses from passive management related to the additional CPP being ultimately 0.14%. The investment expenses from active management for the additional CPP are therefore 0.61%.

The following section shows the overall rates of return on CPP assets net of investment expenses for the base and additional CPP.

B.6.7 Overall rates of return on base and additional CPP assets

The best-estimate real rates of return on total assets for each of the base and additional Plans are derived from the weighted average assumed real rates of return on all types of assets, using the assumed asset mix proportions as weights. The best-estimate real rates of return are further adjusted to incorporate an allocation for rebalancing and diversification. In addition, the best-estimate real rates of return are increased to reflect additional returns due to active management and reduced to reflect all investment expenses. The projected nominal returns are the sum of the assumed levels of inflation and real returns. The ultimate net rates of return are shown in Table 70.

Table 70 Ultimate rates of return on base and additional CPP assets (2042+)
(percentages)

	Base CPP		Additional CPP	
	Nominal	Real	Nominal	Real
Weighted average rate of return (before investment expenses)	6.20	4.20	5.67	3.67
Additional rate of return due to active management	0.82	0.82	0.61	0.61
Total weighted average rates of return before investment expenses	7.02	5.02	6.28	4.28
Expected investment expenses				
Expenses due to passive management	(0.18)	(0.18)	(0.14)	(0.14)
Additional expenses due to active management	(0.82)	(0.82)	(0.61)	(0.61)
Total expected investment expenses	(1.00)	(1.00)	(0.75)	(0.75)
Ultimate rate of return after investment expenses	6.02	4.02	5.53	3.53

The resulting nominal and real rates of return for selected projection years are shown in Table 71. The projected average annual real rates of return over the next 75 years are 4.05% for the base CPP and 3.53% for the additional CPP.

Table 71 Annual rates of return on CPP assets
(percentages)

	Base CPP		Additional CPP	
Year	Nominal	Real	Nominal	Real
2025	6.41	4.21	5.51	3.31
2026	6.39	4.29	5.47	3.37
2027	6.32	4.32	5.47	3.47
2028	6.29	4.29	5.48	3.48
2029	6.27	4.27	5.50	3.50
2030	6.23	4.23	5.50	3.50
2031	6.21	4.21	5.50	3.50
2032	6.19	4.19	5.51	3.51
2033	6.16	4.16	5.51	3.51
2034	6.15	4.15	5.52	3.52
2035	6.13	4.13	5.53	3.53
2040	6.06	4.06	5.54	3.54
2042+	6.02	4.02	5.53	3.53
Average over:				
2025 to 2029	6.34	4.28	5.49	3.43
2025 to 2034	6.26	4.23	5.50	3.47
2025 to 2099	6.06	4.05	5.53	3.53

While the ultimate real rate of return for the base CPP of 4.02% has stayed at the same level when compared to the previous valuation, the additional CPP ultimate real rate of return of 3.53% is 9 basis points lower compared to the previous valuation due to a higher allocation to fixed income and lower allocation to credit to reflect more recent information from the CPPIB on the

composition of the Supplementary pool.

For the base CPP, the 75-year (2025-2099) average annual real rate of return on investments of 4.05% is 4 basis points higher compared to the 31st CPP Actuarial Report average for the same period. This increase is mainly due to higher assumed use of leverage over a longer transition period to the ultimate asset mix, as well as a higher interest rate environment leading to higher fixed income returns for the years prior to 2036.

For the additional CPP, the 75-year (2025-2099) average annual real rate of return on investments of 3.53% is 4 basis points lower compared to the 31st CPP Actuarial Report average for the same period. This is due to the higher allocation to fixed income and lower allocation to credit.

B.7 Benefit expenditures

B.7.1 Benefits payable as at 31 December 2024 and projected benefits

The number of base and additional CPP beneficiaries in pay and average monthly benefits payable as at 31 December 2024 are shown in Table 72.

Table 72 Benefits payable as at 31 December 2024 – base and additional CPP (1)

	Number of beneficiaries in pay (in thousands)		Average monthly benefit ($)	
Benefit type	Males	Females	Males	Females
Retirement	2,905	3,207	833	624
Post-retirement benefit	1,112	967	66	54
Survivor - aged less than 65	46	148	473	544
Survivor - aged 65 and over	211	802	162	407
Disability (2)	131	171	1,188	1,106

	Number of beneficiaries in pay (in thousands)	Average monthly benefit ($)
Benefit type (base CPP only)	Males and females	Males and females
Orphan	60	294
Disabled contributor's child	67	294

(1) The figures in the tables refer to ESDC monthly statistics except for the post-retirement benefit figures, which are estimated by the OCA.
(2) The figures given in the table for the disability benefit refer to the disability pension.

The approach used in this report to project future benefits paid is based on deterministic projections using grouped data. The amount of benefit expenditures is determined by taking into account the administrative agreement established in section 58(1) and 58(2) of the *Canada Pension Plan Regulations* between the CPP and the QPP for beneficiaries who had contributed to both plans.

The retirement, survivor, disability, and children's benefit expenditures for each year following the year of benefit take-up for a given age, sex, and cohort is computed as the product of:

- benefit expenditures in the year of take-up (described in this appendix);

- the probability of survival from the age at benefit take-up to the attained age;
- the rules regarding combined retirement and survivor benefits and combined disability and survivor benefits, as applicable; and
- the Pension Index, which recognizes the annual inflation adjustment to benefits each 1 January following benefit emergence.

The amounts of the benefits payable during any given calendar year are then obtained by simply summing the annual expenditures applicable for the year as described above, in respect of all age and sex cohorts having emerged in the given and all previous calendar years. The projected number of beneficiaries and amounts of benefit expenditures for the base and additional Plans are shown in various tables in the Results sections 5 and 6 of this report.

All projections of base CPP benefits start from the year 1966 instead of the beginning of the current projection period (2025). This is done for the following reasons:

- The valuation methodology can be validated for the historical period up to the valuation year (1966 to 2024) by comparing the projected values (contributions, benefits, beneficiaries, etc.) with actual experience. Based on this comparison, calibration factors of actual to projected historical experience are obtained, which are then used for the future projections of the different types of benefits. For example, the average values of the calibration factors for retirement benefit experience for those starting their pension between ages 60 and 65 are 0.98 for males and 0.95 for females.
- The projection of benefits already in pay as at the valuation date (31 December 2024) is fully integrated with the projection of benefits emerging after that date, thus ensuring full consistency between past experience and the future.

Benefits from the additional Plan have started to be paid out during the calendar year of 2022. As such, there was limited experience to create calibration factors specific for the additional Plan. Therefore, the same calibration factors developed for the base Plan projected benefits are assumed to apply to the additional Plan projected benefits except in the case of the additional retirement benefits, where microsimulation was used to estimate the calibration factors. As experience develops for the additional Plan, more precise calibration factors for each type of benefit will be determined separately for that CPP component.

B.7.2 Benefit eligibility rates

As described in Appendix - A (Summary of Plan Provisions) of this report, eligibility for benefits varies according to the type of benefit. The eligibility rules for the survivor benefit are the same as for the death benefit. The eligibility rules for base CPP benefits determine eligibility for additional CPP benefits.

Benefit eligibility rates (as a percentage of the Canada less Quebec population) for retirement, disability, and death/survivor benefits are projected using regression formulas that were

developed to closely reproduce historical eligibility rates observed over the period 1966 to 2023 from CPP records of earnings data provided by ESDC. The projected eligibility rates take into account the applicable eligibility rules for each type of benefit, the proportion of contributors, and the length of the contributory period for existing and future earners. In addition, for this 32nd CPP Actuarial Report, an improvement to the retirement benefit eligibility rates methodology was made to reflect the impact of non-permanent residents (NPR) on retirement eligibility. This adjustment to retirement eligibility rates is linked to the assumption on the evolution of the number of NPR as a percentage of the population. Table 73 shows the resulting eligibility rates for the various benefit types by sex and age for selected years.

The retirement eligibility rates for some ages and years are greater than 100% due to individuals who contributed to the CPP and then left the country with no further information available as to their status. Since these individuals are not counted in the population, the retirement eligibility rates can be higher than 100%.

Table 73 Benefit eligibility rates by type of benefit
(percentages)

Year	Retirement benefit eligibility rate at age 65		Survivor/Death benefit eligibility rate at age 65		Survivor/Death benefit eligibility rate at ages 20-64		Disability benefit eligibility rate at ages 20-64 (1)		Post-retirement disability benefit eligibility rate at ages 60-64 (2)	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
2025	101.1	98.2	97.7	79.1	77.9	70.0	71.7	65.7	51.5	45.8
2026	100.6	98.1	97.2	79.7	78.1	70.6	72.4	66.3	51.3	45.4
2027	100.2	97.9	96.9	80.2	77.9	71.0	72.0	66.3	51.2	45.5
2028	99.9	97.8	96.7	80.6	77.9	71.4	72.5	66.8	51.5	45.6
2029	99.5	97.7	96.6	81.1	79.3	72.0	73.7	67.9	51.2	45.4
2030	99.1	97.4	96.4	81.4	79.9	72.5	74.9	69.0	51.7	45.9
2031	98.8	97.3	96.2	81.8	79.8	72.6	75.4	69.6	51.6	45.8
2032	98.7	97.3	96.0	82.1	79.7	72.8	75.7	70.1	51.5	45.8
2033	98.8	97.5	95.9	82.3	79.9	73.1	76.2	70.6	52.1	46.3
2034	98.9	97.7	95.8	82.6	81.0	73.5	76.8	71.2	52.1	46.4
2035	99.2	98.0	95.7	82.8	81.4	73.9	77.0	71.6	51.7	46.1
2040	100.5	99.5	95.3	83.6	82.7	75.2	77.8	72.7	52.4	47.2
2045	101.6	101.0	95.3	84.3	83.9	76.2	78.0	73.1	52.5	47.4
2050	103.0	102.6	95.5	84.9	84.8	76.9	77.9	73.1	52.5	47.6
2055	108.7	108.4	95.9	85.5	85.3	77.2	79.1	74.4	51.0	46.1
2060	107.8	107.5	96.2	86.1	85.7	77.5	79.5	74.9	51.3	46.4
2065	107.2	106.7	96.6	86.6	86.0	77.8	80.0	75.4	51.9	47.0
2070	106.5	106.1	96.9	87.0	86.3	78.0	80.0	75.4	52.1	47.2
2075	105.3	104.9	97.2	87.3	86.6	78.3	80.1	75.5	52.3	47.4
2080	104.6	104.2	97.4	87.5	86.8	78.4	80.2	75.6	52.3	47.3
2085	104.4	103.9	97.6	87.7	86.9	78.6	80.4	75.9	52.4	47.6
2090	104.7	104.3	97.8	87.9	87.1	78.7	80.4	75.9	52.4	47.6
2095	104.4	104.1	98.0	88.0	87.3	78.8	80.5	76.0	52.5	47.7
2100	104.6	104.3	98.0	88.1	87.4	78.9	80.6	76.1	52.6	47.8

(1) These are eligibility rates for the disability benefit prior to starting the retirement pension, i.e. for the disability pension only, excluding eligibility for the post-retirement disability benefit. Eligibility for the post-retirement disability benefit is shown separately in the table.
(2) Applies to the base CPP only.

B.7.3 Average earnings-related benefits

B.7.3.1 Base CPP

To determine base CPP benefits, the valuation model first calculates an average earnings-related benefit for all individuals born in a given calendar year, for each sex, and all relevant ages. This average earnings-related benefit is dependent on four main components:

- Average pensionable earnings, adjusted for benefit computation purposes,[15] relative to the YMPE;

15 Adjusted to reflect the impact of credit splitting and to exclude earnings of working beneficiaries.

- Average proportion of contributors adjusted for benefit computation purposes[16];
- 25% of the MPEA for the attained year; and
- the number of years in the elapsed contributory period at the attained age.

The base CPP average earnings-related benefit is then further adjusted to take into account certain provisions of the CPP statute as applicable:

- Disability exclusion: the period during which an individual received a CPP disability pension is excluded from the contributory period;
- Child-rearing provision (exclusion): the period during which an individual was caring for a child younger than age 7 is excluded from the contributory period if earnings during the child-rearing period were sufficiently low;
- Post-65 drop-out: earnings of contributors over age 65, who are not yet retirement beneficiaries, may replace earnings before age 65 if those earnings are lower;
- General drop-out provision (exclusion): 17% of the lowest earnings months up to a maximum of about 8 years may be dropped from the contributory period.

The average base CPP earnings-related benefit is used in the calculation of the total emerging base CPP earnings-related benefit expenditures for a given calendar year, each sex, and all relevant ages.

Table 74 shows the resulting projected average earnings-related benefits for the base CPP as a percentage of the maximum base CPP earnings-related benefits at ages 60 and 65 by sex and year of birth for various cohorts of contributors. The average base CPP earnings-related benefit at age 65 as a percentage of the maximum is lower than at age 60 since those who take their benefit at age 65 have a longer contributory period (producing lower career average earnings) and an historical lower earnings profile than those who take an early benefit at age 60.

The gap in earnings-related benefits as a percentage of the maximum benefit for males compared to females is expected to decrease over time due to the assumed reduction in the male-female earnings gap as well as the assumed relative increases in the participation rates of female participants.

16 Adjusted to reflect the impact of credit splitting.

Table 74 Average earnings-related benefit as percentage of maximum benefit - base CPP
(percentages)

	Males		Females	
Year of birth	Age 60	Age 65	Age 60	Age 65
1950	79	65	59	52
1955	79	65	63	53
1960	74	64	59	54
1965	67	60	54	52
1970	68	60	56	52
1975	69	61	57	54
1980	69	61	58	54
1985	70	61	59	55
1990	69	60	60	56
1995	69	60	60	56
2000	70	61	62	58
2005	70	61	62	58
2010	70	61	62	58
2015	70	61	62	58
2020	70	61	62	58
2025	70	61	62	58
2030	70	61	62	58
2035	70	61	62	58

B.7.3.2 Additional CPP

For the additional CPP, the valuation model also calculates an average earnings-related benefit based on contributors' highest earnings over forty years for all persons of a birth cohort for each calendar year, sex, and all relevant ages. This average earnings-related additional benefit is dependent on five main components:

- Average additional pensionable earnings, adjusted for benefit computation purposes,[17] relative to the YMPE;
- Average proportion of contributors adjusted for benefit computation purposes[18];
- First additional benefit calculated as 8.33% of the MPEA to increase the overall Plan's replacement rate to 33.33% of the MPEA;
- Second additional benefit calculated as 33.33% of 14% of the MPEA to increase coverage to 114% of the MPEA; and
- the fixed contributory period of 40 years.

The additional CPP average earnings-related benefit is then further adjusted to take into account

17 Adjusted to reflect the impact of credit splitting and to exclude earnings of working beneficiaries.
18 Adjusted to reflect the impact of credit splitting.

certain provisions of the CPP statute as applicable:

- Disability drop-in: individuals who became disabled in 2019 or later will have imputed income assigned to those disability periods; and
- Child-rearing provision (drop-in): an imputed income may be assigned to periods of caring for children younger than age 7 on or after 1 January 2019.

The average additional CPP earnings-related benefit is used in the calculation of the total emerging additional CPP earnings-related benefit expenditures for a given calendar year, each sex, and all relevant ages.

Table 75 shows the resulting projected average additional CPP earnings-related benefits as a percentage of the maximum additional CPP earnings-related benefits at ages 60 and 65 by sex and year of birth for various cohorts of contributors. The maximum additional benefit is the maximum benefit for both parts of the additional CPP, that is, below the YMPE and from the YMPE up to YAMPE, combined together.

The average additional CPP earnings-related benefit for males at age 65 as a percentage of the maximum is higher than at age 60 due to the longer contributory periods, which is beneficial in the context of the additional CPP's fixed forty years contributory period.

The additional earnings-related benefits as a percentage of the maximum are expected to generally increase over time for both males and females, since contributory periods are projected to increase relative to the fixed forty years. The gap between male and female average earnings-related benefits as a percentage of the maximum is relatively stable throughout the projection period.

Table 75 Average additional earnings-related benefit as percentage of maximum additional benefit - additional CPP
(percentages)

	Males		Females	
Year of birth	Age 60	Age 65	Age 60	Age 65
1965	5	9	4	7
1970	10	15	8	12
1975	17	21	15	17
1980	24	27	21	23
1985	31	34	26	29
1990	37	40	32	34
1995	42	45	36	39
2000	46	47	40	41
2005	45	47	40	41
2010	45	47	40	41
2015	44	47	40	41
2020	45	47	40	42
2025	44	46	40	41
2030	44	47	40	42
2035	44	47	40	42

B.7.4 Retirement benefit expenditures

Retirement benefit expenditures result from retirement pensions and post-retirement benefits paid under the base and additional CPP. The retirement benefits paid under both components of the CPP are earnings-related. The total retirement benefit payable is the sum of the base and additional pensions and post-retirement benefit amounts.

B.7.4.1 Retirement pension

New retirement pension expenditures are determined for each age from 60 to 70, sex, and calendar year of emergence starting from 1967. Total new retirement pensions are calculated as the product of:

- the population;
- the retirement pension eligibility rate;
- the retirement pension take-up rate;
- the actuarial adjustment factor for early or late pension take-up; and
- the average earnings-related benefit previously described.

B.7.4.2 Retirement Pension Take-up Rates

The projected retirement pension take-up rates (more simply referred to as retirement rates) by age, sex, and calendar year are determined by considering the assumed future work patterns of earners aged 60 and over and the corresponding CPP experience from 1967 to 2024. The sex-distinct take-up rate for a given age and year corresponds to the number of emerging (new) retirement beneficiaries divided by the total number of people eligible for a retirement pension. The same retirement rates for the base CPP apply to the additional CPP.

The unreduced pension age under the *Canada Pension Plan* is 65. Since 1987, a person can choose to receive a reduced retirement pension as early as age 60 or an increased pension if deferred beyond age 65. This provision has had the overall effect of lowering the average age at pension take-up. In 1986, the average age at pension take-up was 65.2 compared to an average age of 62.7 over the decade ending in 2019. However, recent data suggest a reversal of this trend, with individuals increasingly opting to retire later. In 2024, the average age at pension take-up was 64.0 for males and 63.8 for females.

Chart 9 and Chart 10 present the evolution of the retirement rates at age 60, 65 and 70 for males and females, respectively.

Since 2012, the age 60 retirement rates have continually decreased, while age 65 retirement rates have mostly stabilized. Age 70 take-up rates have been low in the past but have increased in recent years. Part of this increase can be attributed to the auto-enrolment provision at age 70 that was enacted in 2019, but the steady increase since then indicates a broader shift toward later retirement.

Chart 9 Historical and projected retirement pension take-up rates for males at ages 60, 65 and 70

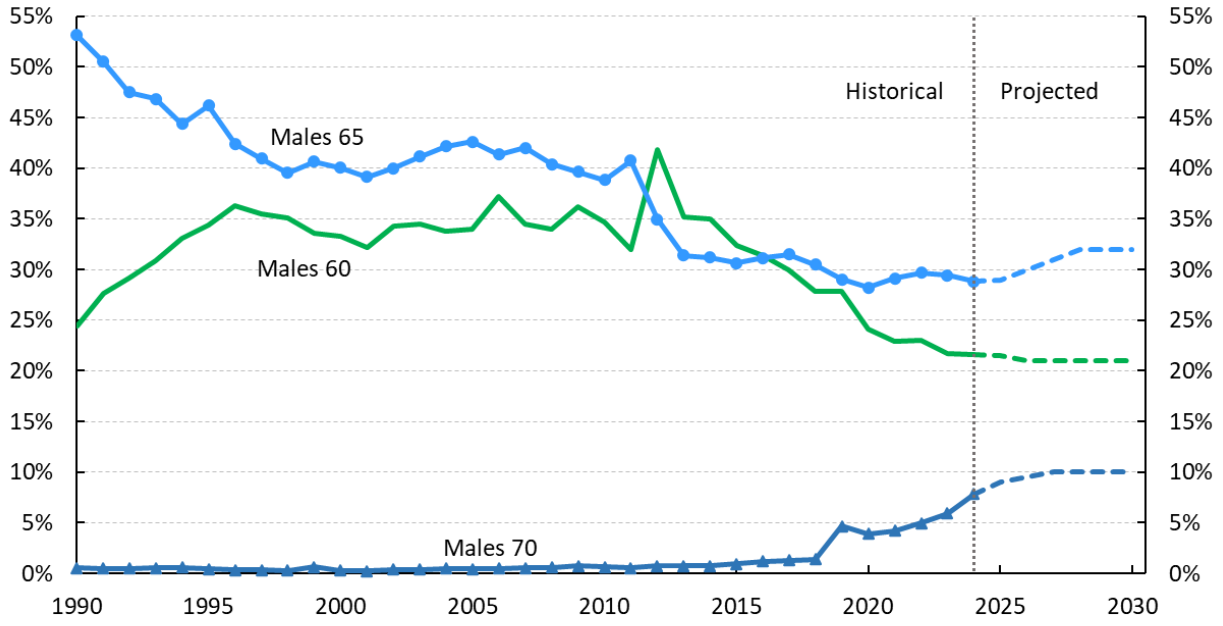
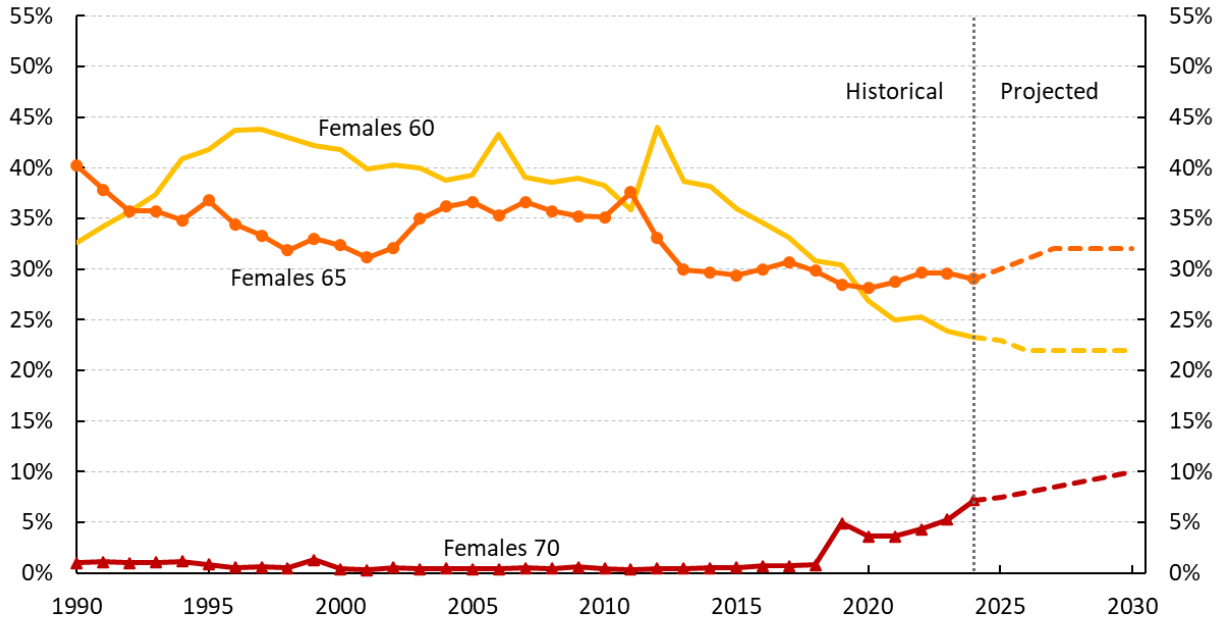


Chart 10 Historical and projected retirement pension take-up rates for females at ages 60, 65 and 70



The assumptions for retirement rates are informed by experience and recent trends. The assumptions at key ages are described below and Table 76 shows the ultimate retirement rates for all ages 60 to 70.

Age 60: Retirement rates have steadily declined since peaking in 2012 (42% for males and 44% for females). By 2024, they dropped to historic lows (22% for males and 23% for females). The rates are assumed decrease slightly and stabilize at 21% for males and 22% for females by 2026.

Age 65: Retirement rates have remained stable at around 30% for both sexes and are projected to increase slightly to 32% by 2027.

Age 70: Retirement rates increased significantly, especially since auto-enrolment was enacted in 2019. In 2018, rates were 2% for males and 1% for females. By 2024, the rates exceeded 7% for both sexes, and this upward trend is assumed to continue, leveling off at 10% by 2030.

All other ages: Slight upward trends have been observed at older ages and are assumed to persist over the next few years. For younger ages, the rates have been relatively stable and are projected to continue at similar levels throughout the projection period.

Table 76 shows the projected retirement rates by age for both males and females. The assumed ultimate retirement rates result in projected average ages at retirement pension take-up in 2031 of 64.3 for both males and females.

Table 76 Retirement pension take-up rates (cohort aged 65 in 2031+) (percentages)

Age	Males	Females
60	21	22
61	4	4
62	4	4
63	4	4
64	10	10
65	32	32
66	5	4
67	4	4
68	3	3
69	3	3
70	10	10
Total	100	100

B.7.4.3 Projected new retirement pensions

Table 77 and Table 78 show the projected number of new retirement beneficiaries and their projected average base and additional monthly retirement pensions by sex. New additional average retirement pensions are quite low in the early years due to the few years of additional contributions. These averages are projected to grow rapidly as the number of years of contributions to the additional CPP increases.

Table 77 New retirement beneficiaries and pensions - base CPP

	Number of new retirement beneficiaries			Average monthly retirement pension		
Year	Males	Females	Total	Males ($)	Females ($)	All ($)
2025	181,700	183,700	365,400	850	690	770
2026	186,200	188,200	374,400	890	730	810
2027	190,700	194,500	385,200	940	770	860
2028	193,500	197,300	390,700	970	810	890
2029	191,900	198,200	390,000	1,010	840	920
2030	189,400	197,600	387,100	1,030	870	950
2031	185,300	194,400	379,800	1,060	890	970
2032	180,400	190,400	370,800	1,090	920	1,000
2033	179,400	190,000	369,400	1,120	950	1,030
2034	179,000	190,600	369,600	1,140	980	1,060
2035	179,800	191,500	371,300	1,170	1,000	1,080
2040	182,100	194,100	376,200	1,340	1,160	1,250
2045	200,300	211,100	411,300	1,520	1,340	1,430
2050	230,200	239,200	469,400	1,740	1,550	1,640
2055	261,000	267,000	528,000	2,000	1,820	1,910
2060	264,400	270,400	534,700	2,340	2,140	2,240
2065	252,500	262,600	515,100	2,720	2,500	2,610
2070	256,200	267,500	523,600	3,090	2,860	2,970
2075	267,300	279,200	546,400	3,540	3,290	3,410
2080	272,300	285,500	557,800	4,080	3,800	3,930
2085	273,400	287,100	560,400	4,680	4,370	4,520
2090	280,500	293,800	574,300	5,350	5,000	5,170
2095	289,900	302,900	592,800	6,140	5,750	5,940
2100	297,400	310,500	607,900	7,060	6,620	6,840

Table 78 New retirement beneficiaries and pensions - additional CPP

	Number of new retirement beneficiaries			Average monthly retirement pension		
Year	Males	Females	Total	Males ($)	Females ($)	All ($)
2025	145,600	136,100	281,700	20	20	20
2026	151,900	142,400	294,300	30	20	30
2027	158,000	150,400	308,500	40	30	30
2028	162,500	155,900	318,500	50	40	40
2029	163,800	160,000	323,700	60	50	50
2030	167,300	167,200	334,500	70	60	60
2031	169,300	172,200	341,500	80	70	70
2032	170,000	176,000	346,000	100	80	90
2033	174,200	182,800	357,000	110	90	100
2034	177,300	188,500	365,800	120	100	110
2035	178,600	189,900	368,500	140	110	120
2040	182,100	194,100	376,200	230	190	210
2045	200,300	211,100	411,300	340	280	310
2050	230,200	239,200	469,400	480	400	440
2055	261,000	267,000	528,000	650	550	600
2060	264,400	270,400	534,700	850	730	790
2065	252,500	262,600	515,100	1,020	880	950
2070	256,200	267,500	523,600	1,160	1,020	1,090
2075	267,300	279,200	546,400	1,330	1,170	1,250
2080	272,300	285,500	557,800	1,530	1,350	1,440
2085	273,400	287,100	560,400	1,760	1,560	1,660
2090	280,500	293,800	574,300	2,010	1,790	1,890
2095	289,900	302,900	592,800	2,310	2,060	2,180
2100	297,400	310,500	607,900	2,650	2,370	2,510

B.7.4.4 Retirement beneficiaries mortality

Projections of retirement pensions in pay require applying survival probabilities to retirement beneficiaries. The mortality rates of CPP retirement beneficiaries used in the projections vary by age, sex, and calendar year.

The mortality rates were developed based on CPP retirement beneficiaries' mortality experience for the year 2023 and the mortality improvement assumptions for the general population in this report. The resulting projected mortality rates and life expectancies of retirement beneficiaries are shown in Table 79 and Table 80.

Table 79 Mortality rates of retirement beneficiaries
(annual deaths per 1,000)

	Males				Females			
Age	2025	2050	2075	2100	2025	2050	2075	2100
60	6.3	4.7	3.7	2.8	3.5	2.7	2.1	1.6
65	11.2	8.4	6.5	5.1	6.8	5.1	4.0	3.1
70	16.2	12.2	9.4	7.3	10.2	7.7	6.0	4.7
75	25.6	19.3	15.0	11.6	17.5	13.5	10.5	8.2
80	44.2	33.4	25.9	20.2	31.2	24.1	18.8	14.6
85	75.8	56.6	44.0	34.2	55.1	41.9	32.6	25.4
90	137.1	109.3	90.3	74.6	105.4	84.3	69.7	57.6

Table 80 Life expectancies of retirement beneficiaries, with improvements after the year shown (1)

	Males				Females			
Age	2025	2050	2075	2100	2025	2050	2075	2100
60	25.8	27.8	29.6	31.2	28.7	30.5	32.1	33.5
65	21.3	23.2	24.9	26.4	24.0	25.6	27.2	28.6
70	17.2	18.9	20.4	21.9	19.5	21.0	22.5	23.8
75	13.3	14.8	16.2	17.5	15.3	16.7	18.0	19.2
80	9.9	11.1	12.3	13.4	11.5	12.7	13.8	14.9
85	6.9	7.9	8.8	9.6	8.2	9.2	10.0	10.9
90	4.6	5.2	5.8	6.3	5.5	6.1	6.7	7.3

(1) These are cohort life expectancies that take into account assumed future improvements in mortality of the general population and therefore differ from calendar year life expectancies, which are based on the mortality rates of the given attained year.

B.7.5 Post-retirement benefit expenditures

Post-retirement benefits are paid to retirement beneficiaries who continue to work and contribute to the Plan. Post-retirement benefits are payable under both the base and additional CPP.

Working beneficiaries younger than 65 are required along with their employers to contribute, whereas contributions are voluntary once reaching age 65 (up to age 69). Employers of those working beneficiaries opting to contribute are required to also contribute. The post-retirement contributions paid in a year are applied toward providing post-retirement benefits in the following years. Post-retirement benefits are described in more detail in Appendix - A -Summary of plan provisions.

Table 81 presents the CPP working beneficiaries who contribute to the CPP as a proportion of retirement beneficiaries in the year of and years following pension take-up, by age and sex. These proportions are assumed to remain constant over the entire projection period.

In the year of retirement pension take-up, contributions are first applied toward maximizing the base and additional retirement pensions, with remaining contributions then applied toward a post-retirement benefit. This affects the proportion of working beneficiaries who contribute toward a post-retirement benefit in the year of pension take-up.

The figures in Table 81 reflect that not all working beneficiaries contribute to the CPP, due to the

following:

- having earnings less than the YBE, and
- opting out of contributing between the ages of 65 and 69.

Table 81 CPP working beneficiaries who are contributors as a proportion of retirement beneficiaries (2025+)
(percentages)

	Year of retirement pension take-up		After year of retirement pension take-up	
Age	Males	Females	Males	Females
60	40	30	0	0
61	50	35	78	65
62	45	35	56	47
63	45	35	50	42
64	45	35	49	37
65	19	14	42	32
66	47	38	28	21
67	43	38	21	17
68	43	33	17	13
69	38	33	13	10

In order to project the contributions of working beneficiaries, assumptions are required with respect to their average contributory earnings (i.e. average earnings between the YBE and YAMPE on which contributions are made). For both males and females, the average contributory earnings of working beneficiaries for years after the year of retirement pension take-up are assumed to be between 20% and 35% lower than the contributory earnings of contributors who are not working beneficiaries, depending on the age and sex. The resulting average annual contributory earnings of working beneficiaries up to the YMPE and YAMPE are presented, respectively, in Table 82 and Table 83.

Table 82 Average contributory earnings of working beneficiaries with pensionable earnings up to the YMPE
(dollars)

	Below age 65		Age 65 and above	
Year	Males	Females	Males	Females
2025	43,100	34,300	40,400	31,300
2026	44,300	35,400	41,600	32,100
2027	45,200	36,300	42,700	33,000
2028	46,200	37,400	43,800	33,900
2029	47,300	38,600	45,000	34,900
2030	48,700	40,100	46,100	35,900
2031	49,800	41,100	47,100	36,900
2032	50,800	42,100	48,000	37,900
2033	51,700	42,900	48,900	38,800
2034	52,700	43,800	49,900	39,900
2035	53,800	44,700	51,000	41,100
2040	61,400	51,300	58,000	47,400
2045	71,100	59,900	67,200	55,400
2050	83,600	71,300	78,600	65,600
2055	98,000	84,300	91,800	77,400
2060	113,600	98,400	106,000	90,100
2065	129,000	111,800	120,400	102,700
2070	146,800	127,400	137,600	117,600
2075	169,500	147,500	158,600	136,100
2080	194,700	169,700	182,100	156,800
2085	222,900	194,100	208,400	179,600
2090	255,300	222,200	238,900	205,900
2095	294,200	256,100	275,100	237,300
2100	338,200	294,300	316,100	272,800

Table 83 Average contributory earnings of working beneficiaries with pensionable earnings up to the YAMPE
(dollars)

	Below age 65		Age 65 and above	
Year	Males	Females	Males	Females
2025	45,900	35,300	43,000	32,200
2026	47,100	36,400	44,300	33,100
2027	48,000	37,300	45,400	34,000
2028	49,000	38,400	46,500	34,800
2029	50,200	39,600	47,700	35,800
2030	51,700	41,200	48,900	36,900
2031	52,800	42,200	49,900	37,900
2032	53,800	43,100	50,900	38,900
2033	54,700	43,900	51,800	39,800
2034	55,700	44,700	52,800	40,800
2035	56,800	45,600	54,000	42,000
2040	64,600	52,300	61,400	48,400
2045	75,000	61,200	71,100	56,700
2050	88,400	73,300	83,400	67,500
2055	104,000	87,300	97,600	80,000
2060	120,800	102,100	112,800	93,300
2065	136,800	115,700	127,800	106,100
2070	155,500	131,600	145,900	121,300
2075	179,500	152,700	168,300	140,700
2080	206,300	175,700	193,200	162,000
2085	236,000	200,900	220,900	185,500
2090	270,100	229,700	253,100	212,600
2095	311,400	265,000	291,600	245,100
2100	357,900	304,500	335,100	281,700

Table 84 shows the projected number of working beneficiaries with their contributions and resulting post-retirement benefits by year. Contributions and benefits are split between the base and additional CPP. Total contributions from working beneficiaries are projected to be about $2.8 billion in 2025 and $6.6 billion in 2050. Total post-retirement benefits payable are projected to be about $1.8 billion in 2025 and $8.1 billion in 2050.

The projected number of working beneficiaries who contribute, their earnings, and contributions are reflected in all other tables in this report that present contributors, earnings, and contributions projections, unless otherwise indicated. Similarly, the post-retirement benefits are presented in combination with retirement benefits as total retirement expenditures in all other tables in this report where expenditures are shown by type of benefit, unless otherwise indicated.

Table 84 Working beneficiaries - contributors, contributions, and post-retirement benefits

Year	Number of contributing working beneficiaries (thousands)	Base CPP		Additional CPP	
		Contributions ($ million)	Post-retirement benefits ($ million)	Contributions ($ million)	Post-retirement benefits ($ million)
2025	625	2,246	1,564	551	189
2026	624	2,305	1,738	565	241
2027	620	2,346	1,918	574	299
2028	614	2,379	2,101	581	365
2029	608	2,417	2,290	588	435
2030	607	2,483	2,461	605	506
2031	599	2,512	2,634	611	579
2032	591	2,534	2,807	614	654
2033	582	2,548	2,977	614	728
2034	576	2,577	3,144	619	802
2035	573	2,627	3,308	630	876
2040	588	3,080	4,114	736	1,266
2045	647	3,942	4,927	946	1,696
2050	742	5,303	5,907	1,288	2,211
2055	851	7,140	7,295	1,752	2,866
2060	890	8,660	9,259	2,134	3,718
2065	857	9,486	11,599	2,321	4,696
2070	873	11,048	14,172	2,690	5,752
2075	923	13,489	17,206	3,292	6,992
2080	951	15,980	20,787	3,900	8,456
2085	959	18,450	24,835	4,492	10,104
2090	988	21,802	29,392	5,298	11,949
2095	1,034	26,274	34,916	6,394	14,187
2100	1,060	30,953	41,683	7,532	16,935

B.7.6 Disability benefit expenditures

Disability expenditures result from disability benefits paid under the base and additional CPP.

Under the base CPP, disability benefits consist of the disability pension and the post-retirement disability benefit. The base CPP disability pension consists of both a flat-rate and earnings-related benefit. The post-retirement disability benefit is equal to the flat-rate benefit.

Under the additional CPP, disability benefits consist only of the additional disability pension, which is an earnings-related benefit. Eligibility for the additional disability pension follows from eligibility for the base disability pension. There is no post-retirement disability benefit payable under the additional CPP.

B.7.6.1 Disability pension

New disability pension expenditures are determined by age and sex for each year starting in 1970 as the product of:

- the population;
- the disability eligibility rate;
- the disability incidence rate; and
- the average annual amount of the benefit.

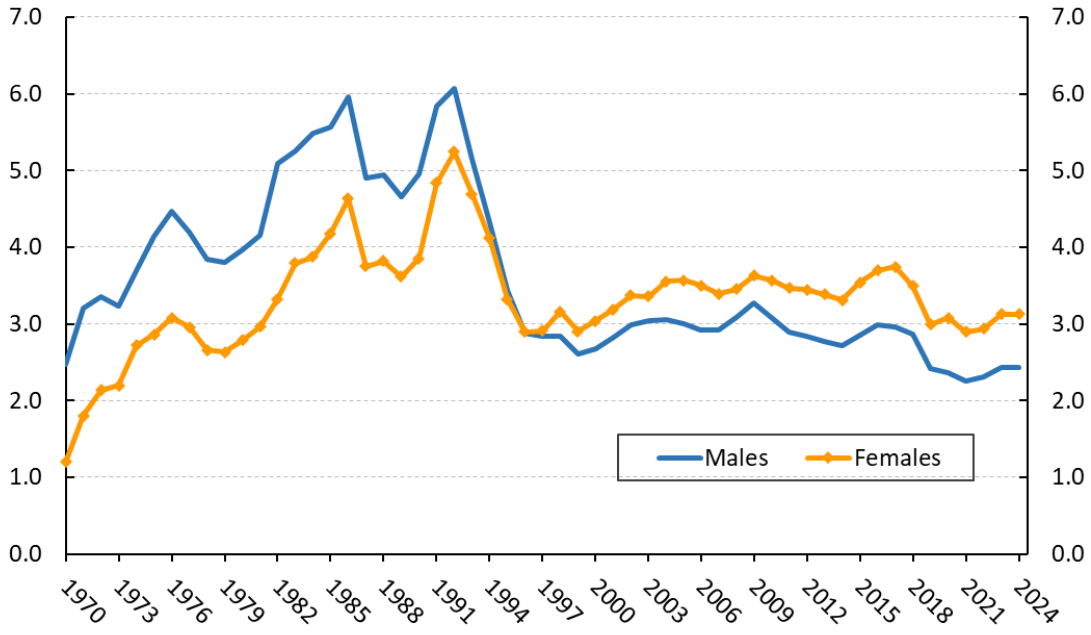
The disability incidence rates equal the ratio of the number of new disability beneficiaries by age and sex to the respective eligible populations.

The value of the emerging disability earnings-related benefit by age and sex is equal to the sum of 75% of the average retirement earnings-related benefits for the base and additional Plans.

B.7.6.2 Disability incidence rates

Chart 11 shows the historical disability incidence rates for the CPP disability pension, and Table 85 provides the assumed ultimate disability incidence rates for the disability pension (base and additional CPP) and post-retirement disability benefit (base CPP).

Chart 11 Historical disability incidence rates
(per 1,000 eligible)(1)



(1) The disability incidence rates for 2023 and 2024 were smoothed to reflect the large number of cases in 2024 attributable to efforts by ESDC to catch up on a backlog of pre-2024 cases.

It can be seen from Chart 11 that the incidence rate for new CPP disability cases (i.e. the number of new cases as a proportion of the eligible population) generally increased from 1970 to the early 1990s. The annual rate of change in incidence rates was particularly acute between 1989 and the recession of the early 1990s. After reaching a peak in 1992, disability incidence rates then declined rapidly during the 1990s.

The decline after 1992 reflects the economic recovery that occurred following the 1990-91 recession. As well, beginning in 1994, the CPP administration initiated a range of measures designed to effectively manage the growing pressure on the disability program. Since the mid-1990s, the rates remained relatively stable until 2018 and then decreased overall.

The historical analysis recognized that since 1996, females have consistently exhibited higher disability incidence rates (DIRs) than males, with the gap generally widening over time. Over the ten-year period ending in 2024, the average difference between female and male rates was about 0.70.

To inform the assumptions, population-standardized DIR averages over periods ranging from three to twenty years ending in 2024 were analysed. This analysis took into account the persistent female-male differential. Data from recent years indicated that disability incidence rates were not significantly impacted by the COVID-19 pandemic.

Further analysis considered trends by cause of disability, particularly the increasing prominence of mental health-related cases. While the relative weight of mental health disabilities has grown in recent years, this is largely attributed to declines in other disability causes. Mental health-related disability incidence has otherwise remained relatively steady, aside from an uptick observed from the mid- to late 2010s. Notably, mental health cases are more common among younger individuals, while the overall DIR is primarily influenced by rates at older ages.

To better understand the observed downward trends in recent years, a trend analysis by age group was also performed. Most age groups showed stable DIRs over time, but the 55 to 59 and 60 to 64 age groups—the two with historically the highest rates—have experienced significant declines since 2004.

Taking all of these elements into account, the ultimate aggregate DIRs based on the 2024 standardized eligible population were set at 2.70 for males and 3.40 for females (per thousand eligible). These aggregate rates are then distributed by age based on the 2024 historical distribution, and applied to projected eligible populations. Given that the 2024 aggregate DIRs are 2.63 for males and 3.46 for females, it is assumed that the ultimate values will be reached gradually over a five-year period, ending in 2029.

B.7.6.3 Post-retirement disability incidence rates

The base CPP post-retirement disability benefit came into effect in 2019 and applies only to early retirement beneficiaries (before age 65) who become disabled.

For this 32nd CPP Actuarial Report, initial benefit data regarding post-retirement disability benefits were available, as provided by ESDC. The assumed post-retirement disability incidence rates by age and sex were derived based on the data for years 2019 to 2021 along with historical records of earnings data of early retirement beneficiaries.

It is projected that, in 2029, the overall disability incidence rates in respect of the post-retirement disability benefit for early retirement beneficiaries will be 12.4 per 1,000 eligible males and 13.0 per 1,000 eligible females. As more experience data regarding post-retirement disability benefits become available, the assumptions for the incidence rates will be revised accordingly for future CPP actuarial reports.

The post-retirement disability incidence rates are shown in Table 85.

Table 85 Ultimate disability incidence rates (2029+) (1)
(per 1,000 eligible)

	Disability pension		Post-retirement disability benefit	
Age	Males	Females	Males	Females
25	0.3	0.4	N/A	N/A
30	0.6	0.8	N/A	N/A
35	0.8	1.2	N/A	N/A
40	1.3	1.9	N/A	N/A
45	2.1	3.0	N/A	N/A
50	3.3	4.5	N/A	N/A
55	6.0	7.4	N/A	N/A
60	9.4	10.1	0.0	0.0
61	9.6	10.1	12.4	13.1
62	9.6	10.1	12.4	13.1
63	9.6	10.0	12.4	13.0
64	9.6	10.0	12.4	13.0
All ages	2.7	3.4	12.4	13.0

(1) The disability incidence rates shown are adjusted by the eligible population in 2024. Note that the projection relies on the assumed ultimate disability rates by age. Consequently, since the eligible populations in years 2029 and onward will be different from the one in 2024, the total projected disability incidence rates will be different than 2.70% for males and 3.40% for females.

B.7.6.4 Projected new disability benefits

Table 86 shows the projected number of new disability beneficiaries for the disability pension (which comprises both base and additional CPP amounts) and the base CPP post-retirement disability benefit. Table 87 shows the projected average new base and additional disability pensions and the post-retirement disability benefits by sex and year.

Table 86 Number of new disability beneficiaries

Year	Disability pension [1]			Post-retirement disability benefit [2]		
	Males	Females	Total [3]	Males	Females	Total [3]
2025	18,500	21,600	40,000	1,500	1,600	3,000
2026	18,500	21,500	40,000	1,500	1,500	3,000
2027	18,500	21,500	40,000	1,400	1,400	2,900
2028	18,700	21,700	40,400	1,400	1,400	2,700
2029	19,000	21,900	41,000	1,300	1,300	2,600
2030	19,300	22,300	41,500	1,300	1,300	2,500
2031	19,400	22,500	41,900	1,200	1,300	2,500
2032	19,500	22,800	42,300	1,300	1,300	2,500
2033	19,800	23,100	42,900	1,300	1,300	2,600
2034	20,100	23,500	43,600	1,300	1,300	2,600
2035	20,400	23,900	44,200	1,300	1,300	2,500
2040	22,000	25,700	47,700	1,300	1,300	2,700
2045	23,600	27,300	50,900	1,500	1,500	3,000
2050	24,600	28,400	52,900	1,700	1,700	3,400
2055	24,900	28,900	53,800	1,900	1,900	3,800
2060	24,800	29,300	54,100	1,800	1,900	3,700
2065	25,500	30,200	55,800	1,700	1,800	3,500
2070	26,500	31,300	57,800	1,900	1,900	3,800
2075	27,000	32,000	59,000	1,900	2,000	3,900
2080	27,400	32,500	60,000	2,000	2,000	4,000
2085	28,100	33,400	61,500	1,900	2,000	3,900
2090	29,000	34,300	63,300	2,000	2,100	4,100
2095	29,700	35,100	64,800	2,100	2,200	4,300
2100	30,400	36,000	66,400	2,100	2,200	4,400

(1) The disability pension paid to new beneficiaries comprises both base and additional CPP disability pension amounts.
(2) The post-retirement disability benefit is a base CPP flat-rate amount.
(3) Components may not sum to totals due to rounding.

Table 87 New disability pensions and post-retirement disability benefits
(dollars)

Year	Average monthly disability pension, base CPP			Average monthly disability pension, additional CPP			Post-retirement disability benefit (flat-rate), base CPP
	Males	Females	Total	Males	Females	Total	
2025	1,200	1,120	1,160	30	20	30	600
2026	1,230	1,150	1,190	40	30	30	610
2027	1,270	1,190	1,220	50	40	40	620
2028	1,300	1,220	1,260	60	50	50	640
2029	1,340	1,260	1,290	70	60	70	650
2030	1,370	1,290	1,330	80	70	70	660
2031	1,410	1,320	1,360	90	80	80	680
2032	1,440	1,360	1,400	100	90	90	690
2033	1,480	1,390	1,430	120	100	100	700
2034	1,520	1,430	1,470	130	110	120	720
2035	1,560	1,470	1,510	140	120	130	730
2040	1,760	1,670	1,710	210	180	190	810
2045	1,980	1,900	1,940	300	250	270	890
2050	2,230	2,150	2,190	390	330	360	980
2055	2,510	2,420	2,460	490	410	440	1,090
2060	2,840	2,750	2,790	580	480	530	1,200
2065	3,220	3,110	3,160	660	550	600	1,330
2070	3,630	3,520	3,570	760	640	690	1,460
2075	4,100	3,970	4,030	870	740	800	1,620
2080	4,630	4,500	4,560	1,000	850	920	1,780
2085	5,240	5,090	5,160	1,140	970	1,050	1,970
2090	5,930	5,760	5,830	1,310	1,120	1,210	2,170
2095	6,710	6,510	6,600	1,510	1,290	1,390	2,400
2100	7,590	7,370	7,480	1,730	1,480	1,590	2,650

B.7.6.5 Disability benefit termination rates

All emerging disability benefits (disability pensions and post-retirement disability benefits) are projected by age and sex for each future year until termination of disability (due to recovery, death, or attainment of age 65). The projected disability termination rates presented in Table 88 apply by age, sex, and duration of disability (i.e. the period of being in receipt of a disability benefit) on an attained calendar year basis. The average graduated experience over the 15-year period 2008 to 2022 is used to produce base year rates for 2022. The base year termination rates are then projected for 2023 and thereafter for males and females, by age of disability onset, and duration of disability using assumed recovery and mortality improvement rates.

Recovery improvement rates are assumed to trend to an ultimate level of 0% by 2029 (i.e. recovery rates are assumed to be constant after 2029), and mortality improvement rates of disability beneficiaries are assumed to trend to an ultimate level of 1.0% by the same year.

Table 88 Disability termination rates in 2025 and 2035 (ultimate), by age, sex, and duration of disability [1]
(per 1,000 people)

	Males - 2025						Females - 2025					
Age	1st Year	2nd Year	3rd Year	4th Year	5th Year	6 Year and more	1st Year	2nd Year	3rd Year	4th Year	5th Year	6 year and more
30	39	65	58	52	52	37	35	50	60	47	45	35
40	38	59	47	44	37	29	28	45	41	37	28	26
50	49	66	55	40	38	27	30	50	45	33	25	20
60	58	69	56	47	39	0	37	49	42	31	29	0

	Males - 2035						Females - 2035					
Age	1st Year	2nd Year	3rd Year	4th Year	5th Year	6 Year and more	1st Year	2nd Year	3rd Year	4th Year	5th Year	6 year and more
30	36	63	56	51	52	37	33	47	59	47	45	36
40	34	57	46	43	37	28	26	42	40	37	28	27
50	44	61	52	38	36	26	26	46	44	32	25	20
60	51	63	53	44	36	0	32	45	40	29	27	0

(1) Assumed termination rates for all disability benefits (disability pensions and post-retirement disability benefits).

B.7.7 Survivor pension expenditures

Survivor expenditures result from survivor's benefits paid under the base and additional CPP. Under both components of the CPP, the survivor's pension changes form at age 65.

Under the base CPP, the survivor's pension payable to individuals younger than 65 consists of a flat-rate and earnings-related benefit. At ages 65 and older, the pension payable is earnings-related. The additional survivor's pension payable takes the same form as the base survivor's pension, except that the additional survivor's pension is strictly earnings-related with no flat-rate benefit payable.

B.7.7.1 New survivor's pension

New survivor pension expenditures are determined by age and sex for each year starting in 1968 as the product of:

- the number of deaths in the population;
- the survivor eligibility rate;
- the probability of being married or in a common-law union at the time of death;
- the spouses age distribution;
- the average annual amount of the benefit (flat-rate and earnings-related benefits); and
- if applicable, the appropriate factor taking into account the base CPP earnings-related benefit limits that apply to combined survivor-disability and combined survivor-retirement pensions.

For each age and sex, the actual proportions of contributors married or in a common-law relationship at the time of death are determined from benefit statistics. Analysis of historical data from 2012 to 2024 shows an upward trend in the average age of surviving spouses at the time of their partner's death. It was also observed that the average age at first marriage has increased over time by approximately 0.8 years every five years.

The observed demographic shifts, together with further adjustments for younger and older ages, are used to determine the assumed proportions of contributors married or in a common-law relationship at the time of death, with assumed ultimate proportions applicable from the year 2026 onward. These proportions account for benefits payable to same-sex couples.

As of 1 January 2025, couples who separate and who apply for a credit split (as described in Appendix - A of this report) are no longer eligible to later receive a survivor pension upon the death of either partner. No adjustment was made to the assumed proportions regarding the amendment as doing so would not have a material impact on the assumption. The assumed proportions of contributors married or in a common-law relationship at the time of death are shown in Table 89.

Table 89 Assumed proportion of contributors married or in a common-law relationship at time of death (2026+)
(percentages)

Age	Males	Females
20	2	4
30	20	24
40	39	48
50	52	58
60	55	58
70	61	52
80	68	37
90	55	14

The value of the emerging earnings-related survivor benefit is equal to 37.5% or 60% of the average retirement earnings-related benefit, depending on whether the surviving spouse or common-law partner is under age 65 or aged 65 or older, respectively. It is further adjusted to account for the fact that eligibility rules are more stringent for survivor benefits than for retirement benefits.

The projected numbers of new base and additional survivor beneficiaries by age (below 65, and 65 and older) are shown in Table 90 and Table 91, respectively. The projected average monthly survivor pensions of emerging (new) benefits for the base and additional CPP by age and sex are shown in Table 92 and Table 93, respectively.

Table 90 Number of new survivor beneficiaries - base CPP

Year	Under 65			65 and over			All ages		
	Males	Females	Total [1]	Males	Females	Total [1]	Males	Females	Total [1]
2025	5,500	16,700	22,200	20,500	53,800	74,200	25,900	70,500	96,400
2026	5,400	16,500	21,900	21,300	55,400	76,700	26,700	71,900	98,600
2027	5,400	16,300	21,700	22,000	57,200	79,300	27,400	73,600	100,900
2028	5,300	16,200	21,500	22,700	59,100	81,800	28,100	75,300	103,300
2029	5,300	16,200	21,500	23,400	60,900	84,400	28,700	77,100	105,800
2030	5,200	16,000	21,200	24,100	62,800	86,900	29,300	78,800	108,200
2031	5,200	15,800	21,000	24,800	64,700	89,400	29,900	80,500	110,400
2032	5,100	15,600	20,700	25,400	66,500	91,900	30,500	82,100	112,600
2033	5,100	15,400	20,500	26,000	68,400	94,400	31,000	83,800	114,800
2034	5,000	15,400	20,400	26,500	70,200	96,700	31,600	85,600	117,200
2035	5,000	15,300	20,300	27,100	71,900	99,000	32,100	87,200	119,300
2040	5,000	15,000	20,100	29,100	79,300	108,400	34,100	94,300	128,400
2045	5,100	15,100	20,200	30,100	83,700	113,800	35,200	98,800	134,000
2050	5,100	15,300	20,300	30,400	85,800	116,200	35,500	101,100	136,600
2055	5,000	15,300	20,300	30,600	86,800	117,400	35,500	102,100	137,700
2060	4,800	15,200	20,000	30,900	87,800	118,700	35,700	103,000	138,700
2065	4,700	14,800	19,500	31,500	90,500	122,000	36,200	105,300	141,500
2070	4,600	14,500	19,100	32,300	95,200	127,500	36,900	109,700	146,600
2075	4,500	14,200	18,700	33,000	100,800	133,800	37,500	115,000	152,500
2080	4,400	13,800	18,200	33,400	105,600	138,900	37,700	119,400	157,100
2085	4,300	13,400	17,700	33,400	108,400	141,900	37,700	121,900	159,600
2090	4,100	13,100	17,200	33,300	109,200	142,500	37,400	122,300	159,700
2095	4,000	12,800	16,800	33,100	109,300	142,500	37,200	122,100	159,300
2100	3,900	12,500	16,400	33,000	110,900	143,900	37,000	123,400	160,400

(1) Components may not sum to totals due to rounding.

Table 91 Number of new survivor beneficiaries - additional CPP

	Under 65			65 and over			All ages		
Year	Males	Females	Total [1]	Males	Females	Total [1]	Males	Females	Total [1]
2025	4,600	13,200	17,700	5,700	8,700	14,400	10,300	21,900	32,200
2026	4,600	13,300	17,900	6,400	10,300	16,700	11,100	23,500	34,600
2027	4,700	13,400	18,100	7,200	12,100	19,300	11,900	25,500	37,300
2028	4,700	13,500	18,200	8,000	14,100	22,100	12,700	27,600	40,300
2029	4,700	13,700	18,400	8,800	16,200	25,100	13,500	30,000	43,500
2030	4,800	13,900	18,700	9,800	18,700	28,600	14,600	32,700	47,300
2031	4,800	14,100	18,900	10,900	21,400	32,400	15,700	35,500	51,200
2032	4,800	14,200	19,100	12,100	24,300	36,400	16,900	38,500	55,400
2033	4,900	14,400	19,300	13,300	27,400	40,700	18,200	41,800	59,900
2034	5,000	14,600	19,500	14,400	30,500	44,900	19,300	45,100	64,400
2035	5,000	14,600	19,500	15,500	33,700	49,200	20,400	48,300	68,700
2040	5,000	14,700	19,800	20,700	51,000	71,800	25,700	65,800	91,500
2045	5,100	15,000	20,100	24,900	66,900	91,800	29,900	81,900	111,900
2050	5,100	15,200	20,300	27,700	77,300	105,000	32,800	92,500	125,300
2055	5,000	15,300	20,300	29,400	83,100	112,500	34,300	98,400	132,800
2060	4,800	15,200	20,000	30,500	86,600	117,100	35,300	101,800	137,100
2065	4,700	14,800	19,500	31,400	90,200	121,700	36,100	105,000	141,200
2070	4,600	14,500	19,100	32,300	95,200	127,500	36,900	109,600	146,500
2075	4,500	14,200	18,700	33,000	100,800	133,800	37,500	115,000	152,500
2080	4,400	13,800	18,200	33,400	105,600	138,900	37,700	119,400	157,100
2085	4,300	13,400	17,700	33,400	108,400	141,900	37,700	121,900	159,600
2090	4,100	13,100	17,200	33,300	109,200	142,500	37,400	122,300	159,700
2095	4,000	12,800	16,800	33,100	109,300	142,500	37,200	122,100	159,300
2100	3,900	12,500	16,400	33,000	110,900	143,900	37,000	123,400	160,400

(1) Components may not sum to totals due to rounding.

Table 92 Average new monthly survivor's pension - base CPP
(dollars)

	Under 65			65 and over		
Year	Males	Females	All	Males	Females	All
2025	460	530	510	170	370	310
2026	470	540	520	190	380	330
2027	480	550	530	200	390	330
2028	500	560	550	210	400	340
2029	510	580	560	220	410	360
2030	520	590	570	230	420	360
2031	540	600	590	240	430	370
2032	550	620	600	250	430	380
2033	570	630	610	260	440	390
2034	580	650	630	270	460	400
2035	600	660	640	280	470	420
2040	680	740	730	340	520	470
2045	770	840	820	410	590	540
2050	870	950	930	480	660	610
2055	990	1,070	1,050	550	740	690
2060	1,120	1,200	1,180	640	830	780
2065	1,270	1,360	1,340	740	950	900
2070	1,440	1,540	1,520	870	1,080	1,030
2075	1,630	1,740	1,720	1,010	1,240	1,180
2080	1,840	1,970	1,940	1,170	1,420	1,360
2085	2,090	2,230	2,200	1,350	1,630	1,560
2090	2,370	2,530	2,490	1,560	1,870	1,800
2095	2,680	2,870	2,820	1,800	2,140	2,060
2100	3,040	3,250	3,200	2,080	2,460	2,370

Table 93 Average new survivor pension - additional CPP [1]
(dollars)

	Under 65			65 and over		
Year	Males	Females	All	Males	Females	All
2025	9	9	9	4	2	3
2026	12	13	13	5	3	4
2027	16	16	16	7	4	5
2028	20	20	20	8	4	6
2029	23	24	24	9	5	7
2030	26	27	27	10	6	8
2031	30	31	31	12	7	9
2032	34	35	35	13	9	10
2033	38	40	39	15	10	11
2034	42	44	44	16	11	13
2035	47	49	49	18	13	14
2040	72	79	77	29	23	25
2045	100	120	110	47	39	42
2050	130	160	150	75	68	70
2055	170	210	200	110	110	110
2060	210	260	250	170	180	170
2065	240	310	290	230	260	250
2070	280	370	350	300	360	340
2075	320	430	400	390	470	450
2080	370	490	460	480	590	560
2085	430	560	530	570	730	690
2090	490	650	610	680	860	820
2095	560	740	700	790	1,010	960
2100	650	850	800	910	1,160	1,100

(1) Values above 100 are rounded to nearest 10.

B.7.7.2 Survivor beneficiaries mortality

All survivor pensions emerging by year, age, and sex of the surviving spouse or common-law partner are projected to each subsequent year using the assumed survivor mortality rates, which reflect the higher mortality of widows and widowers compared to that of the general population.

To determine the assumed mortality rates for CPP survivor beneficiaries, mortality experience from the period 2017-2021 are analyzed by age and sex. These observed survivor mortality rates are smoothed and adjusted using credibility-weighted formulas. The smoothed and adjusted rates are then compared to the corresponding mortality rates by age and sex of the general CPP population (Canada less Quebec) to produce relative mortality ratios (Rx). These ratios capture how survivor beneficiaries' mortality differs from that of the broader population. The Rx values are then used as scaling factors for projections, i.e. the Rx values are applied to the projected general population mortality rates to derive the projected mortality rates for survivor beneficiaries.

Table 94 and Table 95 show, respectively, the projected mortality rates of survivor beneficiaries and the resulting projected life expectancies of survivor beneficiaries by age and sex.

Table 94 Mortality rates of survivor beneficiaries
(annual deaths per 1,000)

	Males				Females			
Age	2025	2050	2075	2100	2025	2050	2075	2100
60	9.2	6.8	5.3	4.1	5.9	4.5	3.5	2.7
65	15.0	11.2	8.7	6.8	9.0	6.8	5.3	4.1
70	22.3	16.7	12.9	10.0	13.8	10.5	8.2	6.4
75	33.7	25.4	19.7	15.3	22.1	17.0	13.2	10.3
80	54.0	40.8	31.7	24.6	35.3	27.3	21.2	16.5
85	88.5	66.1	51.3	39.9	59.0	44.8	34.9	27.2
90	148.4	118.3	97.8	80.8	107.0	85.6	70.7	58.4

Table 95 Life expectancies of survivor beneficiaries, with improvements after the year shown (1)

	Males				Females			
Age	2025	2050	2075	2100	2025	2050	2075	2100
60	23.9	26.0	28.0	29.9	27.4	29.4	31.1	32.7
65	19.7	21.7	23.5	25.2	22.9	24.7	26.4	27.9
70	15.8	17.6	19.3	20.8	18.7	20.3	21.9	23.3
75	12.3	13.8	15.3	16.7	14.8	16.2	17.6	18.9
80	9.2	10.4	11.7	12.8	11.2	12.5	13.6	14.7
85	6.5	7.5	8.4	9.3	8.1	9.1	10.0	10.8
90	4.5	5.1	5.6	6.2	5.5	6.1	6.7	7.3

(1) These are cohort life expectancies that take into account assumed future improvements in mortality of the general population and therefore differ from calendar year life expectancies, which are based on the mortality rates of the given attained year.

B.7.8 Death benefit expenditures

Death benefits are flat-rate, lump sum amounts that are payable only under the base CPP. There are no death benefits under the additional Plan. The eligibility rules for the death benefits are the same as for survivor benefits.

As of 1 January 2019, the basic death benefit is a flat-rate amount of $2,500. Effective 1 January 2025, a top-up death benefit equal to $2,500 for a total death benefit of $5,000 is payable to the estate of contributors who die before receiving any retirement or disability benefit and who are not married or in a common-law relationship at the time of death.

Table 96 shows the projected number of death benefits.

Table 96 Number of death benefits [1]

Year	Males	Females	Total [2]
2025	107,300	77,700	185,000
2026	109,400	79,900	189,300
2027	111,800	83,000	194,800
2028	114,500	86,000	200,500
2029	117,400	89,200	206,500
2030	120,000	92,300	212,400
2031	122,700	95,600	218,300
2032	125,400	98,800	224,300
2033	128,100	102,200	230,400
2034	131,100	105,700	236,800
2035	133,900	109,200	243,100
2040	147,300	127,200	274,500
2045	157,200	143,000	300,200
2050	163,200	154,400	317,700
2055	166,700	161,400	328,100
2060	168,600	164,600	333,200
2065	171,800	167,000	338,900
2070	178,600	172,200	350,800
2075	188,600	181,100	369,800
2080	199,400	191,900	391,300
2085	208,100	201,800	409,900
2090	212,900	208,100	421,000
2095	214,700	211,100	425,800
2100	218,200	214,700	432,900

(1) This is the number of deceased contributors whose estates or persons or institutions as prescribed are entitled to the death benefit during the given year. The number of deceased contributors includes those eligible to the death benefit top-up, as described in Appendix - A of this report.
(2) Components may not sum to totals due to rounding.

B.7.9 Children's benefit expenditures

Children's benefits are flat-rate amounts that are payable only under the base CPP. There are no children's benefits under the additional Plan. The benefit amount payable to orphans and to children of disabled contributors is the same.

The number of disabled contributor's child and orphan benefits emerging each year starting in 1970 and 1968, respectively, are determined by the projected number of children of new disability and/or survivor beneficiaries, based on the assumed fertility rates. The resulting number of emerging child beneficiaries by age, sex, and calendar year are thereafter projected from one year to the next, incorporating the following reasons for termination of benefits:

- attainment of age 25 by the child;
- ceasing full-time or part-time attendance at school while over age 18; and
- regarding disabled contributor's child benefits only, termination (by reason of recovery or death) of the parent's disability benefits.

As of 1 January 2019, eligible children of early retirees who are deemed disabled and meet disability eligibility requirements receive the child's benefit. As of 1 January 2025, eligibility for the disabled contributor's child's benefit continues after the disabled parent reaches age 65. As well, as of 1 January 2025, a dependent child aged 18 to 24, who attends school part-time, is eligible to receive 50% of the benefit paid to full-time students.

Table 97 shows the projected number of new children's benefits by type and year.

Table 97 New children's benefits

Year	Disabled contributor's child [1]	Orphans	Total [2]
2025	14,100	9,500	23,600
2026	14,200	9,400	23,600
2027	14,400	9,200	23,600
2028	14,600	9,100	23,700
2029	15,000	9,100	24,100
2030	15,300	9,000	24,300
2031	15,500	8,700	24,300
2032	15,700	8,500	24,200
2033	15,900	8,400	24,200
2034	16,100	8,300	24,400
2035	16,200	8,200	24,500
2040	16,900	8,000	24,900
2045	17,600	8,000	25,600
2050	18,200	8,000	26,100
2055	18,700	7,800	26,500
2060	19,200	7,600	26,800
2065	19,700	7,400	27,200
2070	20,200	7,200	27,500
2075	20,600	7,000	27,700
2080	21,100	6,800	28,000
2085	21,700	6,700	28,300
2090	22,200	6,500	28,700
2095	22,800	6,300	29,100
2100	23,300	6,200	29,500

(1) Includes benefits payable to children of disabled retirees receiving the post-retirement disability benefit.
(2) Components may not sum to totals due to rounding.

B.8 Operating expenses

The operating expenses of the CPP have historically arisen from different sources, including ESDC, the CRA, Public Services and Procurement Canada, the Office of the Superintendent of Financial Institutions Canada, the Department of Finance Canada, and the CPPIB. For the purpose of this 32nd CPP Actuarial Report, operating expenses of the CPPIB are included in the investment expenses assumptions for the base and additional CPP, as discussed in section B.6.6 of this report. Thus, the following discussion focuses exclusively on operating expenses incurred by government departments and agencies, the majority of which are attributable to ESDC and the CRA.

In the calendar year 2024, operating expenses for the base and additional Plans (other than the CPPIB) amounted to about $761 million and $269 million, respectively, for a total of approximately $1 billion. The base and additional Plan operating expenses equal, respectively, 0.082% and 0.029% of total employment earnings, for a total of 0.111% of total employment earnings in 2024.

Based on actual expenses for years 2022 to 2024 along with estimates provided by ESDC for years 2025 and 2026, the annual total operating expenses for both the base and additional CPP are on average close to 0.105% of total annual employment earnings over the period 2022-2026. It is assumed that total operating expenses (excluding the CPPIB) will decline linearly from 0.111% of total employment earnings in 2024 to 0.105% of total employment earnings by 2026 and remain at that level thereafter.

Based on information provided by ESDC, it is assumed that operating expenses will be allocated as 73% to the base Plan and 27% to the additional Plan, and that this allocation of expenses will be reached by 2026 and remain constant thereafter. As such, the base Plan operating expenses as a percentage of total employment earnings are projected to decrease from 0.082% in 2024 to 0.077% by 2026, while those for the additional Plan are projected to decrease from 0.029% to 0.028% over the same period. Both percentages are assumed to remain stable beyond 2026.

Table 98 and Table 99 show the projected total operating expenses for the base CPP and additional CPP, respectively, as a percentage of total employment earnings.

Table 98 Operating expenses – base CPP [1]

Year	Operating expenses ($ million)	Total employment earnings ($ million) [2]	Operating expenses as % of total employment earnings (%)
2025	754	951,176	0.079
2026	750	977,974	0.077
2027	784	1,022,890	0.077
2028	818	1,066,861	0.077
2029	847	1,104,797	0.077
2030	877	1,143,892	0.077
2031	908	1,184,551	0.077
2032	941	1,227,167	0.077
2033	974	1,271,234	0.077
2034	1,009	1,316,390	0.077
2035	1,045	1,363,271	0.077
2040	1,232	1,607,423	0.077
2045	1,450	1,891,129	0.077
2050	1,699	2,216,592	0.077
2055	1,994	2,601,988	0.077
2060	2,334	3,044,557	0.077
2065	2,731	3,563,487	0.077
2070	3,207	4,184,605	0.077
2075	3,769	4,917,140	0.077
2080	4,421	5,767,565	0.077
2085	5,188	6,767,992	0.077
2090	6,095	7,952,072	0.077
2095	7,167	9,350,941	0.077
2100	8,422	10,987,955	0.077

(1) CPPIB operating expenses are not included in base Plan operating expenses, but are accounted for separately in the investment expenses assumption.
(2) Total earnings used to project operating expenses include earnings from working beneficiaries

Table 99 Operating expenses - additional CPP [1]

Year	Operating expenses ($ million)	Total employment earnings ($ million) [2]	Operating expenses as % of total employment earnings (%)
2025	273	951,176	0.029
2026	277	977,974	0.028
2027	290	1,022,890	0.028
2028	302	1,066,861	0.028
2029	313	1,104,797	0.028
2030	324	1,143,892	0.028
2031	336	1,184,551	0.028
2032	348	1,227,167	0.028
2033	360	1,271,234	0.028
2034	373	1,316,390	0.028
2035	386	1,363,271	0.028
2040	456	1,607,423	0.028
2045	536	1,891,129	0.028
2050	628	2,216,592	0.028
2055	738	2,601,988	0.028
2060	863	3,044,557	0.028
2065	1,010	3,563,487	0.028
2070	1,186	4,184,605	0.028
2075	1,394	4,917,140	0.028
2080	1,635	5,767,565	0.028
2085	1,919	6,767,992	0.028
2090	2,254	7,952,072	0.028
2095	2,651	9,350,941	0.028
2100	3,115	10,987,955	0.028

(1) CPPIB operating expenses are not included in additional Plan operating expenses, but are accounted for separately in the investment expenses assumption.
(2) Total earnings used to project operating expenses include earnings from working beneficiaries.

Appendix - C Financing the Canada Pension Plan

C.1 Historical and legislative background

The retirement system in Canada has been designed as a three-tier system. First, the Old Age Security (OAS) program provides a minimum floor benefit based on age and residence in Canada. Second, the CPP and QPP cover most individuals with employment earnings. Finally, individuals may be covered by registered pension plans (RPPs) as well as pooled registered pension plans (PRPPs), and can invest in individual registered retirement savings plans (RRSPs) and tax-free savings accounts (TFSAs) to supplement their retirement income.

Each tier is financed using a different approach: the OAS program is financed through general tax revenues on a pay-as-you-go basis, the CPP and QPP each consist of base and additional plans, which are, respectively, partially and fully funded based on contributions on employment earnings, and RPPs, PRPPs, RRSPs, and TFSAs are intended to be fully funded. The variety in both the sources and methods of financing enables the Canadian retirement income system to be more resilient to changes in demographic, economic, and investment conditions compared to systems that are less varied in their provision of retirement income.

The CPP was initially established as a pay-as-you-go plan with a small reserve fund worth about two years of benefits. At the time of the Plan's inception, demographic, economic, and investment conditions were characterized by a younger population (higher fertility rates and lower life expectancies), rapid growth in wages and labour force participation, and low rates of return on investments. These conditions made prefunding the Plan unattractive and pay-as-you-go financing more appropriate. Growth in total earnings of the workforce and thus contributions were sufficient to cover growing expenditures without requiring large increases in the contribution rate. The Plan's assets were invested primarily in long-term non-marketable securities of provincial governments at lower than market rates, thus providing the provinces with a relatively inexpensive source of capital to develop needed infrastructure.

However, changing conditions over time, including lower birth rates, increased life expectancies, and lower real wage growth led to increasing Plan costs. These factors, in combination with higher market returns, made fuller funding more attractive and appropriate. By the mid-1980s, the net cash flow (contributions less expenditures) had turned negative, and part of the Plan's investment income was required to meet the shortfall. The shortfall continued to grow, which eventually caused the assets of the reserve fund to start to fall by the mid-1990s.

In the December 1993 (15th) Actuarial Report on the CPP, the Chief Actuary projected that the pay-as-you-go contribution rate (expenditures as a percentage of contributory earnings) would increase to 14.2% by 2030. It was further projected that if changes were not made to the Plan, the reserve fund would be exhausted by 2015. The Chief Actuary identified five factors responsible for the increasing costs of the Plan, namely: lower birth rates, higher life expectancies than projected, the effect of the early 1990s recession on the proportions of earners and average employment earnings, benefit enrichments, and increased numbers of Canadians claiming

disability benefits for longer periods.

In response to these developments, amendments were made in 1998 to gradually increase the level of CPP funding by increasing contribution rates over the short term, reducing the growth of benefits over the long term, and investing net cash flows in the private markets through the CPPIB to achieve higher rates of return. It was also decided that any future increases to benefits or additions of new benefits under the Plan should be fully funded. The reform package agreed to by the federal and provincial governments in 1997 thus included significant changes to the Plan's financing provisions:

- The introduction of *steady-state funding* to replace pay-as-you-go financing in order to build a reserve of assets and stabilize the ratio of assets to expenditures over time. Investment income on this pool of assets is projected to help pay benefits as the large cohort of baby boomers retires. This refers to paragraph 113.1(4)(c) of the *Canada Pension Plan*.
- The introduction of *full funding* that requires that changes to the CPP that increase benefits or add new benefits be fully funded, i.e. that their costs be paid as the benefits are earned and that any costs associated with benefits that have already been earned but not paid for must be amortized and paid for over a defined period of time consistent with common actuarial practice. This refers to paragraph 113.1(4)(e) of the *Canada Pension Plan*.

Both of the financing objectives (steady-state and full funding) were introduced to improve fairness across generations and improve the financial long-term sustainability of the base Plan. The move to steady-state funding eases some of the contribution burden on future generations, while under full funding each generation that will receive benefit enrichments is more likely to pay for such enrichments in full so that the associated costs are not passed on to future generations.

The steady-state and any full funding contribution rates in respect of the base CPP are determined by the Chief Actuary in accordance with subparagraphs 115(1.1)(c)(i) and (ii) of the *Canada Pension Plan* and the prescribed regulations (discussed below).

In 2016, the federal and provincial governments agreed to expand the CPP by creating the additional CPP.

The full funding of the additional CPP is a result of the 1997 reforms to the Plan, specifically the requirement to fully fund any increased or new benefits. In accordance with paragraph 113.1(4)(d) of the *Canada Pension Plan*, the additional retirement, survivor, and disability benefits provided by the additional Plan are to be financed by additional contribution rates that (i) are no lower than the lowest constant rates that can be maintained over the foreseeable future, and (ii) result in projected revenues (contributions and investment income) that are sufficient to fully pay the projected expenditures of the additional CPP over the long term.

The rates referred to in paragraph 113.1(4)(d) of the CPP statute are the first and second additional minimum contribution rates (FAMCR, SAMCR), which apply, respectively, to the first

and second tiers of the additional CPP. The AMCRs are determined by the Chief Actuary in accordance with paragraphs 115(1.1)(d) and (e) of the *Canada Pension Plan* and the prescribed regulations (discussed below). The AMCRs are calculated before and after accounting for any future increase in benefits or new benefits in accordance with the full funding requirements of paragraph 113.1(4)(e) of the CPP statute.

The regulations setting out the calculation of contribution rates for the base and additional CPP are the *Calculation of Contribution Rates Regulations, 2021*.

C.2 Calculation of base and additional minimum contribution rates

C.2.1 Base CPP

The financing objective of the base Plan is stated in the CPP statute in terms of the steady-state contribution rate and full funding rate for any increased or new benefits. The minimum contribution rate for the base CPP is the sum of the steady-state contribution rate and full funding rate as described below.

C.2.1.1 Steady-state contribution rate

The steady-state contribution rate calculation is specifically defined in the *Calculation of Contribution Rates Regulations, 2021* as the lowest level contribution rate, applicable after the end of the review period, to the nearest 0.01% that results in the projected assets/expenditures (A/E) ratio of the base Plan being the same in the 10th and 60th years following the end of the review period. For this report, the end of the review period is 2027. Therefore, the steady-state contribution rate is applicable for the year 2028 and thereafter, and the relevant years for the determination of the steady-state contribution rate are 2037 and 2087. The corresponding A/E ratio for those years is determined to be 10.9, and the steady-state contribution rate, which is rounded to the nearest 0.01%, is determined to be 9.18% for the year 2028 and thereafter for this report.

The steady-state contribution rate is calculated separately from the full funding rate for any increased or new benefits.

C.2.1.2 Full funding rate for increased or new benefits

Subparagraph 115(1.1)(c)(ii) and paragraph 115(1.1)(f) of the CPP statute require the Chief Actuary to specify in the report a contribution rate in respect of any increased or new benefits for the base CPP in accordance with the requirements of paragraph 113.1(4)(e). The amendments to the *Canada Pension Plan* introduced under the *Budget Implementation Act, 2018, No. 1*, which received Royal Assent on 21 June 2018, include amendments in respect of the base CPP that required the application of 113.1(4)(e). These amendments are described in the 29th CPP Actuarial Report.[19]

The amendments under the *Budget Implementation Act, 2018, No. 1* invoked the full funding

19 29th Actuarial Report supplementing the 27th and 28th Actuarial Reports on the Canada Pension Plan as at 31 December 2015

requirement for the base Plan (and also affected the AMCRs of the additional Plan, discussed below in section C.2.2). The temporary and permanent full funding contribution rate calculations for the base CPP are defined in the *Calculation of Contribution Rates Regulations, 2021*.

The effect of the amendments under the *Budget Implementation Act, 2018, No. 1* on the long-term financial states of the base and additional CPP were first evaluated in the 29th CPP Actuarial Report, then were re-evaluated for the 30th and 31st CPP Actuarial Reports and now for this 32nd CPP Actuarial Report. The amendments made to the *Canada Pension Plan* under the *Budget Implementation Act, 2024, No. 1* were determined not to require separate full funding and thus are financed entirely by the steady-state contribution rate.

On the basis of this report, the full funding rates for the base CPP in respect of the amendments under the *Budget Implementation Act, 2018, No. 1* were determined as follows.

C.2.1.2.1 Temporary full funding rate

Since amended base CPP survivor, disability, and death benefits that came into pay after 1 January 2019 are based on contributors' CPP participation both before and after the effective date of the amendments, there is a portion of the projected increase in liabilities that relates to Plan participation prior to the effective date. The increase in liabilities for Plan participation prior to 2019 is determined as at the year following the triennial review period, or as at the effective date of the amendments if later. The triennial review period in respect of this report is 2025 to 2027. As such, this increase in liabilities is calculated as the present value as at 1 January 2028 of the projected increase in base CPP expenditures relating to Plan participation prior to 2019 and is estimated at $1.7 billion.

The net accumulated assets in respect of the past unfunded liabilities are determined at the end of year 2027 based on the:

- projected increase in expenditures relating to Plan participation prior to 2019 over the years 2019 to 2027, and
- contributions calculated using the temporary full funding rates of the prior (29th, 30th, and 31st) reports over the same period.

These net accumulated assets are equal to $919 million as at 31 December 2027.

The temporary full funding contribution rate for the period 2028 to 2033 in respect of the increase in liabilities relating to Plan participation prior to 2019 is determined to be 0.0161%. This temporary full funding rate is equal to the ratio of:

- the difference of the increase in liabilities and the net accumulated assets to
- the present value as at 1 January 2028 of contributory earnings over the period 2028 through 2033.

The amortization of the past unfunded liabilities was initially over the 15-year period 2019-2033

in the 29th CPP Actuarial Report. As the valuation date of this 32nd CPP Actuarial Report is nine years later than the valuation date of the 29th Report, the remaining amortization period is the 6-year period 2028 to 2033. The amortization periods under the 29th Report up to this 32nd Report are consistent with common actuarial practice, as provided in the legislation.

C.2.1.2.2 Permanent full funding rate

The increase in liabilities for Plan participation on or after 1 January 2019 is determined as at the year following the triennial review period, or as at the effective date of the amendments if later.

As such, the increased liabilities due to the base CPP amendments in respect of participation on or after 1 January 2019 is determined as at 1 January 2028 and are estimated to be $3.4 billion, and the corresponding net accumulated assets are estimated to be $145 million as at 31 December 2027. The difference between these liabilities and assets is fully funded with a permanent contribution rate of 0.0103%.

C.2.1.2.3 Total full funding rates

The sum of the temporary full funding rate in respect of participation prior to 2019 and permanent full funding rate in respect of participation from 2019 onward is 0.0263% (0.0161% plus 0.0103%) for the period 2028 to 2033 and 0.0103% for year 2034 and thereafter. The rounded full funding rate is 0.03% for the period 2028 to 2033 and 0.01% for year 2034 and thereafter. The calculations and results are summarized in Table 100.

The Chief Actuary will review the full funding rates on a periodic basis to account for actual experience and any change in assumptions.

Table 100 Full funding rates in respect of the amendments to the base CPP

Component	Variable representation	Value
Present value of contributory earnings (2028 to 2033) as at 31 December 2027	(A) [1]	$4,558 billion
Increase in liabilities due to participation prior to effective date (1 January 2019) as at 31 December 2027	(B) [2]	$1,651 million
Net accumulated assets over period 2019 to 2027 in respect of participation prior to 2019 as at 31 December 2027	(C) [3]	$919 million
Temporary full funding rate for 2028 to 2033 in respect of participation prior to 2019 as at 31 December 2027	(D) = [(B) - (C)] / (A)	0.0161%
Present value of contributory earnings (2028+) as at 31 December 2027	(E) [1]	$31,811 billion
Increase in liabilities due to participation on or after effective date (1 January 2019) as at 31 December 2027	(F) [2]	$3,418 million
Net accumulated assets over period 2019-2027 for participation from 2019 onward as at 31 December 2027	(G) [3]	$145 million
Permanent full funding rate (2028+), before rounding	(H) = [(F) - (G)] / (E)	0.0103%
Sum of permanent full funding rate (2028+) and temporary full funding rate (2028 to 2033 in respect of pre-2019 participation), before rounding	(I) = (D) + (H)	0.0263%
Sum of permanent full funding rate (2028+) and temporary full funding rate (2028 to 2033 in respect of pre-2019 participation), after rounding	(I) after rounding as per regulations	0.03%
Permanent full funding rate (2028+), after rounding	(H) after rounding as per regulations	0.01%

(1) Present values are based on contributory earnings as projected under this report and using a discount rate equal to the assumed overall rate of return on base CPP assets.
(2) Increase in liabilities resulting from the increase in benefits due to participation prior to the effective date (B) and participation on or after the effective date (F), using a discount rate equal to the assumed overall rate of return on base CPP assets.
(3) Represents accumulation of assets net of expenditures over the period 2019-2027 in respect of amendments for participation prior to the effective date (C) and participation on or after the effective date (G), using the full funding rates determined under the prior (29th, 30th, and 31st) CPP Actuarial Reports.

C.2.1.3 Minimum contribution rate

The minimum contribution rate (MCR) is the sum of the rounded steady-state contribution rate and the rounded full funding rate. For this report, the MCR is determined to be 9.21% for years 2028 to 2033 and 9.19% for 2034 and thereafter. This compares to the MCR under the 31st CPP Actuarial Report of 9.56% for years 2025 to 2033 and 9.54% for 2034 and thereafter. The MCR will be recalculated for the next triennial actuarial report to be prepared as at 31 December 2027. It may also be recalculated at any other date to reflect the cost impact of any proposed amendments to the CPP statute.

As the MCR determined for this 32nd CPP Actuarial Report is less than the statutory contribution rate of 9.9%, the insufficient rates provisions in subsections 113.1(11.05) to (11.15) of the CPP statute do not apply. Therefore, in the absence of specific action by the federal and provincial Finance Ministers, the statutory contribution rate will remain at 9.9% for the year 2025 and thereafter as scheduled.

C.2.2 Additional CPP

The financing objective of the additional Plan is stated in the CPP statute in terms of the first and second additional minimum contribution rates (FAMCR and SAMCR) that must be determined before and after taking into account the full funding of any increased or new additional benefits.

C.2.2.1 Additional minimum contribution rates

The AMCRs are defined specifically in the *Calculation of Contribution Rates Regulations, 2021* as the lowest level contribution rates, applicable after the end of the review period, to the nearest 0.0001 percentage points, such that the following conditions are met:

- the present value of projected additional open group obligations is less than or equal to the projected additional assets and present value of projected additional contributions (open group assets);
- the projected assets/expenditures (A/E) ratio of the additional Plan is the same in the 50th and 60th years following the end of the review period, but no earlier than in the years 2088 and 2098, respectively; and
- the SAMCR equals the FAMCR multiplied by the ratio of the earnings replacement rate of the second tier of the additional Plan to the replacement rate of the first tier (33.33% / 8.33%, which equals 4 (rounded)).

In regard to the first condition above, an open group is defined as one that includes all current and future participants of a plan, where the plan is considered to be ongoing into the future, that is, over an extended time horizon. This means that future contributions of current and new participants and their associated benefits are included in order to determine whether current assets and future contributions will be sufficient to pay for all future expenditures.

To determine the open group assets of the additional Plan, future additional contributions (using additional minimum contribution rates) of current and future contributors are projected using the best-estimate assumptions of this report. In order to determine their present value, the projected additional contributions are discounted using the assumed nominal rate of return on the additional CPP assets. This present value is added to the invested assets of the additional Plan to obtain the total open group assets.

To determine the actuarial obligations of the additional Plan on an open group basis, future additional expenditures with respect to current and future additional CPP participants are

projected using the best-estimate assumptions of this report. The open group actuarial obligations are then the present value of these projected additional expenditures discounted using the assumed nominal rate of return on additional CPP assets.

The AMCRs, which fully fund the additional CPP, are determined taking into account the amendments in respect of the additional Plan, as introduced under the *Budget Implementation Act, 2018, No. 1*, mentioned earlier. These amendments are described in the 29th CPP Actuarial Report.[19]

Table 101 shows that the AMCRs satisfy the first condition above. The table shows that, as at 31 December 2024, the additional CPP open group assets are projected to be 104.3% of the open group actuarial obligations. There are $54 billion invested additional CPP assets as at 31 December 2024, and the total open group assets are equal to the current invested assets plus the present value of future additional contributions of current and future participants of the Plan. The open group actuarial obligations are equal to the sum of the present value of future additional benefits for current and future participants of the additional CPP and the benefits in pay, which amounts to $912 billion as at 31 December 2024. The net result is an actuarial excess of $39 billion as at 31 December 2024.

Table 101 Additional CPP balance sheet (open group basis)
(2.01% and 8.04% first/second additional minimum contribution rates, $ billion)

Balance sheet item	As at 31 December 2024
Current assets	54.2
Future contributions	896.5
Total assets (a)	950.7
Actuarial obligations (b) (1)	911.6
Asset Excess (shortfall) (a) – (b)	39.1
Assets as percentage of obligations (a)/(b)	104.3%

(1) Obligations include operating expenses.

For this report, the A/E ratio should be the same in 2088 and 2098, and the corresponding A/E ratio for those years is equal to 24.5.

The current triennial review period of the CPP is 2025 to 2027. During the review period, the statutory additional contribution rates apply. The statutory first additional contribution rate, in respect of earnings between the YBE and YMPE, is 2.0%, and the statutory second additional contribution rate, in respect of earnings between the YMPE and the YAMPE, is 8.0%.

The FAMCR and SAMCR are applicable for the year 2028 and thereafter. The FAMCR and SAMCR are rounded to the nearest 0.01% and are determined for this report to be 2.01% and 8.04% for 2028 and thereafter.

As the AMCRs determined for this report do not deviate materially from the statutory additional

contribution rates, the default provisions of the *Additional Canada Pension Plan Sustainability Regulations* do not apply. Therefore, in the absence of specific action by the federal and provincial governments, the statutory first and second additional contribution rates will remain at 2.0% and 8.0%, respectively, for 2025 and thereafter as scheduled.

C.3 Evolution of assets to expenditures ratios

An important measure of the base and additional Plans' financial states is the ratio of assets at the end of one year to the expenditures of the next year (the A/E ratio).

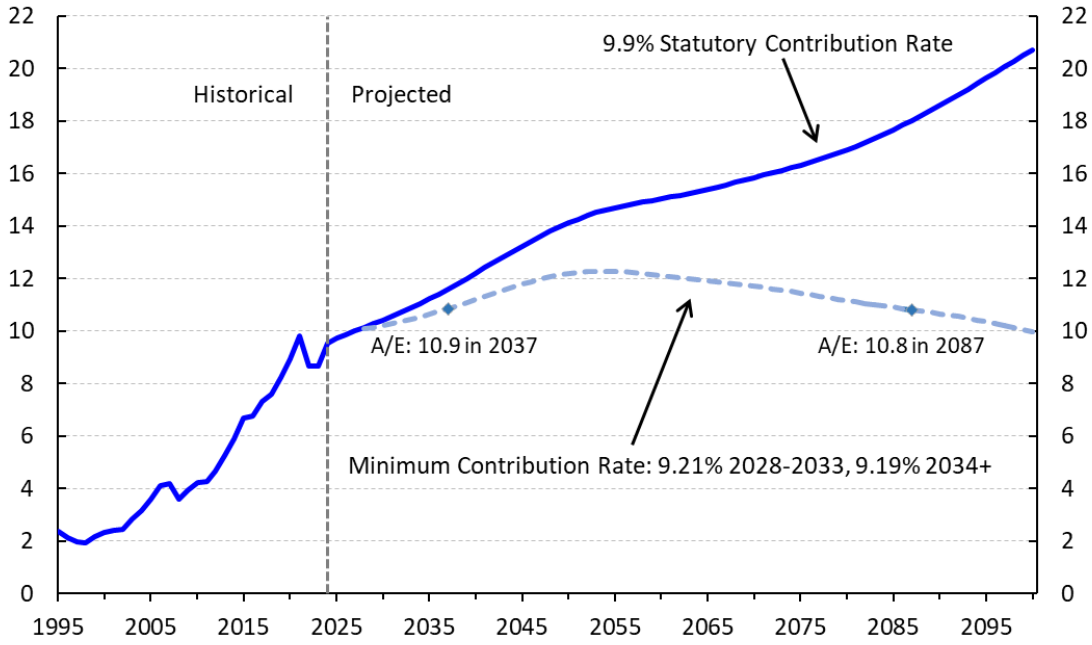
C.3.1 Base CPP

As can be seen in Chart 12, under the statutory contribution rate of 9.9%, the A/E ratio for the base Plan is projected to be 9.7 in 2025 and then increases to 14.1 by 2050 and to 20.7 by 2100.

As the statutory rate of 9.9% is greater than the MCR of 9.21% for years 2028 to 2033 and 9.19% thereafter, the A/E ratios under the statutory rate are higher than the ratios under the MCR. The A/E ratios under the MCR for year 2028 and thereafter are shown in Chart 12 for comparison. The ratios under the MCR in years 2037 and 2087 are nearly equal, at a value of about 10.9, as indicated in the chart. This is because the years 2037 and 2087 are the target years for the steady-state contribution rate of 9.18%, under which the A/E ratios are equal for those years at a value of 10.9.

There is a projected initial slowdown in the growth of the A/E ratio until the early 2030s under the statutory rate of 9.9%. This is caused by the retirement of the baby boom generation, which increases the cash outflows of the Plan. The existence of a large pool of assets enables the base Plan to absorb the increased outflow and maintain the contribution rate at 9.9%.

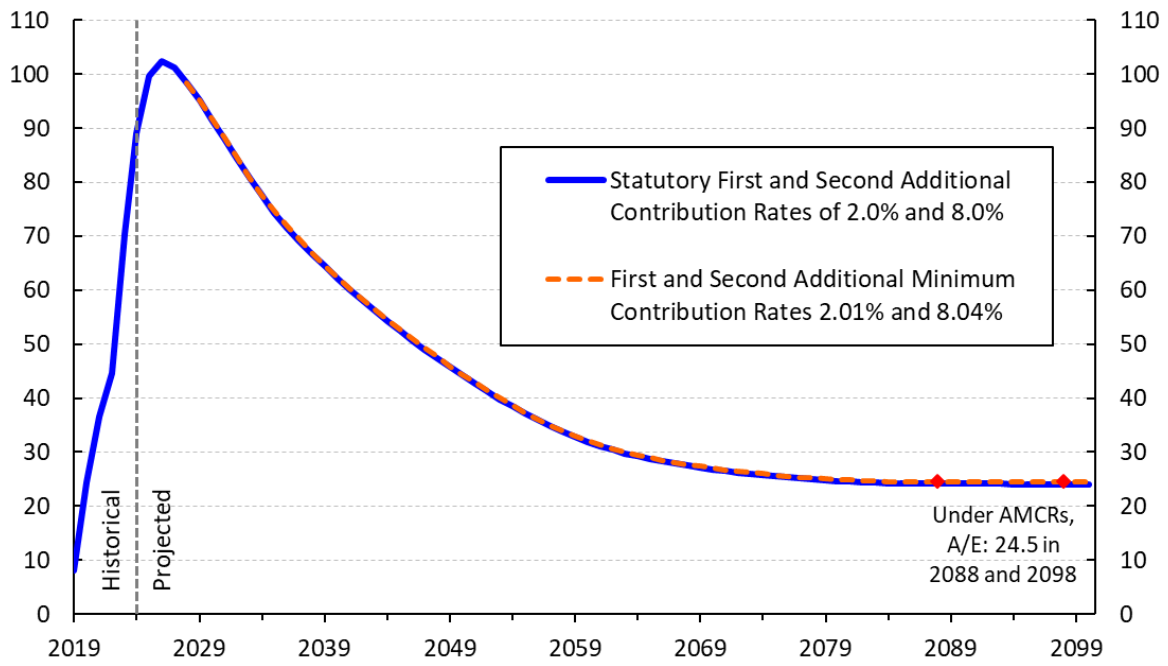
Chart 12 Assets/Expenditures ratio – base CPP
(statutory and minimum contribution rates)



C.3.2 Additional CPP

As shown in Chart 13, under the statutory additional contribution rates of 2.0% (phased in over 2019-2023) and 8.0% (as of 2024), the A/E ratio of the additional CPP increased significantly during the early years of the additional Plan and is projected to remain high as assets rapidly accumulate and benefit expenditures are low. As the additional Plan matures and benefit expenditures increase, the A/E ratio decreases and stabilizes at a level of about 24 by the mid-2080s. The A/E ratio under the AMCRs, also shown in Chart 13, is projected to be slightly higher than under the statutory rates, since the AMCRs are slightly higher than the statutory rates. The target years of 2088 and 2098, which are used in the determination of the AMCRs, are marked in the chart, and the corresponding A/E ratio is 24.5.

Chart 13 Assets/Expenditures ratio – additional CPP
(statutory and additional minimum contribution rates) (1)



(1) The statutory first additional contribution rate of 2.0% was phased in over the five-year period 2019-2023 and applies to earnings between the YBE and YMPE. The statutory second additional contribution rate of 8.0% is effective as of 2024 and applies to earnings between the YMPE and YAMPE.

C.4 Open group balance sheets under the statutory contribution rates

The base and additional CPP balance sheets presented in this section are prepared using an open group approach and the statutory contribution rates of each component. The open group balance sheet methodology is described earlier, in section C.2.2.1 of this appendix.

The choice of the methodology used to produce a social security system's balance sheet needs to be consistent with the financing objectives of the system.

The base CPP is partially funded. Partially funded plans like the base CPP represent a social contract where, in any given year, current contributors allow the use of their contributions to pay current beneficiaries' benefits. This social contract grants current and former contributors a stake in the future contributions of others. As such, the proper assessment of the financial sustainability of partially funded plans by means of their balance sheets should reflect these claims. The open group approach to the balance sheet does account explicitly for these claims by considering the benefits and contributions of both current and future participants.

As discussed in section C.2.1.3, the prescribed financing objectives of the base CPP are stated in terms of the MCR, which is determined using future projections of revenues and expenditures that consider both current and future CPP participants. In other words, the prescribed financing

objectives of the base CPP rely on open group projections.

The additional CPP is a fully funded plan. However, as discussed in section C.2.2.1, the prescribed financing objectives of the additional CPP are stated in terms of the AMCRs which are determined using open group projections.

The actuarial balance sheets of the base and additional Plans under their respective statutory rates are complementary to the MCR and AMCRs in assessing the long-term financial sustainability of the two components of the CPP. That is to say that although the key prescribed financial measures for evaluating the components of the CPP are the MCR and AMCRs, specifically, their adequacy and stability over time, other indicators such as the open group balance sheets under the statutory rates could be used in combination with the minimum rates to assess the sustainability of the base and additional Plans.

C.4.1 Base CPP

The actuarial position of the base Plan as at 31 December 2024 and 31 December 2030 under the open group approach and the statutory contribution rate of 9.9% is presented in Table 102. The open group actuarial assets and obligations of the base CPP are determined similarly as for the additional CPP, as described earlier in section C.2.2.1, but using the base CPP projected contributions and expenditures and the expected rate of return on base CPP assets as a discount rate. To obtain the asset excess (shortfall) of the base CPP, the base Plan's actuarial obligations are deducted from the open group assets at the valuation date. [20]

Table 102 Base CPP balance sheet (open group basis)
(statutory contribution rate of 9.9%, $ billion)

Balance sheet item	As at 31 December 2024	As at 31 December 2030
Current assets	650.6	962.8
Future contributions	2,827.7	3,517.3
Total assets (a)	3,478.3	4,480.1
Actuarial obligations (b) (1)	3,322.5	4,261.7
Asset excess (shortfall) (a) – (b)	155.9	218.3
Assets as percentage of obligations (a)/(b)	104.7%	105.1%

(1) Obligations include operating expenses.

C.4.2 Additional CPP

The prescribed regulations set out the determination of the ratio of the actuarial assets to obligations of the additional Plan on an open group basis in order to determine the AMCRs as described earlier in section C.2.2.1. In this section, the open group additional CPP balance sheet is

20 As at December 31, 2024, under the closed group approach, the actuarial obligations of the base Plan are equal to $1,621.8 billion, the assets are $650.6 billion, and the assets shortfall is equal to $971.2 billion.

prepared under the statutory additional contribution rates.[21]

The actuarial position of the additional Plan as at 31 December 2024 under the open group approach and additional minimum contribution rates is presented in Table 101. The figures shown in Table 101 differ from those shown below in Table 103 since different contribution rates are used. The statutory additional contribution rates are used for Table 103, whereas the AMCRs are used for Table 101.

To obtain the asset excess (shortfall) of the additional Plan, the additional Plan's actuarial obligations are deducted from the open group assets at the valuation date. As shown in Table 103, the ratio of the additional Plan's assets to its obligations using the statutory additional contribution rates is determined for this report to be 103.8% as at 31 December 2024 and 102.7% as at 31 December 2030.

Table 103 Additional CPP balance sheet (open group basis)
(statutory first and second additional contribution rates of 2.0% and 8.0%, $ billion)

Balance sheet item	As at 31 December 2024	As at 31 December 2030
Current assets	54.2	213.7
Future contributions	892.3	1,089.1
Total assets (a)	946.5	1,302.8
Actuarial obligations (b) (1)	911.6	1,269.1
Asset excess (shortfall) (a) – (b)	35.0	33.8
Assets as percentage of obligations (a)/(b)	103.8%	102.7%

(1) Obligations include operating expenses.

21 As at 31 December 2024, under the closed group approach, the actuarial obligations of the additional Plan are equal to $55.4 billion, the assets are $54.2 billion, and the assets shortfall is equal to $1.1 billion.

Appendix - D Detailed reconciliation with previous triennial report

D.1 Base CPP

The results presented in this report differ from those previously projected for a variety of reasons. Differences between the actual experience for 2022 through 2024 and that projected in the 31st CPP Actuarial Report for the same period were addressed in the Reconciliation with Previous Triennial Report – Base CPP section 7.1 of this report. Since historical results provide the starting point for the projections shown in this report, these differences have an effect on the projections. This section provides more details on the impact of the experience update and changes in the assumptions and methodology.

A reconciliation of the change in the MCR of 9.56% for years 2025 to 2033 and 9.54% thereafter, as presented in the 31st CPP Actuarial Report, to the MCR of 9.21% for years 2028 to 2033 and 9.19% thereafter determined for this report is provided in Table 104.

This report reflects a number of improvements made to the methodology used in previous reports. The main methodology changes were related to improvements in modeling non-permanent residents (NPR). The overall impact from the changes in methodology decreases the MCR by about 0.11 percentage points.

The experience over the period 2022 to 2024 was better than anticipated overall, which lowered the MCR. In particular:

- The main contributing factor for the decrease in the MCR was better than expected investment experience, which lowers the MCR by 0.21 percentage points.
- Higher than anticipated growth in total employment earnings, mainly as a result of higher than anticipated net migration, decreases the MCR by 0.03 percentage points.
- Overall lower than expected benefit expenditures, mainly due to lower retirement benefits resulting from lower than assumed take-up rates over the intervaluation period, as well as lower than expected operating expenses, decreases the MCR by 0.03 percentage points.

Changes made to the key best-estimate assumptions since the previous triennial report were outlined in Table 1 of section 4 of this report. The effects of these changes on the MCR are also shown in Table 104 and are summarized below.

- The assumed total fertility rates are lower than those assumed in the previous triennial report, and as such, increase the MCR by 0.22 percentage points.
- The higher mortality improvement rates assumed for this report increase the MCR by 0.08 percentage points. However, other changes in mortality assumptions, including the initial lower mortality rates due to Statistics Canada's data revision, reduce the MCR by 0.06 percentage points.
- The assumed level of net migration excluding NPR is higher over the projection period than in the previous triennial report, and this decreases the MCR by 0.15 percentage points. In

addition, changes to the assumption on the level of NPR as a percentage of the population result in a decrease in the MCR of 0.07 percentage points.

- The changes to the labour market assumptions result in an increase to the MCR of 0.05 percentage points.
- The decrease in the real wage growth assumption increases the MCR by 0.04 percentage points.
- Several changes were made in respect of real rates of return assumptions compared to the previous triennial report. These changes include a different initial and ultimate asset mix, and different ultimate rates of return for certain asset classes. These changes decrease the MCR by 0.07 percentage points.
- Changes in retirement benefit-related assumptions increase the MCR by 0.08 percentage points.
- Changes to the disability benefit assumptions decrease the MCR by 0.03 percentage points.

Some other assumptions, which are described in Appendix - B, were also changed. Overall, the changes in these other assumptions had the effect of decreasing the MCR by 0.03 percentage points.

A progression of the MCR over time based on the steady-state contribution rate target years of future triennial valuation reports and using the best-estimate assumptions of this report is shown in Table 15 of the Results – Base CPP section 5.5 of this report. As shown in that table, the MCR is projected to remain relatively stable over time.

Table 104 Reconciliation of changes in minimum contribution rate - base CPP [1],[2]
(% of contributory earnings)

		Full funding		MCR	
	Steady-state rate	2028-2033	2034+	2028-2033	2034+
31st CPP Actuarial Report - after rounding	9.53	0.03	0.01	9.56	9.54
31st CPP Actuarial Report - before rounding	9.526	0.0346	0.009	9.560	9.535
I. Improvements in methodology	(0.111)	0.000	0.001	(0.111)	(0.110)
II. Experience update (2022-2024)					
Demographic	(0.009)	0.001	0.000	(0.007)	(0.009)
Economic	(0.025)	0.000	0.000	(0.025)	(0.025)
Benefits	(0.029)	(0.008)	0.000	(0.037)	(0.029)
Investments	(0.214)	0.001	0.000	(0.214)	(0.214)
Subtotal:	(0.277)	(0.006)	0.000	(0.283)	(0.277)
III. Changes in assumptions					
Fertility	0.219	0.000	0.000	0.219	0.219
Mortality	0.015	0.002	0.000	0.017	0.015
Net migration	(0.218)	(0.001)	0.000	(0.219)	(0.218)
Labour market	0.051	(0.001)	(0.002)	0.050	0.049
Price increases	0.000	0.000	0.000	0.000	0.000
Real wage increase	0.039	0.000	0.000	0.040	0.040
Real rates of return	(0.070)	0.000	0.000	(0.071)	(0.070)
Retirement	0.077	0.000	0.001	0.077	0.078
Disability	(0.032)	0.001	0.001	(0.031)	(0.031)
Other assumptions	(0.032)	(0.001)	0.000	(0.032)	(0.032)
Subtotal:	0.050	0.000	0.000	0.049	0.050
IV. Others (Change in funding targets from 2034-2084 to 2037-2087)	(0.007)	(0.002)	0.000	(0.009)	(0.007)
Total of I to IV	(0.346)	(0.008)	0.001	(0.354)	(0.345)
Rates before rounding	9.180	0.026	0.010	9.206	9.190
Rounded rate, in accordance with the *Calculation of Contribution Rates Regulations, 2021*	9.18	0.03	0.01	9.21	9.19
32nd CPP Actuarial Report	9.18	0.03	0.01	9.21	9.19

(1) Components may not sum to totals due to rounding.
(2) For each triennial CPP actuarial report, the MCR is determined for all years following the three-year review period in which the report is prepared, with the statutory contribution rate applied during the review period. For the 31st CPP Actuarial Report, the MCR was determined for the year 2025 and thereafter, with the statutory rate of 9.9% applied for the 2022 to 2024 review period. For the 32nd CPP Actuarial Report, the MCR is determined for 2028 onward, with 9.9% applied for the 2025 to 2027 review period.

D.2 Additional CPP

Differences between the actual experience for 2022 through 2024 and that projected in the 31st CPP Actuarial Report for the same period were addressed in the Reconciliation with Previous Triennial Reports –Additional CPP section 0 of this report. Since historical results provide the starting point for the projections shown in this report, these differences have an effect on the projections. This section provides more details on the impact of the experience update and changes in the assumptions and methodology.

A reconciliation of the change in the FAMCR of 1.97% and SAMCR of 7.88%, as presented in the 31st CPP Actuarial Report, to the FAMCR of 2.01% and SAMCR of 8.04% for this report is provided in Table 105.

The experience over the period 2022 to 2024 was better than anticipated overall, which lowered the AMCRs. The main contributing factor was better than expected investment experience, which lowered the FAMCR and SAMCR by 0.01 and 0.04 percentage points, respectively.

Changes made to the key best-estimate assumptions since the previous triennial report were outlined in Table 1 of section 4 of this report. The main effects of these changes on the AMCRs are also shown in Table 105 and are summarized below.

- The higher mortality improvement rates assumed for this report increase the FAMCR and SAMCR by 0.037 and 0.148 percentage points, respectively. However, other changes in mortality assumptions, including the initial lower mortality rates due to Statistics Canada's data revision, reduce the FAMCR and SAMCR by 0.009 and 0.036 percentage points, respectively.
- The decrease in the real wage growth assumption causes the FAMCR and SAMCR to decrease by 0.031 percentage points and 0.124 percentage points, respectively. The AMCRs decrease instead of increasing as for the base plan MCR due to the different financing approaches.
- Several changes were made in respect of real rates of return assumptions compared to the previous triennial report. These changes include a different initial and ultimate asset mix to reflect more recent information from the CPPIB on the composition of the Supplementary pool, and different ultimate rates of return for certain asset classes. These changes increase the FAMCR and SAMCR by 0.049 percentage points and 0.197 percentage points, respectively.
- Changes in retirement benefit-related assumptions increased the FAMCR and SAMCR by 0.025 and 0.098 percentage points, respectively.

Some other assumptions, which are described in Appendix - B, were also changed but had small impacts.

A progression of the AMCRs over time based on the AMCR target years of future triennial valuation reports and using the best-estimate assumptions of this report is shown in Table 26 of this report. As shown in that table, the AMCRs are projected to remain relatively stable over time.

Table 105 Reconciliation of changes in additional minimum contribution rates [1]
(% of additional CPP contributory earnings)

	First additional minimum contribution rate	Second additional minimum contribution rate
31st CPP Actuarial Report - after rounding	1.97	7.88
31st CPP Actuarial Report - before rounding	1.970	7.879
I. Improvements in methodology	0.004	0.014
II. Experience update (2022-2024)		
Demographic	(0.004)	(0.016)
Economic	(0.004)	(0.018)
Benefits	(0.002)	(0.008)
Investments	(0.010)	(0.040)
Subtotal:	(0.020)	(0.082)
III. Changes in assumptions		
Fertility	(0.011)	(0.044)
Mortality	0.028	0.112
Net migration	0.009	0.037
Labour market	(0.006)	(0.026)
Price increases	0.000	0.000
Real wage increase	(0.031)	(0.124)
Real rates of return	0.049	0.197
Retirement	0.025	0.098
Disability	0.001	0.003
Other assumptions	(0.006)	(0.025)
Subtotal:	0.057	0.229
Total of I to III	0.041	0.162
Rates before rounding	2.010	8.041
Rounded rates, in accordance with the *Calculation of Contribution Rates Regulations, 2021*	2.01	8.04
32nd CPP Actuarial Report	2.01	8.04

(1) Components may not sum to totals due to rounding.

Appendix - E Uncertainty of results

E.1 Introduction

This actuarial report on the Canada Pension Plan is based on the projection of its revenues and expenditures for both of its components, the base and additional CPP, over a long period of time. The information required by statute, which is presented in the Results sections 5 and 6 of this report, has been derived using best-estimate assumptions regarding future demographic, economic, and investment trends. Given the length of the projection period and the number of assumptions required, it is unlikely that actual future experience will develop precisely in accordance with the best-estimate projections.

The inherent uncertainty of the projections is amplified in the current global context. Emerging and evolving trends such as the impacts of climate change, shifting geopolitical dynamics, evolving trade policies, and rapid technological advancements introduce significant variability into economic, demographic, and investment outlooks.

The objective of this section of the report is to illustrate the sensitivity of the financial states of the base and additional Plans to changes in the future demographic, economic, and investment outlooks.

For the additional CPP, there is a stronger link between contributions paid by individuals and the benefits they will receive. As a result, while some assumptions regarding factors such as fertility, migration, and labour force participation affect the cash flows and amount of assets of the additional Plan, they, in general, do not have a major impact on the AMCRs. In comparison, these assumptions could have a significant impact on the MCR of the base CPP. Other assumptions have a more significant impact on the AMCRs for the additional CPP, such as the real rate of return. This again is attributable to the different financing approaches of the base and additional CPP.

Section E.2 examines the sensitivity of the base and additional CPP MCRs to intervaluation investment experience, while section E.3 presents sensitivity tests on individual long-term assumptions that are derived based on judgment or stochastic modeling techniques. Next, sections E.4 builds on the individual sensitivity tests performed in section E.3 by combining various assumptions of the individual tests to create scenarios of higher and lower long-term economic growth. The combination of the individual sensitivity test assumptions is not intended to represent probable scenarios, but rather to illustrate the potential high-level impacts from different economic environments. Finally, section E.5 makes use of scenario analysis to illustrate certain risks that are relevant in the current context. Since the additional CPP is still in its early stages, it focuses on the base CPP only. These scenarios are prepared for illustration purposes only and are not meant to represent forecasts or predictions.

E.2 Sensitivity to intervaluation investment experience

E.2.1 Context

The assets of the CPP are invested by the CPPIB through a diversified portfolio that respects the

risk limits of its reference portfolios. More information on how the CPPIB invests assets of the base and additional CPP according to their respective reference portfolios can be found in Appendix - B.

In settings its risk targets and making investment decisions, the CPPIB adopts a long-term approach. However, given the level of risk reflected in the CPPIB's portfolios, short-term returns can be volatile and affect the starting value of assets used to calculate the MCRs and AMCRs every three years. The starting value of assets, and therefore the intervaluation investment experience, can have a significant impact on the Plan's MCRs.

The purpose of this section is to highlight the sensitivity of the Plan's MRCs to intervaluation investment experience.

E.2.2 Base CPP

Table 106 shows what the MCR of this report would have been based on different levels of assets as at 31 December 2024, while maintaining the same best-estimate assumptions. It is meant to provide a simple illustration of the sensitivity of the MCR to the starting value of assets.

Based on the actual assets as at 31 December 2024 of $651 billion, the MCR for year 2034 and thereafter is 9.19%. However, if assets as at 31 December 2024 had been 10% lower, the MCR would have increased by 0.21 percentage points to 9.40%, and if they had been 10% higher, the MCR would have decreased by 0.22 percentage points to 8.97%. Assets would have had to be at least 33% lower for the MCR to be above the statutory rate of 9.9%.

Table 106 Base CPP MCR as at December 31, 2024 based on different levels of starting assets

Level	Assets (billion $)	Average nominal return,2022-2024 (%)	MCR at 31 December 2024 (%) (1)	Difference with actual (%)
20% lower	520	(2.6)	9.62	0.43
10% lower	586	1.4	9.40	0.21
Actual	651	4.9	9.19	0.00
10% higher	716	8.4	8.97	(0.22)
20% higher	781	11.6	8.76	(0.43)

(1) The MCR in this table refers to the rate applicable for 2034 and thereafter.

Even though the base CPP relies more heavily on contributions than on investment income, the MCR can change significantly from one valuation to the next due to investment experience alone. The sensitivity to investment returns for the base CPP has increased since the 31st CPP Actuarial Report due to stronger than expected investment performance.

To put the variability in the MCR due to intervaluation investment experience into context, a stochastic analysis of investment returns was performed. It is used to determine the distribution of the MCR as a function of intervaluation investment experience. For this purpose, 10,000 paths of returns were generated and probability distributions of the resulting MCR were determined.

It is projected using the assumed asset allocation and correlations between asset classes, as well

as the standard deviations and expected returns for each asset class.

Based on the best-estimate assumptions of this report and as shown in Table 15, the MCR at the next valuation as at 31 December 2027 is expected to be 9.19% for year 2034 and after. Table 107 presents the estimated probability of the MCR as at 31 December 2027 falling into certain ranges based on the stochastic projection of investment returns during the three-year intervaluation period 2025-2027. All other assumptions are in line with the best-estimate assumptions of this report.

Table 107 Probability distribution of MCR as at 31 December 2027 based on 2025-2027 intervaluation investment experience
(percentages)

MCR at 31 December 2027 (1)	Probability
Less than 8.84	22
8.84 - 9.03	15
9.04 - 9.34	28
9.35 - 9.54	15
9.55 - 9.9	15
Above 9.9	5

(1) The MCR in this table refers to the rate applicable for 2034 and thereafter.

Based on the results, there is a 72% probability that the MCR at the next valuation as at 31 December 2027 will have a difference of more than 15 percentage points relative to the best-estimate MCR of 9.19% (i.e. MCR outside of the 9.04% to 9.34% range) due to investment experience alone.

Given the current level of the MCR, the probability of the MCR exceeding the statutory rate of 9.9% at the next valuation as at 31 December 2027 is low at only 5%.

E.2.3 Additional CPP

Since the additional CPP is still in its early years, the intervaluation investment experience doesn't currently have a material impact on the AMCRs.

However, given its financing approach and the fact that the additional CPP assets are expected to grow rapidly over the next decades, investment experience is expected to eventually become one of the main drivers behind additional Plan surpluses or deficits. The impact of investment experience on the AMCRs will therefore become more pronounced over time.

This subsection illustrates sensitivities similar to those presented in the previous subsection on the base CPP, but instead focuses on dates in the future when the additional Plan will be more mature. For this purpose, dates of 31 December 2045 and 31 December 2048 were selected, which are close to thirty years after the introduction of the additional Plan.

Table 108 shows the estimated impact on the FAMCR of different levels of assets as at 31 December 2045, while maintaining all other assumptions in line with the best-estimate

assumptions of this report. As the SAMCR is four times the value of the FAMCR, the table shows only the FAMCR.

Based on the best-estimate assumptions of this report, the additional CPP assets as at 31 December 2045 are expected to be $1,005 billion, and the FAMCR as at 31 December 2045 is expected to be 2.02%. However, if assets as at 31 December 2045 were 10% lower, the FAMCR would increase by 0.11 percentage points to 2.13%. If starting assets as at 31 December 2045 were 10% higher, the FAMCR would decrease by 0.11 percentage points to 1.91%.

Compared to Table 106 in the previous subsection, on a relative basis, the additional Plan is much more sensitive to the level of assets than the base CPP. For example, assets that are 20% lower result in a relative increase of 4.7% in the base CPP MCR (9.19% to 9.62%) compared to a relative increase of 11.1% for the additional CPP FAMCR (2.02% to 2.25%). This is line with the additional Plan's financing approach that relies more heavily on investment income than the base CPP.

Table 108 Additional CPP FAMCR as at December 31, 2045 based on different levels of starting assets

Level	Assets (billion $)	Average nominal return, 2043-2045 (%)	FAMCR at 31 December 2045 (%) (1)	Difference with best-estimate (%)
20% lower	804	(2.3)	2.25	0.23
10% lower	905	1.8	2.13	0.11
Best-estimate	1,005	5.5	2.02	0.00
10% higher	1,106	9.1	1.91	(0.11)
20% higher	1,206	12.4	1.80	(0.23)

(1) The FAMCR in this table refers to the rate applicable as at 1 January 2049 and thereafter. The SAMCR is equal to four times the FAMCR.

For the additional CPP, investment experience could cause the AMCRs to deviate from their statutory rates of 2.0% and 8.0% into various ranges. As per the *Additional Canada Pension Plan Sustainability Regulations*, the FAMCR may fall between 1.7% and 2.2% without requiring immediate action from 2024 to 2038. From 2039 onward, this "No Action Required" range is reduced to between 1.8% and 2.1%. The corresponding ranges for the SAMCR are those of the FAMCR with the boundary values multiplied by four.

As the additional Plan assets are relatively low over the intervaluation period 2025-2027, it is unlikely that short-term investment experience would cause the AMCRs to fall outside the "No Action Required" ranges prescribed by the proposed *Additional Canada Pension Plan Sustainability Regulations*. However, as mentioned previously, the impact of intervaluation investment experience will become more important as the plan matures.

To put this into context, a stochastic analysis similar to the one described in the previous subsection on the base CPP was performed. As mentioned above, based on the best-estimate assumptions of this report, the FAMCR as at 31 December 2045 is expected to be 2.02%. The FAMCR in the following valuation report as at 31 December 2048 is also expected to be 2.02%, but it could deviate from this level due to the 2046-2048 investment experience alone. Based on the stochastic analysis, the probability of the FAMCR as at 31 December 2048 falling outside the 1.8% to 2.1% range due to investment experience during the 2046-2048 period is 51%. As the

best-estimate FAMCR as at 31 December 2045 exceeds the statutory rate, there is a 30% probability of the FAMCR as at 31 December 2048 being above 2.1%, which is greater than the 21% probability of it being below 1.80%.

Table 109 Probability distribution of FAMCR as at 31 December 2048 based on 2046-2048 investment returns experience
(percentages)

FAMCR at 31 December 2048 (1)	Probability
Below 1.70	10
1.70 to 1.79	11
1.80 to 2.10	49
2.11 to 2.20	13
Above 2.20	17

(1) The FAMCR in this table refers to the rate applicable as at 1 January 2052 and thereafter. The SAMCR is equal to four times the FAMCR.

E.3 Individual sensitivity tests

The key best-estimate assumptions used for the projections in this report are described in Appendix - B. Individual sensitivity tests have been performed that consist of projecting the financial states of the base and additional CPP using alternative individual assumptions to illustrate a reasonable range of how experience could vary from the best-estimate projections. The individual results cannot simply be combined, because a change in any one particular assumption may have an impact on other assumptions to varying degrees.

All individual sensitivity tests, except the one for the real rates of return, are deterministic and are based on judgment. The tests for the real rates of return for the base and additional CPP are developed using a stochastic approach. The ranges analyzed for each assumption are described below.

The sensitivity tests were performed by varying most of the key assumptions individually and by keeping the remaining assumptions at their best-estimate levels. Each sensitivity test was categorized as either a lower-cost scenario or a higher-cost scenario. In the lower-cost scenarios for the base and additional CPP, the alternative assumptions have the effect of reducing the MCR and AMCRs. Conversely, the assumptions for the higher-cost scenarios for each component of the CPP increase the minimum contribution rates. It should also be noted that for both the base and additional Plans, once the lower- and higher-cost assumptions reach their ultimate values, they are held constant for the rest of the 75-year projection period, and both components of the CPP are assumed to remain in their current forms.

It is possible that a lower-cost scenario for the base CPP may be a higher-cost scenario for the additional CPP, and vice versa. This is the case, for example, for the real wage increase test. The opposite effects for the base and additional CPP are attributable to the different financing approaches of the two components.

The different financing approaches also mean that the relative sensitivity of changing a given assumption can differ between the base CPP and additional CPP. For example, although investment income is an important source of revenue for both components of the CPP, the additional CPP relies more heavily on investment income than the base CPP and is therefore more sensitive to the assumption on the real rate of return on investments. The base CPP on the other hand is more sensitive to changes in fertility and migration.

Table 110 summarizes the alternative assumptions used in the individual sensitivity tests. It is followed by a brief discussion of these tests.

Table 110 Individual sensitivity test assumptions - Canada

Assumptions	Lower cost	Best-estimate	Higher cost
Total fertility rate [1]	1.65	1.35	1.05
Mortality: Canadian life expectancy at age 65 in 2050 with future improvements - males	20.8	23.4	25.9
Mortality: Canadian life expectancy at age 65 in 2050 with future improvements - females	23.2	25.7	28.1
Net migration rate [1] [2]	0.92%	0.72%	0.52%
and non-permanent residents level	4%	2.5%	1%
Rate of increase in prices	3.0%	2.0%	1.0%
Real wage increase - base CPP	1.4%	0.8%	0.2%
Real wage increase - additional CPP	0.2%	0.8%	1.4%
75-year average real rate of return - base CPP	5.65%	4.05%	2.45%
75-year average real rate of return - additional CPP	4.73%	3.53%	2.33%
CPP disability incidence rates (per 1,000 eligible) - males [1]	1.70	2.70	3.70
CPP disability incidence rates (per 1,000 eligible) - females [1]	2.40	3.40	4.40

(1) These tests do not significantly impact the AMCRs.
(2) The net migration rate includes changes in non-permanent residents.

The following provides some description on the selection of assumptions for lower- and higher-cost scenarios.

- Fertility Rates: This test is presented only for the base CPP. Experience of all ten provinces was used to generate the lower- and higher-cost scenarios over the projection period.
- Mortality Rates: Under the lower-cost scenario, mortality is assumed to improve at a slower rate than under the best-estimate scenario, with ultimate values of the mortality improvement rates gradually reduced to 0% for all ages in 2039. Under the higher-cost scenario, mortality is assumed to improve at a faster pace than under the best-estimate scenario with the ultimate mortality improvement rates being doubled compared to their best-estimate values.
- Net Migration Rates and Non-Permanent Residents Levels: This test is presented only for the base CPP. For the lower-cost assumption, the ultimate net migration rate is assumed to increase by 0.20 percentage points while the ultimate level of non-permanent residents as a percentage of population is assumed to increase to 4.0%. For the higher-cost assumption, the ultimate net migration rate is assumed to decrease by 0.20 percentage points while the ultimate level of non-permanent residents as a percentage of population is assumed to decrease to 1.0%. The lower-cost and higher-cost assumptions were selected by analyzing

historical data and trends.

- Price Increases: Price increases affect nominal wages, nominal returns, and pension indexation. The higher-cost and lower-cost assumptions are selected to represent the lower and upper bounds of the 1% to 3% inflation-control target range of the Bank of Canada and federal Government.
- Real Wage Increases: Analysis of different periods of both high and low real wage growth within Canada as well as the experience of other countries were used to generate the lower- and higher-cost scenarios.
- Real Rate of Return on Investments: These tests were developed using a stochastic approach. For both CPP components, the lower and higher-cost assumptions represent the ranges such that the averages of the projected rates of return over 75 years for the base and additional Plans will be within these ranges with 80% probability. These ranges differ for the base and additional Plans, since they are based on different asset allocations.
- Disability Incidence Rates: These tests are presented only for the base CPP. As well, the tests mainly affect the disability pension and not the post-retirement disability benefit or disabled contributor's child's benefit, which have no significant impacts on the base CPP. Based on the disability incidence rate experience since the mid-1990s, lower- and higher-cost scenarios over a 75-year projection period for the Plan were generated.

E.3.1 Results for the base CPP

Under each sensitivity test, the contribution rate for the base CPP was projected to follow the current statutory rate of 9.9% through 2027, and a new MCR for the base Plan was determined for 2028 and thereafter. Table 111 summarizes the base Plan MCR and pay-as-you-go rates under each of the sensitivity tests.

Table 111 Sensitivity of base CPP minimum contribution rate
(percentages)

Assumption	Scenario	Minimum contribution rate [1]	Change in MCR relative to best-estimate	Pay-as-you-go rates	
				2028	2065
All	Best-estimate	9.19	0.00	9.58	12.73
Total fertility rate	Lower cost	8.92	-0.27	9.58	11.96
	Higher cost	9.48	0.29	9.58	13.63
Mortality rates	Lower cost	8.63	-0.56	9.58	12.08
	Higher cost	9.69	0.50	9.59	13.31
Net migration rate	Lower cost	8.85	-0.34	9.58	11.51
	Higher cost	9.54	0.35	9.58	14.16
Price increases	Lower cost	8.97	-0.22	9.50	12.39
	Higher cost	9.44	0.25	9.67	13.14
Real wage increase	Lower cost	9.07	-0.12	9.39	11.63
	Higher cost	9.32	0.13	9.79	14.00
Real rate of return on investments	Lower cost	7.10	-2.09	9.58	12.73
	Higher cost	11.38	2.19	9.58	12.73
Disability incidence rates	Lower cost	8.96	-0.23	9.54	12.46
	Higher cost	9.42	0.23	9.62	13.00

(1) The minimum contribution rate in this table refers to the rate applicable for 2034 and thereafter.

Given how the alternative scenarios were developed, it is difficult to draw conclusions about their relative sensitivities by comparing them with each other. However, it can be seen that the real rate of return assumption can have a significant impact on the base Plan MCR. If the average annual real rate of return over the next 75 years is assumed to be 5.65% instead of the best-estimate of 4.05%, then the MCR decreases to 7.10%. However, if the average annual real rate of return over the next 75 years is assumed to be 2.45%, then the MCR increases to 11.38%. In addition, the base CPP is more sensitive to investment returns compared to the corresponding sensitivity analysis under the 31st CPP Actuarial Report when comparing the MCR spread between the higher-cost and lower-cost scenarios.

Furthermore, a decrease of 100 basis points in the assumed average annual 75-year nominal rate of return would result in the MCR increasing to 10.54%, which on a relative basis, is 15% higher than under the best-estimate assumption. An increase of 100 basis points would result in the MCR decreasing to 7.88%, which on a relative basis, is 14% lower than under the best-estimate assumption.

The net migration rate sensitivities in Table 111 also include the impact from changing the future level of NPR as a percentage of the population. Changing the net migration rate excluding changes to the NPR assumption results in a MCR of 8.96% for the lower-cost scenario and 9.43% for the higher-cost scenario. Adding the changes to the NPR assumption results in a MCR of 8.85% for the lower cost-scenario and 9.54% for the higher-cost scenario as shown in Table 111.

Unlike the MCR, the pay-as-you-go rates are not affected by the assumed rates of returns on investments. For all other assumptions, the MCR and pay-as-you-go rates tend to move in the

same direction.

E.3.2 Results for additional CPP

As for the base Plan, under each scenario, the contribution rates for the additional Plan were projected to follow the current schedule of rates through 2027, and new AMCRs were determined for 2028 and thereafter. Table 112 summarizes the additional Plan AMCRs under each of the scenarios.

Table 112 Sensitivity of additional CPP minimum contribution rates
(percentages)

Assumption	Scenario	First additional minimum contribution rate (FAMCR) (1)	Second additional minimum contribution rate (SAMCR) (1)	Change in AMCRs relative to best-estimate
All	Best-estimate	2.01	8.04	–
Mortality rates	Lower cost	1.76	7.04	(0.25) and (1.00)
	Higher cost	2.21	8.84	0.20 and 0.80
Price increases	Lower cost	1.98	7.92	(0.03) and (0.12)
	Higher cost	2.05	8.20	0.04 and 0.16
Real wage increase	Lower cost	1.80	7.20	(0.21) and (0.84)
	Higher cost	2.24	8.96	0.23 and 0.92
Real rate of return on investments	Lower cost	1.33	5.32	(0.68) and (2.72)
	Higher cost	2.97	11.88	0.96 and 3.84

(1) The first and second additional minimum contribution rates in this table refer to the rates applicable for 2028 and thereafter.

When comparing with the results from the base CPP, on a relative basis, the AMCRs are significantly more sensitive to changes in mortality, real wage, and investment assumptions than the base CPP MCR. On the other hand, the AMCRs are not very sensitive to changes in fertility rates and net migration rates, and for that reason are not shown.

The differences in relative sensitivities between the AMCRs and the base CPP MCR, as well as the opposite impacts of changing the real wage increase assumption, are due to the different financing approaches of each component of the Plan, as explained at the beginning of this section.

Given how the alternative scenarios were developed, it is difficult to draw conclusions about their relative sensitivities by comparing them with each other. However, it can be seen that the real rate of return assumption can have a significant impact on the AMCRs. If an average annual real rate of return of 4.73% is assumed over a 75-year projection period instead of the best-estimate of 3.53%, then the FAMCR decreases to 1.33% and the SAMCR to 5.32%. On the other hand, if an average annual real rate of return of 2.33% is assumed over the period, then the FAMCR increases to 2.97% and the SAMCR to 11.88%.

Furthermore, a decrease of 100 basis points in the assumed average annual 75-year nominal rate of return would result in the FAMCR and SAMCR increasing to 2.78% and 11.12% respectively,

which on a relative basis is 38% higher than under the best-estimate assumption. An increase of 100 basis points would result in the FAMCR and SAMCR decreasing to 1.43% and 5.72% respectively, which on a relative basis is 29% lower than under the best-estimate assumption.

E.4 Higher and lower economic growth

While the best-estimate assumptions in this report reflect sustained moderate economic growth in the future, there is significant uncertainty and volatility surrounding the economic environment. Many factors could lead to long-term economic growth in Canada being different than assumed under the best-estimate scenario. These factors could stem from both domestic and global forces, including geopolitical conflicts, health crises, extreme weather events due to climate change, the timing and pace of transition to a green economy, the pace of technological advances and innovation, shifts in global trade dynamics between protectionism and globalisation, as well as demographic pressures from an aging population.

Given the high level of uncertainty, scenarios of higher and lower economic growth were considered in this report. These alternative economic growth scenarios are constructed using a combination of individual assumptions, specifically, the labour market assumptions and the real wage growth assumption.

In respect of the labour market, employment levels are reflected in the actuarial projection model through the assumptions made regarding labour force participation and job creation rates by year, age and sex. These rates vary not only with the rate of unemployment, but also reflect the trend of increased female participation rates and trends in the workforce attachment patterns of older workers.

Under the best-estimate scenario, the job creation rate assumption is determined on the basis of expected moderate economic growth and an unemployment rate (ages 15+) that is projected to increase from 6.3% in 2024 to 7.0% in 2025, and then decrease to 6.7% in 2026, reaching an ultimate level of 6.1% by 2028. Furthermore, the participation rates for all age groups are expected to increase due in part to the projected growth in labour force participation rates of women and continuing trends toward longer working lives. Under the best-estimate scenario, the participation rate of those aged 18 to 69 for Canada is expected to increase from 77.3% in 2025 to 80.0% in 2035.

From 2030, the retirement benefit take-up rates at age 60 are assumed to be 21% and 22% for males and females, respectively, while at age 65, the rates are assumed to be 32% for both sexes, and at age 70, the rates are assumed to be 10% for both sexes. These rates result in projected average ages at retirement pension take-up in 2030 of 64.3 for both males and females.

The best-estimate assumption for the real wage increase is assumed to be 0.8% in 2025 and onward. The ultimate real wage increase assumption together with the price increase assumption of 2.0% leads to an ultimate nominal wage increase of 2.8% for 2027 and thereafter.

E.4.1 Higher economic growth

For this higher economic growth scenario, the job creation rate is assumed to increase at a faster pace than under the best-estimate scenario, resulting in an unemployment rate of 4.1% in 2030 and thereafter. In addition, the assumed ultimate participation rates in 2035 are set to increase to higher levels than the best estimates, and the assumed ultimate gap between male and female participation rates in 2035 for those aged 18 to 69 is set equal to 3.1% as opposed to 6.1% under the best-estimate scenario. This results in an overall participation rate of 85.1%.

The lower unemployment rate and higher participation rate are assumed to encourage individuals to ask for their CPP retirement pension at a later age. Therefore, by 2045, retirement pension take-up rates at age 60 are assumed to gradually decrease to levels that are about 20 percentage points lower than the best estimates, i.e. to 2.0% and 3.0% for males and females, respectively. This results in an increase in the projected average age at retirement pension take-up for both sexes combined, from 64.3 years to 65.3 years in 2050. The proportions of working beneficiaries were adjusted to reflect the shift in retirement pension take-up to later ages.

In addition to the assumed changes in the labour market, the real wage increase is assumed to be 1.4% as opposed to 0.8% under the best-estimate scenario. The higher economic growth scenario results in total employment earnings in 2035 being about 16% higher compared to the best estimate.

E.4.2 Lower economic growth

For this lower economic growth scenario, the job creation rate is assumed to increase at a slower pace than the best estimate, resulting in an unemployment rate of 8.1% in 2030 and thereafter. In addition, male and female participation rates by age group are assumed to remain constant at their 2024 levels. This results in an overall participation rate of 77.8% for those aged 18 to 69 in 2035.

The higher unemployment rate and lower participation rate are assumed to encourage individuals to ask for their CPP retirement pension at an earlier age. Therefore, retirement pension take-up rates at age 60 are assumed to gradually increase to levels in 2044 that are about 20 percentage points higher than the best estimates, i.e. to 41% and 42% for males and females, respectively. This results in a decrease in the projected average age at retirement pension take-up for both sexes combined, from 64.3 years to 63.3 years in 2050. The proportions of working beneficiaries were adjusted to reflect the shift in retirement pension take-up to earlier ages.

In addition to the assumed changes in the labour market, the real wage increase assumption is assumed to be 0.2% compared to 0.8% under the best-estimate scenario. The lower economic growth scenario results in total employment earnings in 2035 being about 11% lower compared to the best estimate.

E.4.3 Results

Table 113 presents a summary of the assumptions and results used in the sensitivity analysis of economic growth and the resulting minimum contribution rates.

The base Plan MCR is 8.88% under the higher economic growth scenario and 9.58% under the lower economic growth scenario. The impact on the additional Plan AMCRs is opposite to that for the base Plan MCR. Under the higher economic growth scenario, the FAMCR and SAMCR increase, respectively, to 2.37% and 9.48%, while under the lower economic growth scenario, the FAMCR and SAMCR decrease, respectively, to 1.73% and 6.92%.

The AMCRs move in the opposite direction compared to the base Plan MCR due to the differing effects of the real wage increase assumption on the base and additional Plans, which is attributable to their different financing approaches.

Table 113 Higher and lower economic growth sensitivity scenarios

Canada	Higher economic growth	Best-estimate	Lower economic growth
Participation rate (age group 18-69) (2035)	85.1%	80.0%	77.8%
Unemployment rate (15+) (Ultimate)	4.1%	6.1%	8.1%
Average CPP retirement benefit take-up age (Ultimate)	65.3 years	64.3 years	63.3 years
Real wage increase (Ultimate)	1.4%	0.8%	0.2%
Minimum contribution rate (MCR) (1)	8.88%	9.19%	9.58%
Additional minimum contribution rates (AMCRs) (2)	2.37% and 9.48%	2.01% and 8.04%	1.73% and 6.92%

(1) The MCR in this table refers to the rate applicable for the year 2034 and thereafter.
(2) The AMCRs in this table refer to the FAMCR and SAMCR applicable for the year 2028 and thereafter.

E.5 Scenario analysis

As mentioned, long-term actuarial projections are inherently uncertain, and this uncertainty is amplified in the current global context. This section focuses on assessing and illustrating risks that are relevant in the current context. It illustrates the potential impacts on the base CPP MCR of changes in the future earnings distribution, of an acute economic event scenario, as well as of hypothetical transition scenarios to a green economy. Since the additional CPP is still at its early stages, this section focuses on the base CPP only. The section is not meant to represent forecasts or predictions and should be interpreted with caution.

E.5.1 Change in earners and earnings distributions

E.5.1.1 Context

The earners and earnings distributions have an impact on the amounts of contributions paid to the CPP, and eventually the amounts of benefits paid. The best-estimate scenario assumes a stable distribution of earners and earnings by level over time. In particular, the same nominal wage increase (real wage increase plus inflation) is applied to all earners independent of their

level of earnings.

In the future, the pattern of increase in earnings by level may change as the profile of the labour

force evolves. New technologies, automatization, immigration patterns, population aging, and evolving skills requirements are among the factors that could influence earnings and earners distributions in the future, which could in turn affect future CPP cashflows and the MCR. Depending on the dynamics, the changes could exert downward or upward pressure on the MCR.

As such, scenarios were developed for this report to illustrate the potential impact of changing the distributions of earners and earnings over time by applying different salary increases by age and level of earnings. For this purpose, different wage increases are assumed until 2055. After 2055, uniform wage increases in line with the best-estimate assumption are applied.

Two scenarios were developed:

- One where changes to the profile of the labour force would result in better work opportunities (i.e. higher wage increases) for middle earners at the expense of higher earners; and
- One where changes to the profile of the labour force would result in better work opportunities (i.e. higher wage increases) for higher earners at the expense of middle earners.

More information on the scenarios and how earners were classified is provided below.

At the time of writing this report, it is not possible to estimate if and how the changing circumstances could influence earnings and earners distributions. The scenarios were therefore developed for illustration purposes and are not meant to be associated with a specific set of circumstances or narrative.

E.5.1.2 Scenarios

Under the scenarios, earners were split into categories as follows:

- Earners under the age of 30: given that many of these earners are possibly still in school or may not have reached their ultimate career path, their earnings are assumed to increase at the same pace as the best-estimate assumption.

- Earners over the age of 30: earners above the age of 30 are deemed to be on their established career path. These earners were divided into 3 categories as follows:
    - Lower earners: Individuals earning less than 40% of YMPE. For both scenarios, lower earners are assumed to have wage increases that are in line with the best-estimate assumption.
    - Middle earners: Individuals earning between 40% and 120% of YMPE.
        - For scenario 1, middle earners are assumed to have wage increases that are higher than the best-estimate assumption.
        - For scenario 2, they are assumed to have wage increases that are lower than the best-estimate assumption.

- Higher earners: Individuals earning more than 120% of YMPE.
  - For scenario 1, higher earners are assumed to have wage increases that are lower than the best-estimate assumption.
  - For scenario 2, they are assumed to have wage increases that are higher than the best-estimate assumption.

Table 114 summarizes the assumed nominal wage increases by category of earners and scenario.

Table 114 Assumed annual nominal wage increase by category of earners and scenario (2025-2055) (1)

Category	Scenario 1	Scenario 2
Earners under the age of 30	2.80%	2.80%
Lower earners over the age of 30	2.80%	2.80%
Middle earners over the age of 30	4.00%	1.60%
High earners over the age of 30	1.60%	3.40%
Overall	2.80%	2.80%

(1) After 2055, uniform wage increases in line with the best-estimate assumption are applied.

Chart 14 below illustrates the impact that scenarios 1 and 2 have on the distribution of different categories of earners relative to the best estimate.

Chart 14 Scenario impact on distribution of earners categories relative to best estimate

E.5.1.3 Results

While the projected total earnings are the same as under the best-estimate assumption, the scenarios result in different total contributory earnings, as well as different average contributory earnings due to the variations in earnings distributions.

Scenario 1 would result in an increase in total contributory earnings of 6.8% while Scenario 2 would result in a decrease in total contributory earnings of 11.6%.

For the base CPP, an increase in contributory earnings leads to a lower MCR and vice versa. While a change in contributory earnings will also result in a change in future expenditures, the impact of the immediate change in contributions outweighs the impact of the deferred and gradual increase in expenditures. Scenario 1 therefore creates downward pressure on the MCR while Scenario 2 creates upward pressure.

The impact on the base CPP MCR for each scenario is shown in Table 115.

Table 115 Impact on the base CPP MCR of different earners and earnings distributions

Scenario	MCR(1)	Absolute change relative to best-estimate
Best-estimate	9.19%	-
Scenario 1: Benefit to middle earners	8.98%	-0.21%
Scenario 2: Benefit to higher earners	9.61%	0.42%

(1) The MCR in this table refers to the rate applicable for the year 2034 and thereafter.

E.5.2 Acute economic event

E.5.2.1 Context

The best-estimate assumptions of this report are set in the context of sustained moderate economic growth over the projection period. Individual sensitivity tests and long-term higher and lower growth economic scenarios illustrate the impact of sustained differences in assumptions compared to the best estimates on the Plan. The purpose of this scenario is to illustrate the impact of an acute, relatively short-term economic event on the MCR of the base CPP. This scenario could be instigated by any number of causes, for example, geopolitical events, escalating trade tensions, public health crises, etc. The economic environment resulting from the acute economic shock is characterized by high inflation, high unemployment, low real wage growth and low real return on assets.

The acute economic event scenario draws on historical shocks and patterns in underlying variables but is not based on one particular period of history.

The event would be characterized by a short burst of high inflation that surpasses what was seen during the COVID-19 pandemic. The disruption in the economy would cause immediate job losses. Real wages would decline as the weak labour markets would not result in wages keeping up with the high inflation. The scenario is also assumed to be global in nature and impacts global financial markets. Both equity and fixed income assets would experience short-term negative returns due to the stagflationary nature of the event.

E.5.2.2 Assumptions

The acute economic event scenario introduces economic shocks beginning in 2026 and is

assumed to unfold over a four-year period. Under such a scenario, inflation is projected to rise sharply in 2026 before gradually returning to the Bank of Canada's target range within three years, following a similar trajectory as observed during the COVID-19 pandemic. Specifically, inflation is assumed to reach 7% in 2026, then decline to 4% in 2027, 3% in 2028, and return to the 2% target rate by 2029.

It is assumed that unemployment rates will remain elevated relative to the best-estimate assumptions for a few years following the acute economic event. The unemployment rate is assumed to peak at 11.0% in 2026, then decline to 9.0% in 2027. Further decreases are assumed in 2028 and 2029, with rates of 8.0% and 7.0%, respectively. By 2030, the unemployment rate is assumed to return to the best-estimate ultimate level of 6.1%.

It is assumed that only a portion of inflation is reflected in nominal wage increases, leading to lower real wage growth under this scenario. This pass-through rate is projected to gradually rise, reaching 100% by 2028. Real wage growth is assumed to be -4% in 2026, -2% in 2027, and 0% in 2028, before returning to the ultimate best-estimate assumption of 0.8% in 2029.

Additionally, it is assumed that during the acute economic event, only a portion of inflation is reflected in nominal base CPP returns. This results in lower real rates of return compared to the best-estimate assumptions, with projected real returns of -3% in 2026 and -1% in 2027. Positive real returns of 1% and 4% are assumed in 2028 and 2029, respectively. From 2030 onward, all assumptions are set to revert to the best-estimate levels.

E.5.2.3 Results

Under the acute economic event scenario, the base CPP MCR increases by 0.36 percentage points to 9.55% for the year 2034 and thereafter. Under the base CPP, higher inflation normally leads to lower MCRs given that the impact of higher nominal wages (i.e. more contributions) and investment returns outweigh the impact of higher expenditures. However, in the current scenario, only part of the inflation is reflected in nominal wage increases and returns, while it is fully reflected in expenditures.

E.5.3 Climate change

This section presents potential climate scenarios and the framework used to estimate the impact on economic and investment assumptions, and ultimately on the MCR for the base CPP. It is important to note that the purpose of this section is to foster a better understanding of the potential impact of climate risk on the CPP. The scenarios presented are meant as tools to illustrate the risks. No probabilities are assigned to the likelihood of any given scenario occurring. This section is not intended to represent OCA forecasts or predictions, and the results should be interpreted with caution.

E.5.3.1 Context

Climate change can affect the CPP through various channels given its potential impact on the future demographic, economic, and investment environments. As stated in the Global Risks

Report 2025 by the World Economic Forum, the top four risks in terms of severity identified over the next ten years are environmental risks, with the top risk being extreme weather events.

The uncertainty section of the 31st CPP Actuarial Report included analysis to illustrate downside risks associated with three hypothetical climate scenarios.

Since the 31st CPP Actuarial Report, the OCA has conducted an actuarial Climate Change Study (the Study) to better assess how climate change can affect the OCA's overall assumption-setting process for its actuarial valuations, with a special focus on the CPP. According to the Study, there is still a lot of uncertainty on the direction and magnitude of potential impacts from climate change, and the risk is evolving constantly. In addition, research and data to quantify the full impact of climate change on the demographic, economic, and investment environments are incomplete and, in certain cases, somewhat conflicting. The OCA is therefore not ready to incorporate the potential impacts from climate change explicitly in the best-estimate assumptions and continues to believe that scenario analysis is an appropriate approach for understanding and illustrating this risk.

In line with the recommendations presented in the Study, the OCA decided on the following for the present report:

- Hypothetical climate scenarios: Update scenarios based on more recently available information.
- Demographic assumptions: Exclude demographics from climate change scenario analysis, due to the high level of uncertainty and the lack of Canadian-specific research.
- Economic assumptions: Maintain a similar framework to that used in the 31st CPP Actuarial Report. This framework builds on a foundation for relating economic assumptions to potential shocks in Gross Domestic Product (GDP) from climate change.
- Investment assumptions: Enhance the framework used in the 31st CPP Actuarial Report by incorporating additional dynamics. This involves integrating factors such as climate change impacts on fixed income returns, as well as incorporating GDP impacts by different markets.

E.5.3.2 Framework

Consistent with the framework of the 31st CPP Actuarial Report, the OCA continues to consider GDP as a critical variable to assess and illustrate the potential climate change impact on the base CPP MCR. GDP is an overarching macroeconomic variable that can be used to adjust the future economic and investment environments. Additionally, policy rates are added as another variable. Nominal policy rates are deemed to be a reasonable proxy for the long-term government bond yields in Canada, as they reflect the Bank of Canada's stance on monetary policy, which influences the interest rates in the economy. Therefore, climate change impacts on policy rates can be used to adjust returns on fixed income asset classes.

For this report, the OCA used a subset of scenarios from the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). The NGFS publishes a variety of climate scenarios covering a wide range of physical and transition risks, which are well recognized by the

financial industry.

The scenarios presented in this report are subsets of three NGFS climate scenarios, that is, Net Zero 2050, Delayed Transition, and Current Policies. The narratives for these scenarios are presented below and are similar to those of the three scenarios in the 31st CPP Actuarial Report. However, since various levels of risks can be assessed within the same scenario narrative under the most recent NGFS data release (in November 2024), the OCA has updated its scenario selection to better benefit from this flexibility.

It is worthwhile to point out that NGFS climate scenario impacts are all relative to the NGFS baseline scenario, which is defined as a hypothetical scenario with neither physical nor transition risks. The baseline scenario should not be assessed against the best-estimate assumptions of this report. For illustration purposes only, the differences relative to the NGFS baseline scenario were applied to the best-estimate assumptions of this report. Given that the range of impacts in NGFS scenarios is quite wide, the analysis remains appropriate to illustrate risk.

Below are descriptions of the narratives underlying the selected scenarios and the framework used to adjust the economic and investment assumptions under the scenarios to estimate potential impacts on the base CPP MCR. Then, in the following sections, greater details on the selected scenarios and the resulting base CPP MCR are presented.

Net zero 2050: assumes that ambitious climate policies are introduced immediately. Under this scenario narrative, global warming is limited to 1.5° C by the end of the 21st century through stringent climate policies and innovation, and global net zero CO2 emissions are reached around 2050.

Delayed transition: assumes that new climate policies are not introduced until 2030, and the level of action differs across countries and geographies based on currently implemented policies. Strong policies are then needed to limit global warming to be below 2 °C by the end of 21st century.

Current policies: assumes that no further climate policies are implemented, leading to high physical risk. Under this scenario narrative, global warming exceeds 3 °C by the end of the 21st century, leading to irreversible changes.

The GDP and policy rates impacts from the selected NGFS climate scenarios are translated into impacts on the base CPP MCR using the approach described below.

- Adjustments to economic growth: a simplified approach is used, where the changes in Canadian GDP growth are translated one-for-one into changes in labour productivity growth through the real wage increase assumption.
- Adjustments to equity investment returns: changes in GDP growth are incorporated in the developed market public equities and real assets return assumptions through the growth in earnings component, which is proxied by developed market GDP growth per capita. These adjustments also flow through return assumptions for emerging market equities and private equities, which are expressed using a premium over developed market public equities. The framework is enhanced in this report to consider the GDP impact of both Canada and the U.S., since a significant part of developed public equities is invested in the U.S. under the current base CPP investment portfolio.

- Adjustments to fixed income returns: this report reflects potential impacts from transition risk on fixed income returns. For this purpose, impacts on Canadian policy rates from the selected NGFS scenarios are used as a proxy for impacts on the long-term Government of Canada bond yields, which serve as the first building block to develop return assumptions for all fixed income asset classes (marketable bonds, non-marketable bonds, and credit).

E.5.3.3 Illustrative scenarios

The scenarios presented in this report are based on publicly available information from the NGFS Phase V publication released in November 2024. For each scenario narrative in the NGFS Phase V data, users can assess risks at various levels by selecting different percentiles for both temperature and damage functions. Such an addition makes it possible to perform meaningful scenario analysis at various risk levels, rather than focusing only on the downside risk. However, it is worthwhile to point out the following:

- The scenarios presented in this report are not forecasts, and there is no probability associated to any of them.[22] Instead, they represent a few scenarios out of a wide range of plausible futures. These scenarios facilitate the illustration of climate risk for the base CPP.
- The NGFS data for physical risk is based on a stochastic analysis and available until 2100. Meanwhile, the data for transition risk is based on a deterministic approach and available until 2050 only. GDP impacts stem from both physical and transition risks, while policy rate impacts only come from transition risks.
- Physical risk includes both chronic and acute components. Although NGFS Phase V scenarios focus primarily on chronic physical risks, they do incorporate some acute physical risks implicitly through the updated damage function. While moderate regular impacts of acute risks may be captured well under the updated damage function, severe tail events are less likely to be captured. In an effort to reflect the impact of tail acute events while minimizing the risk of double counting, acute risk estimates from NGFS earlier modeling approaches (Phase IV[23]) were added in the set of downside risk scenarios, but not in the set of delayed transition scenarios.[24]
- NGFS scenarios have been constantly improved. Nonetheless, there are still limitations to the modelling. For example, NGFS scenarios do not account for long-term climate adaptation measures, for some climate phenomena such as tipping points, for indirect socio-economic impacts such as migration and for other sources of risk such as nature-related risks and the occurrence of polycrises.
- The NGFS GDP and policy rate impacts are available on both a real and nominal basis. The OCA decided to use the NGFS impacts on a real basis in its scenario analysis. NGFS inflation impacts are therefore not considered. Using nominal NGFS impacts instead would not have a material impact on the results when considering the underlying uncertainty of the climate scenarios.

22 That is, the likelihood that any of the scenarios will happen cannot be determined. However, within each of the scenarios, risks at different percentiles can be assessed.

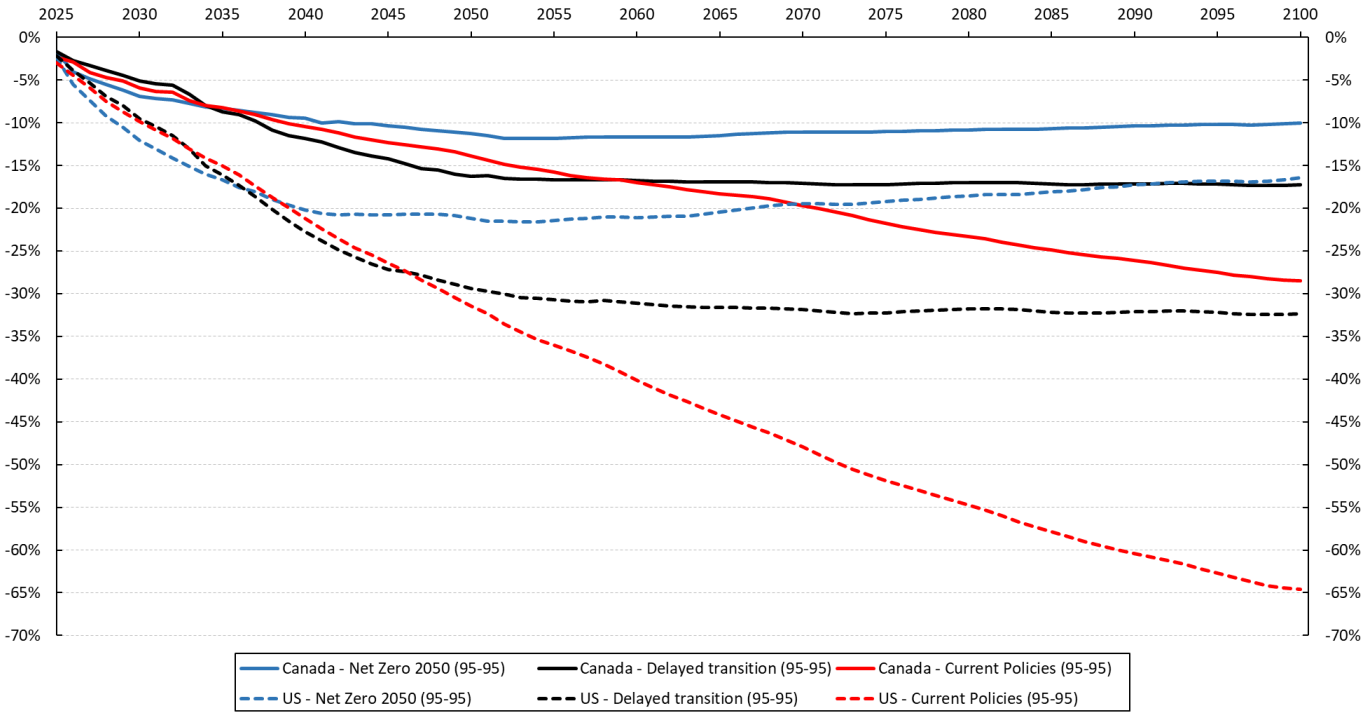
23 In Phase IV scenarios, chronic risks and acute risks are modeled separately.

24 NGFS acknowledges that this add-on approach may lead to double counting but may be useful in certain cases such as capturing tail risk events. More details can be found in Explanatory note on NGFS Phase V damage function.

In terms of GDP impacts, two sets of scenarios are presented. The first set is the downside risk scenarios, similar to those in the 31st CPP Actuarial Report. In this set, for each of the three scenario narratives presented in the previous section, the impact at the most severe risk level (95th percentile) is assessed for both damage and temperature functions.

Chart 15 shows the impact on real GDP for both Canada and the U.S. under the set of downside risk scenarios. The GDP impacts for Canada are similar to those presented in the 31st CPP Actuarial Report. However, the chart shows that the impacts on GDP in the U.S. are projected to be more severe.

Chart 15 Downside risk scenarios – cumulative real GDP impact for Canada and the U.S. relative to NGFS baseline scenario (physical and transition risks) (1)

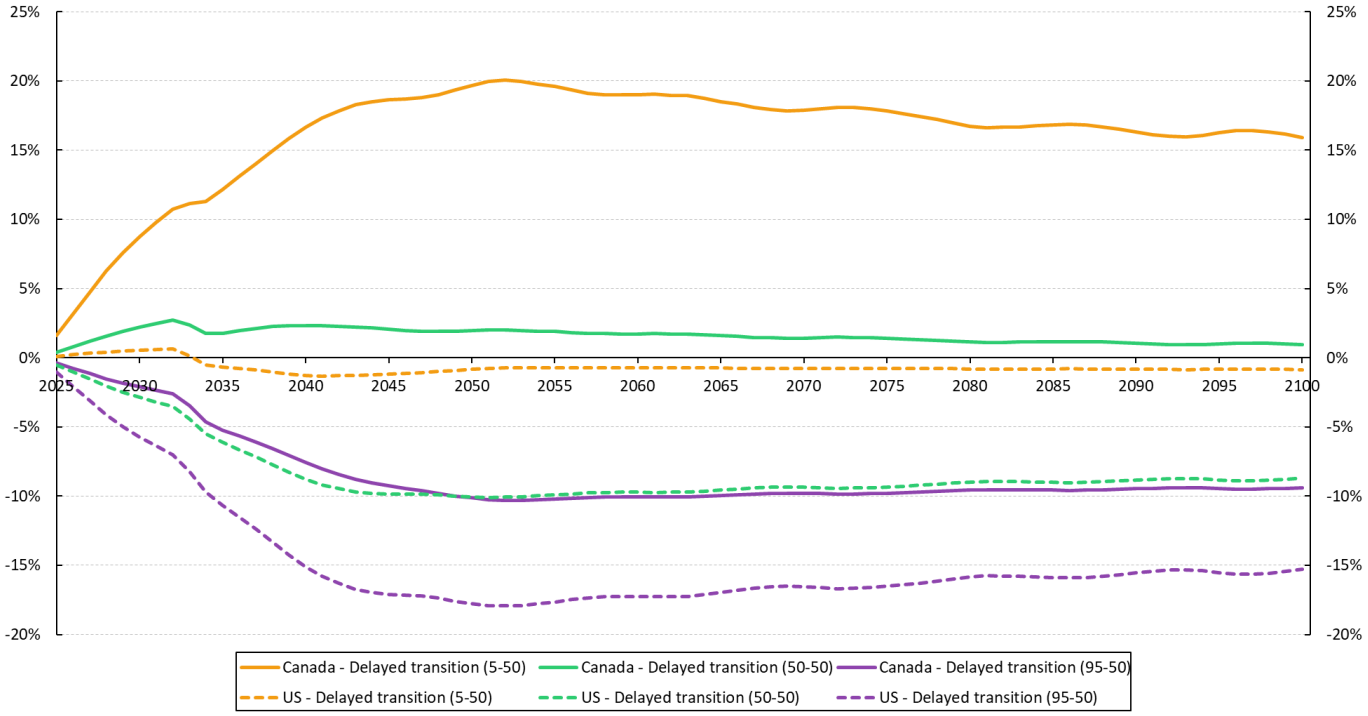


(1) The numbers in brackets in the legend indicate the percentiles of damage and temperature functions, respectively.

The second set of scenarios is focused on the Delayed Transition scenario narrative only, with the risk level for the temperature function fixed at the 50th percentile, but with three varying risk levels for the damage function (95th, 50th and 5th percentiles), thus providing a comprehensive illustration.

Chart 16 shows the GDP impact at different risk levels under the Delayed Transition scenario. It is apparent that the impact on GDP significantly differs at different levels of damage function. The range of results would be even wider if different temperature levels were also included. Chart 16 also shows that the GDP impact for Canada is positive for two out of the three scenarios, and that the divergence between the impact on Canadian GDP and U.S. GDP is significant.

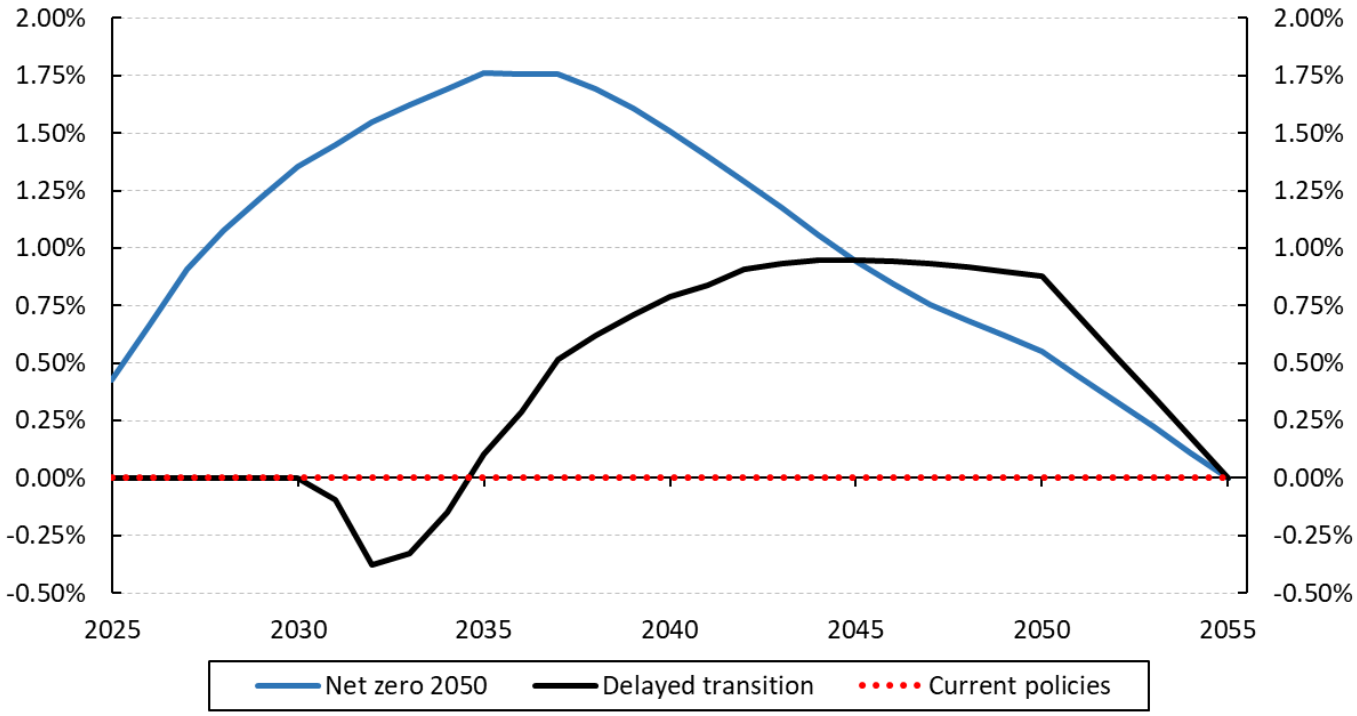
Chart 16 Delayed transition scenarios – cumulative real GDP impact for Canada and the U.S. relative to NGFS baseline scenario (physical and transition risks) (1)



(1) The numbers in brackets in the legend indicate the percentiles of damage and temperature functions, respectively. Higher percentiles represent higher risk.

In terms of policy rate impacts, given that only transition risk is considered, there is no probabilistic framework for temperature and damage functions. There is therefore only one impact path for each scenario narrative that applies until 2050. It is assumed that the policy rates will revert to those under the best-estimate assumptions over 5 years after 2050. Chart 17 shows the impact on policy rates for each scenario narrative.

Chart 17 Annual impact on Canada real policy rates relative to NGFS baseline scenario (transition risk only)



E.5.3.4 Results

Based on the selected scenarios and framework presented above, Table 116 summarizes the impact on the real wage increase assumption and investment returns over the 75-year period 2025-2099. The resulting impact on the base CPP MCR for each scenario is shown in Table 117. It is important to reiterate that these hypothetical scenarios are meant to illustrate risks only and are not meant to be forecasts or predictions.

Table 116 Climate change impact on economic and investment assumptions (percentages)

Scenario narrative	Percentile for damage and temperature functions	Annual real wage increase (75-year average)	Annual real rate of return (75-year average)
Best-estimate	n/a	0.80	4.05
Net zero 2050	95-95 (downside risk)	0.65	4.03
Delayed transition	95-95 (downside risk)	0.54	3.76
Current policies	95-95 (downside risk)	0.34	3.13
Delayed transition	5-50	1.01	4.12
Delayed transition	50-50	0.81	4.04
Delayed transition	95-50	0.66	3.96

Table 117 Climate change impact on base CPP MCR (percentages)

Scenario narrative	Percentile for damage and temperature functions	MCR(1)	Change relative to best-estimate
Best-estimate	n/a	9.19	0.00
Net zero 2050	95-95 (downside risk)	9.34	0.15
Delayed transition	95-95 (downside risk)	9.85	0.66
Current policies	95-95 (downside risk)	10.68	1.49
Delayed transition	5-50	8.95	(0.24)
Delayed transition	50-50	9.19	0.00
Delayed transition	95-50	9.43	0.24

(1) The MCR in this table refers to the rate applicable for the year 2034 and thereafter.

As shown in Table 116 and Table 117, climate change may have significant impacts on the underlying economic and investment assumptions and therefore on the base CPP MCR. Under the set of downside risk scenarios, the investment returns are lower in the Delayed Transition narrative and even lower in the Current Policy narrative, which lead to large increases in the base CPP MCR under those narratives. Additionally, the lower real wage increases also increase the base CPP MCR under all three scenario narratives. Under the set of Delayed Transition scenarios, there would be diverging impacts on the base CPP MCR. At the median risk level of damage function, the average investment returns and the average real wage increases are similar to those under the best-estimate assumptions[25], and as such, result in minimal changes to the base CPP MCR. Although the MCR remains unaffected, this does not imply that the report's best estimate is based on the delayed transition 50-50 scenario. At the 5th and 95th risk levels of damage function, there would be a moderate impact on the base CPP MCR, but of opposite direction.

25 The path for investment returns and the path for real wage increases are still different from those under the best-estimate assumptions.

Appendix - F Adjustment factors

F.1 Introduction

As described in Appendix A, CPP beneficiaries can ask for their retirement pension at any time between ages 60 and 70. However, adjustment factors are applied to the unreduced retirement pension, resulting in a downward adjustment for early (pre-65) and upward adjustment for late (post-65) pension take-up. The current legislated adjustment factor for early pension take-up is 0.6% for each month between the start of the pension and age 65, and the factor for late pension take-up is 0.7% for each month between age 65 and the start of the pension. The current legislated adjustment factors are applied to both components of the CPP (base CPP and additional CPP).

In accordance with subsection 115(1.11) of the *Canada Pension Plan*, in the first actuarial report prepared after 2015 and in every third report that follows, the Chief Actuary is required to specify the adjustment factors as calculated according to a methodology that they deem appropriate. The Chief Actuary may also specify the adjustment factors more frequently if they consider it necessary. The federal and provincial Ministers of Finance, as part of their triennial review of the financial state of the CPP, review the adjustment factors specified by the Chief Actuary and may make recommendations as to whether they should be changed.

The 27th CPP Actuarial Report as at 31 December 2015, prepared in 2016, was the first report for which the Chief Actuary was required to specify the adjustment factors. The methodology used to calculate the factors is described in the study: *Canada Pension Plan Actuarial Adjustment Factors: Actuarial Study No. 18* (AS18). The factors specified in the 27th CPP Actuarial Report were 0.6% per month and 0.7% per month for early (pre-65) and late (post-65) pension take-up, respectively. These factors are the same as the current legislated ones. At that time, the factors were specified for the base CPP only, since the additional CPP was not yet in effect.

Subsequently, this 32nd CPP Actuarial Report as at 31 December 2024 is the second report for which the Chief Actuary is required to specify the factors in accordance with the legislation. The purpose of this appendix is to specify these factors and to describe the methodology used to calculate them. This is the first time that the analysis is done for both components of the CPP (base CPP and additional CPP). Given the different provisions and financing approaches, the factors are calculated separately for each component.

The adjustment factors will next be specified no later than in the CPP Actuarial Report as at 31 December 2033.

F.2 Methodology

In accordance with the *Canada Pension Plan,* the adjustment factors specified in this report are based on a methodology that is deemed appropriate by the Chief Actuary. For this report, the factors are determined using the same methodology as the one described in AS18, which was used to determine the adjustment factors specified by the Chief Actuary in the 27th CPP Actuarial Report.

The underlying principle of the methodology is to determine the adjustment factors that result in the steady-state contribution rate for the base CPP, or the AMCRs for the additional CPP, remaining the same whether all the Plan's contributors start their retirement pension at age 60, 65, or 68, with age 65 being the benchmark scenario for the target steady-state contribution rate and AMCRs.

For this purpose, it is assumed that the changes in retirement behaviour associated with collective pension take-up at any of these ages would follow from certain changes in the labour market environment. In particular, compared to the best-estimate assumptions of this report, the scenario with collective take-up at:

- age 60 assumes a weaker labour market environment.
- age 65 (the benchmark scenario) assumes a stronger labour market environment.
- age 68 assumes a stronger labour market environment than under the age 65 scenario.

The anchor points at ages 60 and 68 were selected based on an analysis of historical and expected pension take-up patterns. Statistical data show that prior to age 65, the majority of early pension take-up occurs at age 60, and this is projected to continue. After age 65, there is more uncertainty surrounding the recent late retirement trend as well as the impact of auto-enrolment at age 70 on retirement patterns. In addition, the distribution of take-up ages is more even until age 70. It was therefore decided to use the average late take-up age of 68 for pension take-up after age 65.

The methodology is deemed appropriate since it recognizes all of the benefits and financing provisions of the Plan as well as aligns retirement benefit take-up behaviour with the labour market environment.

Note that the adjustment factors determined as a result of this analysis do not ensure that the steady-state contribution rate and AMCRs will remain the same independent of the actual or assumed retirement pension take-up rates. That is, as individuals start their CPP pension at different ages, rather than collectively at a single age, the application of the calculated adjustment factors may lead to variations in the steady-state contribution rate and AMCRs.

F.3 Assumptions for alternative take-up age scenarios

The results of this analysis are based on the best-estimate assumptions of this report modified as described below in order to develop plausible labour market environments associated with the take-up of the CPP retirement pension by all contributors at selected ages. The specific assumptions that are modified are those relating to the labour force participation rates, unemployment rate, and average employment earnings.

The following plausible alternative scenarios are considered and consist of assumed labour market environments associated with collective pension take-up at ages 60, 65 and 68:

- For the scenario of collective pension take-up at age 60 (weaker labour market environment), the labour force participation rates and average employment earnings are decreased for ages between 50 and 59 while the unemployment rate is increased for all ages.
- For the scenarios of collective pension take-up at ages 65 and 68 (stronger labour market environments), the labour force participation rates and average employment earnings are increased for ages over 55, while the unemployment rate is decreased for age 68 scenario.

For all scenarios, it is assumed that working beneficiaries aged 65 and older choose not to contribute to the CPP.

Table 118 summarizes the modifications made to this report's best-estimate assumptions for each take-up age scenario.

Table 118 Alternative assumptions – Changes relative to CPP32 best-estimate assumptions

Collective age at pension take-up	Labour force participation rates	Unemployment rate	Average employment earnings
Age 60	*Ages 50-59:* same as best-estimate ages 60-64	6.6% (2028+)	*Ages 50-59:* same as best-estimate age 60 *Ages 60-69:* 60% working beneficiaries' earnings / 40% regular contributors' earnings aged 60-69
Age 65 (Benchmark)	*Ages 55-64:* same as best-estimate ages 50-54	No modification	*Ages 55-64:* same as best-estimate age 54
Age 68	*Ages 55-64:* same as best-estimate ages 50-54 *Ages 65-69:* same as best-estimate ages 60-64	5.8% (2028+)	*Ages 55-64:* same as best-estimate age 54 *Ages 65-69:* same as best-estimate age 64

All other best-estimate assumptions of this report are used without modification. A description of the best-estimate assumptions of the 32nd CPP Actuarial Report is provided in Appendix - B.

F.4 Results

The adjustment factors determined on the basis of this 32nd CPP Actuarial Report are specified as follows:

Table 119 Adjustment factors

Basis	Pre-65 downward monthly adjustment factor	Post-65 upward monthly adjustment factor
Legislated for Base and Additional CPP	*0.6%*	*0.7%*
Base CPP	0.6%	0.7%
Additional CPP	0.4%	0.5%

The difference in the adjustment factors between the base CPP and the additional CPP is due to the different fundamental characteristics of the additional CPP relative to the base CPP. In particular, the additional CPP is fully funded whereas the base CPP is partially funded. The additional CPP also has different benefits provisions and a different investment portfolio.

For the base CPP, the adjustment factors specified by the Chief Actuary are the same as the current legislated adjustment factors. However, for the additional CPP, the specified adjustment factors are 20 basis points lower than the current legislated adjustment factors for both pre-65 and post-65 pension take-up.

Changing the legislated adjustment factors for the additional CPP to be in line with those determined under this report, as specified in Table 119 above, would result in an increase in the FAMCR of 0.04% and in the SAMCR of 0.16%. Considering the best-estimate AMCRs determined in this report of 2.01% and 8.04%, the resulting FAMCR and SAMCR would be 2.05% and 8.20%, respectively.

Table 120 shows the cumulative impact on the retirement pension at each integer age when applying the legislated monthly adjustment factors as well as the monthly adjustment factors specified for this report.

Table 120 Cumulative adjustments from adjustment factors on the retirement pension by age

Age	Legislated for both base and additional CPP Pre-/Post-65 monthly factors: 0.6% / 0.7%	Specified for base CPP Pre-/Post-65 monthly factors: 0.6% / 0.7%	Specified for additional CPP Pre-/Post-65 monthly factors: 0.4% / 0.5%
60	64.0%	64.0%	76.0%
61	71.2%	71.2%	80.8%
62	78.4%	78.4%	85.6%
63	85.6%	85.6%	90.4%
64	92.8%	92.8%	95.2%
65	100.0%	100.0%	100.0%
66	108.4%	108.4%	106.0%
67	116.8%	116.8%	112.0%
68	125.2%	125.2%	118.0%
69	133.6%	133.6%	124.0%
70	142.0%	142.0%	130.0%