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 19th

on the Pension Plan for the Public Service of Canada

as at 31 March 2020

Canada

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29 September 2021

The Honourable Jean-Yves Duclos, P.C., M.P.
President of the Treasury Board
Ottawa, Canada
K1A 0R5

Dear Minister:

Pursuant to Section 6 of the *Public Pensions Reporting Act*, I am pleased to submit the report on the actuarial review as at 31 March 2020 of the pension plan for the Public Service of Canada. This actuarial review is in respect of pension benefits and contributions which are defined by Parts I, III and IV of the *Public Service Superannuation Act*, the *Special Retirement Arrangements Act* and the *Pension Benefits Division Act*.

Yours sincerely,

Assia Billig, FCIA, FSA, PhD
Chief Actuary

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1 Executive Summary

This actuarial report on the pension plan for the Public Service of Canada (PSPP) was made pursuant to the *Public Pensions Reporting Act* (PPRA).

This actuarial valuation is as at 31 March 2020 and is in respect of pension benefits and contributions defined by Parts I, III and IV of the *Public Service Superannuation Act* (PSSA), the *Special Retirement Arrangements Act* (SRAA), which covers the Retirement Compensation Arrangements Regulations No. 1 and No. 2 (RCA), and the *Pension Benefits Division Act* (PBDA).

The previous actuarial report was prepared as at 31 March 2017. The next periodic review is scheduled to occur no later than 31 March 2023.

1.1 Purpose of Actuarial Report

The purposes of this actuarial valuation are to determine the state of the Public Service Superannuation Account (Superannuation Account), the Public Service Pension Fund (Pension Fund) and the RCA Accounts, to determine the projected current service costs for the Pension Fund and the RCA Accounts as well as to assist the President of the Treasury Board in making informed decisions regarding the financing of the government's pension benefit obligations. This report may not be suitable for another purpose.

1.2 Main Findings

Table 1 Main Results as at 31 March 2020[1]
($ millions)

	Superannuation Account	Pension Fund	RCA No. 1 Account	RCA No. 2 Account
Financial Position				
Recorded Balance/Actuarial Value of Assets	91,537	125,409	2,615	1,272
Actuarial Liability	98,837	110,909	2,192	1,142
Actuarial Excess(Shortfall)/Surplus(Deficit)	**(7,300)**	**14,500**	**423**	**130**
Current Service Costs for Calendar Year 2022				
Member Contributions	-	2,754	6.6	-
Government Current Service Cost	-	2,783	39.0	-
Total Current Service Cost/Credit	-	5,537	45.6	-
Special Credits/Payments in Plan Year 2022	**7,805**	-	-	-

The proposed amounts to be credited to (or debited from) the Accounts and the Pension Fund are shown on a calendar year basis in this section, beginning with calendar year 2022, which is the first calendar year that follows the expected tabling of this report. Valuation results on a plan year[2] basis are shown in Section II.

1.2.1 Superannuation Account (Service prior to 1 April 2000) as at 31 March 2020

- The balance of the Superannuation Account is $91,537 million;
- the actuarial liability for service prior to 1 April 2000[3] is $98,837 million;
- the resulting actuarial shortfall is $7,300 million;
- it is expected that the government will make a one-time credit of $7,805 million as at 31 March 2022 to eliminate the actuarial shortfall.

The time, manner and amount of such credits are to be determined by the President of the Treasury Board.

1 Numbers shown in the tables throughout this report may not add up due to rounding.
2 Any reference to a given plan year in this report should be taken as the 12-month period ending 31 March of the given year.
3 The actuarial liability for service prior to April 1, 2000 refers to the actuarial liability for service accrued prior to that date except for service elections made on or after April 1, 2000. Service elections made on or after 1 April 2000 are deemed to be service accrued since that date.

1.2.2 Pension Fund (Service since 1 April 2000)

1.2.2.1 Financial Position as at 31 March 2020

- The actuarial value of the assets in respect of the Pension Fund is $125,409 million;
- the actuarial liability is $110,909 million;
- the resulting actuarial surplus is $14,500 million;
- the funding ratio is 113.1%.

1.2.2.2 Current Service Cost [1]

Table 2 shows the projected current service cost expressed in millions of dollars and as a percentage of the expected pensionable payroll[2] for the three calendar years following the expected tabling of this report. The ratio of government current service cost to contributor current service cost is also shown. Tables 3 and 4 show the same results for Group 1[3] and Group 2[4], respectively.

Projected current service costs shown in these tables are based on the member[5] contribution rates presented in Table 5.

Table 2 PSSA Current Service Cost on a Calendar Year Basis

Calendar Year	Current Service Cost ($ millions)			Current Service Cost (% of pensionable payroll)			Ratio of Government to Contributor Current Service Cost
	Contributors	Government	Total	Contributors	Government	Total	
2022	2,754	2,783	5,537	9.74%	9.84%	19.58%	1.01
2023	2,850	2,880	5,730	9.68%	9.79%	19.47%	1.01
2024	2,945	2,977	5,921	9.64%	9.74%	19.38%	1.01

Table 3 PSSA Current Service Cost on a Calendar Year Basis – Group 1

Calendar Year	Current Service Cost ($ millions)			Current Service Cost (% of pensionable payroll)			Ratio of Government to Contributor Current Service Cost
	Contributors	Government	Total	Contributors	Government	Total	
2022	1,717	1,746	3,463	10.47%	10.64%	21.11%	1.02
2023	1,675	1,705	3,380	10.47%	10.65%	21.12%	1.02
2024	1,632	1,664	3,296	10.46%	10.66%	21.12%	1.02

Table 4 PSSA Current Service Cost on a Calendar Year Basis – Group 2

Calendar Year	Current Service Cost ($ millions)			Current Service Cost (% of pensionable payroll)			Ratio of Government to Contributor Current Service Cost
	Contributors	Government	Total	Contributors	Government	Total	
2022	1,037	1,037	2,074	8.73%	8.73%	17.46%	1.00
2023	1,175	1,175	2,350	8.75%	8.75%	17.50%	1.00
2024	1,313	1,313	2,626	8.78%	8.78%	17.56%	1.00

1 Also called normal cost.
2 *Pensionable payroll* means the aggregate of pensionable earnings of all contributors with less than 35 years of service.
3 Members who entered the PSPP prior to 1 January 2013.
4 Members who entered the PSPP on or after 1 January 2013.
5 Any reference to member in this report should be read as *contributor* as defined in the PSSA.

1.2.2.3 Member Contribution Rates

The current service cost is borne jointly by the plan members and the government. Group 1 and Group 2 member contribution rates are determined such that the government share of the current service cost contribution is 50%. Table 5 shows the member contribution rates for the three calendar years following the expected tabling of this report.

Table 5 Member Contribution Rates

	Group 1		Group 2	
Calendar year	Below YMPE	Above YMPE	Below YMPE	Above YMPE
2022	9.36%	12.48%	7.95%	11.82%
2023	9.35%	12.37%	7.93%	11.72%
2024	9.35%	12.25%	7.94%	11.54%

1.2.3 RCA No. 1 Account as at 31 March 2020

- The balance of the RCA No. 1 Account is $2,615 million;
- the actuarial liability is $2,192 million;
- the resulting actuarial excess is $423 million.

Table 6 shows the projected current service cost in millions of dollars and as a percentage of the expected pensionable payroll for the three calendar years following the expected tabling of this report. The ratio of government current service cost to contributor current service cost is also shown.

Table 6 RCA No. 1 Current Service Cost on a Calendar Year Basis

Calendar Year	Current Service Cost ($ millions)			Current Service Cost (% of pensionable payroll)			Ratio of Government to Contributor Current Service Cost
	Contributors	Government	Total	Contributors	Government	Total	
2022	6.6	39.0	45.6	0.03%	0.15%	0.18%	5.91
2023	7.2	38.1	45.3	0.03%	0.15%	0.18%	5.29
2024	7.9	36.6	44.5	0.03%	0.15%	0.18%	4.63

1.2.4 RCA No. 2 Account as at 31 March 2020

- The balance of the RCA No. 2 Account is $1,272 million;
- the actuarial liability is $1,142 million;
- the resulting actuarial excess is $130 million.

1.3 Valuation Basis

This report is based on pension benefit provisions enacted by the legislation, summarized in Appendices A and B.

The *Public Service Superannuation Act* was amended by Bill C-97 which received Royal Assent on 21 June 2019. The amendment modified the rule regarding the non-permitted surplus, increasing the permitted surplus from 10% to 25% of liabilities.

Other minor amendments applied to the *PSSA* and the *Public Service Superannuation Regulations* since the previous valuation. Those modifications did not have any impact on the actuarial valuation of the plan.

The Funding Policy for the Public Sector Pension Plans (Funding Policy) was approved by the Treasury Board in 2018. The policy provides guidance and rules to support prudent governance of the plans[1] and ensures that sufficient assets are accumulated to meet the cost of the accrued pension benefits. The methods, assumptions and results of this actuarial valuation are consistent with the provisions of the Funding Policy.

The financial data on which this valuation is based on are composed of:

- The Pension Fund invested assets that the government has earmarked for the payment of benefits for service since 1 April 2000;
- the Superannuation Account established to track the government's pension benefit obligations for service prior to 1 April 2000.
- the RCA Accounts established to track the benefit obligations in excess of those that can be provided under the *Income Tax Act* limits for registered pension plans.

These pension assets and account balances are summarized in Appendix C.

The membership data are provided by the Department of Public Services and Procurement Canada (PSPC). Membership data and tests performed on them are summarized in Appendix D.

The valuation was prepared using accepted actuarial practices, methods and assumptions, which are summarized in Appendices E to I.

All actuarial assumptions used in this report are best-estimate assumptions and do not include any margin for adverse deviations. They are independently reasonable and appropriate in aggregate for the purposes of the valuation at the date of this report.

Actuarial assumptions used in the previous report were revised based on economic trends and demographic experience. A complete description of the assumptions is detailed in Appendices F to I.

[1] The plans refer to the Pension Plans for the Public Service of Canada, the Canadian Forces – Regular Force and Reserve Force and the Royal Canadian Mounted Police.

Table 7 presents a summary of the ultimate economic assumptions used in this report and those used in the previous report.

Table 7 Ultimate Best-Estimate Economic Assumptions

	31 March 2020	31 March 2017
Assumed level of inflation	2.0%	2.0%
Real increase in average pensionable earnings	0.7%	0.8%
Real rate of return on the Pension Fund	3.9%	4.0%
Real projected yield on the Superannuation Account	2.1%	2.7%
Real projected yield on the RCA No. 1 and No. 2 Accounts	2.1%	2.7%

Table 8 presents a summary of the demographic assumptions used in this report and those used in the previous report.

Table 8 Demographic Assumptions

	31 March 2020	31 March 2017
Promotional and seniority rate of increase		
Male	0.6 - 5.9%	0.6 - 5.6%
Female	0.7 - 6.1%	0.7 - 5.7%
Life expectancy at age 65[1]		
Male	22.9 years	21.9 years
Female	24.6 years	23.7 years
Average retirement age		
Group 1	60.1 years	59.3 years
Group 2	62.1 years	61.6 years

We have reflected the impacts of the COVID-19 pandemic on the economic assumptions used in this report. Notable examples are assumptions for plan years 2020 to 2024 for the Year's Maximum Pensionable Earnings (YMPE) and the Maximum Pensionable Earnings (MPE). The impact of COVID-19 on the economic assumptions is explained in Appendix F. It is important to note that the pandemic is a very fluid situation that will likely continue to evolve for some time. We have estimated the impacts based on the information known at the time the report was prepared. The final impacts of this health and economic crisis will likely generate some differences in the future.

[1] Life expectancy with assumed future mortality improvements.

2 Valuation Results

This report is based on the pension benefit provisions enacted by the legislation, summarized in Appendices A and B, and the financial and membership data, summarized in Appendices C and D, respectively. The valuation was prepared using accepted actuarial practices, methods and assumptions summarized in Appendices E to I. Emerging experience that differs from the corresponding assumptions will result in gains or (losses), which will be revealed in subsequent reports.

2.1 PSSA – Financial Position

Since 1 April 2000, member and government contributions to the PSPP are credited to the Pension Fund, and the total amount of contributions net of benefits paid and administrative expenses is transferred to the Public Sector Pension Investment Board (PSPIB) and invested in the financial markets.

This section presents the financial positions for both PSSA financing arrangements as at 31 March 2020. The results of the previous valuation are also shown for comparison.

Table 9 State of the Superannuation Account
(Service prior to 1 April 2000)
($ millions)

	31 March 2020	31 March 2017
Recorded Account balance	91,516	94,209
Present value of prior service contributions	21	61
Total	**91,537**	**94,270**
Actuarial Liability		
Active contributors	12,422	17,142
Non-active contributors	111	80
Retirement pensioners	76,266	69,978
Disability pensioners	2,523	2,617
Surviving dependents	6,985	6,526
Outstanding payments	7	12
Administrative expenses	523	782
Total Actuarial Liability	**98,837**	**97,137**
Actuarial Excess/(Shortfall)	**(7,300)**	**(2,867)**

In accordance with the PSSA, the actuarial shortfall of $7,300 million could be amortized over a maximum period of 15 years beginning on 31 March 2022. If the shortfall is amortized over the maximum period, 15 equal annual credits of $626 million could be made to the Superannuation Account. The time, manner and amount of such credits are to be determined by the President of the Treasury Board.

It is expected that the government will eliminate the actuarial shortfall of the Superannuation Account by making a one-time credit of $7,805 million as at 31 March 2022 to take into account the interest on the shortfall accumulated from 31 March 2020 to 31 March 2022.

Table 10 Balance Sheet – Pension Fund
(Service Since 1 April 2000)
($ millions)

	31 March 2020	31 March 2017
Assets		
Market value of assets	123,433	98,770
Actuarial smoothing adjustment[1]	1,248	(6,672)
Present value of prior service contributions	728	858
Total actuarial value of assets	**125,409**	**92,956**
Actuarial Liability		
Active contributors	68,398	57,387
Non-active contributors	210	114
Retirement pensioners	39,237	27,617
Disability pensioners	1,929	1,435
Surviving dependents	963	624
Outstanding payments	172	136
Total Actuarial Liability	**110,909**	**87,313**
Actuarial Surplus/(Deficit)	**14,500**	**5,643**

As at 31 March 2020, the Pension Fund has a surplus of $14,500 million and the funding ratio is 113.1%. As such, no special payments are required and there is no non-permitted surplus[2].

1 Includes the unrecognized investment gains and losses as well as the impact of the application of corridor, if applicable.
2 A non-permitted surplus exists when the amount by which the assets exceed the liabilities is greater than 25 percent of the amount of liabilities.

2.2 PSSA – Reconciliation of the Changes in Financial Position

Table 11 shows the reconciliation of the changes in the financial positions of the Superannuation Account and the Pension Fund. Explanations of the items largely responsible for the changes follow the table.

Table 11 Reconciliation of PSSA Financial Position
($ millions)

	Superannuation Account Actuarial Excess/(Shortfall)	Pension Fund Actuarial Surplus/(Deficit)
As at 31 March 2017	**(2,867)**	**5,643**
Recognized investment gains as at 31 March 2017	-	6,672
Change in methodology	(57)	1,235
Retroactive changes to the population data	(129)	(895)
Revised Initial Financial Position as at 31 March 2017	**(3,053)**	**12,655**
Expected interest on initial financial position	(381)	2,036
Special credits / payments	3,225	377
Net experience gains and (losses)	327	1,479
Revision of actuarial assumptions	(7,598)	(3,400)
Change in the present value of administrative expenses	181	-
Change in the present value of prior service contributions	(1)	105
Unrecognized investment losses as at 31 March 2020	-	1,248
As at 31 March 2020	**(7,300)**	**14,500**

2.2.1 Recognized Investment Gains as at 31 March 2017

An actuarial asset valuation method that minimizes the impact of short-term fluctuations in the market value of assets was used in the previous valuation report, causing the actuarial value of the Pension Fund assets to be $6,672 million less than its market value.

2.2.2 Change in Methodology

Two changes occurred since the last valuation:

- A new actuarial valuation software was used to complete the valuation.
- As a result of the change in actuarial valuation software, the Age Last approach was replaced by an Age Nearest approach. These two methodologies are detailed in Appendix E.2.4.

The combined changes increased the Superannuation Account liability by $57 million and decreased the Pension Fund liability by $1,235 million.

2.2.3 Retroactive Changes to the Population Data

The population data maintained by PSPC is constantly subject to retroactive changes such as new collective agreements. The impacts of these changes increased the Superannuation Account liability as at 31 March 2017 by $129 million and the initial Pension Fund liability as at the same date by $895 million.

2.2.4 Expected Interest on Revised Initial Financial Position

The amount of interest expected to accrue during the intervaluation period increased the shortfall by $381 million for the Superannuation Account and increased the surplus by $2,036 million for the Pension Fund.

These amounts of interest were based on the Superannuation Account yields and the Pension Fund returns projected in the previous report for the three-year intervaluation period.

2.2.5 Special Credits and Payments Made in the Intervaluation Period

The government made a one-time special credit to eliminate the $2,867 million shortfall reported in the Superannuation Account as at 31 March 2017. After factoring the expected interest, this credit resulted in an increase of $3,225 million in the recorded balance of the Superannuation Account as at 31 March 2020.

A deficit was reported in the Pension Fund as at 31 March 2014 which were to be amortized over a period of 15 years in accordance with the legislation. A special paymenf of $340 million was made to the Pension Fund during the intervaluation period that resulted in an increase of $377 million in the assets of the Pension Fund after factoring the expected interest to 31 March 2020.

2.2.6 Experience Gains and (Losses)

Since the previous valuation, experience gains and losses decreased the Superannuation Account shortfall by $327 million and increased the Pension Fund surplus by $1,479 million. The main experience gain and loss items are shown in Table 12.

Table 12 Experience Gains and (Losses)
($ millions)

	Superannuation Account	Pension Fund
Demographic experience (i)		
New members	$30	$140
Rehired pensioner members	0	(35)
Terminations	(5)	(262)
Retirements	(382)	(599)
Disabilities with an annuity	(13)	(62)
Active deaths	8	(133)
Retired pensioner mortality	(216)	(70)
Disabled pensioner mortality	(23)	(55)
Widow(er) mortality	8	0
Total	**(593)**	**(1,076)**
Investment earnings (ii)	(56)	583
Service/contributions difference (iii)	2	571
Expected/actual disbursements (iv)	(39)	172
Pension indexation (v)	381	218
Promotional and seniority increases (vi)	223	999
Economic salary increases (vii)	43	321
YMPE and MPE increases	0	16
Outstanding payments	5	(36)
Pension benefit division	6	52
Administrative expenses	17	(13)
Miscellaneous	338	(329)
Experience Gains and (Losses)	**327**	**1,479**

(i) The net impact of the demographic experience increased the Superannuation Account liability by $593 million and the Pension Fund liability by $1,076 million. The increases in liability were largely due to
- higher than expected number of retirements;
- higher transfer values paid upon termination of active members;
- mortality experience was different than expected, resulting in a loss.

(ii) The rates of interest credited to the Superannuation Account were in aggregate smaller than the corresponding projected Account yields in the previous valuation resulting in an experience loss of $56 million.

The return realized on the Pension Fund for plan years 2018 to 2020 were 9.8%, 7.1% and -0.6% versus the expected returns of 4.7%, 5.1%, and 5.5%, respectively. Consequently, the Pension Fund experienced an investment gain of $583 million over the three-year intervaluation period.

(iii) Unexpected revised credited service resulted in a decrease of $2 million in the Superannuation Account shortfall. Lower than anticipated part-time service and service buyback contributions resulted in an increase of $571 million in the Pension Fund surplus.

(iv) Higher than anticipated pension payments resulted in an increase of $39 million in the Superannuation Account shortfall, while lower than anticipated pension payments resulted in an increase of $172 million in the Pension Fund surplus.

(v) The pension benefit indexation rates for the period from January 2018 to January 2020 were, in aggregate, 0.6% lower than the projected pension indexation, resulting in a $381 million decrease in the Superannuation Account liability and a $218 million decrease in the Pension Fund liability.

(vi) Lower than expected promotional salary increases resulted in a decrease of $223 million in the Superannuation Account liability and a decrease of $999 million in the Pension Fund liability.

(vii) Lower than anticipated economic salary increases resulted in a decrease of $43 million in the Superannuation Account liability and a decrease of $321 million in the Pension Fund liability.

2.2.7 Revision of Actuarial Assumptions

Actuarial assumptions were revised based on economic trends and demographic experience as described in Appendices F to I. These revisions have increased the Superannuation Account shortfall by $7,598 million and decreased the Pension Fund surplus by $3,400 million. The impact of these revisions is shown in Table 13 with the most significant items discussed thereafter.

Table 13 Gains and (Losses) due to Revision of Actuarial Assumptions
($ millions)

Assumptions	Superannuation Account	Pension Fund
Economic assumptions		
Yields and Rates of return	(7,304)	(4,921)
Increase in average pensionable earnings	108	2,120
Pension indexation	(56)	(48)
Total	**(7,252)**	**(2,849)**
Demographic assumptions		
Withdrawals	(8)	(91)
Pensionable retirements	(45)	(20)
Disabled retirements	(3)	11
Healthy pensioner and contributor mortality rates	(656)	(718)
Disabled pensioner mortality rates	26	15
Spouse mortality rates	(56)	(42)
Proportion married at death of member	163	105
Promotional salary increases	8	104
Spouse Age difference	225	49
Proportion of Member Electing for deferred pension	0	11
Other items	0	25
Total	**(346)**	**(551)**
Net impact of revision	**(7,598)**	**(3,400)**

The net impact of the revision of the assumptions is largely attributable to the changes in economic assumptions.

The following revisions were made to the economic assumptions used in the previous report:

- ultimate real rate of return on the Pension Fund decreased from 4.0% to 3.9%;
- ultimate real projected yield on the Superannuation Account was decreased from 2.7% to 2.1%;
- ultimate real increases in YMPE and MPE were decreased from 1.1% to 1.0% ; and
- ultimate real increase in average pensionable earnings decreased from 0.8% to 0.7%.

Details of the changes in economic assumptions are described in Appendix F.

The main revision to the demographic assumptions is a change to the mortality improvement rates. Details of the changes in demographic assumptions are described in Appendix G.

2.2.8 Change in the Present Value of Administrative Expenses

The previous report annual administrative expense assumption of 0.45% of total pensionable payroll decreased to 0.40% in this report. This decrease is based on an analysis of the trend in administrative expenses charged to both the Superannuation Account and the Pension Fund over the last three years.

For plan year 2021, 44% of total administrative expenses are being charged to the Superannuation Account; it is assumed that the proportion charged to the Superannuation Account will reduce at the

rate of 2.0% per year as in the previous report. These changes in the annual administrative expenses resulted in an decrease of $181 million of the Superannuation Account shortfall as at 31 March 2020.

2.2.9 Change in the Present Value of Prior Service Contributions

New members' prior service election paid through instalments since the last report and changes to payment schedules for some members resulted in a change in the present value of prior service contributions. This change increased the Superannuation Account shortfall by $1 million and the Pension Fund surplus by $105 million.

2.2.10 Unrecognized Investment Gains

An actuarial asset valuation method that minimizes the impact of short-term fluctuations in the market value of assets was also used for this valuation. This method, which is described in Section E.1, resulted in an actuarial value of assets that is $1,248 million more than the market value of the Pension Fund assets as at 31 March 2020.

2.3 PSSA – Cost Certificate

2.3.1 Current Service Cost

The details of the current service cost for plan year 2022 and reconciliation with the 2019 current service cost are shown below.

Table 14 Current Service Cost for Plan Year 2022
($ millions)

Member required contributions	2,675
Government current service cost	2,701
Total current service cost	**5,376**
Expected pensionable payroll	27,332
Total current service cost as % of expected pensionable payroll	**19.67%**

Table 15 Reconciliation of PSSA Current Service Cost
(% of pensionable payroll)

For plan year 2019	**20.16**
Expected current service cost change	(0.47)
Change in methodology	(0.20)
Change in demographics	(0.47)
Changes in assumptions	
Economic assumptions	0.47
Demographic assumptions	0.18
For plan year 2022	**19.67**

2.3.2 Projection of Current Service Costs

The current service cost is borne jointly by the plan members and the government. Group 1 and Group 2 member contribution rates are determined such that the government share of the current service cost contribution is 50%. They are determined on a calendar year basis and are shown in Table 2.

Current service costs on a plan year basis, expressed in dollar amount as well as in percentage of the projected pensionable payroll, are shown in Table 16.

Table 16 Projection of Current Service Cost on a Plan Year Basis

Plan Year	$ Millions			Percentage of Pensionable Payroll			Portion Borne by the Government[1]
	Contributors	Government	Total	Contributors	Government	Total	
2022	2,675	2,701	5,376	9.79%	9.88%	19.67%	50.23%
2023	2,778	2,807	5,585	9.73%	9.83%	19.56%	50.26%
2024	2,874	2,904	5,778	9.67%	9.77%	19.44%	50.26%
2025	2,971	3,003	5,974	9.63%	9.74%	19.37%	50.28%

2.3.3 Administrative Expenses

The Pension Fund administrative expenses are included in the total current service costs and are estimated to be as follows.

Table 17 Pension Fund Administrative Expenses

Plan Year	($ millions)
2022	68
2023	74
2024	79
2025	84

The Superannuation Account administrative expenses have been capitalized and are shown as a liability in the balance sheet.

[1] Operational members contribution rates are those of Group 1 members. Deemed operational members contribute an additional 0.62% of their payroll to maintain their entitlement to the operational benefits. Government contributions for Operational members are higher than 50% of their current service cost, resulting in an overall portion borned by the Government being slightly over 50%.

2.3.4 Contributions for Prior Service Elections

Member and government contributions for prior service elections were estimated as follows:

Table 18 Estimated Contributions for Prior Service BuyBack
($ millions)

	Superannuation Account		Pension Fund	
Plan Year	Contributors	Government	Contributors	Government
2022	2	2	97	71
2023	2	1	95	67
2024	1	1	93	63
2025	1	1	92	59

2.4 Sensitivity of Valuation Results to Assumptions

The information required by statute, which is presented in the main report, has been derived using best-estimate assumptions regarding future demographic and economic trends. The key best-estimate assumptions, i.e. those for which changes within a reasonable range have the most significant impact on the long-term financial results, are described in Appendices F and G. Given the length of the projection period and the number of assumptions required, it is unlikely that the actual experience will develop precisely in accordance with the best-estimate assumptions. Individual sensitivity tests have been performed, projecting the pension plan's financial status using alternative assumptions.

This valuation assumes that the current mortality rates applicable to members of the PSPP will improve over time in line with the mortality improvement assumption contained in the 30th Actuarial Report on the Canada Pension Plan. Table 19 presents the effect of varying the mortality improvement assumption on the plan year 2021 current service cost and the liabilities for the Superannuation Account and the Pension Fund. The best-estimate mortality improvement assumption is described in Table 61 of Appendix G.

Table 19 Sensitivity of Valuation Results to Variations in Mortality Improvement Rates

	Current Service Cost as a percentage of pensionable payroll		Actuarial Liability ($ millions)				Age 65 Life Expectancy in 2020	
			Superannuation Account		Pension Fund		Male	Female
Mortality Improvement Rates	2022	Effect		Effect		Effect		
Best-estimate basis	19.67	None	98,837	None	110,909	None	22.9	24.6
- if 0%	18.94	(0.73)	95,606	(3,231)	107,313	(3,596)	21.5	23.3
- if ultimate 50% higher	19.82	0.15	99,126	289	111,503	594	23.1	24.8
- if ultimate 50% lower	19.51	(0.16)	98,551	(286)	110,313	(596)	22.6	24.5
- if kept at 2021 level	20.23	0.56	100,677	1,840	113,413	2,504	23.9	25.4

Table 20 shows the effect on the plan year 2022 current service cost and the liabilities for the Superannuation Account and the Pension Fund when key economic assumptions are varied by one percentage point per annum.

Table 20 Sensitivity of Valuation Results to Variations in Key Economic Assumptions

	Current Service Cost (%)		Actuarial Liability ($ millions)			
			Superannuation Account		Pension Fund	
Assumption(s) Varied	2022	Effect		Effect		Effect
None (i.e. current basis)	19.67	None	98,837	None	110,909	None
Investment yield/return						
- if 1% higher	15.80	(3.87)	88,204	(10,633)	93,866	(17,043)
- if 1% lower	25.03	5.36	111,769	12,932	133,072	22,163
Pension indexation						
- if 1% higher	21.97	2.30	110,989	12,152	124,634	13,725
- if 1% lower	17.71	(1.96)	88,599	(10,238)	99,267	(11,642)
Salary, YMPE and MPE						
- if 1% higher	21.53	1.86	98,990	153	115,933	5,024
- if 1% lower	18.10	(1.57)	98,703	(134)	106,523	(4,386)
Inflation[1]						
- if 1% higher	19.21	(0.46)	98,433	(404)	109,463	(1,446)
- if 1% lower	20.15	0.48	99,263	426	112,410	1,501

The differences between the results above and those shown in the valuation can also serve as a basis for approximating the effect of other numerical variations in one of a key assumptions to the extent that such effects are assumed to be linear.

[1] Change in inflation impacts nominal investment yield and salary, as well as pension indexation.

2.5 RCA – Financial Position

This section shows the financial position of the RCA accounts as at 31 March 2020. The results of the previous valuation are also shown for comparison.

Table 21 State of the RCA No. 1 Account
($ millions)

	31 March 2020	31 March 2017
RCA No. 1 recorded account balance	1,315	1,193
Refundable tax	1,297	1,184
Present value of prior service contributions	3	2
Total	**2,615**	**2,379**
Actuarial Liability		
Pensionable excess earnings		
• Active contributors	689	592
• Pensioners	1,003	666
Survivor Allowance		
• Active contributors	99	97
• Pensioners	363	228
Former deputy heads	38	35
Total Actuarial Liability	**2,192**	**1,618**
Actuarial Excess/(Shortfall)	**423**	**761**

The sum of the recorded balance of the RCA No. 1 Account, the refundable tax and the present value of prior service cost contributions as at 31 March 2020 is $2,615 million, which exceeds the actuarial liability of $2,192 million by $423 million.

Table 22 State of the RCA No. 2 Account
($ millions)

	31 March 2020	31 March 2017
RCA No. 2 Recorded Account Balance	628	718
Refundable tax	644	731
Total	**1,272**	**1,449**
Actuarial Liability	**1,142**	**1,208**
Actuarial Excess/(Shortfall)	**130**	**241**

Since the previous valuation, the actuarial excess of the RCA No. 2 Account reduced from $241 million to $130 million.

2.6 RCA No. 1 Current Service Cost

The projected current service cost, which is borne jointly by the members and the government, decreased by 0.05% to 0.18% of pensionable payroll in this valuation for plan year 2022 from 0.23% of pensionable payroll calculated in the previous actuarial report.

The RCA No. 1 current service cost is estimated to be 0.18% of pensionable payroll for plan year 2022 to 2025.

Table 23 shows the estimated RCA No. 1 current service cost for the next four plan years.

Table 23 RCA No. 1 – Current Service Cost
($ millions)

	Plan Year			
	2022	2023	2024	2025
Total current service cost				
Pensionable excess earnings	34.1	33.3	32.2	30.8
Survivor allowance	11.5	12.3	12.9	13.6
Total	**45.7**	**45.7**	**45.2**	**44.4**
Member contributions				
Pensionable excess earnings	7.9	6.8	7.4	8.0
Total	**7.9**	**6.8**	**7.4**	**8.0**
Government current service cost	**37.8**	**38.9**	**37.8**	**36.4**

The current service cost for former deputy heads is negligeable for years 2022 to 2025, due to the very low number of active members.

2.7 Summary of Estimated Government Costs

Table 24 summarizes the estimated total government credits for the RCA No. 1 and the Superannuation Account on a plan year basis. Table 25 summarizes the estimated total government costs for the Pension Fund on a plan year basis.

Table 24 Estimated Government Credits
($ millions)

	RCA No. 1	Superannuation Account		Total Government Credits
Plan Year	Current Service Cost	Total Prior Service Contributions	Expected Special Credits	
2022	38	2	7,805	7,845
2023	39	1	0	40
2024	38	1	0	39
2025	36	1	0	37

Table 25 Estimated Government Cost - Pension Fund
($ millions)

Plan Year	Current Service Cost	Total Prior Service Contributions	Total Government Cost
2022	2,701	71	2,772
2023	2,807	95	2,902
2024	2,904	93	2,997
2025	3,003	92	3,095

3 Actuarial Opinion

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

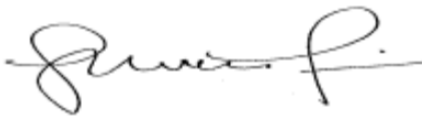
- the valuation data on which the valuation is based are sufficient and reliable for the purposes of the valuation;
- the assumptions used are individually reasonable and appropriate in aggregate for the purposes of the valuation; and
- the methods employed are appropriate for the purposes of the valuation.

This report has been prepared, and our opinion given, in accordance with accepted actuarial practice in Canada. In particular, this report was prepared in accordance with the Standards of Practice (General Standards and Practice – Practice-Specific Standards for Pension Plans) published by the Canadian Institute of Actuaries.

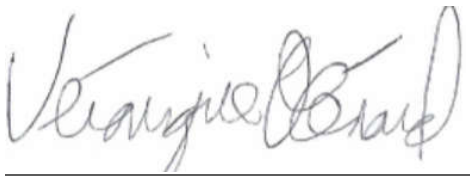
We have reflected the impacts of the COVID-19 pandemic on the economic assumptions used in this report. It is important to note that the pandemic is a very fluid situation that will likely continue to evolve for some time. We have estimated the impacts based on the information known at the time the report was prepared. The final impacts of this health and economic crisis will likely generate some differences in the future.

To the best of our knowledge, after discussion with Public Services and Procurement Canada and the Treasury Board of Canada Secretariat, there were no subsequent events between the valuation date and the date of this report that would have a material impact on the results of this valuation.

Assia Billig, FCIA, FSA
Chief Actuary



Laurence Frappier, FCIA, FSA



Véronique Ménard, FCIA, FSA

Ottawa, Canada
29 September 2021

Appendix A — Summary of Pension Benefit Provisions

The government has been providing its employees with a pension plan since 1870. Pensions for members of the Public Service are provided primarily under the *Public Service Superannuation Act* (PSSA) as enacted in 1954 and modified thereafter. Benefits are also provided to public servants under the *Special Retirement Arrangements Act*. Benefits may be modified in accordance with the *Pension Benefits Division Act* if there is a breakdown of a spousal union.

Changes Since the Last Valuation

The *Public Service Superannuation Act* was amended by Bill C-97 which received Royal Assent on 21 June 2019. The amendment modified the rule regarding the non-permitted surplus, increasing the permitted surplus from 10% to 25% of liabilities.

Other minor amendments applied to the *PSSA* and the *Public Service Superannuation Regulations* since the previous valuation. Those modifications did not have any impact on the actuarial valuation of the plan.

Summary of Pension Benefit Provisions

Summarized in this Appendix are the pension benefits provided under the PSSA registered provisions, which are in compliance with the *Income Tax Act*. The portion of the benefits in excess of the *Income Tax Act* limits for registered pension plans is provided under the retirement compensation arrangements described in Appendix B.

In case of any discrepancy between this summary and the legislation, the legislation shall prevail.

A.1 Membership

Subject to the exceptions mentioned in the next paragraph, membership in the plan is compulsory for all full-time and part-time employees working 12 or more hours per week (except those who were grandfathered as at 4 July 1994) in the Public Service. This includes all positions in any department or portion of:

- the Executive Government of Canada;
- the Senate and the House of Commons;
- the Library of Parliament; and
- any board, commission or corporation listed in a Schedule to the Act, as well as those designated as contributors by the President of the Treasury Board either individually or as members of a class for persons engaged as seasonal employees and some others.

The main groups of persons employed in the Public Service to which the Act does not apply are:

- part-time employees working less than 12 hours per week;
- persons locally engaged outside Canada;
- employees of some Crown corporations, boards or commissions covered by their own pension plans; and

- seasonal employees, and some others, unless designated as contributors by the President of the Treasury Board.

Since the previous valuation, no entities have left the plan.

A.2 Contributions

A.2.1 Members

Different contribution rates apply to Group 1[1] and Group 2[2] contributors. The expected rates are consistent with the government objective of maintaining a 50:50 employer to employee current service cost sharing ratio.

During the first 35 years of pensionable service, members contribute according to the rates shown in the following table.

Table 26 Member Contribution Rates

	Group 1		Group 2	
Calendar year	Below YMPE	Above YMPE	Below YMPE	Above YMPE
2020[3]	9.53%	11.72%	8.69%	10.15%
2021[4]	9.83%	12.26%	8.89%	10.59%
2022	9.36%	12.48%	7.95%	11.82%
2023	9.35%	12.37%	7.93%	11.72%
2024	9.35%	12.25%	7.94%	11.54%

The contribution rates shown after calendar year 2022 are estimates and subject to change.

After 35 years of pensionable service, members contribute only 1% of pensionable earnings.

In order to keep their rights to an early retirement benefit, deemed operational members of Correctional Service Canada (CSC) contribute 0.62% of total earnings during a calendar year in addition to the above contribution rates.

A.2.2 Government

A.2.2.1 Current Service

The government determines the normal monthly contribution as the amount which, when combined with the required contributions by members in respect of current service and expected interest earnings, is sufficient to cover the cost, as estimated by the President of the Treasury Board, of all future payable benefits that have accrued in respect of pensionable service during that month and the Pension Fund administrative expenses incurred during that month.

1 Members who entered the PSPP prior to 1 January 2013.
2 Members who entered the PSPP on or after 1 January 2013.
3 The contributions rates for calendar year 2020 were established in the previous valuation.
4 The contribution rates established in 2021 were based on the economic assumptions of the Actuarial Report on the Pension Plans for the Canadian Forces as at 31 March 2019 and on the data and demographic assumptions of the Actuarial Report on the Pension plan for the Public Service of Canada as at 31 March 2017.

A.2.2.2 Elected Prior Service

The government matches member contributions made to the Superannuation Account for prior service elections; however, it makes no contributions if the member is paying the double rate.

Government contributions to the Pension Fund in respect of elected prior service are calculated using the same ratio of Government contributions to employee contributions as for the current service cost. For member paying the double rate, the government contributes only the excess of the ratio of Government contributions to employee contributions over 1.

A.2.2.3 Actuarial Excess and Surplus

The PSSA gives the government the authority to:

- debit the excess of the Superannuation Account over the actuarial liability subject to limitations, and
- deal with any actuarial surplus, subject to limitations, in the Pension Fund as they occur, either by
    - reducing employer contributions or
    - reducing employer and employee contributions or
    - by making withdrawals.

A.2.2.4 Actuarial Shortfall and Deficit

In accordance with the PSSA, if either a Superannuation Account actuarial shortfall or a Pension Fund actuarial deficit is identified through a triennial statutory actuarial valuation, the actuarial shortfall/deficit can be amortized over a period of up to 15 years.

The President of the Treasury Board will determine the time, the manner and the amount of credits to be made. The shortfall/deficit must be fully paid by the end of the fifteenth fiscal year following the tabling of that report at the latest.

A.3 Summary Description of Benefits

The objective of the PSPP is to provide an employment earnings–related lifetime retirement pension to eligible members. Benefits to members in case of disability and to the spouse and children in case of death are also provided.

Subject to coordination with the pensions paid by the Canada Pension Plan (CPP) or the Québec Pension Plan (QPP), the initial rate of retirement pension is equal to 2% of the highest average of annual pensionable earnings over any period of five consecutive years, multiplied by the number of years of pensionable service not exceeding 35. Once in pay, the pension is indexed annually with the Consumer Price Index. Such indexation also applies to deferred pensions during the deferral period. Detailed notes on the following overview are provided in the following section.

Contributor's Type of Termination	Benefit
With less than two years of service[1]	Return of contributions
With two or more years of service[1]; and	
▪ Disability	Immediate annuity
▪ Death leaving no surviving spouse or eligible children	Minimum benefit
▪ Death leaving surviving spouse and/or eligible children	Survivor allowance(s)
▪ Leaving prior to age 45, except for death or disability	
– Actual operational service between 20 and 25 years	Actual operational service annual allowance[2]
– Actual operational service 25 years or more	Immediate annuity
– Otherwise	Deferred annuity or transfer value
▪ Leaving at ages 45 to 49, except for death or disability, and	
– Deemed operational service 20 years or more	Deemed operational service annual allowance[3]
– Actual operational service between 20 and 25 years	Actual operational service annual allowance[2]
– Actual operational service 25 years or more	Immediate annuity
– Otherwise	Deferred annuity or transfer value
▪ Leaving at age 50 or over, except for death or disability, and	
– Deemed operational service between 20 and 25 years	Deemed operational service annual allowance [3]
– Deemed operational service 25 years or more	Immediate annuity
– Actual operational service between 20 and 25 years	Actual operational service annual allowance[2]
– Actual operational service 25 years or more	Immediate annuity
– Otherwise, but Group 1, age 60 or over, or age 55 or over and service 30 years or more	Immediate annuity
– Otherwise, but Group 2, age 65 or over, or age 60 or over and service 30 years or more	Immediate annuity
– Otherwise	Deferred annuity or annual allowance

Deferred and Immediate Pensioner's Type of Termination	Benefit
▪ Group 1 disability before age 60 while entitled to a deferred annuity or an annual allowance	Immediate annuity
▪ Group 2 disability before age 65 while entitled to a deferred annuity or an annual allowance	Immediate annuity
▪ Death leaving no eligible survivor	Minimum benefit
▪ Death leaving eligible survivor(s)	Survivor allowance(s)

1 Thresholds are determined using total pensionable service, including operational service.

2 Based on actual operational service only. Additional non-operational and/or deemed operational service, if any, results in the applicable non-operational benefit and/or deemed operational benefit (see Note A.4.9).

3 Based on deemed operational service only. Additional non-operational service, if any, results in the applicable non-operational benefit (see Note A.4.10).

A.4 Explanatory Notes

A.4.1 Pensionable Earnings

Pensionable earnings means the annual employment earnings (excluding overtime but including pensionable allowances such as bilingual bonuses) of a contributor.

Pensionable payroll means the aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.

A.4.2 Indexation

A.4.2.1 Level of Indexation Adjustments

All immediate and deferred annuities (pensions and allowances) are adjusted every January to the extent warranted by the increase, as at 30 September of the previous year, in the 12-month average Consumer Price Index relative to the corresponding figure one year earlier. If the indicated adjustment is negative, annuities are not decreased for that year; however, it is carried-forward and the next positive adjustment is diminished accordingly.

A.4.2.2 First Indexation Adjustment

Indexation adjustments accrue from the end of the month in which employment terminates. The first annual adjustment following termination of employment is prorated accordingly.

A.4.2.3 Commencement of Indexation Payments

The indexation portion of a retirement, disability or survivor pension normally starts being paid when the pension is put into pay. However, regarding an operational service retirement pension, indexation payments start only when the pensioner is either

- at least 55 years old, provided the sum of age and pensionable service is at least 85; or
- at least 60 years old.

A.4.3 Pensionable Service, Actual Operational Service and Deemed Operational Service

Pensionable service of a contributor includes any period of service in the Public Service for which the contributor has been required to contribute or has elected to contribute, if eligible to do so, and such other types of service for which the contributor has elected to make the required special contributions to the Superannuation Account or the Pension Fund. Pensionable service is limited to 35 years.

Actual operational service refers to CSC employees working in federal correctional facilities, parole offices and community correctional centres. More specifically, operational service is defined as service by a person employed by CSC whose principal place of work is not: the national headquarters or a regional headquarters of CSC; the offices of the CSC Commissioner; or a regional CSC Staff College or any other institution that provides similar training to CSC employees.

Deemed operational service refers to CSC employees in operational service for one or more periods totalling at least 10 years, who then cease to be engaged in operational service but continue to be

employed by CSC and elect to continue to accumulate operational service and contribute an additional 0.62% of earnings.

A.4.4 Return of Contributions

Return of contributions means the payment of an amount equal to the accumulated current and prior service contributions paid or transferred by the contributor into the plan. Interest is credited quarterly on returned contributions in accordance with the investment return on the Pension Fund.

A.4.5 Immediate Annuity

Immediate annuity means an unreduced pension that becomes payable immediately upon a pensionable retirement or pensionable disability. The annual amount is equal to 2% of the highest average of annual pensionable earnings of the contributor over any period of five[1] consecutive years, multiplied by the number of years of pensionable service not exceeding 35. For contributors with periods of part-time pensionable service, earnings used in the five-year average are based on a full 37.5-hour workweek but the resulting average is multiplied by the proportion of the actual workweek over a full workweek averaged by the contributor over the entire period of pensionable service.

When a pensioner attains age 65 or becomes entitled to a disability pension from the CPP or the QPP, the annual pension amount is reduced by a percentage of the *indexed CPP annual pensionable earnings*[2] (or, if lesser, the indexed five-year[1] pensionable earnings average on which the immediate annuity is based), *multiplied by the years of CPP pensionable service*[3]. The applicable percentage is 0.625%.

Annuities are payable at the end of month until the month in which the pensioner dies or until the disabled pensioner recovers from disability (the last payment would then be pro-rated). Upon the death of the pensioner, either a survivor allowance (Note A.4.13) or a residual death benefit (Note A.4.14) may be payable.

A.4.6 Deferred Annuity

Deferred annuity means an annuity that normally becomes payable to a former Group 1 contributor who reaches age 60 or a former Group 2 contributor who reaches age 65. The annual payment is determined as for an immediate annuity (Note A.4.5) but is also adjusted to reflect the indexation (Note A.4.2) from the date of termination to the commencement of benefit payments.

The deferred annuity of a former Group 1 contributor becomes an immediate annuity during any period of disability beginning before age 60. If the disability ceases before age 60, the immediate annuity reverts to the original deferred annuity unless the pensioner elects an annual allowance (Notes A.4.8, A.4.9, and A.4.10) that is the prescribed actuarial equivalent to the deferred annuity. Similarly, the deferred annuity of a former Group 2 contributor becomes an immediate annuity during any period of disability beginning before age 65, and reverts back to the original deferred annuity if the disability

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1 If the number of years of pensionable service is less than five, then the averaging is over the entire period of pensionable service.

2 *Indexed CPP annual pensionable earnings* means the average of the YMPE, as defined in the CPP, over the five calendar years leading up to and including the one in which pensionable service terminated, increased by indexation proportionate to that accrued in respect of the immediate annuity.

3 *Years of CPP pensionable service* mean the number of years of PSSA pensionable service after 1965 or after attaining age 18, whichever is later, but not exceeding 35.

ceases before age 65, unless the pensioner elects an annual allowance as described above.

A.4.7 Transfer Value

A contributor who has ceased to be employed in the public service and has to his credit two or more years of pensionable service, is a Group 1 contributor and is under age 50, or is a Group 2 contributor and is under age 55, and is eligible for a deferred annuity may elect to transfer the commuted value of his benefit, determined in accordance with the regulations, to

- a locked-in Registered Retirement Savings Plan of the prescribed kind; or
- another pension plan registered under the *Income Tax Act;* or
- a financial institution for the purchase of a locked-in immediate or deferred annuity of the prescribed kind.

A.4.8 Annual Allowance For Members

For a Group 1 member, *annual allowance* means an annuity payable immediately on retirement or upon attaining age 50, if later. The amount of the allowance is equal to the amount of the deferred annuity to which the member would otherwise be entitled, reduced by 5% for each year between 60 and the age when the allowance becomes payable. However, if the member is at least 50 years old at termination, and has at least 25 years of pensionable service[1], then the difference is reduced (subject to the above as a maximum) to the greater of

- 55 minus the age, and
- 30 minus the number of years of pensionable service[1].

For a Group 2 member, the eligibility age is increased by 5 years, so that a*nnual allowance* means an annuity payable immediately on retirement or upon attaining age 55 if later. The amount of the allowance is equal to the amount of the deferred annuity to which the member would otherwise be entitled, reduced by 5% for each year between 65 and the age when the allowance becomes payable. However, if the member is at least 55 years old at termination, and has at least 25 years of pensionable service[1], then the difference is reduced (subject to the above as a maximum) to the greater of

- 60 minus the age, and
- 30 minus the number of years of pensionable service[2].

The Treasury Board can waive all or part of the reduction for Group 1 contributors who are involuntarily retired at ages 55 and over with at least 10 years of Public Service employment, or for Group 2 contributors who are involuntarily retired at ages 60 and over with at least 10 years of Public Service employment.

When a Group 1 member in receipt of an annual allowance becomes disabled before reaching age 60, or a Group 2 member in receipt of an annual allowance becomes disabled before reaching age 65, the

[1] For privatized members who elected not to transfer their PSSA benefits to their new employer's pension plan, service (including any operational) with the new employer is included.

[2] For privatized members who elected not to transfer their PSSA benefits to their new employer's pension plan, service (including any operational) with the new employer is included.

annual allowance becomes an immediate annuity adjusted in accordance with the regulations to take into account the amount of any annual allowance received prior to becoming disabled.

A.4.9 Deemed Operational Service - Immediate Annuity and Annual Allowance

A deemed operational service immediate annuity differs from an immediate annuity (Note A.4.5) only in that it is available as early as age 50 with 25 years of operational service.

A deemed operational service annual allowance differs from an annual allowance (Note A.4.8) in two ways. Firstly it is available as early as age 45 with 20 years of operational service. Secondly the reduction factor is 5% multiplied by the greater of

- 50 minus the age, and
- 25 minus the years of operational service.

The foregoing operational service–related benefits are calculated in relation to both deemed and actual operational service only. Additional non-operational service results in the applicable non-operational benefit where any thresholds or reductions are based on total pensionable service, including operational service.

A.4.10 Actual Operational Service - Immediate Annuity and Annual Allowance

An actual operational service immediate annuity differs from an immediate annuity (Note A.4.5 and Note A.4.9) only in that it is available when the member has accrued 25 years of actual operational service.

An actual operational service annual allowance differs from other annual allowances (Note A.4.8 and Note A.4.9) in two ways. Firstly it is available as soon as 20 years of actual operational service is accrued. Secondly the reduction factor is 5% multiplied by

- 25 minus the years of actual operational service.

The foregoing operational service-related benefits are calculated in relation to actual operational service only. Additional non-operational service results in the applicable non-operational benefit where any thresholds or reductions are based on total pensionable service, including operational service. Also, additional deemed operational service results in the applicable deemed operational benefit where any thresholds or reductions are based on operational pensionable service.

A.4.11 Eligible Surviving Spouse

Eligible surviving spouse means the surviving spouse (includes a common-law or same-sex partner recognized under the plan) of a contributor or pensioner except if:

- the contributor or pensioner died within one year of commencement of the spousal union, unless the Treasury Board is satisfied that the health of the contributor or pensioner at the time of such commencement justified an expectation of surviving for at least one year; or
- the pensioner married after ceasing to be a contributor, unless after such marriage the pensioner either:
  - became a contributor again, or

- made an optional survivor benefit election within 12 months following marriage to accept a reduced pension so that the new spouse would be eligible for a survivor benefit. This reduction is reversed if and when the new spouse predeceases the pensioner or the spousal union is terminated for reason other than death.

A.4.12 Eligible Surviving Children

Eligible surviving children includes all children of the contributor or pensioner who are under age 18, and any child of the contributor or pensioner who is age 18 or over but under 25, in full-time attendance at a school or university, having been in such attendance substantially without interruption since he or she reached age 18 or the contributor or pensioner died, whichever occurred later.

A.4.13 Annual Allowance for Eligible Survivor(s)

Annual allowance means, for the eligible surviving spouse and children of a contributor or pensioner, an annuity that becomes payable immediately upon the death of that individual. The amount of the allowance is determined with reference to a basic allowance that is equal to 1% of the highest average of annual pensionable earnings of the contributor over five consecutive years, multiplied by the number of years of pensionable service not exceeding 35.

The annual allowance for a spouse is equal to the basic allowance unless the spouse became eligible as a result of an optional survivor benefit election, in which case it is equal to the percentage of the basic allowance specified by the pensioner making the election.

The annual allowance for an eligible surviving child is equal to 20% of the basic allowance, subject to a reduction if there are more than four eligible surviving children in the same family. The allowance otherwise payable to an eligible surviving child is doubled if there is no eligible surviving spouse.

Survivor annual allowances are not integrated with the CPP or the QPP and are payable in equal monthly instalments in arrears until the end of the month in which the survivor dies or otherwise loses eligibility. If applicable, a residual benefit (Note A.4.14) is payable to the estate upon the death of the last survivor.

A.4.14 Minimum and Residual Death Benefits

If a contributor or a pensioner dies leaving no eligible survivor, the lump sum normally paid is the excess of five times the annual amount of the immediate annuity to which the contributor would have been entitled, or the pensioner was entitled, at the time of death, less any pension payments already received. Indexation adjustments are excluded from these calculations.

The same formula is used to determine the residual death benefit, which is the lump sum payable upon the death of an eligible survivor but also subtracting all amounts (excluding indexation adjustments) already paid to the survivor.

A.4.15 Division of Pension with Former Spouse

In accordance with the *Pension Benefits Division Act*, upon the breakdown of a spousal union (including common-law), a lump sum can be debited by court order or by mutual consent from the accounts and/or the Pension Fund, as the case may be, to the credit of the former spouse of a contributor or pensioner. The maximum transferable amount is half the value, calculated as at the transfer date, of the

retirement pension accrued by the contributor or pensioner during the period of cohabitation. If the member's benefits are not vested, the maximum transferable amount corresponds to half the member's contributions made during the period subject to division, accumulated with interest at the rate applicable on a refund of contributions. The accrued benefits of the contributor or pensioner are then reduced accordingly.

Appendix B — Retirement Compensation Arrangement Benefit Provisions

Retirement compensation arrangements (RCAs) are arrangements for benefits in excess of benefit limitations of registered pension plans and therefore are less tax-advantageous as the fund must transfer a 50% refundable tax to the Canada Revenue Agency (CRA) immediately. Under the PSSA RCA a debit is made from the RCA Account such that in total roughly half the recorded balance in the RCA Account is held as a tax credit (CRA refundable tax). This Appendix describes the Public Service pension benefits financed through retirement compensation arrangements (RCA No. 1 and RCA No. 2) rather than through the registered PSSA provisions that have a material impact on this valuation

Effective 15 December 1994, RCA No. 1 was established pursuant to the *Special Retirement Arrangements Act* (SRAA) to provide for all pension benefits in excess of those that may, in accordance with the *Income Tax Act* (ITA) restrictions on registered pension plans, be paid under the PSSA registered provisions.

Effective 1 April 1995, RCA No. 2 was established by the RCA regulations as a program for certain Public Service employees declared surplus before 1 April 1998 as part of the downsizing initiative. Participation was limited to individuals between ages 50 and 54 who met the conditions specified in the regulations. RCA No. 2 pays the difference between a pension unreduced for early retirement and the reduced pension payable in accordance with the PSSA. It is financed entirely by the government.

The following benefits have been provided under RCA No. 1 since 20 November 1997, unless otherwise indicated, to the extent that they are in excess of the ITA limit.

Benefit	PSSA Registered Provisions limit
Survivor allowance for service from 1 January 1992 onward (see Note A.4.13 of Appendix A)	Pre-retirement death • Maximum spouse allowance is two-thirds of greater of A and B; and • Maximum aggregate dependants' allowance is the greater of A and B, where A is the amount of member annuity earned to date of death, and B is the lesser of the hypothetical amount of member's annuity projected to age 65 based on current salary history and 1.5 times the YMPE in effect during the year of the member's death. Post-retirement death The amount of spouse allowance is limited in any year to a maximum of two-thirds the retirement benefit that would have been payable to the member in that year.

Benefit	PSSA Registered Provisions limit
Minimum lump sum death benefit (see Note A.4.14 of Appendix A)	Pre-retirement death The amount of pre-retirement death benefit if the member has no eligible dependants is limited to the greater of the member contributions with interest and the present value of the member's accrued benefits on the day prior to death. Post-retirement death If the member has no eligible dependants at retirement, then the minimum death benefit is limited to the member contributions with interest.
Continued benefit accrual for former deputy heads (provided since 15 December 1994 for service since then)	This entire benefit is outside the registered plan limit. Deputy heads ceasing employment under age 60 may elect to be deemed full-time employees absent from the Public Service on leave without pay up to age 60.
Elective service for service prior to 1 January 1990	The amount of lifetime retirement benefits for each such year of service is limited to two-thirds of the defined benefit limit (i.e. $3,245.56 for calendar year 2021) for the year in which the lifetime retirement benefits commence to be paid. For years subsequent to the commencement year of lifetime retirement benefits, this amount can be adjusted to reflect increases in the Consumer Price Index.
Excess pensionable earnings (provided since 15 December 1994 for service since then)	The highest average of pensionable earnings is subject to a prescribed yearly maximum that varies by calendar year and the registered plan's benefit formula. The calendar year 2021 Maximum Pensionable Earnings is $181,600.

Appendix C — Assets, Accounts and Rates of Return

C.1 Assets and Account Balances

The government has a statutory obligation to fulfill the pension promise enacted by legislation to members of the Public Service. Since 1 April 2000, the government has earmarked invested assets (the Pension Fund) to meet the cost of pension benefits.

With respect to the unfunded portion of the PSPP, accounts were established to track the government's pension benefit obligations, such as the Superannuation Account for service prior to 1 April 2000, and the RCA No. 1 and No. 2 Accounts for benefits in excess of those that can be provided under the *Income Tax Act* limits for registered pension plans.

C.1.1 Public Service Superannuation Account

PSSA member contributions, government costs and benefits earned up to 31 March 2000 are tracked entirely through the Public Service Superannuation Account, which forms part of the Accounts of Canada.

The Superannuation Account is credited with all PSSA member contributions and government costs prior to 1 April 2000, as well as with prior service contributions and costs for elections made prior to 1 April 2000 and for periods before 1 April 2000 but credited after that date. It is charged with both the benefit payments made in respect of service earned under the Superannuation Account and the allocated portion of the plan administrative expenses.

The Superannuation Account is credited with interest earnings as though net cash flows were invested quarterly in 20-year Government of Canada bonds issued at prescribed[1] interest rates and held to maturity. No formal debt instrument is issued to the Superannuation Account by the government in recognition of the amounts therein. Interest is credited every three months on the basis of the average yield for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces and RCMP pension plans.

[1] Under Section 42 (1) (b) of the *Public Service Superannuation Act*, rates may be prescribed by Regulations. The interest rates are defined under Section 46 (2) (a) of the *Public Service Superannuation Regulations*.

Table 27 Reconciliation of Balances in Superannuation Account
($ millions)

Plan Year	2018	2019	2020	2018-2020
Opening balance as at 1 April of the previous year	94,209	92,536	93,700	94,209
INCOME				
Interest earnings	3,830	3,593	3,411	10,834
Employer contributions	7	5	3	15
Member contributions	8	6	4	18
Transfers received	-	1	-	1
Actuarial liability adjustments	-	3,107	-	3,107
Subtotal	**3,845**	**6,712**	**3,418**	**13,975**
EXPENDITURES				
Annuities	5,413	5,456	5,512	16,381
Pension divisions	17	17	14	48
Return of contributions	-	-	-	-
Pension transfer value payments	13	10	12	35
Transfers to other pension plans	4	4	3	11
Minimum benefits	16	15	14	45
Administrative expenses	55	46	47	148
Subtotal	**5,518**	**5,548**	**5,602**	**16,668**
Closing balance as at 31 March of the plan year	**92,536**	**93,700**	**91,516**	**91,516**

Since the last valuation, the Account balance has decreased by $2.7 billion (a 2.9% reduction) to reach $91.5 billion as at 31 March 2020.

C.1.2 Public Service Pension Fund

Since 1 April 2000, PSSA contributions (except for prior service elections made prior to 1 April 2000) have been credited to the Pension Fund. The Pension Fund is invested in the financial markets with a view to achieving maximum rates of return without undue risk.

The Pension Fund has been credited with all PSSA contributions since 1 April 2000, as well as with prior service contributions in respect of elections made since that date. The Pension Fund is also credited with the net investment returns generated by the capital assets managed by PSPIB. It is debited with both the benefit payments made in respect of service earned and prior service elections made since 1 April 2000 and the allocated portion of the plan administrative expenses.

Table 28 Reconciliation of Balances in Pension Fund
($ millions)

Plan Year	2018	2019	2020	2018-2020
Opening balance as at 1 April of the previous year	**98,770**	**111,381**	**121,991**	**98,770**
INCOME				
Investment earnings	9,805	8,070	(763)	17,112
Employer contributions	2,371	2,571	2,579	7,521
Member contributions	2,414	2,627	2,656	7,697
Transfers received	51	56	67	174
Actuarial liability adjustments	340	-	-	340
Subtotal	**14,981**	**13,324**	**4,539**	**32,844**
EXPENDITURES				
Annuities	2,002	2,255	2,529	6,786
Pension divisions	36	42	39	117
Return of contributions	15	16	19	50
Pension transfer value payments	219	288	388	895
Transfers to other pension plans	37	42	48	127
Minimum benefits	15	19	18	52
Administrative expenses	46	52	56	154
Subtotal	**2,370**	**2,714**	**3,097**	**8,181**
Closing balance as at 31 March of the plan year	**111,381**	**121,991**	**123,433**	**123,433**

Since the last valuation, the Pension Fund balance has increased by $24.7 billion (a 25.0% increase) to reach $123.4 billion as at 31 March 2020.

C.1.3 Public Service RCA No. 1 Account

The amount in the RCA No. 1 Account is composed of the recorded balance in the Retirement Compensation Arrangements Account, which forms part of the Accounts of Canada, and a tax credit (CRA refundable tax). Each calendar year, a debit/credit is made from the RCA Account such that in total roughly half the recorded balance in the RCA Account is held as a tax credit (CRA refundable tax).

No formal debt instrument is issued to the RCA No. 1 Account by the government in recognition of the amounts therein. Interest earnings are credited every three months on the basis of the average yield for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces and RCMP pension plans.

Table 29 Reconciliation of Balances in RCA No. 1 Account
($ millions)

Plan Year	2018	2019	2020	2018-2020
Opening balance as at 1 April of the previous year	**1,193**	**1,241**	**1,266**	**1,193**
INCOME				
Interest earnings	0	0	0	0
Employer contributions	84	41	75	200
Member contributions	12	14	21	47
Transfers received	0	0	0	0
Actuarial liability adjustments	50	49	47	146
Subtotal	**146**	**104**	**143**	**393**
EXPENDITURES				
Annuities	45	49	57	151
Pension divisions	0	1	0	1
Return of contributions	0	0	0	0
Pension transfer value payments	1	1	2	4
Transfers to other pension plans	1	0	1	2
Minimum benefits	0	0	0	0
Amount transfer to CRA	51	28	34	113
Subtotal	**98**	**79**	**94**	**271**
Closing balance as at 31 March of the plan year	**1,241**	**1,266**	**1,315**	**1,315**
CRA Refundable tax	**1,235**	**1,263**	**1,297**	**1,297**

Since the last valuation, the RCA No. 1 Account balance has grown by $122 million (a 10.2% increase) to reach 1,315 million as at 31 March 2020 and the refundable tax has increased by $113 million (a 9.5% increase) to reach $1,297 million.

C.1.4 Public Service RCA No. 2 Account

The amount in the RCA No. 2 Account is composed of the recorded balance in the Retirement Compensation Arrangements Account, which forms part of the Accounts of Canada, and a tax credit (CRA refundable tax). Each calendar year, a debit/credit is made from the RCA Account such that in total roughly half the recorded balance in the RCA Account is held as a tax credit (CRA refundable tax).

No formal debt instrument is issued to the RCA No. 2 Account by the government in recognition of the amounts therein. Interest earnings are credited every three months on the basis of the average yield for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces and RCMP pension plans.

Table 30 Reconciliation of Balances in RCA No. 2 Account
($ millions)

Plan Year	2018	2019	2020	2018-2020
Opening balance as at 1 April of the previous year	**718**	**689**	**659**	**718**
INCOME				
Interest earnings	29	26	23	78
Actuarial liability adjustments	0	0	0	0
Subtotal	**29**	**26**	**23**	**78**
EXPENDITURES				
Annuities	85	85	85	255
Amount transfer to CRA	(27)	(29)	(30)	(86)
Subtotal	**58**	**56**	**55**	**169**
Closing balance as at 31 March of the plan year	**689**	**659**	**627**	**627**
CRA Refundable tax	**703**	**674**	**644**	**644**

Since the last valuation, the RCA No. 2 Account balance has decreased by $91 million (a 12.7% reduction) to $627 million as at 31 March 2020 and the refundable tax has decreased by $87 million (an 11.8% reduction) to $644 million.

C.2 Rates of Interest (Return)

The interest earnings in respect of the Superannuation Account were calculated using the entries in Table 31, which are based on book values since the notional bonds are deemed to be held to maturity. The interest earnings were computed using the dollar-weighted approach and assume that cash flows occur in the middle of the plan year (except for actuarial liability adjustments, which occur on 31 March). The Pension Fund rates of return are those from the PSPIB Annual Report for the respective plan years.

Table 31 Rates of Interest (Return)

Plan Year	Superannuation Account	Pension Fund
2018	4.2%	9.8%
2019	4.0%	7.1%
2020	3.7%	(0.6%)

C.3 Sources of Asset Data

The Superannuation Account, the RCA No. 1 Account, the RCA No. 2 Account and the Pension Fund entries shown in Section C.1 above were taken from the Public Accounts of Canada and the financial statements of the Public Sector Pension Investment Board.

Appendix D — Membership Data

D.1 Sources of Membership Data

The valuation data required in respect of contributors (both active and non-active), pensioners and survivors are extracted from master computer files maintained by the Department of Public Services and Procurement Canada (PSPC).

The main valuation data file supplied by PSPC contained the historical status information on all members up to 31 March 2020.

D.2 Validation of Membership Data

We performed certain tests on internal consistency, as well as tests of consistency with the data used in the previous valuation, with respect to membership reconciliation, basic information (date of birth, date of hire, date of termination, gender, etc.), salary levels, and pensions to survivors and pensioners.

We assumed that members with unknown gender were 50% male and 50% female.

Based on the omission and discrepancies identified by these and other tests, appropriate adjustements were made to the basic data after consulting with the data provider.

D.3 Membership Data

A summary of the valuation data as at 31 March 2020 and reconciliations of contributors, pensioners and survivors during the intervaluation period are shown in Table 32 to Table 38. Detailed membership data upon which this valuation is based are shown in Appendix L.

Table 32 Summary of Membership Data

	As at 31 March 2020	As at 31 March 2017
Contributors[1]		
Number	331,406	295,881
Average Annual Earnings	$84,915	$79,495
Average Pensionable Service	11.63	12.63
Average Age	44.39	44.58
Retirement Pensioners[2]		
Number	243,024	229,045
Average Annual Pension	$31,502	$29,399
Average Age	68.66	67.64
Disabled Pensioners		
Number	15,513	15,159
Average Annual Pension	$18,168	$18,345
Average Age	64.73	64.10
Surviving Spouses		
Number	47,677	49,206
Average Annual Pension	$16,021	$14,516
Average Age	79.62	78.89
Surviving Children		
Number	1,159	1,068
Average Annual Pension	$2,201	$2,388
Average Age	13.29	14.42

1 Includes non-participating and non-accruing members.
2 Include retirement pensioners with an annuity in pay or a deferred annuity.

Table 33 Reconciliation of Group 1 Contributors

	Participating and Accruing		Participating Non-Accruing		Total Participating	Non-Participating Non-Accruing		
	Male	Female	Male	Female		Male	Female	Total
As at 31 March 2017	**102,383**	**131,298**	**2,468**	**1,737**	**237,886**	**457**	**523**	**980**
Data corrections	(1,232)	(1,031)	691	159	(1,413)	41	84	125
New contributors								
Re-qualifying contributors[1]	168	326	2	-	496	44	85	129
Rehired pensioners	414	696	1	-	1,111	5	16	21
Subtotal	**582**	**1,022**	**3**	**-**	**1,607**	**49**	**101**	**150**
Changes of								
Participating accruing	103	235	-	-	338	(103)	(235)	(338)
Participating non-accruing	(1,767)	(1,182)	1,767	1,182	-	-	-	-
Non-participating non-accruing	(378)	(414)	(52)	(13)	(857)	430	427	857
Subtotal	**(2,042)**	**(1,361)**	**1,715**	**1,169**	**(519)**	**327**	**192**	**519**
ROC or TV[2]	(1,308)	(1,481)	(68)	(5)	(2,862)	(28)	(42)	(70)
Pensionable terminations								
Disabled Pensioners	(506)	(1,242)	(22)	(6)	(1,776)	-	(1)	(1)
Deferred Retired Pensioners	(2,363)	(2,427)	(29)	(6)	(4,825)	(20)	(49)	(69)
Retired Pensioners in Pay	(9,397)	(12,316)	(1,626)	(1,532)	(24,871)	(219)	(188)	(407)
Death (no survivors)	(148)	(145)	(18)	(6)	(317)	(5)	(6)	(11)
Death (with survivors)	(284)	(246)	(27)	(9)	(566)	(13)	(3)	(16)
Subtotal	**(12,698)**	**(16,376)**	**(1,722)**	**(1,559)**	**(32,355)**	**(257)**	**(247)**	**(504)**
As at 31 March 2020	**85,685**	**112,071**	**3,087**	**1,501**	**202,344**	**589**	**611**	**1,200**

1 Re-qualifying contributors are members who were deemed deferred as at the previous valuation, but returned to work. Since they never cash-out their benefits accrued before their first termination, they return as members of Group 1.

2 Termination of membership resulting in a refund of contributions or a payment of transfer value.

Table 34 Reconciliation of Group 2 Contributors

	Participating and Accruing		Participating Non-Accruing		Total Participating	Non-Participating Non-Accruing		
	Male	Female	Male	Female		Male	Female	Total
As at 31 March 2017	**25,088**	**31,247**	**85**	**12**	**56,432**	**237**	**346**	**583**
Data corrections	1,162	1,998	101	8	3,268	73	117	190
New contributors								
New entrants	35,672	46,796	182	26	82,675	436	622	1,058
Rehired cash-out	1,038	1,703	1	1	2,743	20	46	66
Rehired pensioners	150	242	-	-	392	2	5	7
Subtotal	**36,860**	**48,741**	**183**	**27**	**85,810**	**458**	**673**	**1,131**
Changes of								
Participating accruing	372	532	-	-	904	(372)	(532)	(904)
Participating non-accruing	(207)	(20)	209	20	2	(2)	-	(2)
Non-participating non-accruing	(352)	(524)	(2)	-	(878)	354	524	878
Subtotal	**(187)**	**(12)**	**207**	**20**	**28**	**(20)**	**(8)**	**(28)**
ROC or TV[1]	(6,387)	(8,113)	(41)	(5)	(14,546)	(259)	(393)	(652)
Pensionable terminations								
Disabled Pensioners	(29)	(41)	-	-	(70)	-	-	-
Deferred Retired Pensioners	(1,623)	(1,891)	(2)	(1)	(3,517)	(19)	(40)	(59)
Retired Pensioners in Pay	(263)	(236)	(18)	(3)	(520)	(8)	(4)	(12)
Death (no survivors)	(58)	(48)	(1)	(1)	(108)	(1)	-	(1)
Death (with survivors)	(36)	(31)	-	-	(67)	-	-	-
Subtotal	**(2,009)**	**(2,247)**	**(21)**	**(5)**	**(4,282)**	**(28)**	**(44)**	**(72)**
As at 31 March 2020	**54,526**	**71,613**	**514**	**57**	**126,710**	**461**	**691**	**1,152**

[1] Termination of membership resulting in a refund of contributions or a payment of transfer value.

Table 35 Reconciliation of Pensioners

	Deferred Retired Pensioners			Disabled Pensioners			Retired Pensioners in Pay[1]		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
As at 31 March 2017	**11,462**	**14,733**	**26,195**	**5,855**	**9,304**	**15,159**	**111,828**	**91,022**	**202,850**
Data corrections	(526)	(761)	(1,287)	(84)	28	(56)	(234)	(237)	(471)
New pensioners	4,067	4,445	8,512	660	1,291	1,951	11,552	14,298	25,850
Transfer status to									
Rehired	(513)	(875)	(1,388)	(1)	(3)	(4)	(58)	(81)	(139)
Disabled Pensioners	(13)	(29)	(42)	13	29	42	-	-	-
Retired Pensioners in Pay	(1,468)	(1,707)	(3,175)	-	-	-	1,468	1,707	3,175
Subtotal	**(1,994)**	**(2,611)**	**(4,605)**	**12**	**26**	**38**	**1,410**	**1,626**	**3,036**
Cash paid out	(1)	(2)	(3)	-	-	-	-	-	-
Death (no survivors)	(14)	(13)	(27)	(442)	(559)	(1,001)	(5,659)	(4,585)	(10,244)
Death (with survivors)	(11)	(7)	(18)	(392)	(186)	(578)	(5,608)	(1,156)	(6,764)
Subtotal	**(26)**	**(22)**	**(48)**	**(834)**	**(745)**	**(1,579)**	**(11,267)**	**(5,741)**	**(17,008)**
As at 31 March 2020	**12,983**	**15,784**	**28,767**	**5,609**	**9,904**	**15,513**	**113,289**	**100,968**	**214,257**

Table 36 Reconciliation of Surviving Spouses

	Widows	Widowers	Total
As at 31 March 2017	**42,950**	**6,256**	**49,206**
Data corrections	288	76	364
New from Contributors	338	260	598
New from Pensioners	5,987	1,356	7,343
Spouse deaths	(8,833)	(1,001)	(9,834)
As at 31 March 2020	**40,730**	**6,947**	**47,677**

[1] Retired Pensioners include both members receiving an Immediate Annuity and those receiving an Annual Allowance.

Table 37 Reconciliation of Children Survivors	Children	Students	Total
As at 31 March 2017	**805**	**263**	**1,068**
Data corrections	67	211	278
New from Contributors	283	90	373
New from Pensioners	57	49	106
Termination of benefits	(227)	(439)	(666)
Eligible as student	(129)	129	-
As at 31 March 2020	**856**	**303**	**1,159**

Table 38 Reconciliation of Pensioners with ERI Benefits	Male	Female	Total
As at 31 March 2017	**5,968**	**3,904**	**9,872**
Data corrections	(22)	(14)	(36)
Pensioner deaths	(394)	(197)	(591)
Rehired	-	-	-
As at 31 March 2020	**5,552**	**3,693**	**9,245**

Appendix E — PSSA Valuation Methodology

E.1 Plan Assets

E.1.1 Public Service Superannuation Account

The balance of the Superannuation Account forms part of the Accounts of Canada. The underlying notional bond portfolio described in Appendix C is shown at the book value.

The only other Superannuation Account–related amount consists of the discounted value of future member contributions and government credits in respect of prior service elections[1]. The discounted value of future member contributions and government credits was calculated using the projected Superannuation Account yields.

The present value of contributions, determined as at 31 March 2020 is $21 million.

E.1.2 Public Service Pension Fund

For valuation purposes, an adjusted market value method is used to determine the actuarial value of assets in respect of the Pension Fund. The method is unchanged from the previous valuation.

Under the adjusted market value method, the difference between the observed investment returns during a given plan year and the expected investment returns for that year based on the previous report assumptions, is recognized over five years at the rate of 20% per year. The actuarial value is then determined by applying a 10% corridor, such that the actuarial value of assets is within 10% of the market value of assets. The value produced by this method is related to the market value of the assets but is more stable than the market value.

The only other Pension Fund–related asset consists of the discounted value of future member and government contributions in respect of prior service elections[1]. The discounted value of future member and government contributions was calculated using the assumed rates of return on the Pension Fund.

The actuarial value of the assets, determined as at 31 March 2020 is $125,409 million and was determined as follows.

[1] As described in Appendix A.2.2.2 Elected Prior Service.

Table 39 Actuarial Value of Pension Fund Assets ($ millions)						
Plan Year	2016	2017	2018	2019	2020	Total
Actual net investment return (A)	583	11,012	9,805	8,070	(763)	
Expected investment return (B)	4,147	4,312	4,700	5,744	6,769	
Investment gains (losses) (C = A-B)	(3,564)	6,700	5,105	2,326	(7,532)	
Unrecognized percentage (D)	0%	20%	40%	60%	80%	
Unrecognized investment gains (losses) (CxD)	-	1,340	2,042	1,396	(6,026)	(1,248)
Market value as at 31 March 2020						**123,433**
Plus						
Actuarial Smoothing Adjustment, before application of corridor						1,248
Actuarial value as at 31 March 2020 (before application of corridor)						124,681
Impact of application of corridor[1]						-
Actuarial value as at 31 March 2020 (after application of corridor)						124,681
Present value of prior service contributions						728
Actuarial value as at 31 March 2020						**125,409**

E.2 Actuarial Cost Method

As benefits earned in respect of current service will not be payable for many years, the purpose of an actuarial cost method is to assign costs over the working lifetime of the members.

As in the previous valuation, the projected accrued benefit actuarial cost method (also known as the projected unit credit method) was used to determine the current service cost and actuarial liability. Consistent with this cost method, pensionable earnings are projected up to retirement using the assumed annual increases in pensionable earnings (including seniority and promotional increases). The yearly maximum salary cap and other benefit limits under the *Income Tax Act* described in Appendix B were taken into account to determine the benefits payable under the PSSA and those payable under the RCA No. 1.

E.2.1 Current Service Costs and Member Contribution Rates

Under the projected accrued benefit actuarial cost method, the current service cost, also called the normal cost, computed in respect of a given year is the sum of the value, discounted in accordance with the actuarial assumptions for the Pension Fund, of all future payable benefits considered to accrue in respect of that year of service. The Pension Fund administrative expenses are also included in the total current service cost.

Under this method, the current service cost for an individual member will increase each year as the member approaches retirement. However, all other things being equal, the current service cost for the

[1] The corridor is 90% - 110% of market value, that is (111,090 - 135,776).

total population, expressed as a percentage of total pensionable payroll, can be expected to remain stable as long as the average age and service of the total population remain constant. This is true to the extent that the plan population is mature and stable. For a given year, the government current service cost is the total current service cost reduced by the members contributions during the year.

Member contribution rates were determined such that the members and the government share the total current service at 50/50[1].

The current service costs for Group 1 and Group 2 were determined as follows:

(i) the current service cost and member contribution rates were determined for Group 1 contributors based on the total Public Service population (i.e., Group 1 and Group 2 members) and on the benefits available to Group 1 members. The result effectively levels the current service cost of Group 1 contributors since members of Group 2 are treated as though they are entitled to pre-2013 retirement benefits;

(ii) an amount equal to the excess of the actual current service cost for Group 1 contributors over the average current service cost of the combined Group 1 and Group 2 population determined in i) above was determined;

(iii) the excess amount determined in ii) above was then added to the current service cost for Group 2, which was determined based on the Group 2 population and the benefits available to Group 2 contributors.

The Group 2 population is young and its average age is expected to increase until the group reaches a mature state. As such, the contributions rates are expected to increase over time. The impact of the transfer of cost calculated in step ii) is expected to reduce over time, as Group 2 population grows while Group 1 is closed. These two trends, which partially offset each other, help stabilizing Group 2 contribution rates.

The following adjustments were made given member contribution rates are effective on a calendar year basis:

- valuation runs were performed as at 31 December 2019;
- active member population was assumed to be the same at 31 December 2019 as at 31 March 2020, with salaries adjusted for 3 months; and
- mortality decrements and expected rates of return were adjusted to be applied on a calendar year basis.

This modified cost method respects the fundamental attributes of the projected unit credit cost method and provides an appropriate allocation of the cost between Group 1 and Group 2 contributors.

E.2.2 Actuarial Liability

The actuarial liability with respect to contributors corresponds to the value, discounted in accordance with the actuarial assumptions, of all future payable benefits accrued as at the valuation date in respect of all previous service. For pensioners and survivors, the actuarial liability corresponds to the value,

[1] For the determination of member contribution rates, the benefits for operational service were excluded. As a result, the government contributions are slightly higher than member contributions.

discounted in accordance with the actuarial assumptions, of future payable benefits.

E.2.3 Government Contributions

The recommended government contribution corresponds to the sum of:

- the government current service cost;
- the government contributions for prior service; and
- as applicable, special credits/payments in respect of a shortfall/deficit or as the case may be, debits when an actuarial surplus exists.

E.2.4 Age and Service Determination

In the previous valuation, the Age Last methodology was applied to determine ages and services used for eligibility and decrements. Under this approach, age is the age at the most recent birthday and service is based on the member's completed years of pensionable service.

In this valuation, the Age Nearest methodology is applied; age and service are determined by rounding the exact value to the nearest integer.

The change from Age Last to Age Nearest methodology mainly affects the timing of benefit eligibility and application of age and/or service-dependent decrements.

Appendix F — PSSA Economic Assumptions

As per the Funding Policy, all of the assumptions used in this report are best-estimate assumptions, i.e., they reflect our best judgement of the future long-term experience of the plan and do not include margins.

F.1 Inflation-Related Assumptions

F.1.1 Level of Inflation

Price increases, as measured by changes in the Consumer Price Index (CPI), tend to fluctuate from year to year. In 2016, the Bank of Canada and the Government renewed their commitment to keep inflation between 1% and 3% until the end of 2021. The Bank of Canada will renew its monetary policy framework in 2021. As a result of the COVID-19 pandemic, a slowdown in inflation is expected during plan year 2021. Based on economic forecasts, the CPI is expected to increase at a rate above 2% for the following two years and to revert to the Bank of Canada's long-term target thereafter. It is assumed that the Bank of Canada will remain committed to meeting the mid-range 2% target. In this report, it is assumed that the level of inflation will increase from 0.7% in plan year 2021 to 2.3% in plan year 2022 and 2.2% in plan year 2023. The ultimate rate of 2.0% is reached in 2024. It is unchanged from the assumed rate in the previous valuation.

F.1.2 Increase in Pension Factor

The assumption in respect to the year's pension indexing factor is required to account for indexation of pensions each January 1. It is derived by applying the indexation formula described in Appendix A, which relates to the assumed CPI increases over successive 12-month periods ending on September 30.

F.2 Employment Earnings Increases

F.2.1 Increase in the Year's Maximum Pensionable Earnings (YMPE)

Since the benefit payable under the plan when a pensioner attains age 65[1] is calculated based on the YMPE, an assumption for the increase in the YMPE is required in the valuation process. The assumed increase in the YMPE for a given calendar year is derived, in accordance with the *Canada Pension Plan*, to correspond to the increase in the average weekly earnings (AWE), as calculated by Statistics Canada, over successive 12-month periods ending on 30 June. The AWE, and thus the YMPE, is deemed to include a component for seniority and promotional increases.

The YMPE is equal to $61,600 for calendar year 2021. It increased by 4.9% compared to 2020, which is the largest increase in YMPE since the early 1990s. The increase was the result of lower wage earners loosing employment in the first half of 2020 as a result of the COVID-19 pandemic. This resulted in a significant increase in AWE. Until employment levels for lower wage earners return to their pre-pandemic level, the AWE increase is expected to remain high. It is assumed that the 2022 YMPE will increase by 6.2%. Subsequent increases in the YMPE are assumed to be lower, as it is assumed that employment levels for lower wage earners gradually increase over time. Future increases in the YMPE

[1] Or becomes entitled to a disability pension from the CPP or the QPP.

correspond to the assumed real[1] increase in the AWE plus assumed increases in the CPI.

The real-wage differential (real increase in the AWE) is developed taking into account historical trends, a possible labour shortage, and an assumed moderate economic growth for Canada. After the initial disruption due to COVID-19, it is assumed to gradually converge to the ultimate assumption of 1.0% by 2027 (1.1% in the previous valuation). The ultimate real-wage differential assumption combined with the ultimate price increase assumption results in an assumed annual increase in nominal wages of 3.0% in 2027 and thereafter. Thus, the ultimate rate of increase for the YMPE is 3.0%.

F.2.2 Increase in Pensionable Earnings

Pensionable earnings are applicable to PSPP members only, whereas the YMPE applies to the general working population in Canada. In addition, increases in pensionable earnings are exclusive of seniority and promotional increases, which are considered as a separate demographic assumption. Increases up to plan year 2022 are based on current collective agreements. Subsequent increases are based on average increases over recent rounds of collective bargaining and are assumed to gradually converge to the ultimate level in 2029. Over the long term, the annual increase in pensionable earnings is assumed to be 0.3% lower than the corresponding increase in the YMPE (unchanged from the previous valuation). This correspond to an ultimate value of 2.7% in 2029 and theafter (2.8% in the previous valuation for plan year 2024 and thereafter).

F.2.3 Increase in Maximum Pensionable Earnings (MPE)

The maximum annual pension accrual of $3,092.22 for 2020 will increase to $3,245.56 for 2021, in accordance with *Income Tax Regulations*. Thereafter, the maximum annual pension accrual is assumed to increase in accordance with the assumed annual increase in the YMPE, which is the same as the assumed annual increase in the AWE.

The tax-related maximum pensionable earnings were derived from both the maximum annual pension accrual under a registered defined benefit plan and the YMPE. The MPE is equal to $181,600 for calendar year 2021.

F.3 Investment-Related Assumptions

F.3.1 New Money Rate

The new money rate is the nominal yield on 10-year-plus Government of Canada bonds and is set for each year in the projection period. The real yield on 10-year-plus federal bonds is equal to the new money rate less the assumed rate of inflation.

During the last quarter of plan year 2020, the emerging COVID-19 pandemic marked the beginning of a severe humanitarian and economic shock. Many governments enacted unprecedented measures to support families and workers, and central banks reacted swiftly to support the economy and stabilize financial markets. In Canada, the net effect was a decrease in both short-term and long-term interest rates during the early months of the pandemic. This economic shock occurred in a context where

[1] Note that all of the real rates presented in this report are actual differentials, i.e. the difference between the effective annual rate and the rate of increase in prices. This differs from the technical definition of a real rate of return, which, for example in the case of the ultimate Pension Fund assumption would be 3.8% (derived from 1.059/1.020) rather than 3.9%.

interest rates were already considered low by historical standards and where many were already contemplating the prospects of a "low-for-long" interest rates environment. Consequently, the new money rate is assumed to be lower than in the previous valuation.

The annual nominal yield on 10-year-plus federal bonds is assumed to be 1.2% in plan year 2021. Then it is projected to increase gradually to its ultimate level of 4.1% in plan year 2034. The assumed rates over the short-term (2021-2025) are consistent with the average of private sector forecasts and take into account the recent market conditions. The ultimate level of 4.1% is equivalent to an ultimate real rate of 2.1%. The ultimate real yield was assumed to be 2.7% in 2027 in the previous valuation. The real new money rates over the plan years 2021 to 2033 are on average 1.3% lower than those assumed in the previous valuation over the same period.

F.3.2 Projected Yields on Superannuation Account

The projected yields assumed for computing the present value of accrued benefits for service prior to 1 April 2000 and to be credited to the Superannuation Account are the projected annual yields on the combined book value of the Superannuation Accounts of the Public Service, Canadian Forces and RCMP pension plans.

The projected Account yields were determined by an iterative process involving the following:

- the combined notional bond portfolio of the three Superannuation Accounts as at the valuation date;
- the assumed future new money interest rates;
- the expected future benefits payable in respect of all pension entitlements accrued up to 31 March 2000;
- the expected future contributions for prior service elections made up to 31 March 2000; and
- the expected future administrative expenses,

taking into account that each quarterly interest credit to a Superannuation Account is calculated as if the principal at the beginning of a quarter remains unchanged during the quarter. The projected yield on the Account is 3.5% in plan year 2021. It is projected to reach a low of 2.4% in 2032 and to reach its ultimate value of 4.1% in 2052.

F.3.3 Rate of Return on the Pension Fund

The expected annual nominal rates of return on the Pension Fund are required for the computation of present values of benefits to determine the liability for service since 1 April 2000 and the current service cost. The following sections describe how the rates of return on the Pension Fund are determined.

F.3.3.1 Investment Strategy

Since 1 April 2000, government and employee contributions, net of benefit payments and administrative expenses, are invested in capital markets by the Public Sector Pension Investment Board (PSPIB). PSPIB's mandate is to achieve a maximum rate of return, without undue risk of loss, with regard to the funding, policies and requirements of the PSPP. PSPIB's investment policy is set and approved by its Board of

Directors and takes into account the Funding Policy for the Public Sector Pension Plans[1], including the Reference Portfolio set out in this Funding Policy, as well as financial market constraints. The Reference Portfolio is a passively managed, easily investable portfolio used to express the funding risk target of the Government of Canada in respect to the public sector pension plans. It is communicated by the Treasury Board of Canada Secretariat on behalf of the President of the Treasury Board to PSPIB, which then uses this portfolio as an anchor for its investment policy.

For the purpose of this report and in line with the PSPIB investment policy, the investments have been grouped into four broad categories: fixed income securities, equities, real assets and credit. Fixed income securities consist of a mix of federal, provincial and inflation-linked bonds. Equities consist of public (Canadian and foreign) and private equities. Real assets include real estate, infrastructure and natural resources. Credit is composed of private debt investments, non-investment-grade public debt and quasi-debt investments.

As at 31 March 2020, PSPIB's assets consisted of 20% fixed income securities (including 0.5% cash), 43% equity (including 0.5% complementary investments), 29% real assets and 8% credit. PSPIB has developed a long-term target Policy Portfolio (approved by its Board of Directors in the fall of 2020 and subject to an annual review), which consists of 21% fixed income securities, 39% equity, 31% real assets and 9% credit. The Policy Portfolio asset mix weights represent long-term targets. Therefore, it is assumed that the initial asset mix (derived using the actual investments reported by PSPIB as at 31 March 2020) will gradually converge towards the long-term target Policy Portfolio. The ultimate asset mix is assumed to be reached in plan year 2023.

Net cash flows (contributions less expenditures, disregarding special payments) are expected to become negative during plan year 2031 at which point a portion of assets will be required to pay benefits. Changes to the assumed asset mix may be required in the future to comply with the Funding Policy and to take into account the maturity of the plan.

Table 40 shows the assumed asset mix for each plan year throughout the projection period.

Table 40 Asset Mix

Plan Year	Fixed Income Securities	Cash	Public Equity	Private Equity	Real Assets	Credit
2021	19%	1%	29%	14%	29%	8%
2022	19%	1%	28%	13%	30%	9%
2023+	19%	2%	27%	12%	31%	9%

[1] https://www.canada.ca/en/treasury-board-secretariat/services/pension-plan/plan-information/funding-policy-public-sector-pension-plans.html

F.3.3.2 Rates of Return by Asset Class

Rates of return are determined for each asset class in which the Pension Fund assets are invested. With the exception of fixed income securities and cash, rates of return are assumed to remain constant for the entire projection period. The expected progression of fixed income securities' rates of return reflects the current context of low yields and the general outlook that yields will remain low for a few years and slowly increase thereafter. A constant rate of return is assumed for more volatile asset classes, reflecting the difficulty to predict annual market returns.

The rates of return were developed by looking at historical returns (expressed in Canadian dollars); these returns were then adjusted upward or downward to reflect future expectations. Given the long projection period, future gains and (losses) due to currency variations were expected to offset each other over time. Hence, it was assumed that currency variations will not have an impact on the long-term rates of return.

As in the previous valuation, an overall allowance for diversification has been added to the rate of return on the total assets. Such diversification is achieved through the rebalancing of the portfolio and aims at keeping the asset mix constant. Details are presented in Section F.3.3.2.

All rates of return described in this section are shown before reduction for assumed investment expenses; Section F.3.3.3 describes how the returns are adjusted for investment expenses.

Cash

The real yield on cash is expected to be negative over the first years of the projection period, particularly in fiscal year 2022 and 2023 as a result of higher expected inflation. Yield on cash, which is currently near-zero (in nominal terms) due to central banks' response to the pandemic, is expected to gradually increase over time as the effects of the pandemic dissipate. The real yield on cash is expected to reach 0.5% in 2034.

Fixed Income Securities

As at 31 March 2020, PSPIB had 20% of its portfolio invested in fixed income securities, including Canadian fixed income, inflation-linked bonds (mostly US Treasury Inflation-Protected Securities (TIPS)) and cash. It is assumed that the proportion invested in fixed income securities will reach the level of 21% for the projection period.

As per the information communicated by PSPIB, the allocation to Canadian fixed income is expected to change, going from 12.6% as at 31 March 2020 to a target allocation of 7% in plan year 2023. Cash allocation will increase from 0.5% to 2% and the allocation to emerging market debt will reach 5%. Consequently, the fixed income securities' ultimate mix (excluding cash) in plan year 2023 and thereafter is expected to consist of 17% federal bonds, 20% provincial bonds, 37% US TIPS and 26% emerging market debt, which reflects PSPIB's long-term target allocation.

As described in Section F.3.1 above, the assumed real yield on 10-year-plus federal bonds is expected to be positive for plan year 2021, then negative until plan year 2023, and then increase gradually to its ultimate level of 2.1% in plan year 2034. Compared to cash, the yield on 10-year-plus federal bond is 102 basis points higher at the valuation date. The spread is assumed to reach 160 basis points in 2034.

Since the current PSPIB Policy Portfolio and its long-term target Policy Portfolio are composed of

universe bonds (long, mid and short terms), it is assumed that fixed income securities are composed of universe bonds for the entire projection period. Due to their overall shorter maturity, the yields on universe bonds are lower than the yields on long-term bonds. As a result, the spreads of universe bonds over cash are lower than those of long-term bonds over cash. The spread of the universe federal bonds over cash is assumed to increase from 64 basis points in plan year 2021 to 88 basis points in plan year 2034.

Credit quality is another important factor affecting bond spreads. The spread on provincial bonds versus cash is expected to be greater than the spread of federal bonds versus cash. However, that spread is smaller than the spread on emerging market bonds, which present additional credit risk and currency risks. The initial spread of universe provincial bonds over cash is assumed to be 190 basis points while the ultimate spread is assumed to be 179 basis points (in plan year 2034). The initial spread of emerging market debt over cash is assumed to be 256 basis points and the ultimate spread is assumed to increase to 282 basis points in plan year 2034. Inflation-linked bonds offer protection against inflation, which tend to lower spread versus cash. The initial spread of inflation-linked bonds (US TIPS) over cash is assumed to be 52 basis points and is expected to increase to 124 basis points in plan year 2034.

The expected real rates of return for individual bonds take into account the coupons and market value fluctuations due to the expected movement of their respective yield rates. The real yield on 10-year-plus federal bonds is assumed to remain negative until plan year 2023 (except for plan year 2021), then gradually increase between plan years 2024 and 2034. Consequently, bond returns are quite low for the plan years prior to 2034. The assumed ultimate real rate of return for 10-year-plus federal bonds is 2.1% starting in plan year 2034. An ultimate fixed income real rate of return of 2.2% is assumed for 2034 and thereafter.

Equity

Currently, forty-three percent of the assets of the Pension Fund are invested in equities (both public and private). In the derivation of the real rates of return for these equity investments, consideration was given to dividend yields, expected growth of the underlying economies, and long-term equity risk premiums.

Public equities are composed of developed market equities, developed market small capitalization equities (small caps), and emerging market equities. Various elements contribute to the return on an equity investment. A company distributes some of its earnings to its shareholders via dividends. Remaining earnings are retained and reinvested in the company, thereby increasing its value. However, a significant portion of a company's market value is influenced by investors' expectations regarding a company's future earnings. When future earnings are uncertain, investors require a higher risk premium. In other words, investors are willing to pay less and a company's valuation will be lower, all other things being equal. Fluctuation in valuation and investor sentiment is thus another source of return on equity investments. Finally, the value of foreign equity investments are also affected by local currency appreciation and depreciation relative to the Canadian dollar.

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

dividend yields for developed markets and PSPIB's Policy Portfolio equity allocation, the return from dividend on developed market equities is expected to be 2.5%. Growth in earnings is derived from expected real GDP growth in developed economies. It is expected to add 1.6% to the overall real return of developed market equities. Hence, the expected return on developed market equities is 4.1%. Because of their additional risk, small caps are assumed to yield an additional 0.1% and emerging market equities are assumed to yield an additional 1.0%.

The overall return on public equities, based on PSPIB's relative allocation to developed market, small caps and emerging market equities, is projected to be 4.4%.

The expected return for private equities is expected to be 50 basis points higher than for public equities, reflecting the additional risk inherent with investments in private markets. Thus, the real rate of return for private equity is projected at 4.9%.

Real Assets

Real assets such as real estate, infrastructure and natural resources are considered to be a hybrid of fixed income and equity. For the purpose of this report, they are assumed to share characteristics of both of these asset classes in the proportion of 25% fixed income and 75% public equity. Hence, the assumed return on real assets is composed of 25% of the return on fixed income securities and 75% of the return on public equity. Considering the inherent difficulties in modelling short-term returns for volatile assets, real assets are projected to earn 3.8% throughout the projection period.

Credit

Credit is also considered to be a hybrid of fixed income and equity. Therefore, based on information shared by PSPIB, it is assumed that credit shares characteristics of both of these asset classes in the proportion of 45% fixed income and 55% public equity. The proportion differs from the last report to reflect the evolution of market conditions and lower fixed income return going forward. Hence, the assumed return on credit is composed of 45% of the return on fixed income securities and 55% of the return on public equity. Considering the inherent difficulties in modelling short-term returns for volatile assets, credit is projected to earn 3.4% throughout the projection period.

Table 41 summarizes the assumed real rates of return by asset type throughout the projection period, prior to reduction for investment expenses.

Table 41 Real Rate of Return by Asset Type
(in percentage)

Plan Year	Fixed Income Securities	Cash	Public Equity	Private Equity	Real Assets	Credit
2021	(0.4)	(0.5)	4.4	4.9	3.8	3.4
2022	(1.3)	(2.2)	4.4	4.9	3.8	3.4
2023	(2.5)	(2.1)	4.4	4.9	3.8	3.4
2024	(1.8)	(1.7)	4.4	4.9	3.8	3.4
2025	(1.4)	(1.2)	4.4	4.9	3.8	3.4
2026	0.2	(0.7)	4.4	4.9	3.8	3.4
2027	0.4	(0.3)	4.4	4.9	3.8	3.4
2028	0.5	(0.2)	4.4	4.9	3.8	3.4
2029	0.7	(0.1)	4.4	4.9	3.8	3.4
2030	0.8	0.0	4.4	4.9	3.8	3.4
2031	0.9	0.2	4.4	4.9	3.8	3.4
2032	1.4	0.3	4.4	4.9	3.8	3.4
2033	1.5	0.4	4.4	4.9	3.8	3.4
2034+	2.2	0.5	4.4	4.9	3.8	3.4

F.3.3.3 Investment Expenses

Over the last three plan years, PSPIB's operating and asset management expenses averaged 0.7% of average net assets. It is assumed that going forward, PSPIB investment expenses will average 0.7% of average net assets. The majority of those investment expenses were incurred through active management decisions.

The objective of active management is to generate returns in excess of those from the Policy Portfolio, after reduction for additional expenses. Thus, the additional returns from a successful active management program should equal at least the cost incurred to pursue active management. In nine of the past ten years, PSPIB's additional returns from active management exceeded related expenses. For the purpose of this valuation, it is assumed that additional returns due to active management will equal additional expenses related to active management. These expenses are assumed to be the difference between total investment expenses of 0.7% and the assumed expenses of 0.2% that would be incurred for the passive management of the portfolio.

The next section shows the overall rate of return on the fund net of investment expenses.

F.3.3.4 Overall Rate of Return on Assets of the Pension Fund

The best-estimate rate of return on total assets is derived from the weighted average assumed rate of return on all types of assets using the assumed asset mix proportions as weights. The best-estimate rate of return is further increased to reflect additional returns due to active management and allowance for rebalancing and diversificiation, and reduced to reflect all investment expenses. Table 42 shows how the ultimate nominal and real rates of return are developed.

Table 42 Overall Rate of Return on Assets of the Pension Fund

	Nominal	Real
Weighted average rate of return	5.6%	3.6%
Additional returns due to active management	0.5%	0.5%
Allowance for rebalancing and diversification[1]	0.5%	0.5%
Expected investment expenses		
Expenses due to passive management	(0.2%)	(0.2%)
Additional expenses due to active management	(0.5%)	(0.5%)
Total expected investment expenses	(0.7%)	(0.7%)
Net rate of return	**5.9%**	**3.9%**

The resulting nominal and real rates of return for each projection year are as follows:

Table 43 Rates of Return on Assets in Respect of the Pension Fund
(in percentage)

Plan Year	Nominal	Real
2021	4.2	3.5
2022	5.6	3.3
2023	5.2	3.0
2024	5.1	3.1
2025	5.2	3.2
2026	5.5	3.5
2027	5.6	3.6
2028	5.6	3.6
2029	5.6	3.6
2030	5.7	3.7
2031	5.7	3.7
2032	5.8	3.8
2033	5.8	3.8
2034+	5.9	3.9
2021-2025	5.1	3.2
2021-2030	5.3	3.4
2021-2034	5.5	3.5

It is assumed that the ultimate real rate of return on investments will be 3.9% in 2034, net of all investment expenses. This represents a reduction of 0.1% from the previous valuation. The real rates of return over the first ten years of the projections are on average 0.3% lower than assumed for the corresponding years in the previous valuation. The real rate of return on assets takes into account the assumed asset mix as well as the assumed real rate of return for all categories of assets. The nominal returns projected for the Pension Fund are simply the sum of the assumed level of inflation and the real return.

Using the variable real rates of return on assets in the previous table is equivalent to using a flat real

[1] 0.45% before rounding.

discount rate of 3.6% for the purpose of calculating the liability at 31 March 2020 for service since 1 April 2000.

F.3.4 Transfer Value Real Interest Rate

Interest rates for transfer values are determined in accordance with the Standards of Practice published by the Canadian Institute of Actuaries (CIA). The CIA issued amendments to the standards for determining the interest rates used for the computation of commuted value which were effective 1 December 2020. In particular, the nominal interest rates for the computation of commuted values as at a particular date are as follows:

First 10 years: $i_7 + s_{1-10}$

After 10 years: $i_L + 0.5 \times (i_L - i_7) + s_{10+}$

Implied increase in CPI is then determined as follows:

First 10 years: $(1+i_7)/(1+r_7) - 1$

After 10 years: $(1 + i_L + 0.5 * (i_L - i_7)) / (1 + r_L + 0.5 * (r_L - r_7)) - 1$

Where $r_7 = r_L \times \left(\frac{i_7}{i_L}\right)$, and

r_L is the long-term real-return Government of Canada bond yield, annualized,

i_L is the long-term Government of Canada benchmark bond yield, annualized,

i_7 is the 7-year Government of Canada benchmark bond yield, annualized,.

s_{1-10} is a weighted average of mid-term provincial and corporate spreads over mid-term federal bonds, with two third of the weight on the provincial spread and one third on the corporate spread, annualized, and

s_{10+} is a weighted average of long-term provincial and corporate spreads over long-term federal bonds, with two third of the weight on the provincial spread and one third on the corporate spread, annualized.

Nominal rates interest rates are then adjusted by implied inflation.

The obtained rates of interest are rounded to the nearest multiple of 0.10%.

More details regarding the Standards of Practice can be found in the Section 3540 of the following paper: https://www.cia-ica.ca/docs/default-source/standards/sp120120e.pdf

For example, for plan year 2021, the assumed real rates of interest are 0.9% for the first 10 years and 1.2% thereafter. The rates are derived from the assumed CPI increase, the assumed 10-year-plus Government of Canada benchmark bond yield (which corresponds to the new money rate in this valuation), and the assumed spreads[1] between the new money rate and the long-term real-return

[1] The spreads for the first year are based on the average spreads for plan year 2021 of -20, 12 and -61 basis points between 10-year-plus Government of Canada bond yield and the bonds underlying r_L, i_L and i_7 respectively. The ultimate spreads of 36, -8 and -64 basis points

Government of Canada bond yield, the long-term Government of Canada benchmark bond yield, and the 7-year Government of Canada benchmark bond yield.

Table 44 shows the assumed transfer value real interest rates used in this report:

Table 44 Transfer Value Real Interest Rates
(As a percentage)

					Real Interest Rates	
Plan Year	r_L	i_L	i_7	r_7	First 10 Years	After 10 Years
2021[1]	-0.5	0.9	0.2	-0.1	0.9	1.2
2022	-0.1	1.9	1.2	-0.1	0.9	1.1
2023	0.1	2.1	1.4	0.1	1.1	1.4
2024	0.1	2.3	1.7	0.1	1.1	1.4
2025	0.8	2.7	2.0	0.6	1.5	2.1
2026	1.1	3.0	2.4	0.9	1.9	2.5
2027	1.3	3.1	2.5	1.1	2.1	2.7
2028	1.5	3.3	2.7	1.2	2.3	3.0
2029	1.7	3.4	2.8	1.4	2.4	3.1
2030	1.9	3.5	2.9	1.6	2.5	3.3
2031	2.0	3.7	3.1	1.7	2.7	3.5
2032	2.2	3.8	3.2	2.0	2.9	3.6
2033	2.3	3.9	3.3	2.0	2.9	3.8
2034+	2.4	4.0	3.4	2.1	3.0	3.9

F.3.5 Administrative Expenses

PSPIB operating expenses are implicitly recognized through a reduction in the real return on the Pension Fund. The same approach was used in the previous valuation.

Administrative expenses are assumed to be 0.40% of pensionable payroll, a decrease from 0.45% in the previous valuation. This assumption is supported by an analysis of the administrative expenses over the last three years. For plan year 2021, 44% of total administrative expenses are being charged to the Superannuation Account; it is assumed that the proportion charged for the Superannuation Account will reduce at an annual rate of 2.0% the same as in the previous report. Expenses expected to be debited to the Superannuation Account in the future have been capitalized and are shown as a liability on the balance sheet, whereas the expenses to the Pension Fund are shown on an annual basis as they occur.

(starting in plan year 2034) are based on the average spreads over the last 10 years. The spreads for $S_{1\text{-}10}$ and S_{10+} are assumed to be 1.0% and 1.3%, respectively. An interpolation reflecting the variation in new money rates is applied for intermediate years.

[1] Monthly real interest rates for plan year 2021 are available. As such, both short-term and long-term real interest rates for plan year 2021 are the average of the respective 12 month actual rates.

F.3.6 Summary of Economic Assumptions

The economic assumptions used in this report are summarized in the Table 45.

Table 45 Economic Assumptions[1]
(As a percentage)

	Inflation			Employment Earning Increases			Interest	
Plan Year	CPI Increase[2]	Pension Indexation[3]	YMPE[3]	Pensionable Earnings[4]	Maximum Pensionable Earnings[3,5]	New Money Rate	Projected Yield on Account	Projected Return on Fund
2021	**0.7**	**1.0**	**4.9**	1.5	**4.9**	1.2	3.5	4.2
2022	2.3	1.9	6.2	1.5	6.2	1.9	3.3	5.6
2023	2.2	1.9	1.1	2.0	1.1	2.0	3.1	5.2
2024	2.0	2.3	0.8	2.0	0.8	2.3	3.0	5.1
2025	2.0	2.0	1.4	2.0	1.4	2.7	2.9	5.2
2026	2.0	2.0	2.4	2.2	2.4	3.0	2.8	5.5
2027	2.0	2.0	3.0	2.4	3.0	3.2	2.8	5.6
2028	2.0	2.0	3.0	2.6	3.0	3.3	2.7	5.6
2029	2.0	2.0	3.0	2.7	3.0	3.5	2.6	5.6
2030	2.0	2.0	3.0	2.7	3.0	3.6	2.5	5.7
2035	2.0	2.0	3.0	2.7	3.0	4.1	2.4	5.9
2040	2.0	2.0	3.0	2.7	3.0	4.1	2.9	5.9
2045	2.0	2.0	3.0	2.7	3.0	4.1	3.8	5.9
2052+	2.0	2.0	3.0	2.7	3.0	4.1	4.1	5.9

1 Bold figures denote actual experience.
2 Assumed to be effective during Plan Year.
3 Assumed to be effective as at 1 January.
4 Assumed to be effective as at 1 April. Exclusive of seniority and promotional increases.
5 Calendar year 2021 Maximum Pensionable Earnings is $181,600.

Appendix G — PSSA Demographic Assumptions

G.1 Demographic Assumptions

Given the size of the population subject to the PSSA, the plan's own experience, except where otherwise noted, was deemed to be the best model to determine the demographic assumptions. Assumptions from the previous valuation were updated to reflect past experience to the extent it was deemed credible.

The demographic assumptions in the previous report were based on the member's completed years of pensionable service, age at most recent birthday, or both. In this valuation, members age and service are determined by rounding the exact value to the nearest integer. Previous assumptions were converted to reflect this change of methodogy.

All references to assumptions from the previous valuation in this section refer to assumptions converted to Age Nearest basis.

G.1.1 Seniority and Promotional Salary Increases

Seniority means length of service within a classification, and *promotion* means moving to a higher paid classification. The assumption of the previous report was changed by giving equal credibility to the plan's experience over the last three plan years and the assumption from the previous valuation.

Table 46 Sample of Assumed Seniority and Promotional Salary Increases
(Percentage of annual earnings)

Years of Pensionable Service	Male	Female
0	5.9	6.1
1	5.5	5.7
2	5.0	5.2
3	4.4	4.6
4	3.8	4.0
5	3.3	3.5
6	3.0	3.1
7	2.7	2.9
8	2.5	2.7
9	2.3	2.5
10	2.1	2.4
15	1.5	1.7
20	1.2	1.4
25	1.0	1.2
30	0.9	1.0

G.1.2 New Contributors

As the active population of the plan is expected to grow, new contributors are projected to replace members that cease to be active as well as increase the number of contributors over time.

The assumed percentage increase in the number of contributors for each plan year is shown in Table 47.

Table 47 Assumed Annual Increases in Number of Contributors

Plan Year	Percentage
2021	4.5
2022	2.0
2023	1.0
2024	0.7
2025+	0.6

New contributors are assumed to share the same characteristics as participants with less than one year of service at the valuation date. In particular they are assumed to have:

- The same average age,
- The same gender distribution, and
- The same average initial salary which is adjusted by the economic salary increase for plan year 2021 and beyond.

G.1.3 Pensionable Retirement

The pensionable retirement assumption was revised to reflect the intervaluation plan experience by giving equal credibility to the plan's experience and the assumption form the previous valuation. Where less data was available, the retirement rates from the previous valuation were not revised. In particular, the rates remained unchanged for

- Group 1 members for ages 65 and over, and
- Group 2 members with more than 8 years of service.

For Group 1 contributors below the age of 65, the assumed retirement rates decreased by an average of 4% for males and 6% for females.

For Group 2 contributors, the analysis included the plan's experience over the last seven plan years. For Group 2 contributors below the age of 65 and with less than 8 years of service, the assumed retirement rates increased by an average of 3% for males and decreased by an average of 11% for females.

For operational service contributors, the assumed pensionable retirement rates are the same for both sexes and are on average 2% lower than assumed in the previous valuation.

For contributors who are *deemed* operational, the assumed rates of retirement are the same as for members of the operational service group except that rates of retirement are zero for ages below 45.

Tables 48 to 52 provide sample rates of pensionable retirement.

Table 48 Sample of Assumed Rates of Retirement – Main Group 1 – Male
(Per 1,000 individuals)

	Years of Pensionable Service						
Age[1]	2	5	10	20	29	30	35
50	55	35	30	20	15	20	0
55	60	50	25	20	130	250	315
60	120	65	110	155	270	295	300
65	205	165	185	220	255	305	325
70	215	285	250	290	355	425	410

Table 49 Sample of Assumed Rates of Retirement – Main Group 1 – Female
(Per 1,000 individuals)

	Years of Pensionable Service						
Age[1]	2	5	10	20	29	30	35
50	90	45	15	10	15	10	0
55	90	50	25	35	195	345	490
60	130	75	125	225	360	390	335
65	230	215	245	270	245	285	455
70	195	195	290	380	365	310	490

Table 50 Sample of Assumed Rates of Retirement – Main Group 2 – Male
(Per 1,000 individuals)

	Years of Pensionable Service						
Age[1]	2	5	10	20	29	30	35
55	30	40	25	20	20	20	15
60	95	60	45	55	160	210	345
65	170	170	220	295	400	455	425
70	215	285	250	290	355	425	410

Table 51 Sample of Assumed Rates of Retirement – Main Group 2 – Female
(Per 1,000 individuals)

	Years of Pensionable Service						
Age[1]	2	5	10	20	29	30	35
55	45	35	25	20	20	20	15
60	95	75	65	80	210	300	445
65	195	165	290	380	440	525	425
70	195	195	290	380	365	310	325

[1] Expressed in rounded years calculated at the beginning of the plan year.

Table 52 Sample of Assumed Rates of Retirement – Operational Service
(Per 1,000 individuals)

	Years of Pensionable Service						
Age[1]	2	5	10	19	20	30	35
40	-	-	-	-	10	-	-
45	-	-	-	-	5	20	-
50	75	40	25	10	10	130	160
55	75	50	25	25	25	210	180
60	125	70	120	155	195	345	320
65	215	190	210	260	245	295	390
70	205	245	270	315	330	375	445

G.1.4 Disability Retirement

The disability incidence rate assumption was revised to reflect the intervaluation experience, by giving equal credibility to the plan's experience over the last three plan years and the assumption from the previous valuation.

Disability incidence is independent from plan provisions. As such, the incidence rates are the same for members not eligible to immediate retirement for both Groups. Disability incidence is assumed to be nil once a member is eligible to immediate retirement

The assumed rates of disability retirement for ages 60 to 64 are the same as in the previous valuation, although they appear different since they have been adjusted from the Age Last to the Age Nearest basis. The assumed rates of pensionable disability for contributors between the ages of 30 and 59 have decreased by an average of 3% for males and 7% for females.

It is assumed that 75% of future new disability pensioners will receive a C/QPP disability pension at the onset of disability. This is unchanged from the previous valuation.

Table 53 Sample of Assumed Rates of Pensionable Disability[2]
(Per 1,000 individuals)

Age	Male	Female
25	0.00	0.00
35	0.38	0.89
45	1.44	2.76
55	4.06	7.07
59	4.95	7.44
60	8.02	10.76
61	9.72	12.01
62	11.70	13.20
63	13.69	14.20
64	14.69	15.20

[1] Expressed in rounded years calculated at the beginning of the plan year.
[2] Rates for 60 to 64 apply to Group 2 only.

G.1.5 Withdrawal

Withdrawal with less than two years of service includes termination of employment for any reason. Withdrawal with two or more years of service means termination of employment for reasons other than death, disability or retirement with an immediate annuity or an annual allowance. The withdrawal rate assumption was revised to reflect the plan experience.

The assumed withdrawal rates were developed by giving equal credibility to the plan's experience over the last three plan years and the assumption from the previous valuation. However, all assumed withdrawal rates for contributors with more than 20 years of service were revised to zero.

In addition, for Group 2 contributors aged 50 to 54 with 2 to 7 years of service, the assumed withdrawal rates were developed by giving equal credibility to the plan's experience over the last seven plan years and the assumption from the previous valuation. Finally, the assumed withdrawal rates for Group 2 contributors aged 50 to 54 with 8 to 20 years of service are assumed to be the same as in the previous valuation.

The assumed withdrawal rates for ages below the age of 50 decreased by an average of 15% for males and 22% for females.

Tables 54 to 56 provide samples of the assumed rates of withdrawal.

Table 54 Sample of Assumed Rates of Withdrawal – Main Group – Male
(Per 1,000 individuals)

	Years of Pensionable Service						
Age[1]	0	1	5	10	15	20	21+
20	375	375	-	-	-	-	-
25	150	135	35	-	-	-	-
30	115	105	35	20	-	-	-
35	105	90	25	20	10	-	-
40	105	100	45	10	10	5	-
45	115	100	35	25	15	5	-
50	140	125	30	15	10	5	-
54	160	145	31	15	10	5	-
60	226	215	-	-	-	-	-

[1] Expressed in rounded years calculated at the beginning of the plan year.

Table 55 Sample of Assumed Rates of Withdrawal – Main Group – Female
(Per 1,000 individuals)

	Years of Pensionable Service						
Age[1]	0	1	5	10	15	20	21+
20	365	365	-	-	-	-	-
25	145	130	20	-	-	-	-
30	115	105	20	10	-	-	-
35	110	95	25	10	5	-	-
40	110	100	30	15	10	5	-
45	125	110	25	20	10	5	-
50	160	140	35	15	10	5	-
54	190	165	40	20	15	10	-
60	250	230	-	-	-	-	-

In the previous valuation, assumed withdrawal rates for operational service contributors varied based on both age and service, while in this report they vary on the basis of service only. Full credibility was applied to the plan's experience over the last three years. The assumed rates of withdrawal are the same for actual operational contributors as well as for deemed operational contributors.

Table 56 Sample of Assumed Rates of Withdrawal – Operational Group
(Per 1,000 individuals)

Years of Pensionable Service	Unisex
0	41
1	36
2	30
3	21
4	19
5	16
10	10
15	11
19	8
20+	-

G.1.6 Proportions of Terminating Contributor Opting for a Deferred Annuity

Upon termination, contributors are eligible to a deferred annuity payable at age 60 for Group 1 and at age 65 for Group 2, or to a commuted valued of this deferred pension, when termination occurs more than ten years prior to the deferred age of payment. Notwithstanding the above, members with less than 2 years of service are only eligible to a return of their contributions.

The assumption for proportion of terminating contributors opting for a deferred annuity applies only to members with less than 20 years of service, since withdrawal rates for members with 20 or more years of service are assumed to be zero.

The assumption for the proportion of terminating Group 1 and Group 2 contributors opting for a

deferred annuity is determined by combining the experience of Group 1 and Group 2 contributors who terminated before age 50. The assumption was revised by giving equal credibility to the plan's experience over the last three plan years and the assumption from the previous valuation for all age and service combinations where the exposures to a termination was significant.

For Group 2 contributors ages above 49, the proportion of terminating contributor opting for a deferred annuity was revised to 100% for all age and service combinations.

For Group 1 and Group 2 contributors under age 50 the assumed proportion of terminating members electing a deferred annuity increased by an average of 4% for males and decreased by an average of 3% for females. For operational service contributors under age 50 the assumed proportion of terminating members electing a deferred annuity increased by an average of 1%.

Tables 57 to 59 provide samples of the proportions of terminating contributors opting for a deferred annuity.

Table 57 Sample of Proportions Opting for a Deferred Annuity – Main Group – Male
(Per 100 individuals)

	Years of Pensionable Service				
Age[1]	2	5	10	15	20
20	29	-	-	-	-
25	32	25	-	-	-
30	44	54	41	-	-
35	33	46	55	21	-
40	48	52	39	47	22
45	27	58	58	39	73
50	35	100	100	100	100
54	71	100	100	100	100

Table 58 Sample of Proportions Opting for a Deferred Annuity – Main Group – Female
(Per 100 individuals)

	Years of Pensionable Service				
Age[1]	2	5	10	15	20
20	44	-	-	-	-
25	43	76	-	-	-
30	41	52	38	-	-
35	42	52	44	66	-
40	43	60	52	41	17
45	48	52	57	49	41
50	100	100	100	100	100
54	100	100	100	100	100

[1] Expressed in rounded years calculated at the beginning of the plan year.

Table 59 Sample of Proportions Opting for a Deferred Annuity – Operational Service Group
(Per 100 individuals)

	Years of Pensionable Service				
Age[1]	2	5	10	15	19
20	44	-	-	-	-
25	38	52	-	-	-
30	42	53	40	-	-
35	38	49	49	45	-
40	45	56	46	44	47
45	38	55	57	45	45
50	69	100	100	100	-
54	75	100	100	100	-

G.1.7 Mortality

As in the previous valuation, the mortality rates assumed for contributors, retirement pensioners and surviving spouses were derived by giving full credibility to the plan's experience over the last three years. The mortality experience was weighted by salary[1] to reflect the impact of socio-economic status on mortality rates. It is assumed that an above (below) average socio-economic status, which is partly dictated by salary level, leads to longer (shorter) life expectancy.

For contributors and retirement pensioners the mortality rates for plan year 2021 are lower by an average of 2% for male and 3% for female between the ages of 60 to 100 compared to the mortality rate for plan year 2018 from the previous valuation.

Due to the limited disabled mortality experience over the three-year intervaluation period, the mortality rates for disabled pensioners were derived by giving equal credibility to the plan's experience during that time and the projected assumption from the previous valuation. For disability pensioners the mortality rates for plan year 2021 increased by an average of 2% for males and 3% for females between the ages of 60 and 100, compared to plan year 2018.

For spouse survivors, mortality rates for ages below 60 were revised to zero given the low number of spouse survivors aged below 60. The impact of revising the rates for ages below 60 to zero was minimal. For spouse survivors over age 60, the mortality rates for plan year 2021 decreased by an average of 2% for male survivors and 4% for female survivors between the ages of 60 to 100 compared to plan year 2018 used in the previous valuation.

[1] Valuation salary for contributors and adjusted salary at retirement for pensioners.

Table 60 shows a sample of assumed mortality rates weighted by salary.

Table 60 Sample of Assumed Rates of Mortality Weighted by Salary
For Plan Year 2021
(Per 1,000 individuals)

	Contributors and Retirement Pensioners		Disability Pensioners		Surviving Spouses	
Age[1]	Male	Female	Male	Female	Male	Female
30	0.3	0.2	5.6	2.3	0.0	0.0
40	0.4	0.4	10.2	4.4	0.0	0.0
50	1.1	0.9	10.3	8.5	0.0	0.0
60	3.9	2.8	20.0	11.8	8.6	5.2
70	11.8	9.4	36.1	23.7	17.6	13.6
80	39.9	28.5	79.3	56.3	56.3	36.6
90	141.9	113.9	186.5	150.9	151.1	111.9
100	358.1	323.0	412.4	423.3	364.8	304.6
110	500.0	500.0	500.0	500.0	500.0	500.0

Mortality rates are reduced in the future in accordance with the same mortality improvement assumption used in the 30th Actuarial Report on the Canada Pension Plan. Mortality improvements are expected to continue in the future but at a slower pace than most recently observed over the 15-year period ending in 2015. Further, it is assumed that, ultimately, mortality improvement rates for males will decrease to the same level as females.

Mortality improvement rates shown in the 30th Actuarial Report of the Canada Pension Plan are based on calendar years. These rates have been interpolated to plan year basis.

A sample of assumed mortality improvement rates is shown in Table 61.

Table 61 Sample of Assumed Mortality Improvement Rates
(applicable at the beginning of the plan year)

	Initial and Ultimate Plan Year Mortality Improvement Rates (%)			
	Male		Female	
Age[1]	2022	2037+	2022	2037+
30	1.10	0.80	0.59	0.80
40	1.57	0.80	1.42	0.80
50	1.49	0.80	0.98	0.80
60	2.18	0.80	1.65	0.80
70	2.07	0.80	1.49	0.80
80	2.08	0.80	1.50	0.80
90	1.83	0.65	1.66	0.65
100	0.62	0.29	0.67	0.29
110+	0.03	0.01	0.03	0.01

[1] Expressed in rounded years calculated at the beginning of the plan year.

Table 62 shows the calculated cohort life expectancy[1] for contributors and retirement pensioners based on the mortality assumptions described in this section.

Table 62 Cohort Life Expectancy of Contributors and Retirement Pensioners
(Years)

	As at 31 March 2020		As at 31 March 2036	
Age Nearest	Male	Female	Male	Female
60	27.7	29.5	28.6	30.4
65	22.9	24.6	23.9	25.5
70	18.4	20.0	19.3	20.8
75	14.2	15.7	15.0	16.5
80	10.4	11.8	11.2	12.5
85	7.2	8.3	7.9	8.9
90	4.7	5.6	5.2	6.1

The assumptions on mortality rates and mortality improvement rates represent best-estimate assumptions regarding future demographic trends. Given the length of the projection period, it is unlikely that the actual experience will develop precisely in accordance with best-estimate assumptions. The following table measures the effect on the life expectancy when mortality improvement rates vary.

Table 63 Sensitivity of Life Expectancy to Variations in Mortality Improvement Rates

	Age 65 Life Expectancy in 2020		Age 65 Life Expectancy in 2037	
	Male	Female	Male	Female
Mortality Improvement Rates				
Current basis	22.9	24.6	23.9	25.5
- if 0%	21.5	23.3	21.5	23.3
- if ultimate 50% higher	23.1	24.8	24.4	26.1
- if ultimate 50% lower	22.6	24.5	23.2	25.0
- if kept at 2020 level	23.9	25.4	26.3	27.3

G.1.8 Family Composition

The assumptions regarding spouse survivors were revised based on the intervaluation experience.

Between ages 30 and 90 the assumption regarding the probability of a member, upon death, leaving a spouse eligible for a survivor pension was decreased by an average of 7% for males and 3% for females.

The assumption for spouse age difference was revised as shown in Table 64. The impact of this change is immaterial to the plan.

[1] Cohort life expectancies take into account assumed future improvements in mortality and therefore differ from calendar year life expectancies, which are based on the mortality rates of the given attained year.

Table 64 Assumptions for Survivor Spouse Allowances[1]

	Male		Female	
Age[2]	Probability of an Eligible Spouse at Death of Member	Spouse Age Difference	Probability of an Eligible Spouse at Death of Member	Spouse Age Difference
30	0.31	(3)	0.42	2
40	0.45	(3)	0.55	2
50	0.56	(3)	0.55	2
60	0.61	(3)	0.51	2
70	0.63	(4)	0.39	0
80	0.59	(4)	0.24	0
90	0.42	(4)	0.07	0
100	0.13	(4)	0.00	0

It is assumed that deceased members will leave no eligible child survivors. This change has a negligible impact on the valuation results.

The sex of each eligible surviving spouse is assumed to be the opposite of the deceased member's.

1 Survivor pensions are not payable if the deceased member has less than two years of pensionable service.
2 Expressed in rounded years calculated at the beginning of the plan year.

Appendix H — Transfer Value Valuation Methodology and Assumptions

Section 92 (1) of the *Public Service Superannuation Regulations* states that demographic assumptions used for the calculation of transfer value are those of the last actuarial report file prior to the calculation date. This section summarizes the methodology and assumptions required for the calculation of transfer values.

H.1 Valuation Methodology

A contributor who has ceased to be employed in the public service is eligible to a deferred annuity and may elect to transfer the commuted value of the accrued pension benefits if that contributor:

- has two or more years of pensionable service and
- is under
    - age 50 if a Group 1 contributor, or
    - age 55 if a Group 2 contributor.

The transfer value payment made to the former contributor represents the present value of the benefit accrued at the time of termination. The present value evaluates the following benefits:

- the former contributor's accrued pension which is payable from age 60 for a Group 1 contributor or from age 65 for a Group 2 contributor;
- the former contributor's accrued pension which is payable immediately based on the probability that the contributor becomes disabled after termination but prior to age 60 for a Group 1 contributor or age 65 for a Group 2 contributor;
- 50% of the former contributor's accrued pension which is payable to surviving spouses based on the probability that the former contributor has an eligible surviving spouse at the time of death.
- 10% of the former contributor's accrued pension payable to children based on the probability that the former contributor has eligible children at the time of death.

H.2 Economic Assumptions

Interest rates for transfer value amounts are determined in accordance with Section "Pension Commuted Values" of the Standards of Practice – Pensions published by the Canadian Institute of Actuaries. The rates used for transfer value calculation are shown in Table 44 on page 64.

H.3 Demographic Assumptions

For the purpose of calculating the transfer value amount payable to a former contributor the following demographic assumptions are used.

H.3.1 Mortality Assumptions

The mortality rates and mortality improvement rates for a former contributor in receipt of an annuity, for a former contributor becoming disabled after termination, and a surviving spouse upon the death of the former contributor are respectively the same as discussed in Section G.1.7.

H.3.2 Disability Incidence

The disability incidence rates are used to determine the proportion of former contributors becoming disabled during the period after termination and prior to the attainment of age 60 for former Group 1 contributors or age 65 for former Group 2 contributors. These are shown in Table 53 on page 69.

H.3.3 Probability of an Eligible Spouse at Death of Former Contributor

In order to be eligible for a survivor benefit, the survivor must be an eligible spouse[1] as at the termination date and remain eligible up until the time of death of the former contributor. Given that the PSPP does not capture the marital status at time of termination, it is assumed that the proportions of former members married at termination are the same as for the Canadian population. As such, the data was extracted from the Statistics Canada CANSIM Table 051-0042 for the year 2020 for all ages below age 71.

The expected proportion of the former contributors having an eligible spouse at time of termination is determined by combining marital status of married (and not separated), separated (not living in common law) and living in common law.

Table 65 shows the expected proportions of former contributors having an eligible spouse at time of termination.

Table 65 Sample of Assumed Proportion Eligible Spouse at Termination of Member[2]

Age[3]	Male	Female
20	0.03	0.07
30	0.52	0.64
40	0.75	0.77
50	0.75	0.75
60	0.77	0.72
70	0.80	0.64

Once determined to be married at termination, a former contributor's probability of remaining in the marriage after the time of termination diminishes over time by reason of a possible divorce or death of the spouse before the member.

Once married, an individual is subject to the possibility of a divorce which would remove the survivor coverage at the former contributor's time of death if the spouse has survived to such time. As no experience data is available for the PSPP, it was assumed that the probabilities of divorce after marriage of former members are the same as for the Canadian population. The latest available data on divorce rates are those published by Statistics Canada in the publication Divorces in Canada 84F0213X. The divorce rates were derived from the years 1996 to 2003.

1 The eligible survivor is defined in Section A.4.11.
2 Survivor pensions are not payable if the deceased member has less than two years of pensionable service.
3 Expressed in rounded years calculated at the beginning of the plan year.

Table 66 Sample of Assumed Divorce Rates

Age	Male	Female
20	0.020	0.022
30	0.019	0.019
40	0.016	0.015
50	0.012	0.010
60	0.006	0.004
70	0.002	0.001
80	0.002	0.001
90	0.002	0.001

For individual transfer value calculation purposes, it is assumed that at the date of termination, the spouse is three years younger than the male contributor and three years older than the female contributor.

It is assumed that deceased former members will leave no eligible child survivors.

Appendix I — RCA Valuation Methodology and Assumptions

I.1 Valuation of the Account Balance

The amounts available for benefits comprise the recorded balances of the RCA (RCA No. 1 and RCA No. 2) Accounts, which form part of the Public Accounts of Canada as well as a tax credit (CRA refundable tax) with respect to the RCAs.

Interest is credited on the RCA Accounts every three months in accordance with the actual average yield on a book value basis for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces – Regular Force and RCMP pension plans. The actuarial value of the account balance is equal to the book value.

I.2 Valuation of Liabilities

Described in this Appendix are the liability valuation methodologies used and any differences in economic assumptions from those used in the PSSA valuation.

I.2.1 Terminally Funded RCA Benefits

The following RCA benefits are being terminally funded (i.e. not prefunded but on an occurrence basis):

- Early Retirement Incentive (ERI) program
- pre-retirement survivor benefits
- minimum death benefit
- elective service

Except for the now-closed ERI program, the above benefits are terminally funded because they are uncommon or of little financial significance. For example, the pre-retirement survivor benefit becomes payable only when the average salary is less than 1.4 times the YMPE. As well, the minimum death benefit is expected to occur only with deaths at younger ages, where the probability of death is small.

I.2.2 RCA No. 1 Post-Retirement Survivor Benefits

The limit on the amount of spousal annual allowance that can be provided under the PSSA decreases when the member's pension is reduced due to the CPP (or QPP) offset, which usually occurs at age 65.

This benefit was valued conservatively by assuming the plan limit is always coordinated with the CPP (or QPP). The liability overstatement is minor because the probability of the former contributor dying prior to age 65 is small. (This overstatement tends to be offset by the understatement of accrued liability caused by terminally funding the pre-retirement survivor benefit.) The projected accrued benefit cost method was used to estimate the liabilities and normal costs for this RCA No. 1 benefit.

I.2.3 RCA No. 1 Continued Benefit Accrual for Former Deputy Heads

All former deputy heads that have accrued or are accruing benefits are included. For those accruing benefits, it was assumed that they would cease to do so when first eligible to receive an immediate annuity.

I.2.4 RCA No. 1 Excess Pensionable Earnings

The projected accrued benefit cost method was used to estimate plan liability and current service costs for retirement benefits in excess of the Maximum Pensionable Earnings (MPE).

I.2.5 Administrative Expenses

To compute the liability and current service costs, no provision was made regarding the expenses incurred for the administration of either the RCA No. 1 Account or the RCA No. 2 Account. These expenses, which are not debited from the RCA Accounts, are borne entirely by the government and are commingled with all other government expenses.

I.3 Actuarial Assumptions

The valuation economic assumptions described in Appendix F were used without any modifications.

I.4 Valuation Data

The RCA No. 1 and RCA No. 2 pension benefits in payment were provided as at 31 March 2020. RCA No. 1 and RCA No. 2 benefits expected to be paid in respect of contributors and accrued spousal allowances of current retired members were all derived from the membership data described in Appendix D and shown in Appendix L.

Appendix J — Public Service Pension Plan Projection

The results of the following projections were computed using the data described in Appendices D and L, the methodology described in Appendix E and the assumptions described in Appendices F, G and H.

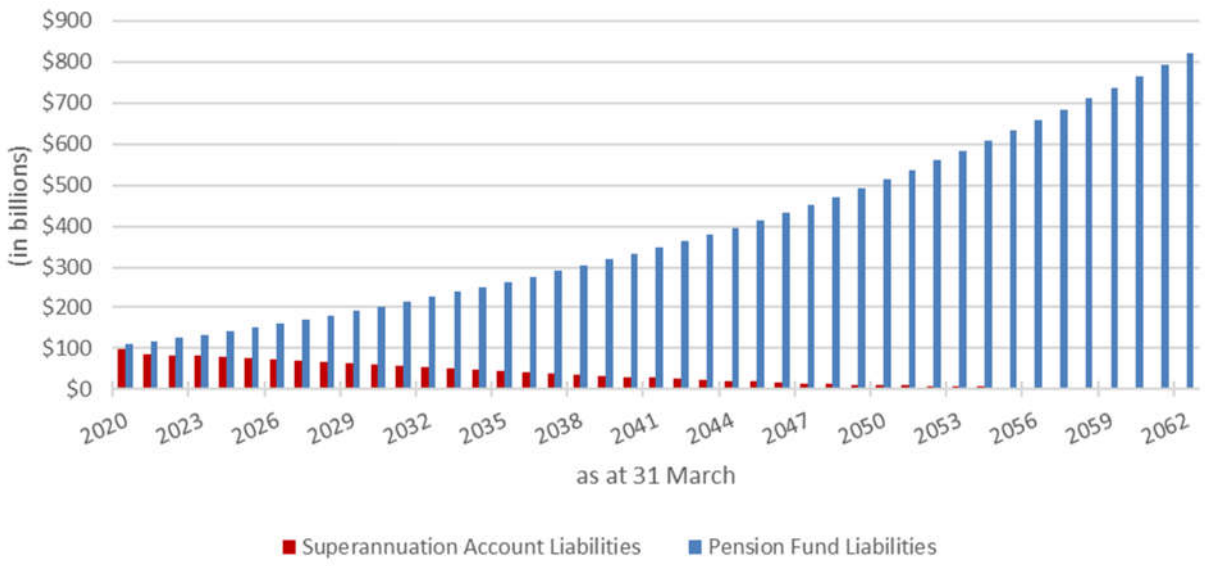
J.1 Projection of the Superannuation Account and the Pension Fund Liabilities

Prior to 1 April 2000, the PSSA Superannuation Account tracked all government pension benefit obligations related to the PSSA. The Superannuation Account is now debited only with benefit payments made in respect of service earned before that date and administrative expenses; it is credited with prior service contributions related to elections made prior to 1 April 2000 and interest earnings.

Starting 1 April 2000, the PSSA is financed through the Pension Fund. The Pension Fund is credited with employer and member contributions, investment earnings and prior service contributions for elections made since 1 April 2000. The Pension Fund is debited with benefit payments made in respect of service earned since that date and administrative expenses.

The following graph presents the evolution over time of the Superannuation Account liabilities for service prior to 1 April 2000 and the Pension Fund liabilities for service after 31 March 2000.

Chart 1 Evolution of Liabilities of Superannuation Account and Pension Fund over Time

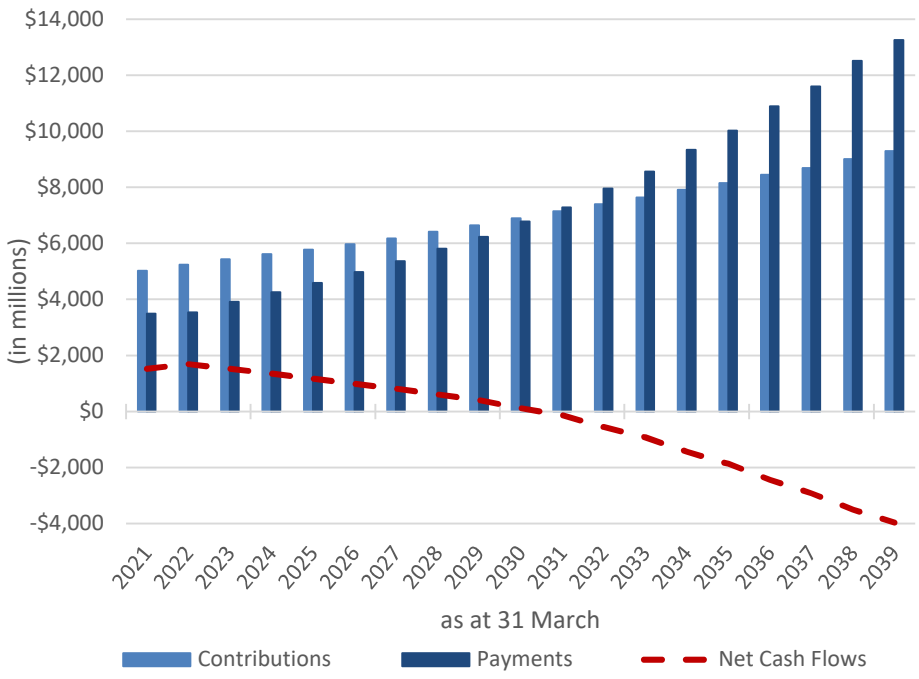


J.2 Evolution of Cash Flows under the Pension Fund

In plan year 2021, contributions to the Pension Fund are expected to reach $5,019 million, whereas payouts, including benefit payments and administrative expenses, are expected to reach $3,474 million. Contributions that are higher than payouts ensure that the Pension Fund has sufficient liquidity to cover all the payouts in a year. However, as the population of the Pension Fund matures, the amount of payouts will increase and will eventually exceed the contributions. This will result in negative cash flows to the Pension Fund.

It is expected that the Pension Fund will have negative cash flows from plan year 2031, at which point a portion of the assets will be required to pay benefits. However, regular liquid revenue from the Pension Fund such as fixed income interest, stock dividends, infrastructure and real estate rents will be readilly available to cover the excess payouts. Nevertheless, it should be noted that although negative cash flows will begin in the plan year 2031, the Pension Fund's overall assets are expected to grow for the entire duration of the projection presented below when investment income is taken into consideration[1].

Chart 2 Evolution of Cash Flows over Time

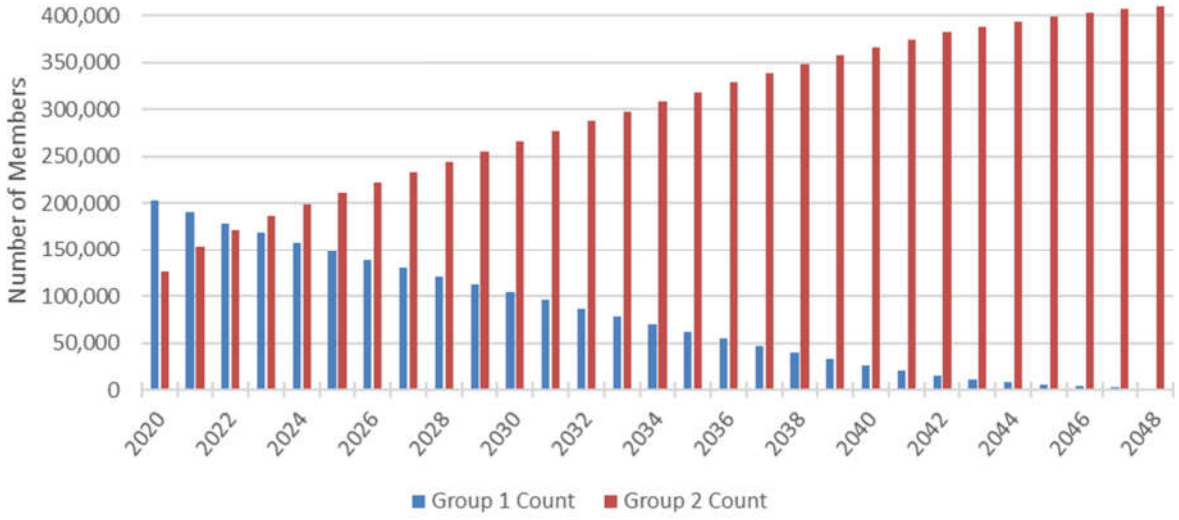


[1] It is assumed that any non-permitted surplus would be withdrawn from the Pension Fund.

J.3 Evolution of Group1 and Group 2 Active Membership

Due to the implementation of Division 23 of Part 4 of the *Jobs and Growth Act, 2012* (S.C. 2012, c. 31), members who entered the Plan prior to 1 January 2013 are considered Group 1 members and members who entered the Plan on or after 1 January 2013 are considered Group 2 members. The benefit costs of Group 2 members are generally less than that of Group 1 members. Chart 3 shows the evolution of membership between the two groups. Group 2 active members are expected to outnumber Group 1 active members in plan year 2023. By plan year 2063, there should be no Group 1 active members left in the Plan.

Chart 3 Evolution of Group 1 and Group 2 Active Membership



Appendix K — Uncertainty of Future Investment Returns

K.1 Introduction

The projected financial status of the Pension Fund depends on many demographic and economic factors, including new contributors, average earnings, inflation, level of interest rates and investment returns. The projected long-term financial status of the Pension Fund is based on best-estimate assumptions. The objective of this section is to present a range of outcomes resulting from various alternative investment returns scenarios. The alternatives presented illustrate the sensitivity of the long-term projected financial position of the Pension Fund to changes in the future economic outlook. In this appendix, any references to assets, liabilities, surplus/(deficit), annual special payments and service cost are related to those of the Pension Fund.

Section K.2 illustrates how investment experience may affect the funding status of the Pension Fund over time. The impact of financial market tail events on the financial status of the Pension Fund is explored in Section K.3, where a severe one-time financial shock is applied to the best-estimate portfolio with the purpose of quantifying the impact on the funding ratio over the short-term horizon.

K.2 Range of Potential Funding Ratio due to Investment Experience

Chart 4 illustrates a range of funded ratios (actuarial value of assets over actuarial liabilities) that could be expected under the best-estimate portfolio. It takes into account that actuarial valuation would occur every three years starting in 2020, that deficits are covered by additional government contributions, and that legislated non-permitted surplus (surplus in excess of 25% of liabilities) results in a full or partial contribution holiday for the government.

As shown in Chart 4, the median expected funded ratio is relatively flat (between 112% and 114%) over the projection period.

Chart 4 Range of Potential Funding Ratio for the Best-Estimate Portfolio – PS Pension Fund

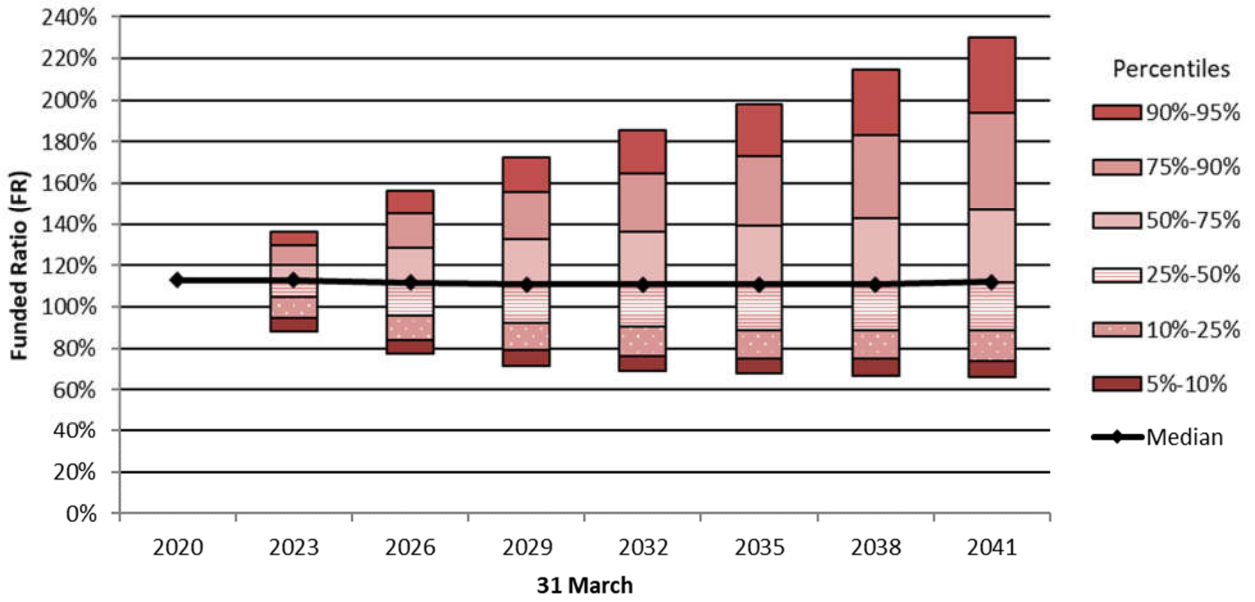
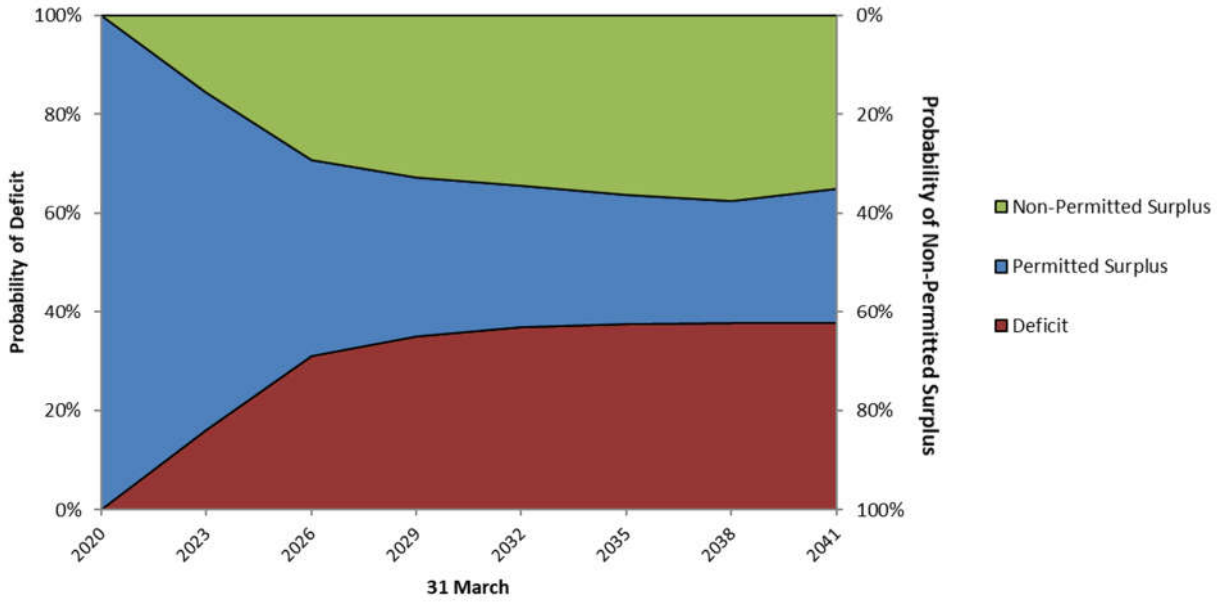


Chart 4 shows that the range of potential outcomes widens with time. Chart 5 illustrates the probabilities associated with three possible funded statuses over the next 20 years: deficit, surplus less than 25% of liabilities, and non-permitted surplus.

Chart 5 Likelihood of Deficit, Permitted and Non-Permitted Surplus due to Investment Experience



On Chart 5, the left axis shows the likelihood of deficit while the right axis shows the likelihood of non-permitted surplus. The likelihood of the permitted surplus is determined as 100% minus probability of deficit minus probability of non-permitted surplus.

K.3 Financial Market Tail Events

This section focuses on the inherent volatility in the best-estimate portfolio and the potential extreme outcomes. During plan year 2009, the nominal return on Pension Fund assets was negative 22.7% due to the economic slowdown. Such an event could be characterized as low probability (also referred to as a "tail event"). However, when these events do occur, the impact on the funded ratio is significant. This section analyzes the impacts that tail-event returns would have on the Plan's funded ratio and the projected surplus/(deficit) as at 31 March 2023 (the expected date of the next actuarial review).

To illustrate this, returns other than the best-estimate are assumed to occur in plan year 2021 followed by the best-estimate returns for plan years 2022 and 2023.

The returns are assumed to follow a normal distribution. Two probability levels were selected to analyze: 1/10 and 1/50. The probabilities of earning these returns can be thought of as the event occurring once every 10 and 50 years, respectively. The left tail event is the occurrence of a nominal return such that the probability of earning that return or less is equal to 1/10 (or 1/50). The right tail event is the occurrence of a nominal return such that the probability of earning that return or more is equal to 1/10 (or 1/50).

Table 67 Financial Positions at Tail-Events of Best-Estimate Portfolio[1] as at 31 March 2023

			As at 31 March 2023				
	Nominal Return at Plan Year 2021	Average Nominal Return from Plan Year 2021 - 2023	Funded Ratio	Actuarial Value of Assets	Liability	Surplus/ (Deficit)	Annual Special Payment[2]
Current Basis	**4.2%**	**5.0%**	**108%**	**144,550**	**133,284**	**11,266**	**0**
Investment return[3]							
- Left Tail event at 1/50th probability	(18.7%)	(2.7%)	98%	131,174	133,284	(2,110)	219
- Left Tail event at 1/10th probability	(9.8%)	0.7%	104%	139,125	133,284	5,841	0
- Right Tail event at 1/10th probability	19.5%	10.4%	124%	165,036	133,284	31,752	0
- Right Tail event at 1/50th probability	28.4%	13.1%	130%	172,839	133,284	39,555	0

Table 67 shows that extreme events occurring during intervaluation period, as demonstrated by the 1/50th left and right tails, will result in the plan either requiring a special payment when there is a severe economic downtown or exceeding the non-permitted surplus threshold when market conditions are extremely favorable. Table 67 also shows that the impact of an isolated tail-event is dampened over time when investment conditions revert to the best-estimate scenario.

1 Best-Estimate Portfolio: 19% Marketable Bonds / 29% Public Equity / 14% Private Equity / 8% Credit / 29% Real Assets

2 Amortized over 15 years at best-estimate rates of return.

3 The probability of earning the positive returns in the table corresponds to the probability that the annual return is greater than or equal to the indicated return. Similarly, the probability of earning a negative portfolio return corresponds to the probability of earning the indicated return or less.

Appendix L — Detailed Information on Membership Data

Table 68 Male Contributors (Main Group)
Number and Average Pensionable Earnings[1] as at 31 March 2020

Age[2]	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service[2]
To 24	3,453 $56,910	11 $77,234							3,464 $56,975
25-29	9,350 $67,464	865 $80,436	13 $92,038						10,228 $68,592
30-34	8,090 $72,015	3,473 $84,494	1,483 $91,162	14 $94,823					13,060 $77,532
35-39	6,021 $75,435	3,586 $86,960	6,134 $93,638	1,050 $99,058	20 $106,245				16,811 $86,048
40-44	4,425 $76,912	2,562 $88,158	5,782 $94,824	5,041 $104,544	909 $105,781	26 $121,798			18,745 $92,867
45-49	3,462 $79,750	1,852 $87,902	4,052 $94,275	5,039 $104,221	3,306 $109,831	552 $105,536	51 $102,656		18,314 $96,792
50-54	2,754 $80,848	1,411 $90,083	2,903 $93,677	3,558 $100,965	3,082 $108,577	2,923 $110,660	1,338 $100,192	94 $110,222	18,063 $98,735
55-59	2,201 $83,722	1,158 $89,078	2,353 $91,691	2,843 $98,938	2,381 $103,158	2,974 $106,721	2,678 $101,730	1,295 $94,397	17,883 $97,419
60-64	1,063 $83,468	663 $89,386	1,256 $89,826	1,543 $96,820	1,329 $100,383	1,226 $105,757	1,208 $104,080	1,131 $94,292	9,419 $96,151
65+	361 $81,759	250 $92,577	544 $88,739	615 $95,992	455 $98,835	395 $98,534	379 $102,959	760 $101,278	3,759 $95,731
All Ages	41,180 $72,989	15,831 $86,983	24,520 $93,386	19,703 $101,835	11,482 $106,254	8,096 $107,565	5,654 $101,959	3,280 $96,409	129,746 $89,888

Table 69 Main Male - Summary

	March 31, 2020	March 31, 2017
Average age[2]:	45.0 years	45.2 years
Average pensionable service[2]:	12.2 years	13.6 years
Annualized pensionable payroll[3]:	$11,650 million	$9,504 million
Total PBDA[4] indexed reduction to basic annuity:	$15,050,400	$13,300,400
Total PBDA[4] indexed reduction adjustment:	$2,849,800	$2,726,200

1 As defined in Note A.4.1, Section A.4 of Appendix A.
2 Expressed in rounded years calculated at the beginning of the plan year.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
4 PBDA means the Pension Benefits Division Act.

Table 70 Female Contributors (Main Group)
Number and Average Pensionable Earnings[1] as at 31 March 2020

Age[2]	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service[2]
To 24	4,644 $55,241	4 $74,944							4,648 $55,258
25-29	13,185 $65,961	1,146 $77,807	12 $80,275						14,343 $66,920
30-34	10,005 $69,268	4,380 $81,320	1,992 $85,827	7 $72,198					16,384 $74,505
35-39	7,564 $70,339	4,055 $82,021	8,378 $89,132	1,600 $94,014	8 $83,223				21,605 $81,577
40-44	5,830 $70,277	3,106 $81,101	8,041 $89,270	7,627 $97,408	1,275 $98,632	8 $108,791			25,887 $86,877
45-49	4,535 $69,767	2,339 $79,900	5,569 $87,778	6,653 $97,843	4,578 $102,795	771 $97,809	50 $89,549		24,495 $89,551
50-54	3,344 $69,924	1,777 $78,158	4,109 $82,837	4,645 $92,244	3,722 $100,223	3,727 $101,590	1,858 $92,414	40 $87,897	23,222 $89,072
55-59	2,331 $70,281	1,410 $75,283	3,102 $78,760	3,732 $86,062	2,907 $89,454	3,081 $96,827	2,525 $94,474	530 $84,064	19,618 $85,479
60-64	1,154 $71,144	795 $74,913	1,661 $75,790	1,942 $81,841	1,493 $84,256	1,163 $91,545	868 $92,493	542 $87,025	9,618 $81,742
65+	324 $71,015	300 $77,259	565 $74,168	608 $78,482	466 $81,870	318 $86,421	278 $84,961	344 $84,681	3,203 $79,360
All Ages	52,916 $67,658	19,312 $79,991	33,429 $86,088	26,814 $93,276	14,449 $96,480	9,068 $97,836	5,579 $92,962	1,456 $85,417	163,023 $82,370

Table 71 Main Female - Summary

	March 31, 2020	March 31, 2017
Average age[2]:	44.1 years	44.5 years
Average pensionable service[2]:	11.4 years	12.7 years
Annualized pensionable payroll[3]:	$13,415 million	$10,250 million
Total PBDA[4] indexed reduction to basic annuity:	$5,717,100	$3,569,700
Total PBDA[4] indexed reduction adjustment:	$1,189,900	$820,500

1 As defined in Note A.4.1, Section A.4 of Appendix A.
2 Expressed in rounded years calculated at the beginning of the plan year.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
4 PBDA means the Pension Benefits Division Act.

Table 72 Male Contributors (Operational Group)
Number and Average Pensionable Earnings[1] as at 31 March 2020

Age[2]	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service[2]
To 24	105 $67,947								105 $67,947
25-29	311 $72,056	73 $82,981							384 $74,399
30-34	223 $73,661	387 $84,462	91 $86,031						701 $81,230
35-39	154 $73,821	334 $84,936	509 $85,267	35 $90,584					1,032 $83,724
40-44	117 $73,239	213 $83,031	498 $86,523	337 $86,914	59 $86,646				1,224 $84,759
45-49	98 $71,303	146 $82,319	360 $85,884	420 $88,659	446 $89,950	29 $95,567	3 $83,328		1,502 $86,751
50-54	59 $76,241	82 $83,264	216 $85,350	225 $88,798	347 $89,532	171 $89,053	63 $85,696		1,163 $87,219
55-59	50 $73,645	66 $77,454	140 $82,862	67 $83,102	137 $87,077	107 $85,398	135 $86,055	14 $84,801	716 $83,568
60-64	37 $74,118	36 $73,298	47 $79,753	42 $83,846	49 $87,121	43 $92,928	47 $86,542	16 $91,287	317 $83,419
65+	6 $83,699	13 $83,622	22 $88,078	15 $90,962	7 $85,195	6 $101,889	8 $63,612	13 $91,192	90 $86,595
All Ages	1,160 $72,690	1,350 $83,321	1,884 $85,489	1,141 $87,757	1,046 $89,089	356 $89,169	256 $85,323	43 $89,146	7,236 $84,108

Table 73 CSC Male - Summary

	March 31, 2020	March 31, 2017
Average age[2]:	44.5 years	41.6 years
Average pensionable service[2]:	13.0 years	11.3 years
Annualized pensionable payroll[3]:	$608 million	$543 million
Total PBDA[4] indexed reduction to basic annuity:	$349,200	$615,800
Total PBDA[4] indexed reduction adjustment:	$84,800	$159,000

1 As defined in Note A.4.1, Section A.4 of Appendix A.
2 Expressed in rounded years calculated at the beginning of the plan year.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
4 PBDA means the Pension Benefits Division Act.

Table 74 Female Contributors (Operational Group)
Number and Average Pensionable Earnings[1] as at 31 March 2020

Age[2]	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service[2]
To 24	125 $67,322								125 $67,322
25-29	422 $70,716	36 $80,023							458 $71,448
30-34	272 $74,179	296 $85,073	85 $83,746						653 $80,363
35-39	167 $72,490	272 $86,642	423 $87,610	38 $88,928					900 $84,666
40-44	122 $71,269	151 $81,795	441 $86,651	289 $89,563	67 $85,057				1,070 $84,898
45-49	119 $69,523	118 $79,860	270 $83,901	277 $88,616	402 $89,535	51 $79,957			1,237 $84,902
50-54	78 $65,902	97 $77,711	148 $80,150	117 $85,621	241 $88,713	141 $84,832	44 $81,867		866 $82,565
55-59	49 $67,977	63 $73,708	123 $77,551	47 $74,979	134 $83,423	77 $79,660	64 $78,952	18 $95,402	575 $78,470
60-64	19 $62,211	28 $74,710	44 $73,353	26 $72,949	23 $78,645	24 $80,959	22 $68,960	8 $90,070	194 $74,163
65+	7 $66,825	11 $83,666	19 $73,450	10 $73,414		3 $68,521		5 $85,086	55 $82,660
All Ages	1,380 $70,746	1,072 $82,647	1,553 $84,396	804 $87,042	871 $87,737	296 $82,167	133 $77,859	31 $92,362	6,140 $81,634

Table 75 CSC Female - Summary

	March 31, 2020	March 31, 2017
Average age[2]:	43.3 years	40.8 years
Average pensionable service[2]:	11.9 years	10.3 years
Annualized pensionable payroll[3]:	$500 million	$428 million
Total PBDA[4] indexed reduction to basic annuity:	$17,700	$33,400
Total PBDA[4] indexed reduction adjustment:	$5,200	$10,300

1 As defined in Note A.4.1, Section A.4 of Appendix A.
2 Expressed in rounded years calculated at the beginning of the plan year.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
4 PBDA means the Pension Benefits Division Act.

Table 76 Contributors on Leave Without Pay and Non-active Contributors
Number and Average Pensionable Earnings[1] as at 31 March 2020

Age[2]	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service[2]
To 24	694 $47,235								694 $47,235
25-29	1,626 $62,449	181 $75,152	3 $79,630						1,810 $63,748
30-34	2,300 $68,950	1,305 $80,318	455 $84,395						4,060 $74,385
35-39	1,475 $70,221	1,523 $80,562	1,708 $86,816	167 $89,260					4,873 $79,922
40-44	791 $69,154	794 $78,545	1,260 $85,495	730 $91,566	66 $89,808				3,641 $81,785
45-49	496 $67,000	457 $75,330	682 $81,599	653 $88,520	306 $92,668	47 $89,353			2,641 $81,004
50-54	415 $66,790	328 $69,159	444 $79,185	501 $86,674	314 $93,038	277 $90,204	93 $88,966		2,372 $80,760
55-59	396 $63,528	321 $69,859	440 $72,483	459 $82,580	312 $85,851	312 $90,642	158 $83,088	60 $82,682	2,458 $77,516
60-64	220 $62,284	219 $65,684	304 $69,866	256 $75,531	142 $84,404	146 $83,553	69 $84,150	45 $76,083	1,401 $72,860
65+	229 $74,148	193 $69,810	220 $81,128	207 $78,797	131 $78,843	115 $88,014	84 $98,538	125 $96,742	1,304 $80,853
All Ages	8,642 $65,723	5,321 $77,217	5,516 $82,747	2,975 $86,297	1,271 $88,589	899 $88,997	406 $88,048	231 $89,102	25,261 $76,836

Table 77 LWOP - Summary

	March 31, 2020	March 31, 2017
Average age[2]:	43.4 years	41.4 years
Average pensionable service[2]:	9.6 years	9.4 years
Annualized pensionable payroll[3]:	$1,941 million	$1,669 million
Total PBDA[4] indexed reduction to basic annuity:	$1,303,300	$719,800
Total PBDA[4] indexed reduction adjustment:	$52,800	$174,400

1 As defined in Note A.4.1, Section A.4 of Appendix A.
2 Expressed in rounded years calculated at the beginning of the plan year.
3 The aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.
4 PBDA means the Pension Benefits Division Act.

Table 78 Male Retired Pensioners
Number, Average Annual Pension[1] as at 31 March 2020

			RCA No. 1		RCA No. 2	
Age[2]	Number	Pension ($)	Number	Pension ($)	Number	Pension ($)
To 24	28	1,898	-	-	-	-
25-29	359	3,266	-	-	-	-
30-34	1,031	5,251	-	-	-	-
35-39	1,757	7,548	-	-	-	-
40-44	2,167	9,915	11	2,628	-	-
45-49	2,271	12,514	20	8,982	-	-
50-54	2,573	16,718	53	4,839	-	-
55-59	7,369	39,655	440	6,074	-	-
60-64	16,578	46,706	1,244	6,492	-	-
65-69	22,819	40,043	1,209	7,682	-	-
70-74	24,738	36,578	1,171	6,184	2,323	11,643
75-79	18,618	32,287	716	5,256	3,144	8,628
80-84	12,776	32,653	286	3,400	85	4,990
85-89	8,336	30,872	73	2,103	-	-
90-94	3,584	30,346	4	483	-	-
95-99	1,119	32,254	-	3	-	-
100-104	146	30,256	-	-	-	-
105+	3	34,372	-	-	-	-
All Ages	126,272	35,027	5,227	6,243	5,552	9,833

Table 79 Pensioner Male - Summary

	March 31, 2020	March 31, 2017
Average age	70.3 years	69.3 years
Average age at termination	56.0 years	55.6 years
Average age at entitlement	58.9 years	58.3 years
Total annual pensions payable from		
PS Superannuation Account	$3,026 million	$3,036 million
PS Pension Fund	1,397 million	1,013 million
RCA No. 1 Account	33 million	25 million
RCA No. 2 Account	55 million	55 million

1 Includes deferred annuity to age 60, annual allowance adjustments, PBDA reductions and C/QPP offsets in effect at the valuation date.
2 Expressed in rounded years calculated at the beginning of the plan year.

Table 80 Female Retired Pensioners
Number, Average Annual Pension[1] as at 31 March 2020

			RCA No. 1		RCA No. 2	
Age[2]	Number	Pension ($)	Number	Pension ($)	Number	Pension ($)
To 24	41	1,775	-	-	-	-
25-29	396	3,092	-	-	-	-
30-34	1,292	4,743	-	-	-	-
35-39	2,192	6,745	-	2,904	-	-
40-44	2,880	9,060	7	1,220	-	-
45-49	2,879	11,357	13	3,843	-	-
50-54	2,979	15,262	44	3,387	-	-
55-59	10,612	37,533	437	4,749	-	-
60-64	21,986	51,944	1,232	4,654	-	-
65-69	24,937	36,601	830	5,753	-	-
70-74	19,672	24,573	367	7,108	1,580	9,857
75-79	11,323	18,188	139	6,140	2,068	7,414
80-84	7,246	16,896	37	4,216	46	4,622
85-89	4,736	15,323	4	594	-	-
90-94	2,383	14,721	-	-	-	-
95-99	1,038	15,593	-	-	-	-
100-104	147	15,673	-	-	-	-
105+	13	17,384	-	-	-	-
All Ages	116,752	26,536	3,110	5,278	3,694	8,424

Table 81 Pensioner Female - Summary

	March 31, 2020	March 31, 2017
Average age	66.9 years	65.7 years
Average age at termination	55.2 years	54.7 years
Average age at entitlement	58.8 years	58.3 years
Total annual pensions payable from		
PS Superannuation Account	$1,726 million	$1,598 million
PS Pension Fund	1,372 million	965 million
RCA No. 1 Account	17 million	12 million
RCA No. 2 Account	31 million	31 million

1 Includes deferred annuity to age 60, annual allowance adjustments, PBDA reductions and C/QPP offsets in effect at the valuation date.
2 Expressed in rounded years calculated at the beginning of the plan year.

Table 82 Male Disabled Pensioners
Number, Average Annual Pension[1] as at 31 March 2020

			RCA No. 1	
Age[2]	Number	Pension ($)	Number	Pension ($)
To 24	-	-	-	-
25-29	-	-	-	-
30-34	5	8,818	-	-
35-39	36	9,278	-	-
40-44	79	12,567	-	-
45-49	174	14,348	-	-
50-54	364	18,737	3	13,336
55-59	814	22,063	8	2,019
60-64	914	21,244	9	6,998
65-69	955	20,168	8	602
70-74	853	19,117	-	-
75-79	578	18,267	-	-
80-84	455	19,672	-	-
85-89	266	19,048	-	-
90-94	84	18,488	-	-
95-99	29	22,196	-	-
100-104	3	13,232	-	-
105+	-	-	-	-
All Ages	5,609	19,690	28	4,427

Table 83 Male Disabled Pensioner- Summary

	March 31, 2020	March 31, 2017
Average age	67.1 years	66.6 years
Average age at disability	50.6 years	50.2 years
Total annual pensions payable from		
Superannuation Account	$72 million	$85 million
Pension Fund	39 million	31 million
RCA Account	0 million	0 million

1 Includes deferred annuity to age 60, annual allowance adjustments, PBDA reductions and C/QPP offsets in effect at the valuation date.
2 Expressed in rounded years calculated at the beginning of the plan year.

Table 84 Female Disabled Pensioners
Number, Average Annual Pension[1] as at 31 March 2020

			RCA No. 1	
Age[2]	Number	Pension ($)	Number	Pension ($)
To 24	-	-	-	-
25-29	n/a	n/a	-	-
30-34	13	5,045	-	-
35-39	99	9,383	-	-
40-44	284	12,366	-	-
45-49	558	14,729	-	1,449
50-54	917	18,040	5	1,831
55-59	1,814	21,134	10	9,463
60-64	2,077	19,554	18	3,257
65-69	1,553	17,997	6	872
70-74	1,070	15,349	3	2,118
75-79	612	12,625	-	-
80-84	481	12,200	-	-
85-89	271	11,823	-	-
90-94	103	11,122	-	-
95-99	44	11,466	-	-
100-104	4	7,491	-	-
105+	n/a	n/a	-	-
All Ages	9,904	17,276	42	4,177

Table 85 Female Disabled Pensioner - Summary

	March 31, 2020	March 31, 2017
Average age	63.4 years	62.5 years
Average age at disability	49.9 years	49.4 years
Total annual pensions payable from		
Superannuation Account	$89 million	$98 million
Pension Fund	82 million	64 million
RCA Account	0 million	0 million

1 Includes deferred annuity to age 60, annual allowance adjustments, PBDA reductions and C/QPP offsets in effect at the valuation date.
2 Expressed in rounded years calculated at the beginning of the plan year.

Table 86 Surviving Spouses
Number and Average Annual Allowance as at 31 March 2020

	Number			RCA No. 1			
				Allowance on Service Since 1992		Maximum Earnings Limit on Service Since 1994	
Age[1]	Widower	Widow	Allowance	Number	Allowance	Number	Allowance
To 24	n/a	n/a	n/a	n/a	n/a	-	
25-29	4	4	8,467	n/a	n/a	-	
30-34	3	14	6,959	n/a	n/a	-	
35-39	18	50	8,657	4	1,000	-	
40-44	44	84	9,377	10	1,687	-	
45-49	101	186	10,914	27	1,901	-	
50-54	208	356	12,624	48	2,531	-	
55-59	395	902	13,845	211	1,946	-	
60-64	700	1,777	15,491	512	1,329	-	
65-69	909	3,157	16,930	1,048	1,214	-	
70-74	1,258	4,811	16,432	2,063	1,243	-	
75-79	1,057	5,698	16,429	2,345	1,014	-	
80-84	979	6,860	16,008	1,853	844	-	
85-89	723	7,459	15,625	1,074	724	-	
90-94	401	5,964	15,482	365	674	-	
95-99	127	2,936	15,141	68	652	-	
100-104	18	449	15,008	4	808	-	
105+	-	20	12,572	n/a	n/a	-	
All Ages	6,947	40,730	15,808	9,637	1,052	-	

Table 87 Survivor - Summary

	March 31, 2020	March 31, 2017
Male average age	73.6 years	71.7 years
Female average age	80.6 years	79.6 years
Total annual pensions payable from		
Superannuation Account	$689 million	$658 million
Pension Fund	65 million	24 million
RCA Account	0 million	0 million

[1] Expressed in rounded years calculated at the beginning of the plan year.

Appendix M — Acknowledgements

The Superannuation Directorate of the Department of Public Services and Procurement Canada provided the data on plan members.

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