



Actuarial Valuation of the Pension Adjustment Account as at December 31, 2023 to Determine the Cost of Living Adjustment Effective July 1, 2024

The Teachers' Retirement Allowances Fund

March 19, 2024





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Executive Summary

An actuarial valuation has been prepared for the Pension Adjustment Account (“PAA”) as at December 31, 2023. The purpose of the valuation is to determine the financial position of the PAA at the valuation date, to determine the maximum cost of living adjustment (COLA) which may be granted effective July 1, 2024 in accordance with The Teachers’ Pensions Act (the “TPA”), and to determine the additional liability which would result from granting the calculated COLA at July 1, 2024. This section provides a summary of the important results and the key inputs to the valuation process. Please note that this section is not intended to replace the integral report attached.



A. Summary of Results

	Valuation Date	
	Dec 31, 2022	Dec 31, 2023
Valuation interest rate	3.25%	4.00%
<u>Financial Position Before Granting July 1 COLA</u>		
PAA invested assets	\$446,652,000	\$469,685,000
Actuarial present value of COLAs granted from 1977 to date	\$395,317,000	\$398,110,000
Actuarial surplus before granting July 1 COLA	\$51,335,000	\$71,575,000
Maximum COLA per subsection 10(7) of the TPA (lesser of a and b)	1.50%	2.20%
<i>a. COLA supportable by actuarial surplus available</i>	1.50%	2.20%
<i>b. Change in CPI over the year</i>	6.32%	3.40%
Actuarial present value of maximum COLA	\$51,141,000	\$71,550,000
Actuarial surplus remaining after granting July 1 COLA	\$194,000	\$25,000
<u>Financial Position After Granting July 1 COLA</u>		
PAA invested assets	\$446,652,000	\$469,685,000
Actuarial present value of COLAs after July 1 COLA	\$446,458,000	\$469,660,000
Total actuarial surplus after granting July 1 COLA	\$194,000	\$25,000



B. PAA Cost of a One Basis Point COLA

The following chart summarizes for the last 5 years the percentage COLA granted, the cost of the COLA granted, and the cost of granting each 0.01% (one basis point) of new COLA.

Year of Increase	Total % COLA Granted - July 1	Cost of COLA Granted	Cost of Granting 0.01% COLA
2020	1.35%	41,779,000	309,000
2021	0.73%	23,935,000	328,000
2022	2.10%	70,616,000	336,000
2023	1.50%	51,141,000	341,000
2024	2.20%	71,550,000	325,000

C. Summary of Membership

The following table illustrates the average monthly amount of total indexing granted relative to the average total pension formula.

Monthly Amounts Including Province Share								
December 31, 2022					December 31, 2023			
Number ¹	Average Formula Pension ²	Average Indexing Amount	Average Total Pension	Age of Recipient	Number ¹	Average Formula Pension ²	Average Indexing Amount	Average Total Pension
1	\$1,310.95	\$251.41	\$1,562.36	Under 55	0	\$0.00	\$0.00	\$0.00
883	2,896.95	50.39	2,947.34	55-59	834	2,968.17	50.19	3,018.36
1,939	2,930.28	139.42	3,069.70	60-64	1,957	2,976.42	149.38	3,125.80
2,729	2,676.17	228.26	2,904.43	65-69	2,661	2,753.40	243.96	2,997.36
3,486	2,302.42	324.60	2,627.02	70-74	3,347	2,361.38	347.89	2,709.27
3,199	2,114.01	409.94	2,523.95	75-79	3,399	2,134.50	426.54	2,561.04
2,061	1,888.40	518.97	2,407.37	80-84	2,193	1,924.60	535.03	2,459.63
1,035	1,656.73	604.21	2,260.94	85-89	1,173	1,711.14	620.73	2,331.87
512	1,376.30	732.04	2,108.34	90-94	526	1,408.68	736.85	2,145.53
164	1,298.36	868.73	2,167.09	95-99	171	1,348.07	886.98	2,235.05
30	974.17	912.97	1,887.14	Over 100	32	1,012.76	921.39	1,934.15
37	1,527.19	157.56	1,684.75	N/A³	37	1,483.26	168.96	1,652.22
16,076	\$2,298.05	\$349.99	\$2,648.04	Total/ Average	16,330	\$2,331.44	\$371.95	\$2,703.39

¹ Excludes life annuities which are not subject to indexing.

² Monthly pension in the normal form (Plan A), which serves as the basis for COLAs.

³ Represents beneficiaries of deceased members receiving monthly pension and indexing for the remainder of the guarantee period only.



D. Key Assumptions

The key assumptions to which the valuation results are most sensitive are outlined in the following table.

Actuarial Assumptions	December 31, 2022	December 31, 2023
Valuation Discount Rate	3.25% per annum	4.00% per annum
Mortality of Pensioners	TRAF 2014 Mortality Table Generational, projected with Scale MI-2017 (TRAF2014MI)	TRAF 2014 Mortality Table Generational, projected with Scale MI-2017 (TRAF2014MI)



Section 1: Introduction

A. Purpose and Terms of Engagement

Aon has been retained by The Teachers' Retirement Allowances Fund (TRAF) to prepare a valuation of the PAA as at December 31, 2023. This valuation is conducted annually.

The purpose of the valuation is to determine:

- the financial position of the PAA at the valuation date;
- the maximum COLA which may be granted effective July 1, 2024 in accordance with the TPA; and
- the additional liability which would result from granting the calculated COLA at July 1, 2024.

As per our engagement, we have summarized the results of this actuarial valuation along with the ensuing opinions and recommendations in this report to TRAF.

B. Summary of Changes since the Last Valuation

The last such actuarial valuation commissioned by TRAF in respect of the PAA was performed as at December 31, 2022. Since the time of the last valuation, we note that the following change has been introduced or occurred:

- An unrestricted surplus of \$25,000 is generated as at December 31, 2023 should a 2.20% COLA be granted at July 1, 2024. The unrestricted surplus remains in the PAA and will be used to grant future COLAs.

C. Actuarial Valuation Information and Inputs

To prepare our valuation, we have relied upon the following information:

- Asset and member data compiled as at December 31, 2023 as provided by TRAF and as summarized in Appendices A and B, respectively;
- PAA provisions contained in the TPA, as summarized in Appendix D;
- Information on the All Items Consumer Price Index for Canada (CPI) as reported on the Bank of Canada website; and
- The actuarial report on the PAA as at December 31, 2022 prepared by Aon.

Furthermore, our actuarial assumptions and methods (as summarized in Appendix C) have been chosen to reflect our understanding of TRAF's actuarial valuation policy and are in accordance with accepted actuarial practice and regulatory constraints.



D. Subsequent Events

As of the date of this report, we have not been made aware of any subsequent events that would impact the results of this valuation. However, the following points should be noted in this regard:

- Actual experience deviating from expected since December 31, 2023 to the date of this report, will result in gains or losses; and
- To the best of our knowledge, the results contained in this report are based on the regulatory and legal environment in effect at the date of this report and do not take into consideration any potential changes that are currently the subject of debate, review and/or court appeal. To the extent that actual changes in the regulatory and legal environment transpire, any financial impact on the PAA as a result of such changes will be reflected in future valuations.

E. Summary of Recommended Action

The following summarizes the specific action for TRAF that is recommended in this report:

- COLAs should be granted in accordance with the provisions of the TPA at the rate of 2.20% effective July 1, 2024; and
- The next actuarial valuation should be prepared as at December 31, 2024.



Section 2: Valuation Results

A. Summary of Results

The actuarial surplus available for the July 1 COLA as at the valuation date is determined as follows:

- a) the PAA invested assets as at the valuation date; less
- b) the actuarial present value of the COLAs granted under the PAA from July 1977 to the valuation date, which is payable in the future to current pensioners.

The actuarial surplus available, if any, is then used to determine the amount of COLA supportable at July 1 following the valuation date. For 2018 and subsequent years, the maximum COLA per subsection 10(7) of the TPA cannot exceed the change in CPI. If the maximum COLA for a year is limited by the change in CPI, any actuarial surplus remaining after granting the July 1 COLA will be used for granting COLA in subsequent years.



The financial position of the PAA at December 31, 2023 and the COLA to be granted for July 1, 2024 (with December 31, 2022 information presented for comparison) is summarized as follows:

	Valuation Date	
	Dec 31, 2022	Dec 31, 2023
Valuation interest rate	3.25%	4.00%
Financial Position Before Granting July 1 COLA		
PAA invested assets	\$446,652,000	\$469,685,000
Actuarial present value of COLAs granted from 1977 to date	\$395,317,000	\$398,110,000
Actuarial surplus before granting July 1 COLA	\$51,335,000	\$71,575,000
Maximum COLA per subsection 10(7) of the TPA (lesser of a and b)	1.50%	2.20%
<i>a. COLA supportable by actuarial surplus available</i>	1.50%	2.20%
<i>b. Change in CPI over the year</i>	6.32%	3.40%
Actuarial present value of maximum COLA	\$51,141,000	\$71,550,000
Actuarial surplus remaining after granting July 1 COLA	\$194,000	\$25,000
Financial Position After Granting July 1 COLA		
PAA invested assets	\$446,652,000	\$469,685,000
Actuarial present value of COLAs after July 1 COLA	\$446,458,000	\$469,660,000
Total actuarial surplus after granting July 1 COLA	\$194,000	\$25,000



B. Reconciliation of Financial Position

This report reveals an actuarial surplus of \$71,575,000 at December 31, 2023, all of which is available for granting a COLA at July 1, 2024. In the previous report prepared as at December 31, 2022, the PAA had an actuarial surplus of \$51,335,000 before the granting of a COLA at July 1, 2023.

The actuarial surplus of \$71,575,000 at December 31, 2023, available for granting a COLA at July 1, 2024, can be reconciled as follows:

Reconciliation of Financial Position	
Actuarial surplus at December 31, 2022 before July 1, 2023 COLA	\$51,335,000
Value of July 1, 2023 COLA at December 31, 2022	51,141,000
Actuarial surplus at December 31, 2022 after July 1, 2023 COLA	\$194,000
Interest on actuarial surplus during inter-valuation period at 3.25% per annum	6,000
Member PAA contributions for 2023	22,407,000
Interest on member PAA contributions at 3.25% per annum (half year)	364,000
Net gain due to interest credited to the PAA in 2023 (8.11%) greater than the assumed rate of 3.25%	21,354,000
Net gain/(loss) due to mortality experience	1,063,000
Net gain/(loss) due to member data adjustments	(93,000)
Net gain/(loss) due to assumption changes	26,280,000
Actuarial Surplus Available to grant July 1, 2024 COLA	\$71,575,000



C. Increase in CPI for 2023

In accordance with subsection 10(7) of the TPA, the percentage increase in the consumer price index (CPI) for Canada (December over December) is used as the basis for determining the maximum COLA to be granted in July of each year. For the purposes of determining this percentage increase, the All Items Consumer Price Index for Canada (CPI) has been used. This index has been used historically and, in my opinion, continues to be the most appropriate index for the determination of the change in CPI. The index at December 2023 was 158.3 and at December 2022 was 153.1, resulting in an increase of 3.40% for CPI in the 2023 calendar year.



D. Historical COLAs Granted

The following table summarizes the COLA percentages granted each year since 1977, as well as the cost of the COLAs granted and the contributions to the PAA.

Year of increase	Pensioners January 1st	Number Entitled to COLA ¹	Relevant Change in CPI	Adjustment Granted		Percentage of Change in CPI Granted	Cost of COLA Granted	Contributions to PAA ²
				% Part	¢ Part			
1977	2,416	2,416	5.91%	2.90%	46	98.1%	\$2,578,000	\$4,003,238
1978	2,523	2,523	9.46%	3.50%	56	74.0%	3,054,300	3,013,606
1979	2,648	2,642	8.36%	3.00%	53	71.8%	3,292,800	3,390,732
1980	2,787	2,756	9.80%	2.70%	48	55.1%	2,912,500	3,604,271
1981	2,935	2,851	11.19%	2.75%	52	49.2%	3,100,636	3,378,791
1982	3,007	2,913	12.10%	2.76%	54	45.6%	3,336,545	3,955,661
1983	3,117	3,004	9.30%	3.55%	65	76.3%	4,419,535	4,320,344
1984	3,236	3,109	4.50%	2.25%	49	100.0%	3,266,600	4,505,815
1985	3,353	3,211	3.76%	1.89%	45	100.0%	3,197,800	4,654,538
1986	3,527	3,379	4.35%	2.18%	59	100.0%	4,443,200	4,811,438
1987	3,733	3,562	4.19%	2.09%	59	100.0%	4,030,400	5,145,611
1988	3,970	3,767	4.15%	2.08%	61	100.0%	5,411,900	5,694,364
1989	4,176	3,929	4.00%	2.00%	64	100.0%	6,060,900	5,994,500
1990	4,357	4,118	5.13%	2.57%	85	100.0%	8,706,500	6,213,334
1991	4,554	4,297	5.00%	2.50%	95	100.0%	9,886,900	7,258,332
1992	4,734	4,466	3.78%	3.66%	n/a	96.7%	9,684,400	6,819,736
1993	5,008	4,657	2.14%	2.14%	n/a	100.0%	6,199,400	7,292,692
1994	5,313	4,941	1.70%	1.68%	n/a	99.0%	5,632,200	7,335,322
1995	5,561	5,153	0.23%	0.23%	n/a	100.0%	900,500	6,860,914
1996	5,866	5,420	1.75%	1.75%	n/a	100.0%	8,069,787	7,067,480
1997	6,159	5,723	2.17%	2.17%	n/a	100.0%	11,110,369	7,015,241
1998	6,552	6,118	0.73%	0.73%	n/a	100.0%	4,386,031	7,337,383
1999	6,860	6,424	1.02%	0.78%	n/a	76.5%	5,373,116	7,023,158
2000	7,252	6,800	2.58%	2.00%	n/a	77.5%	14,958,518	7,398,553
2001	7,643	7,194	3.23%	1.77%	n/a	54.8%	14,591,303	24,991,786
2002	8,110	7,667	0.70%	0.70%	n/a	100.0%	6,477,085	8,627,687
2003	8,556	8,118	3.88%	1.68%	n/a	43.3%	16,077,000	7,129,723
2004	8,993	8,557	2.00%	0.54%	n/a	27.0%	5,824,000	8,195,425
2005	9,503	9,073	2.10%	0.40%	n/a	19.0%	4,931,000	8,872,146
2006	10,043	9,626	2.20%	0.64%	n/a	29.1%	8,657,000	9,790,534
2007	10,562	10,153	1.60%	0.63%	n/a	39.4%	9,201,000	10,396,487

¹ Pensioners or beneficiaries only receiving life annuities from death benefits or Money Purchase Accounts do not receive COLA increases.

² Includes adjustments/special allocations from Account A (see Appendix A for more detail).



Year of increase	Pensioners January 1st	Number Entitled to COLA ¹	Relevant Change in CPI	Adjustment Granted		Percentage of Change in CPI Granted	Cost of COLA Granted	Contributions to PAA ²
				% Part	¢ Part			
2008	11,088	10,634	2.40%	1.44%	n/a	60.0%	22,342,000	10,832,029
2009	11,553	11,094	1.20%	0.37%	n/a	30.8%	6,494,000	11,444,979
2010	11,900	11,443	1.32%	0.80%	n/a	60.6%	14,553,000	12,129,856
2011	12,364	11,907	2.35%	0.98%	n/a	41.7%	18,639,000	12,279,604
2012	12,752	12,301	2.30%	0.97%	n/a	42.2%	19,885,000	13,435,845
2013	13,085	12,645	0.83%	0.55%	n/a	66.7%	12,378,000	14,830,266
2014	13,440	13,008	1.24%	0.83%	n/a	66.7%	19,816,000	15,853,717
2015	13,782	13,354	1.47%	0.98%	n/a	66.7%	25,269,000	17,627,141
2016	14,111	13,694	1.61%	1.07%	n/a	66.7%	28,529,000	19,502,236
2017	14,468	14,063	1.50%	1.00%	n/a	66.7%	27,606,000	19,518,949
2018	14,832	14,432	1.87%	1.35%	n/a	72.2%	38,805,000	20,295,996
2019	15,215	14,817	1.99%	1.23%	n/a	61.8%	36,781,000	19,773,226
2020	15,540	15,153	2.25%	1.35%	n/a	60.0%	41,779,000	20,393,124
2021	15,826	15,452	0.73%	0.73%	n/a	100.0%	23,935,000	22,723,199
2022	16,154	15,798	4.80%	2.10%	n/a	43.8%	70,616,000	22,223,848
2023	16,419	16,076	6.32%	1.50%	n/a	23.7%	51,141,000	22,406,629
2024	16,663	16,330	3.40%	2.20%	n/a	64.7%	71,550,000	n/a
Total	N/A	N/A	N/A	N/A	N/A	N/A	\$729,889,225	\$487,369,486

¹ Pensioners or beneficiaries only receiving life annuities from death benefits or Money Purchase Accounts do not receive COLA increases.

² Includes adjustments/special allocations from Account A (see Appendix A for more detail).



E. Determination of Historical COLAs

The following chart shows the cost of a 1 basis point (0.01%) COLA for each year since 1977.

Year of increase	Actuarial Surplus Available	Cost of COLA Granted	Residual Surplus after COLA	Total Restricted Surplus	Cost of Granting 0.01% COLA	Total % COLA Granted - July 1st	COLA Granted % Change in CPI
1977	\$2,578,000	\$2,578,000	0	0	\$4,000	5.80%	98.1%
1978	3,054,300	3,054,300	0	0	4,000	7.00%	74.0%
1979	3,292,800	3,292,800	0	0	5,000	6.00%	71.8%
1980	2,912,500	2,912,500	0	0	5,000	5.40%	55.1%
1981	3,100,636	3,100,636	0	0	6,000	5.51%	49.2%
1982	3,336,545	3,336,545	0	0	6,000	5.52%	45.6%
1983	4,419,535	4,419,535	0	0	6,000	7.10%	76.3%
1984	4,439,697	3,266,600	1,173,097	0	7,000	4.50%	100.0%
1985	6,364,136	3,197,800	3,166,336	0	9,000	3.76%	100.0%
1986	8,593,826	4,443,200	4,150,626	0	10,000	4.35%	100.0%
1987	9,834,406	4,030,400	5,804,006	0	10,000	4.19%	100.0%
1988	10,413,411	5,411,900	5,001,511	0	13,000	4.15%	100.0%
1989	11,244,162	6,060,900	5,183,262	0	15,000	4.00%	100.0%
1990	11,765,271	8,706,500	3,058,771	0	17,000	5.13%	100.0%
1991	10,640,228	9,886,900	753,328	0	20,000	5.00%	100.0%
1992	9,684,475	9,684,400	75	0	26,000	3.66%	96.7%
1993	6,442,421	6,199,400	243,021	0	29,000	2.14%	100.0%
1994	5,643,128	5,632,200	10,928	0	34,000	1.68%	99.0%
1995	9,052,972	900,500	8,152,472	0	39,000	0.23%	100.0%
1996	14,051,244	8,069,787	5,981,457	0	46,000	1.75%	100.0%
1997	11,120,986	11,110,369	10,617	0	51,000	2.17%	100.0%
1998	4,400,904	4,386,031	14,873	0	60,000	0.73%	100.0%
1999	5,439,473	5,373,116	66,357	0	69,000	0.78%	76.5%
2000	14,958,518	14,958,518	0	0	75,000	2.00%	77.5%
2001	14,633,868	14,591,303	42,565	0	82,000	1.77%	54.8%
2002	9,993,375	6,477,085	3,516,290	0	93,000	0.70%	100.0%
2003	16,134,161	16,077,000	57,161	0	96,000	1.68%	43.3%
2004	5,870,000	5,824,000	46,000	0	108,000	0.54%	27.0%
2005	5,000,000	4,931,000	69,000	0	123,000	0.40%	19.0%
2006	8,719,000	8,657,000	62,000	0	135,000	0.64%	29.1%
2007	9,317,000	9,201,000	116,000	0	146,000	0.63%	39.4%
2008	22,401,000	22,342,000	59,000	0	155,000	1.44%	60.0%
2009	6,588,000	6,494,000	94,000	0	176,000	0.37%	30.8%
2010	14,700,000	14,553,000	147,000	0	182,000	0.80%	60.6%
2011	18,811,000	18,639,000	172,000	0	190,000	0.98%	41.7%

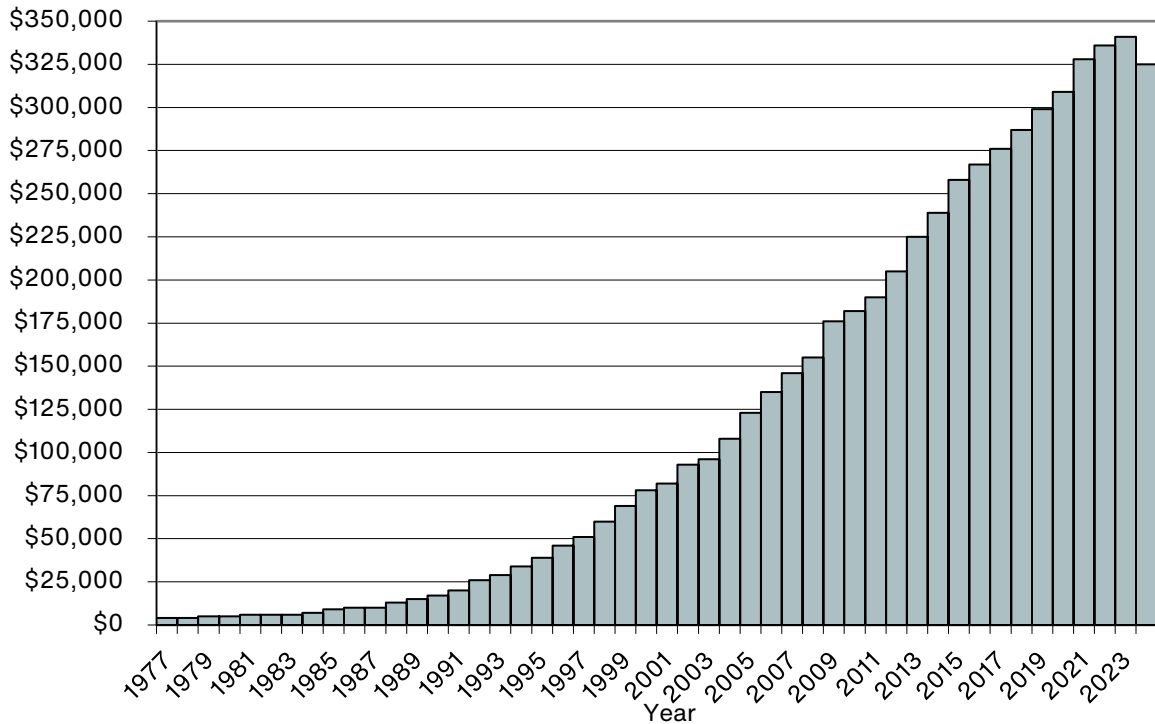


Year of increase	Actuarial Surplus Available	Cost of COLA Granted	Residual Surplus after COLA	Total Restricted Surplus	Cost of Granting 0.01% COLA	Total % COLA Granted - July 1st	COLA Granted % Change in CPI
2012	20,018,000	19,885,000	133,000	0	205,000	0.97%	42.2%
2013	17,138,000	12,378,000	4,760,000	4,760,000	225,000	0.55%	66.7%
2014	24,034,000	19,816,000	4,218,000	8,978,000	239,000	0.83%	66.7%
2015	27,696,000	25,269,000	2,427,000	11,405,000	258,000	0.98%	66.7%
2016	37,601,000	28,529,000	9,072,000	20,477,000	267,000	1.07%	66.7%
2017	35,116,000	27,606,000	7,510,000	27,987,000	276,000	1.00%	66.7%
2018	38,937,000	38,805,000	132,000	22,390,000	287,000	1.35%	72.2%
2019	36,917,000	36,781,000	136,000	16,792,000	299,000	1.23%	61.8%
2020	41,930,000	41,779,000	151,000	11,195,000	309,000	1.35%	60.0%
2021	32,940,000	23,935,000	9,005,000	5,597,000	328,000	0.73%	100.0%
2022	70,795,000	70,616,000	179,000	0	336,000	2.10%	43.8%
2023	51,335,000	51,141,000	194,000	0	341,000	1.50%	23.7%
2024	71,575,000	71,550,000	25,000	0	325,000	2.20%	64.7%



Generally, the cost of 1 basis point of COLA increases over time. It is highly dependent on the interest rate and mortality table assumed in the valuation and the demographic profile of the pensioners. The cost of 1 basis point of COLA at December 31, 2023 is lower than it was at December 31, 2022 due to the increase in the discount rate. The following graph illustrates the cost of 1 basis point of COLA since 1977.

Historical Cost of a One Basis Point COLA





F. Hypothetical Wind-Up Valuation as at December 31, 2023

To determine whether the assets of the PAA would be greater than the related liabilities if the PAA were to be wound up, a valuation of the PAA liabilities for COLAs granted prior to the valuation date has been prepared on a hypothetical wind-up basis as at December 31, 2023.

The Canadian Institute of Actuaries (CIA) has developed guidance to value benefits assumed to be settled by annuity purchase. Based on insurance company data on group annuity purchases compiled by the CIA, we have used the following assumptions:

- valuation discount rate of 4.70% per annum (4.90% per annum in the previous valuation); and
- mortality in accordance with the TRAF 2014 Mortality Table with generational mortality improvements projected using scale CPM-B (same as the previous valuation).

Based on these assumptions, the actuarial present value as at December 31, 2023 of COLAs granted to July 1, 2023 would be \$372,193,000. The total market value of assets as at December 31, 2023 is \$469,685,000. We would also assume wind-up expenses of \$1,000,000.

Thus, the value of the PAA assets, less wind-up expenses, would be greater than the related actuarial liabilities if the PAA were to be wound up on the valuation date, assuming the entire asset value of the PAA would be available to finance the COLAs granted prior to December 31, 2023.



Additional Disclosures – Actuarial Standards of Practice

The Canadian Institute of Actuaries standards of practice require the following information be disclosed in the valuation report:

- the sensitivity of the going concern valuation to plausible adverse scenarios;
- effect on the hypothetical wind-up valuation liability, of using a discount rate 1% lower than that used for the valuation; and
- incremental cost on a hypothetical wind-up basis due to the membership in the PAA between the current valuation date and the next valuation date.

The sensitivity of the going concern valuation to plausible adverse scenarios:

For the purposes of this report, the fund's fixed income and equity portfolios are consistent with the respective asset classes as detailed in the Statement of Investment Policies & Procedures (SIP&P). The fund's alternative portfolio referenced below consists of the real estate and infrastructure asset classes as detailed in the SIP&P.

The following plausible adverse scenarios have been applied and reported separately:

- **Interest rate risk:** interest rates decrease by 1% at the valuation date which results in a 1% decline in the future return expectations on the fixed income portfolio, leading to a 1% decrease in the discount rate. In addition, the fund's fixed income and alternative investments will increase in value. The weighted average duration of the fund's fixed income portfolio is estimated to be 6.3 years and the fund's alternative portfolio is assumed to be 6.0 years. For this scenario, 50% of the fund's alternative portfolio is assumed to be interest rate sensitive.
- **Deterioration of asset values:** the fund's equity portfolio values decrease 15% at the valuation date, and no changes to other economic assumptions.
- **Longevity risk:** mortality rates decrease by 10% for all ages versus current assumptions.



The effect on the fund's assets in the applicable adverse scenarios are assumed to occur at the valuation date, which impacts the interest credited to the PAA for 2023. Specifically, the 2023 fund net rate of return would be impacted by the changes above, which would impact the three-year average return credited to the PAA. The full impact of the changes to the assets in 2023 would be realized over a three-year period.

Plausible Adverse Scenario Results				
	Base	Interest Rate Risk	Deterioration of Asset Values	Longevity Risk
PAA invested assets	\$469,685,000	\$473,511,000	\$459,615,000	\$469,685,000
Going concern liability	\$398,110,000	\$433,837,000	\$398,110,000	\$410,720,000
Actuarial surplus before granting July 1 COLA	\$71,575,000	\$39,674,000	\$61,505,000	\$58,965,000
Maximum July 1 COLA	2.20%	1.09%	1.89%	1.81%

Effect on hypothetical wind-up valuation of using a discount rate 1% lower than that used for the valuation:

	Base (4.70%)	Discount rate 1% lower (3.70%)	Effect	
			Increase \$	Increase %
Total solvency liability	\$372,193,000	\$403,587,000	+ \$31,394,000	+ 8.43%

Incremental cost on a hypothetical wind-up basis

The incremental cost on a hypothetical wind-up basis represents the present value at the valuation date of the expected aggregate change in the hypothetical wind-up liability between December 31, 2023 and December 31, 2024, adjusted upwards for expected benefit payments during this period.

Based on this methodology and on the hypothetical wind-up assumptions, the incremental cost on a hypothetical wind-up basis, for the period from December 31, 2023 to December 31, 2024, is \$66,211,000. This represents the cost of providing a 2.20% COLA effective July 1, 2024, calculated on a hypothetical wind-up basis.



Section 3: Actuarial Certificate

This actuarial certificate forms part of the actuarial valuation report for the PAA as at December 31, 2023.

Purpose of Valuation

The purpose of the valuation is to determine:

- the financial position of the PAA at the valuation date;
- the maximum COLA which may be granted effective July 1, 2024 in accordance with the TPA; and
- the additional liability which would result from granting the calculated COLA at July 1, 2024.

In my opinion:

- the membership data on which the valuation is based are sufficient and reliable for the purposes of the valuation;
- the assumptions are, in aggregate, appropriate for the purposes of the valuation;
- the methods employed in the valuation are appropriate for the purposes of the valuation; and
- this report has been prepared, and my opinion has been given, in accordance with accepted actuarial practice.

Nonetheless, emerging experience differing from the assumptions will result in gains or losses that will be revealed in future valuations.

In my opinion, based on the results of the valuation, I hereby certify that:

1. Before considering the cost of granting a COLA at July 1, 2024, the PAA has an actuarial surplus of \$71,575,000 at December 31, 2023. This entire amount is available to grant COLA at July 1, 2024. This is based on assets of \$469,685,000 and accrued actuarial liabilities of \$398,110,000 (which only reflects COLAs granted prior to December 31, 2023 and is based on a valuation interest rate of 4.00% as described in this report).
2. Sufficient surplus is available to grant a 2.20% COLA to pensioners effective July 1, 2024. As of December 31, 2023, the cost of granting a 2.20% COLA effective July 1, 2024 under the PAA is \$71,550,000.
3. The CPI for Canada increased by 3.40% during 2023 (December over December).
4. Subsection 10(7) of the TPA indicates that a full COLA (i.e. full reflection of the previous year's change in CPI) is to be granted effective July 1 of 2018 and each year thereafter, unless doing so would result in an unfunded actuarial liability in the PAA. While the change in CPI is 3.40%, the maximum COLA that can be granted without generating an unfunded liability at July 1, 2024 is 2.20%. The cost of granting a 2.20% COLA effective July 1, 2024 under the PAA is \$71,550,000 at December 31, 2023.



5. As the granting of a 2.20% COLA at July 1, 2024 would not result in an unfunded actuarial liability in the PAA, in accordance with the provisions of the TPA, a 2.20% COLA effective July 1, 2024 should be granted.
6. The next valuation of the PAA should be conducted as at December 31, 2024.
7. The value of the PAA assets would be greater than the related actuarial liabilities if the PAA were to be wound up on the valuation date, assuming the entire asset value of the PAA would be available to finance the COLAs granted prior to December 31, 2023.

A handwritten signature in black ink, appearing to read 'SWIC', is positioned above a horizontal line.

Stephen P. Windsor
Fellow, Society of Actuaries
Fellow, Canadian Institute of Actuaries

Aon
March 19, 2024



Appendix A: Asset Data

A. Background Information and Source of Data

The PAA represents a notional account maintained as an allocation of Account A which represents the invested member contributions under the TPA. Section 49 of the TPA contains the provisions relating to contributions, benefit payments, interest crediting, and rate of return calculations of the PAA. A summary of the provisions of Section 49 of the TPA is provided in Appendix D.

Information on the PAA's asset balance, contribution inflow, interest credits, and benefit payouts was provided to Aon by TRAF.

B. Contributions and Benefit Payments

The PAA is credited with:

- a) A percentage of the members' contributions for service in July 1977 and later months. This percentage as at September 1, 1980 was 16.1%, and is scheduled to increase by 0.1% on September 1, 1985, and on September 1 of every fifth year thereafter, until the percentage reaches 17.0% on September 1, 2025.
- b) Special transfers authorized by amendments to the TPA, which occurred in the years 1977 through 1980 and in 2001.
- c) For 2007 and subsequent years, interest on December 31 in each year, based on the average of the opening monthly balances in the account in that year. (See section C of this appendix for further information.)
- d) For years prior to 2007, interest on June 30 and December 31 in each year, based on the average balance in the PAA. (See section C of this appendix for further information.)

The PAA is charged with one-half of all COLAs paid to persons receiving pensions or disability allowances after 1976. The Province of Manitoba finances the remaining one-half of COLAs granted.

A complete reconciliation of all contributions, special transfers, interest credits, and benefit payments since 1977 is provided in section D of this appendix.



C. Rates of Return Credited to PAA

After 2016

For 2017 and each year thereafter, the rate used to credit interest to the PAA is the average of the fund's annual rates of return on all its investments as determined by the Board, for the year and the immediately preceding two years.

The rate of return, net of investment management and administration fees, credited to the PAA for 2023 was 8.11%. A detailed calculation of this rate is provided below.

Year	Fund Net Rate of Return	3-Year Average Net Rate of Return
2015	7.98%	n/a
2016	6.93%	n/a
2017	8.82%	7.91%
2018	2.67%	6.14%
2019	11.59%	7.69%
2020	6.53%	6.93%
2021	16.56%	11.56%
2022	-0.49%	7.53%
2023	8.27%	8.11%

The net rate of return credited for 2023 of 8.11% exceeded the valuation interest rate of 3.25% assumed in the previous valuation by 4.86%.



Between 2007 to 2016

From 2007 to 2016, the PAA was credited at each December 31 with a three-year average rate of return. The three-year average rate of return is equal to the average of the greater of the net rate of return of the fund and the net rate of return on the fixed income assets (bonds, debentures, mortgages, and similar instruments) held by the fund in the current and two previous calendar years.

A detailed calculation of the rate of return for 2007 to 2016 is provided below.

Year	Fixed Income Net Rate of Return	Fund Net Rate of Return	"Greater of" Annual Net Rate of Return	"Greater of" 3-Year Average Net Rate of Return
2005	6.77%	14.60%	14.60%	n/a
2006	5.16%	15.37%	15.37%	n/a
2007	4.02%	5.47%	5.47%	11.81%
2008	3.59%	(11.96%)	3.59%	8.14%
2009	8.08%	10.35%	10.35%	6.47%
2010	9.32%	10.32%	10.32%	8.09%
2011	11.27%	2.99%	11.27%	10.65%
2012	4.29%	8.96%	8.96%	10.18%
2013	0.69%	13.68%	13.68%	11.30%
2014	9.45%	10.42%	10.42%	11.02%
2015	2.99%	7.98%	7.98%	10.69%
2016	3.92%	6.93%	6.93%	8.44%



Prior to 2007

The PAA was credited with interest each June 30 and December 31 at the rate of return earned on the fixed income investments of Account A.

Prior to 1986, the rate of interest credited to the PAA was the average of the rates of interest earned on new fixed income investments made in each year, rounded down to the next lower 0.5 of 1%. In 1986, the average rate earned on new fixed income investments became less than the rate of interest obtained on all fixed income investments and as a result, the rate of interest credited to the PAA was changed to equal the average rate of interest earned on all fixed income investments.

This approach continued to be used until 1998 when interest credited to the PAA was determined based on the market value return of the fixed income investments held in Account A.

The following summarizes the annual effective interest rates credited to the PAA from 1987 to 2006.

Year	Annual Effective Interest Rate	Year	Annual Effective Interest Rate
1987	11.10%	1997	7.07%
1988	10.75%	1998	9.44%
1989	10.95%	1999	(2.23%)
1990	11.60%	2000	12.65%
1991	11.55%	2001	8.92%
1992	10.60%	2002	9.16%
1993	10.35%	2003	6.82%
1994	10.00%	2004	7.72%
1995	8.78%	2005	6.88%
1996	7.84%	2006	5.23%

With the exception of 1999, the actual rate of interest credited to the PAA each year since its inception has been in excess of the assumed valuation rate. This is a desirable result, as an interest shortfall would result in a decrease in assets available to finance previously granted and future COLAs.



D. Asset Reconciliation of PAA

A complete reconciliation of the PAA since its establishment to December 31, 2023 is shown below:

Year	Notional Account Balance Jan. 1	Member Contributions to PAA	Adjustments/ Special Allocations from Account A	Interest Credits	Pension Adjustment Payments	Notional Account Balance Dec. 31	Subsection 49(6) Restricted Surplus
1977	-	\$771,238	\$3,232,000	\$178,531	(\$182,869)	\$ 3,998,900	N/A
1978	\$3,998,900	1,451,606	1,562,000	532,777	(596,340)	6,948,943	N/A
1979	6,948,943	1,574,532	1,816,200	844,304	(1,049,436)	10,134,543	N/A
1980	10,134,543	2,270,271	1,334,000	1,193,913	(1,469,456)	13,463,271	N/A
1981	13,463,271	3,378,791		1,667,123	(1,897,640)	16,611,545	N/A
1982	16,611,545	3,955,661		2,196,948	(2,349,769)	20,414,385	N/A
1983	20,414,385	4,320,344		2,722,168	(2,889,601)	24,567,296	N/A
1984	24,567,296	4,505,815		3,258,632	(3,398,007)	28,933,736	N/A
1985	28,933,736	4,654,538		3,769,429	(3,781,477)	33,576,226	N/A
1986	33,576,226	4,811,438		4,384,169	(4,208,127)	38,563,706	N/A
1987	38,563,706	5,145,611		4,375,479	(4,729,886)	43,354,910	N/A
1988	43,354,911	5,694,364		4,763,725	(5,276,437)	48,536,562	N/A
1989	48,536,562	5,994,500		5,421,442	(5,901,633)	54,050,871	N/A
1990	54,050,871	6,213,334		6,377,810	(6,698,087)	59,943,928	N/A
1991	59,943,928	7,258,332		7,029,984	(7,689,769)	66,542,475	N/A
1992	66,542,475	6,819,736		7,106,386	(8,624,076)	71,844,521	N/A
1993	71,844,521	7,292,692		7,485,872	(9,302,657)	77,320,428	N/A
1994	77,320,428	7,335,322		7,769,728	(9,745,706)	82,679,772	N/A
1995	82,679,772	6,860,914		7,261,157	(9,768,265)	87,033,578	N/A
1996	87,033,578	7,067,480		6,825,186	(9,865,736)	91,060,508	N/A
1997	91,060,508	7,015,241		6,397,402	(10,656,960)	93,816,191	N/A
1998	93,816,191	7,337,383		8,870,344	(10,814,977)	99,208,941	N/A
1999	99,208,941	7,023,158		(2,151,384)	(10,882,414)	93,198,301	N/A
2000	93,198,301	7,398,553		11,540,593	(10,692,686)	101,444,761	N/A
2001	101,444,761	7,395,284	17,596,502 ¹	10,346,078	(12,874,140)	123,908,485	N/A
2002	123,908,485	8,334,524	293,163 ²	11,150,766	(12,742,777)	130,944,161	N/A
2003	130,944,161	7,129,723		8,741,673	(13,338,799)	133,476,758	N/A
2004	133,476,758	8,195,425		10,074,306	(13,802,504)	137,943,985	N/A

¹ Amount as at January 1, 2001 receivable from Account A regarding special asset transfer to permit year 2000 COLA. The amount reported in the December 31, 2000 valuation was \$17,597,068. An adjustment of (\$566) was made to reflect exact crediting of interest on the transfer from Account A.

² Represents an adjustment at January 1, 2002 to reflect retroactive allocation of contributions and interest to the PAA account for years prior to 2002.



Year	Notional Account Balance Jan. 1	Member Contributions to PAA	Adjustments/ Special Allocations from Account A	Interest Credits	Pension Adjustment Payments	Notional Account Balance Dec. 31	Subsection 49(6) Restricted Surplus
2005	137,943,985	8,872,146		9,295,308	(13,735,234)	142,376,205	N/A
2006	142,376,205	9,790,534		7,314,444	(13,837,578)	145,643,605	N/A
2007	145,643,605	10,396,487		18,899,301 ¹	(14,098,478)	160,840,915	0
2008	160,840,915	10,832,029		12,896,517	(14,942,065)	169,627,396	0
2009	169,627,396	11,444,979		10,805,515	(15,563,892)	176,313,998	0
2010	176,313,998	12,129,856		14,068,194	(15,854,463)	186,657,585	0
2011	186,657,585	12,279,604		19,583,004	(16,617,516)	201,902,677	0
2012	201,902,677	13,435,845		20,261,210	(17,581,903)	218,017,829	4,760,000
2013	218,017,829	14,830,266		24,353,422	(18,239,440)	238,962,077	4,218,000
2014	238,962,077	15,853,717		26,079,578	(18,784,735)	262,110,637	2,427,000
2015	262,110,637	17,627,141		27,783,572	(19,726,175)	287,795,174	9,072,000
2016	287,795,174	19,502,236		24,151,838	(20,988,697)	310,460,551	7,510,000
2017	310,460,551	19,518,949		24,370,198	(22,324,953)	332,024,745	(5,597,400)
2018	332,024,745	20,295,996		20,213,214	(23,904,957)	348,628,998	(5,597,400)
2019	348,628,998	19,773,226		26,527,760	(25,808,559)	369,121,425	(5,597,400)
2020	369,121,425	20,393,124		25,290,756	(27,821,002)	386,984,303	(5,597,400)
2021	386,984,303	22,723,199		44,251,116	(29,351,016)	424,607,602	(5,597,400)
2022	424,607,602	22,223,848		31,595,814	(31,775,514)	446,651,750	0
2023	446,651,750	22,406,629		35,665,048	(35,038,245)	469,685,182	0
Total		\$461,535,621	\$25,833,865	\$573,540,350	(\$591,224,653)		\$0

¹ Includes an adjustment at January 1, 2007 due to the omission of the returns of high yield bonds in the calculation of the PAA interest rate for calendar years 2000 to 2005 inclusive.

Appendix B: Member Data

A. Sources of Member Data and Data Checks Performed

This actuarial report is based on the following member data:

- An electronic file prepared by TRAF which provided information for each person receiving a pension or a disability allowance from the fund as at December 31, 2023. The information included: pensioner number, gender, date of birth, date of commencement of pension, type of pension, amount of pension, any adjustments made in pension up to and including 1976 (pre-1977 indexing), any adjustments made in the pension after 1976 (post-1976 indexing), and, if applicable, the date of expiry of any guarantee period and the date of birth and sex of the beneficiary.
- Pensioner payroll output data prepared by TRAF for December 2023, showing pensioner number, gross pension, and COLA portion.

The data was checked for completeness and consistency, including manual checks of specific single life basic pensions and COLAs in payment with a comparison to prior valuation data. If information was not complete or was inconsistent, clarification was obtained from the source data at TRAF. A reconciliation of the data was prepared to ensure that all members were included appropriately in the valuation.

The data checks conducted during the preparation of this valuation permit the signing actuary to provide an opinion that the data is sufficient and reliable for the purposes of the valuation.

B. Membership Reconciliation

The following table provides a reconciliation of the pensioner membership from December 31, 2022 to December 31, 2023.

Pensioner Reconciliation		Male	Female	Plan B*	Total
Pensioners at December 31, 2022		5,924	10,455	40	16,419
Less:	Deaths - Pensions Ceased	(94)	(189)	(6)	(289)
	Deaths - To Female Beneficiary	(92)	92	0	0
	Deaths - To Male Beneficiary	44	(44)	0	0
	Deaths - To Plan B Beneficiary	(2)	(4)	6	0
Plus:	New Pensioners	164	369	0	533
Pensioners at December 31, 2023		5,944	10,679	40	16,663

*Plan B beneficiaries are individuals receiving annuities that are being paid for the remainder of a term certain period.

Members who have returned to work as of the valuation date and who are entitled to the July 1 COLA when they again become a pensioner have been included in the valuation and membership reconciliation above. As at December 31, 2023, there are seven (7) members who have returned to work who are included in the pensioner reconciliation shown above.



C. Membership Summary

Category of Pensioners	December 31, 2022	December 31, 2023
Retired Members	14,784	14,974
Survivors or beneficiaries of retired members	1,255	1,319
Beneficiaries with balance of guarantee period remaining	37	37
Subtotal	16,076	16,330
Life annuities ¹	343	333
Total	16,419	16,663

The average age of the 16,330 pensioners eligible for a COLA as at December 31, 2023 is 74.6 years for males and 73.1 years for females. This compares to average ages of 74.2 years for males and 72.8 years for females eligible for a COLA as at December 31, 2022.

¹ These former members and beneficiaries of deceased members are not entitled to indexing.



D. Breakdown of Member Information

The following table illustrates the average monthly amount of total indexing granted relative to the average total pension formula. Graphic illustrations of the average monthly pensions contained in this table can be found on the following page.

Monthly Amounts Including Province Share								
December 31, 2022					December 31, 2023			
Number ¹	Average Formula Pension ²	Average Indexing Amount	Average Total Pension	Age of Recipient	Number ¹	Average Formula Pension ²	Average Indexing Amount	Average Total Pension
1	\$1,310.95	\$251.41	\$1,562.36	Under 55	0	\$0.00	\$0.00	\$0.00
883	2,896.95	50.39	2,947.34	55-59	834	2,968.17	50.19	3,018.36
1,939	2,930.28	139.42	3,069.70	60-64	1,957	2,976.42	149.38	3,125.80
2,729	2,676.17	228.26	2,904.43	65-69	2,661	2,753.40	243.96	2,997.36
3,486	2,302.42	324.60	2,627.02	70-74	3,347	2,361.38	347.89	2,709.27
3,199	2,114.01	409.94	2,523.95	75-79	3,399	2,134.50	426.54	2,561.04
2,061	1,888.40	518.97	2,407.37	80-84	2,193	1,924.60	535.03	2,459.63
1,035	1,656.73	604.21	2,260.94	85-89	1,173	1,711.14	620.73	2,331.87
512	1,376.30	732.04	2,108.34	90-94	526	1,408.68	736.85	2,145.53
164	1,298.36	868.73	2,167.09	95-99	171	1,348.07	886.98	2,235.05
30	974.17	912.97	1,887.14	Over 100	32	1,012.76	921.39	1,934.15
37	1,527.19	157.56	1,684.75	N/A³	37	1,483.26	168.96	1,652.22
16,076	\$2,298.05	\$349.99	\$2,648.04	Total/ Average	16,330	\$2,331.44	\$371.95	\$2,703.39

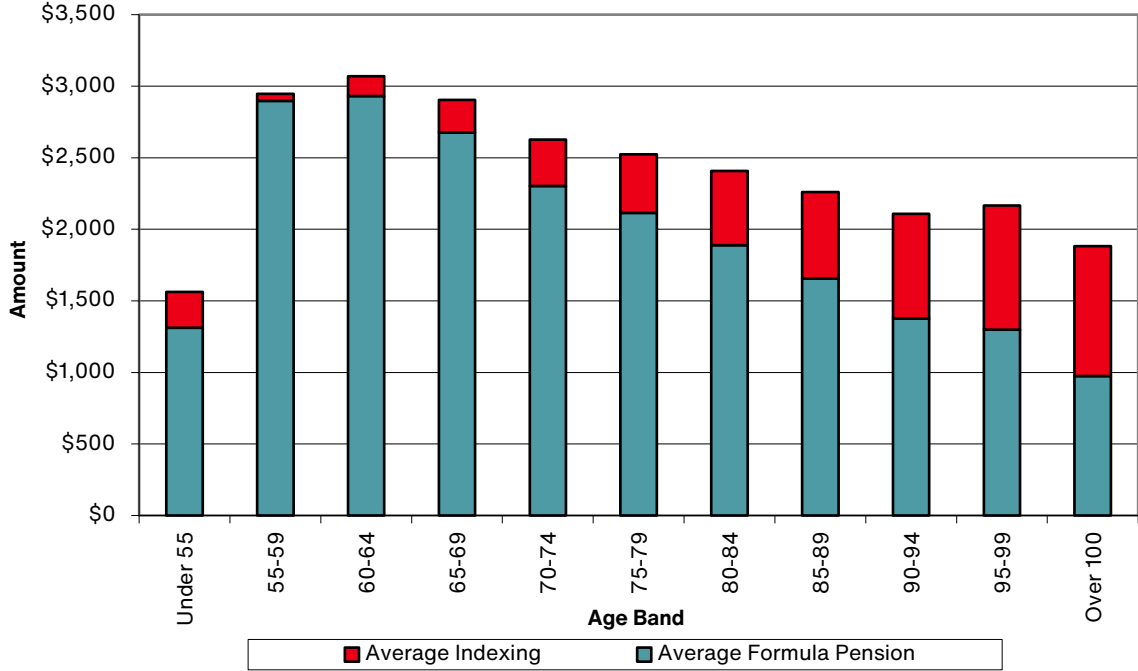
¹ Excludes life annuities which are not subject to indexing.

² Monthly pension in the normal form (Plan A), which serves as the basis for COLAs.

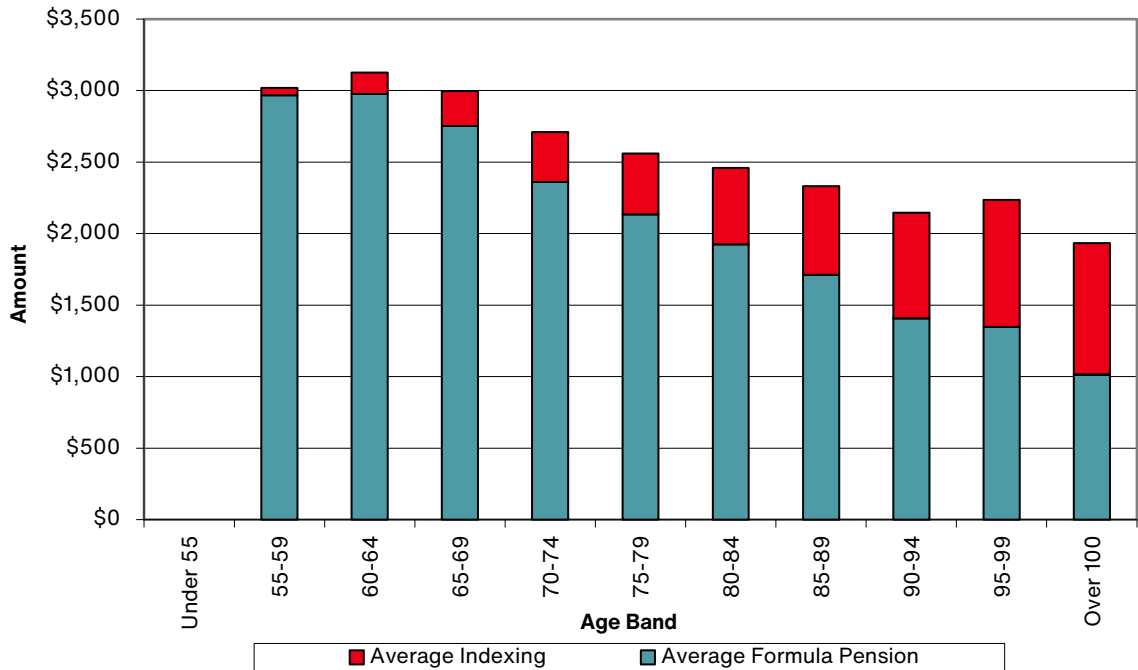
³ Represents beneficiaries of deceased members receiving monthly pension and indexing for the remainder of the guarantee period only.



Average 2022 Total Monthly Pension Amounts



Average 2023 Total Monthly Pension Amounts





Appendix C: Assumptions and Methods

A. Introduction

The PAA is designed to avoid being in a deficit position. COLAs are only granted to the extent that they can be financed from existing surplus at the valuation date. As a result, the actuarial cost method must fully recognize the actuarial liability for COLAs granted prior to the valuation date.

The value of future benefits to be paid from the PAA is contingent on future experience. Assumptions were utilized in determining the COLA liability and the value of any COLAs to be granted.

B. Actuarial Assumptions

The key assumptions affecting the financial position of the PAA are the valuation discount rate and the incidence of mortality of pensioners and beneficiaries who are in receipt of COLA payments. Please note that emerging experience, differing from the assumptions, will result in gains or losses which will be revealed in future valuations.

The actuarial assumptions adopted for this valuation, with comparison to the assumptions utilized in the previous valuation, are described below:

Actuarial Assumptions	December 31, 2022	December 31, 2023
Valuation Discount Rate	3.25% per annum	4.00% per annum
Mortality of Pensioners	TRAF 2014 Mortality Table generational projection using scale MI-2017	TRAF 2014 Mortality Table generational projection using scale MI-2017



Valuation Discount Rate

A valuation discount rate of 4.00% per annum has been used in this valuation. A valuation discount rate of 3.25% per annum was used in the previous actuarial valuation. The valuation discount rate represents a best estimate rate of return, net of investment management and administration fees, for the expected long-term return on the fixed income assets of the portfolio, taking into consideration TRAF's investment policy and valuation policy. In addition, TRAF's valuation policy indicates a margin for adverse deviation may also be applied to the discount rate if determined to be appropriate for the circumstances.

TRAF's valuation policy was updated in February 2021 to permit that any year over year change in the discount rate generally be limited to a maximum of 0.25% per year. The rationale for this policy update is that the discount rate is based on long-term expected returns for the fixed income portfolio and should therefore reflect long-term trends and not necessarily short-term volatility. An exception could be made if there are material and sustained changes in long-term expectations.

At December 31, 2023, the expected long-term return on the fixed income assets in the portfolio is approximately 5.19% per annum, net of fees. An economic environment of materially higher expectations has now been in place since the end of the second quarter of 2022. We consider this a sustained change in expectations and feel it is appropriate to increase the discount rate by more than 0.25%. We have increased the discount rate by 0.75% per annum as a larger step towards the expected long-term return on fixed income assets. This lowers the margin for adverse deviation introduced last year between the expected fixed income return and the discount rate, from 1.95% per annum to 1.19% per annum. If expected returns remain at current levels, further increases in the discount rate will be considered in future valuations.

The use of a fixed income approach is supported by the unique structure of the PAA. Specifically, the PAA valuation is different than a regular going concern valuation because the PAA valuation discount rate is not only used to value the liabilities for COLAs granted to date, it is also used to determine the amount of COLA to be granted to pensioners the following year. As a result, should the net rate of return be less than the assumed valuation discount rate there will be a direct negative financial impact on the financial position of the PAA and hence, future COLAs.

It should be noted that this methodology for deriving the valuation discount rate makes no provision for the additional rates of return that may be generated from the total portfolio returns outperforming the fixed income returns. Under this methodology, additional COLAs as a result of such additional rates of return will be granted only in the years following those in which such additional returns are realized. As such, there is additional margin reflected in the discount rate by basing it on the expected returns on the fixed income portfolio, and not the total portfolio.



Mortality of Pensioners

In 2014, Aon performed a mortality experience study for Teachers' Pension Plans in Alberta, Saskatchewan and Manitoba, based on the data collected for the period between 2003 and 2013. The mortality rates used in the TRAF 2014 mortality table are based on results of this 2014 mortality study.

The TRAF 2014 Mortality Table with generational mortality improvements projected using the improvement scale MI-2017 has been used to value the COLA liabilities of current pensioners. This mortality assumption is believed to be the best representation of future mortality experience for pensioners.

The TRAF 2014 Mortality Table with generational mortality improvements projected using the improvement scale MI-2017 was used in the previous valuation.

Mortality rates per 1,000 lives for males and females at selected ages are summarized in the tables below.

Mortality per 1,000 lives – Male

Current Age	Mortality per 1,000 lives at each future age				
	80	85	90	95	100
60	22.33	45.07	89.93	182.00	325.89
70	24.69	49.83	99.44	193.29	332.48
80	27.58	55.12	109.95	205.28	339.20
90	n/a	n/a	121.53	218.06	346.06

Mortality per 1,000 lives - Female

Current Age	Mortality per 1,000 lives at each future age				
	80	85	90	95	100
60	17.20	34.22	64.70	138.58	281.89
70	19.02	37.83	71.54	147.18	287.59
80	21.10	41.82	79.10	156.31	293.40
90	n/a	n/a	87.30	166.00	299.34



C. Valuation Methods

a) Liability Valuation Method - Unit Credit Actuarial Cost Method

The Unit Credit Actuarial Cost Method (also referred to as the Accrued Benefit Cost Method) has been used in this valuation. Under this method, the accrued actuarial liability is the present value at the valuation date of the COLAs granted prior to the valuation date. All experience gains or losses are determined and identified at each valuation date.

For each person entitled to a COLA payment, the probability that the COLA will be paid each month in the future is determined based on the assumed rates of mortality. The probability of payment is multiplied by the amount of COLA which the PAA is currently providing. A discount factor is then applied to determine the present value of each expected pension adjustment.

The discounted expected future payments at the valuation date for each person are summed to determine the actuarial liability of COLAs in payment.

If the death of a pensioner in a specific month would cause the pension to be paid to a survivor or beneficiary, allowance has been made for the continuation of 2/3rds of the pension adjustment for as long as the survivor is expected to be alive or the end of the beneficiary's guarantee period, as applicable.

b) Asset Valuation Method - Notional Value of PAA Assets

The asset value used in this valuation is the notional asset value of the PAA adjusted for contributions and benefit payments in transit.



D. Hypothetical Wind-Up Valuation Assumptions

The Canadian Institute of Actuaries (CIA) has developed guidance to value benefits assumed to be settled by annuity purchase. Based on insurance company data on group annuity purchases compiled by the CIA, we have used the following assumptions:

- valuation discount rate of 4.70% per annum (4.90% per annum at the previous valuation); and
- mortality in accordance with the TRAF 2014 Mortality Table with generational mortality improvements projected using scale CPM-B (same as the previous valuation).

These assumptions have been developed based on preliminary guidance from the CIA for hypothetical wind-up valuations with a December 31, 2023 effective date. Final guidance from the CIA is not available as of the date this report is prepared. To the extent that the final CIA guidance differs from the preliminary guidance, the hypothetical wind-up liability may increase or decrease relative to the figures provided in this report.



Appendix D: Summary of PAA Provisions

The PAA was established by an amendment to the TPA, effective on July 1, 1977, for the purpose of financing 50% of the pension adjustments (COLAs) granted as a result of increases in the cost of living after pension commencement.

Section 10 of the TPA contains the provisions for granting COLAs to pensioners each year.

Each COLA is determined as a percentage of the basic monthly pension. The basic monthly pension is the formula pension (the pension which would be received currently had the person entitled to the pension elected the normal form of payment), plus any previously granted COLAs.

Prior to 2008, unless an unfunded actuarial liability would result, the COLA to be granted in July of each year is the percentage increase in the CPI over the 12-month period ending in December of the previous year. Subsection 10(8) of the TPA provided for a reduction in the full COLA if granting the full COLA would result in an unfunded actuarial liability.

For COLAs granted between July 1, 2008 and July 1, 2017, inclusive, the COLA was limited to the lesser of 5.33% and 2/3rds of the percentage change in the CPI over the 12-month period ending in December of the previous year.

In accordance with subsection 49(6) of the TPA, if the above COLA was restricted by the 2/3rds limitation (to a maximum of 5.33%), any surplus that remains after granting the above COLA was excluded in determining any future pension adjustments before 2018. The restricted surplus could only be used for determining COLA after 2017 (i.e., for COLAs granted on and/or after July 1, 2018) in accordance with regulations made for such purpose.

The Teachers' Pensions Restricted Surplus Regulation, 2017 was enacted on May 18, 2018. In accordance with this regulation, one-fifth of the restricted surplus of \$27,987,000 (determined as of December 31, 2017) was utilized each year from 2018 to 2022 for the purposes of determining COLA to be provided that year. The final utilization of the restricted surplus occurred at December 31, 2021.

Beginning July 1, 2018, COLAs are limited to the percentage increase in the CPI over the 12-month period ending in December of the previous year. However, the COLA may be further reduced, but never less than 0%, if granting the above COLA would result in an unfunded actuarial liability.



When a survivor or a beneficiary of a deceased pensioner becomes entitled to a benefit in respect of such deceased pensioner, the person to whom the benefits are payable shall be paid 2/3rds of the monthly pension adjustment that the deceased pensioner has received, or would have received had that member continued to live, commencing:

- a) on the 1st day of the month following the date of the pensioner's death, or
- b) on the date on which the deceased person would have commenced receiving the pension adjustment,

whichever is later, and ceasing on the date that the pension ceases to be payable.

COLAs are declared prior to July 1 of each year to be granted effective July 1 of each year.



Those members who retired or who otherwise became eligible for a pension on or before January 1st of the previous year receive 100% of the COLA granted. A partial or interim COLA is granted to those members who retired or who otherwise commenced to receive a pension after that date but before June of the current year.

The following table summarizes the partial COLAs granted to members who retired on or after January 1 of the immediately preceding year prior to the year the current COLA is granted. The figures in Column 2 indicate the percentage of the full COLA declared. Column 3 indicates the month that the partial COLA will commence.

Column 1	Column 2	Column 3
Month of Retirement or Entitlement to a Pension	Percentage of Declared COLA	Effective Date of Partial COLA
January, preceding year	91.67%	July, current year
February, preceding year	83.33%	July, current year
March, preceding year	75.00%	July, current year
April, preceding year	66.67%	July, current year
May, preceding year	58.33%	July, current year
June, preceding year	50.00%	July, current year
July, preceding year	45.83%	August, current year
August, preceding year	41.67%	September, current year
September, preceding year	37.50%	October, current year
October, preceding year	33.33%	November, current year
November, preceding year	29.17%	December, current year
December, preceding year	25.00%	January, following year
January, current year	20.83%	February, following year
February, current year	16.67%	March, following year
March, current year	12.50%	April, following year
April, current year	8.33%	May, following year
May, current year	4.17%	June, following year



Appendix E: Data Certification

With respect to the Actuarial Report of the Pension Adjustment Account (PAA) of The Teachers' Retirement Allowances Fund as at December 31, 2023;

I hereby certify that, to the best of my knowledge and belief:

- a) the asset data supplied to the actuary and as summarized in Appendix A of this report is complete and accurate;
- b) the member data provided to the actuary and summarized in Appendix B of this report is a complete and accurate description of every person who is entitled to benefits under the terms of the PAA;
- c) the PAA provisions under the TPA and the Regulation contained in Appendix D in this report is an accurate summary of the terms of the PAA; and
- d) all events subsequent to the valuation date that may have a material impact on the results of the valuation have been communicated to the actuary.

Date: March 19, 2024

Signed: 

Name: Brad Prokop

Title: Chief Operating Officer

Date: March 19, 2024

Signed: 

Name: Jeremy Tataryn

Title: Vice President, Finance



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