



Actuarial Valuation as at December 31, 2019 for Hamilton-Wentworth Retirement Fund

Canada Revenue Agency Registration Number: 1073352

November 2020

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Executive Summary

An actuarial valuation has been prepared for the Hamilton-Wentworth Retirement Fund (the "Plan") as at December 31, 2019 for the primary purpose of establishing a funding range in accordance with legislative requirements for the Plan until the next actuarial valuation is performed. This section provides an overview of the important results and the key valuation assumptions which have had a bearing on these results. The next actuarial valuation for the purposes of developing funding requirements should be performed no later than as at December 31, 2022.

Summary of Principal Results

Financial Position

	December 31, 2019	December 31, 2016
Going Concern		
Assets	\$ 54,821,000	\$ 59,443,000
Liabilities	<u>48,526,000</u>	<u>55,249,000</u>
Financial Position	\$ 6,295,000	\$ 4,194,000
Adjustments ²	<u>(4,304,000)</u>	<u>-</u>
Surplus/(Unfunded Liability)	\$ 1,991,000	\$ 4,194,000
Solvency		
Assets ¹	\$ 54,751,000	\$ 59,373,000
Liabilities	<u>50,907,000</u>	<u>63,005,000</u>
Financial Position	\$ 3,844,000	\$ (3,632,000)
Adjustments ²	<u>-</u>	<u>3,142,000</u>
Surplus/(Unfunded Liability)	\$ 3,844,000	\$ (490,000)
Hypothetical Wind Up		
Assets ¹	\$ 54,751,000	\$ 59,373,000
Liabilities	<u>64,241,000</u>	<u>79,884,000</u>
Surplus/(Unfunded Liability)	\$ (9,490,000)	\$ (20,511,000)

¹ Net of estimated wind up expenses

² Adjustments include Provision for Adverse Deviation, prior year credit balance, and all solvency liability and solvency asset adjustments, where applicable

Legislative Ratios

	December 31, 2019	December 31, 2016
Funded ratio (Before PfAD)	1.13	1.08
Solvency ratio	1.08	0.94
Transfer ratio	0.85	0.74

Minimum Contribution Requirements

Considering the funding and solvency status of the Plan, the minimum Company contributions for the period from January 1, 2020 to December 31, 2022 in accordance with legislative requirements, are as follows:

	Jan 1, 2020 to Dec 31, 2020	Jan 1, 2021 to Dec 31, 2021	Jan 1, 2022 to Dec 31, 2022
Company normal cost	\$ -	\$ -	\$ -
Special payments toward amortizing unfunded liability	-	-	-
Adjustments	-	-	-
Minimum Required Company Contribution	\$ -	\$ -	\$ -

Required City contributions are zero for the next 3 years.

Key Assumptions

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

Going Concern	December 31, 2019	December 31, 2016
Discount rate	4.40% per year	4.50% per year
Provision for adverse deviation	9.80% of non-indexed liabilities	Not Applicable
Inflation rate	2.00% per year	2.25% per year
Indexing Rate	2.00% per year	0.00% per year
Mortality table	115% of the 2014 Canadian Pensioner Public Mortality with generational improvements using CPM Scale B	2014 Canadian Pensioner Public Mortality with generational improvements using CPM Scale B
Retirement rates	Not Applicable	Not Applicable
Solvency/ Hypothetical Wind Up	December 31, 2019	December 31, 2016
Discount rate	Solvency Annuity purchases: 2.86% per year Hypothetical Wind-Up Annuity purchases: -0.29% per year	Solvency Annuity purchases: 2.91% per year Hypothetical Wind-Up Annuity purchases: -0.09% per year
Inflation rate	Not Applicable	Not Applicable
Indexing rate	Not Applicable	Not Applicable
Mortality table	2014 Canadian Pensioner Mortality Table with generational improvements using CPM Scale B	2014 Canadian Pensioner Mortality Table with generational improvements using CPM Scale B
Retirement rates	Not Applicable	Not Applicable

Section 1: Introduction

Purpose and Terms of Engagement

We have been engaged by Corporation of the City of Hamilton, and hereafter referred to as the City, to conduct an actuarial valuation of the Plan, registered in Ontario, as at December 31, 2019 for the general purpose of determining the minimum and maximum funding contributions required by pension standards, based on the actuarial assumptions and methods summarized herein. Specifically, the purposes of the valuation are to:

- Determine the financial position of the Plan on a going concern basis as at December 31, 2019;
- Determine the financial position of the Plan as at December 31, 2019 on a solvency and hypothetical wind up basis;
- Determine the funding requirements of the Plan as at December 31, 2019 with consideration of the 2016 multi-jurisdictional agreement and Ontario Regulation 250/18 in effect on May 1, 2018; and
- Provide the necessary actuarial certification required under the *Pension Benefits Act (Ontario)* (the "Act") and the *Income Tax Act*.

The results of this report may not be appropriate for accounting purposes or any other purposes not listed above.

The next required valuation will be as at December 31, 2022.

Ontario Funding Reform

This report reflects Ontario Regulation 250/18 that modifies the funding rules for Ontario registered defined benefit pension plans for actuarial valuations effective from May 1, 2018. In particular, this report allows for:

- The funding of a reserve in the Plan, referred to as a Provision for Adverse Deviation (PfAD);
- The amortization of the going concern unfunded liability over 10 years, instead of 15 years, and a "fresh start" at each valuation;
- The funding of a solvency deficiency up to the level that the plan would be 85% funded on a solvency basis;
- The amortization of any benefit improvement over an 8-year period; and
- The full inclusion of the value of post-retirement indexing in the going concern liability.

In addition, the Regulations provide certain one-time transitional measures that will assist plan sponsors with moving to the new Regulations. These include:

- The ability to reduce the solvency special payment amount when there is a solvency excess; and
- The ability to phase in an increase in required contributions over a 3-year period.

On May 21, 2019, the Ontario Minister of Finance filed Ontario Regulation 105/19, which amends the funding rules for Ontario registered defined benefit pension plans. The amendments mainly related to clarifying elements of the funding rules that took effect on May 1, 2018 under Ontario Regulation 250/18. Changes include the following:

- Clarification that the presence of a target allocation in below investment grade bonds in the Statement of Investment Policies and Procedures does not taint an entire bond category, thus allowing its use in the determination of the PfAD;
- Definition of a “closed plan” for the purpose of determining the PfAD: a plan in which at least 25% of the members entitled to defined benefits are in a class of employees from which new members are not permitted, according to the terms of the plan, to join the defined benefit plan;
- Clarification on the use of surplus and contribution holidays; and

Clarification that the Prior Year Credit Balance can be applied as prepayment of employer normal cost contributions, including the PfAD on the normal cost contributions.

Summary of Changes Since the Last Valuation

The last such actuarial valuation in respect of the Plan was performed as at December 31, 2016. Since the time of the last valuation, we note that the following events have occurred:

- There were post-retirement pension increases of 1.49% effective January 1, 2018, 2.29% effective January 1, 2019 and 1.89% effective January 1, 2020. These increases have been reflected in the results presented in this valuation report.
- Ontario regulations were amended and the option to fund the cost of future post-retirement indexation of pensions via the normal cost was removed. The going concern valuation now includes the full cost of post-retirement indexation.
- In December 2017, the Canadian Institute of Actuaries (“CIA”) released a new mortality improvement scale called MI-2017. MI-2017 was developed using general population data from 1967–2015. The City has not adopted MI-2017 as the mortality improvement scale in the going concern valuation as at December 31, 2017; and
- Ontario Regulation 250/18 came into effect.

Company Information and Inputs

In order to prepare our valuation, we have relied upon the following information:

- A copy of the previous valuation report as at December 31, 2016;
- A copy of the Statement of Investment Policies and Procedures for the Plan;
- A copy of the funding policy for the City;
- Membership data compiled as at December 31, 2019 by the City;
- Asset data taken from the Plan’s audited financial statements; and
- A copy of the latest Plan text and amendments up to and including December 31, 2019.

Furthermore, our actuarial assumptions and methods have been chosen to reflect our understanding of the City's desired funding objectives with due respect to accepted actuarial practice and regulatory constraints.

Subsequent Events

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

- Actual experience deviating from expected after December 31, 2019 will result in gains or losses which will be reflected in the next actuarial valuation report.
- Due to the COVID-19 pandemic, the financial markets experienced significant volatility after the valuation date. As with other experience emerging after the valuation date, the financial impact of this event on the Plan will be reflected in the next actuarial valuation report.
- The Canadian Institute of Actuaries has amended the Standards of Practice related to pension plans effective December 1, 2020. In particular, the amended Standards of Practice revise the way that commuted values are determined. The changes impact the interest rates and the retirement age assumption used in the determination of commuted values. As this change is not retroactive, it does not impact the Plan as at December 31, 2019 and the change will be reflected in future valuations.
- 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 may be currently under review. To the extent that actual changes in the regulatory and legal environment transpire, any financial impact on the Plan as a result of such changes will be reflected in future valuations.

Section 2: Going Concern Valuation Results

Going Concern Financial Position of the Plan

The going concern valuation provides an assessment of the Plan's financial position at the valuation date on the premise that the Plan continues on into the future indefinitely.

The selection of the applicable actuarial assumptions and methods reflect the Plan's funding objectives, as communicated by the City, actuarial standards of practice, and pension standards.

On the basis of the Plan provisions, membership data, going concern assumptions and methods, and asset information described in the Appendices, the going concern financial position of the Plan as at December 31, 2019 is shown in the following table. The results as at December 31, 2016 are also shown for comparison purposes.

Going Concern Financial Position

	December 31, 2019	December 31, 2016
Actuarial Value of Assets	\$ 54,821,000	\$ 59,443,000
Going Concern Liabilities¹		
Pensioners	\$ 36,272,000	\$ 40,526,000
Beneficiaries	<u>12,254,000</u>	<u>14,723,000</u>
Total Liabilities	\$ 48,526,000	\$ 55,249,000
Going Concern Position	\$ 6,295,000	\$ 4,194,000
Additional liabilities due to PfAD	<u>4,304,000</u>	-
Surplus/(Unfunded Liability) (before prior year credit balance)	\$ 1,991,000	\$ 4,194,000
Prior year credit balance	<u>-</u>	<u>-</u>
Surplus/(Unfunded Liability)	\$ 1,991,000	\$ 4,194,000

The PfAD is not required to be applied to the liabilities in respect of post retirement indexation of \$4,608,000 as at December 31, 2019.

¹ Going concern liabilities reported at December 31, 2016 exclude the cost of future indexation of \$8,769,000, assuming indexing at 2.25% per annum.

Going Concern Financial Position Breakdown

	Police		Others		Total
Actuarial Value of Assets¹	\$	54,525,000	\$	296,000	\$ 54,821,000
Going Concern Liabilities					
Retirees	\$	36,225,000	\$	47,000	36,272,000
Beneficiaries		12,165,000		89,000	12,254,000
Total Liabilities	\$	48,390,000	\$	136,000	48,526,000
Going Concern Position	\$	6,135,000	\$	160,000	6,295,000

Change in Financial Position

The major components of the change in the Surplus/(Unfunded Liability)² for the period from December 31, 2016 to December 31, 2019 are summarized in the following table.

Surplus/(Unfunded Liability) as at December 31, 2016	\$	4,194,000
Expected interest on Surplus/(Unfunded Liability)		592,000
Company special payments in inter-valuation period with interest		3,736,000
Surplus/(Unfunded Liability) as at December 31, 2019	\$	8,522,000
Change in surplus/(unfunded liability) due to experience gains/(losses)		
Gain/(loss) from investment earnings greater/lower than expected	\$	2,369,000
Gain/(loss) due to mortality experience		1,278,000
Gain/(loss) from the funding of indexation		344,000
Gain/(loss) on indexation experience		566,000
Gain/(loss) on coding changes		(1,571,000)
Net gain/(loss) due to other experience and miscellaneous items		397,000
Surplus/(Unfunded Liability) After Experience Gains/(Losses) as at December 31, 2019	\$	11,905,000
Change due to the inclusion of the value of post-retirement indexation as per Ontario funding reform	\$	(9,035,000)
Change due to the Provision for Adverse Deviation		(4,304,000)
Change due to inflation assumption		637,000
Change due to demographic assumptions		3,101,000
Change due to discount rate		(313,000)
Surplus/(Unfunded Liability) as at December 31, 2019	\$	1,991,000

¹ Split of assets provided by the City in email dated February 24, 2020

² Prior to the application of the Prior Year Credit Balance

Discussion of Changes in Assumptions

Effective December 31, 2019 the following assumptions have been changed:

- The mortality table has been changed from 100% of the 2014 Canadian Pensioner Public Mortality with generational improvements using CPM Scale B to 115% of the 2014 Canadian Pensioner Public Mortality with generational improvements using CPM Scale B. This change decreased the going concern liabilities by \$3,101,000.
- The nominal discount rate has been changed from 4.50% per year to 4.40% per year. This change increased the going concern liabilities by \$313,000.
- The inflation rate has been changed from 2.25% per year to 2.00% per year. This change decreased the going concern liabilities by \$637,000.

Plan Amendments

There were no Plan amendments during the last three years that had a bearing on the results of this valuation.

Going Concern Valuation Sensitivity Results

In accordance with the CIA Standards of Practice specific to pension plans, the table below presents the sensitivity of the going concern liabilities and the total normal cost (prior to the application of the Provision for Adverse Deviation) of using a discount rate 1% lower and 1% higher than that used for the going concern valuation.

December 31, 2019			Effect	
			\$	%
Going concern liabilities	\$	48,526,000		
Going concern liabilities (discount rate – 1%)	\$	51,878,000	3,352,000	6.9%
Going concern liabilities (discount rate + 1%)	\$	45,558,000	(2,968,000)	-6.1%
Normal cost	\$	-		
Normal cost (discount rate – 1%)	\$	-	-	N/A
Normal cost (discount rate + 1%)	\$	-	-	N/A

There is no Normal Cost relating to benefits accruing as there are no active members.

Plausible Adverse Scenarios

In accordance with the Canadian Institute of Actuaries Standards of Practice specific to pension plans, below is summarized scenarios of adverse but plausible assumptions, relative to the best estimate assumptions otherwise selected for the valuation.

Interest Rate Sensitivity

The table below presents the sensitivity of the going concern position of using interest rates 1% lower than the current level. In order to calculate the impact on the Actuarial Value of Assets, the decrease in interest rates only impacts fixed income assets (47.7% of total assets) and a duration of 15.62¹ was considered.

	Base Scenario	Adverse Scenario	Impact (\$)
Actuarial value of assets	\$ 54,821,000	\$ 59,027,000	\$ 4,206,000
Going concern liabilities	<u>48,526,000</u>	<u>51,878,000</u>	<u>3,352,000</u>
Going concern position	\$ 6,295,000	\$ 7,149,000	\$ 854,000
Additional liabilities due to PfAD	<u>4,304,000</u>	<u>4,573,000</u>	<u>269,000</u>
Surplus/(Unfunded Liability)²	\$ 1,991,000	\$ 2,576,000	\$ 585,000
Total Normal Cost			
Jan 1, 2020 to Dec 31, 2020	\$ -	\$ -	\$ N/A
Jan 1, 2021 to Dec 31, 2021	\$ -	\$ -	\$ N/A
Jan 1, 2022 to Dec 31, 2022	\$ -	\$ -	\$ N/A

¹ From the 2019 Audited Financial Statements

² Before application of PYCB

Deterioration in Asset Value

In assessing the risk related to the deterioration in asset value we have chosen an adverse scenario equal to a 15% reduction in the non-fixed income asset values and assume no change in future return expectations.

The table below presents the sensitivity of the going concern position of using the assets with a 15% reduction in non-fixed income asset values.

	Base Scenario	Adverse Scenario	Impact (\$)
Actuarial value of assets	\$ 54,821,000	\$ 50,637,000	\$ (4,184,000)
Going concern liabilities	<u>48,526,000</u>	<u>48,526,000</u>	<u>-</u>
Going concern position	\$ 6,295,000	\$ 2,111,000	\$ (4,184,000)
Additional liabilities due to PfAD	<u>4,304,000</u>	<u>4,304,000</u>	<u>-</u>
Surplus/(Unfunded Liability)¹	\$ 1,991,000	\$ (2,193,000)	\$ (4,184,000)

Total Normal Cost

Jan 1, 2020 to Dec 31, 2020	\$ -	\$ -	\$ N/A
Jan 1, 2021 to Dec 31, 2021	\$ -	\$ -	\$ N/A
Jan 1, 2022 to Dec 31, 2022	\$ -	\$ -	\$ N/A

Mortality Sensitivity

The table below presents the sensitivity of the going concern position of the Plan to using a mortality assumption with a flat 10% improvement to the base mortality rates. For the purposes of this analysis, we have used 105% of the rates of the base table used in the going concern valuation.

	Base Scenario	Adverse Scenario	Impact (\$)
Actuarial value of assets	\$ 54,821,000	\$ 54,821,000	\$ -
Going concern liabilities	<u>48,526,000</u>	<u>50,504,000</u>	<u>1,978,000</u>
Going concern position	\$ 6,295,000	\$ 4,317,000	\$ 1,978,000
Additional liabilities due to PfAD	<u>4,304,000</u>	<u>4,462,000</u>	<u>158,000</u>
Surplus/(Unfunded Liability)²	\$ 1,991,000	\$ (145,000)	\$ 2,136,000

Total Normal Cost

Jan 1, 2020 to Dec 31, 2020	\$ -	\$ -	\$ N/A
Jan 1, 2021 to Dec 31, 2021	\$ -	\$ -	\$ N/A
Jan 1, 2022 to Dec 31, 2022	\$ -	\$ -	\$ N/A

¹ Before application of PYCB

² Before application of PYCB

Section 3: Solvency Valuation Results

Solvency Financial Position of the Plan

The solvency valuation is a financial assessment of the Plan that is required by the *Act* and is performed in accordance with requirements prescribed by that legislation. It is intended to provide an assessment of the Plan's financial position at the valuation date on the premise that certain obligations as prescribed by the *Act* are settled on the valuation date for all members. The liabilities must be calculated based on a postulated scenario that maximizes liabilities on wind up of the Plan. Contingent benefits are included in the liabilities that would be payable under the postulated scenario, unless permitted to be omitted under the definition of solvency liabilities under the Regulations to the *Act*. All assumptions for the solvency valuation are listed in Appendix D.

On the basis of the Plan provisions, membership data, solvency assumptions and methods and asset information described in the Appendices, as well as the requirements of the *Act*, the solvency financial position of the Plan as at December 31, 2019 is shown in the following table. The solvency financial position of the Plan as at December 31, 2016 is shown for comparison purposes.

Solvency Financial Position

	December 31, 2019	December 31, 2016
Assets		
Solvency assets	\$ 54,821,000	\$ 59,443,000
Estimated wind up expenses	(70,000)	(70,000)
Total Assets	\$ 54,751,000	\$ 59,373,000
Solvency Liabilities		
Pensioners	\$ 37,754,000	\$ 46,544,000
Beneficiaries	13,153,000	16,461,000
Total Liabilities	\$ 50,907,000	\$ 63,005,000
Solvency Position	\$ 3,844,000	\$ (3,632,000)
Prior year credit balance	-	-
Present value of special payments	-	3,142,000
Solvency asset smoothing	-	-
Solvency liability adjustment	-	-
Solvency Surplus/(Deficiency)	\$ 3,844,000	\$ (490,000)
Solvency ratio ¹	1.08	0.94

¹ Solvency Assets divided by Solvency Liabilities

Solvency Financial Position Breakdown

	Police		Others		Total
Solvency assets ¹	\$	54,525,000	\$	296,000	\$ 54,821,000
Estimated wind up expenses		(70,000)		-	(70,000)
Total Assets	\$	54,455,000	\$	296,000	\$ 54,751,000
Solvency Liabilities					
Retirees	\$	37,705,000	\$	49,000	\$ 37,754,000
Beneficiaries		13,053,000		100,000	13,153,000
Total Liabilities	\$	50,758,000	\$	149,000	\$ 50,907,000
Surplus/(Unfunded Liability)	\$	3,697,000	\$	147,000	\$ 3,844,000

Statutory Solvency Financial Position

The minimum funding requirements under the Regulation are based on the statutory solvency financial position as at the valuation date. In calculating the statutory solvency financial position, various adjustments can be made including solvency funding of a reduced solvency deficiency effective for valuations filed after December 31, 2017. The reduced solvency deficiency is based upon 0.85 of the solvency liabilities and 0.85 of the solvency liability adjustment.

	December 31, 2019		December 31, 2016	
The amount by which the sum of:				
85% of solvency liabilities	\$	43,271,000	\$	63,005,000 ²
85% of solvency liability adjustment		-		- ³
Prior year credit balance		-		-
	\$	43,271,000	\$	63,005,000
Exceeds the sum of:				
Solvency assets net of wind-up expenses	\$	54,751,000	\$	59,373,000
Solvency asset adjustment		-		3,142,000
	\$	54,751,000	\$	62,515,000
Reduced Solvency Excess/(Deficiency)	\$	11,480,000	\$	(490,000)

¹ Split of assets provided by the City in email dated February 24, 2020

² 100% of total liabilities under regulations in effect prior to May 1, 2018

³ 100% of solvency liability adjustment under regulations in effect prior to May 1, 2018

Solvency Concerns

A report indicates solvency concerns under the *Act* if the ratio of the solvency assets to solvency liabilities is less than 0.85.

Where a report indicates solvency concerns, the effective date of the next valuation that needs to be filed under the *Act* is one year from the valuation date of the valuation that gave rise to the solvency concerns.

Since the ratio of solvency assets to solvency liabilities is equal to 1.08, this report does not indicate solvency concerns.

Solvency Valuation Sensitivity Results

In accordance with the CIA Standards of Practice specific to pension plans, the table below presents the sensitivity of the solvency liabilities to using a discount rate of 1% lower and 1% higher than that used for the solvency valuation.

December 31, 2019		Effect	
		\$	%
Solvency liabilities	\$ 50,907,000		
Solvency liabilities (discount rate – 1%)	\$ 54,549,000	\$ 3,642,000	7.2%
Solvency liabilities (discount rate + 1%)	\$ 47,693,000	\$ (3,214,000)	-6.3%

Incremental Cost on a Solvency Basis

The incremental cost on a solvency basis represents the present value at December 31, 2019 of the expected aggregate change in the solvency liabilities between January 1, 2020 and the next calculation date, that is December 31, 2022. Appendix D gives more details on the calculation methodology and on assumptions.

Based on this methodology and on these assumptions, the incremental cost on a solvency basis can be found in the following table.

	Jan 1, 2020 to Dec 31, 2020	Jan 1, 2021 to Dec 31, 2021	Jan 1, 2022 to Dec 31, 2022
Incremental cost on a solvency basis	\$ 656,000	\$ 587,000	\$ 521,000

Pension Benefits Guarantee Fund ("PBGF")

A PBGF assessment is not required under Article 47(1) of Regulation 909 of the *Act*.

Section 4: Hypothetical Wind Up Valuation Results

Hypothetical Wind Up Financial Position of the Plan

A hypothetical wind up valuation is performed to determine the financial position of the Plan as at the valuation date on a wind up basis, reflecting market settlement rates as of the valuation date. Unlike the solvency valuation, all benefits are included that would be payable under the postulated scenario that would maximize benefits. The hypothetical wind up valuation is determined using benefit entitlements on the assumption that the Plan has neither a surplus nor a deficit. Contingent benefits are included in the liabilities that would be payable under the postulated scenario. Assets are set equal to market value net of estimated wind up expenses. All assumptions for the hypothetical wind up valuation are listed in Appendix D.

On the basis of Plan provisions, membership data, hypothetical wind up assumptions and methods, and asset information described in the Appendices, as well as the requirements of the Act, the hypothetical wind up financial position of the Plan as at December 31, 2019 is shown in the following table. The hypothetical wind up financial position of the Plan as at December 31, 2016 is shown for comparison purposes.

Hypothetical Wind Up Financial Position

	December 31, 2019	December 31, 2016
Assets		
Hypothetical wind up assets	\$ 54,821,000	\$ 59,443,000
Estimated wind up expenses	<u>(70,000)</u>	<u>(70,000)</u>
Total Assets	\$ 54,751,000	\$ 59,373,000
Hypothetical Wind Up Liabilities		
Pensioners	\$ 48,392,000	\$ 60,003,000
Beneficiaries	<u>15,849,000</u>	<u>19,881,000</u>
Total Liabilities	\$ 64,241,000	\$ 79,884,000
Hypothetical Wind Up Surplus/(Deficiency)	\$ (9,490,000)	\$ (20,511,000)

Wind Up Financial Position Breakdown

	Police		Others		Total
Hypothetical wind up assets ¹	\$	54,525,000	\$	296,000	\$ 54,821,000
Estimated wind up expenses		(70,000)		-	(70,000)
Total Assets	\$	54,455,000	\$	296,000	\$ 54,751,000
Hypothetical Wind Up Liabilities					
Retirees	\$	48,330,000	\$	62,000	\$ 48,392,000
Beneficiaries		15,738,000		111,000	15,849,000
Total Liabilities	\$	64,068,000	\$	173,000	\$ 64,241,000
Surplus/(Unfunded Liability)	\$	(9,613,000)	\$	123,000	(9,490,000)

Transfer Ratio

The transfer ratio is determined as follows:

		December 31, 2019	December 31, 2016
(1) Hypothetical wind up assets	\$	54,821,000	\$ 59,443,000
Prior year credit balance (A)	\$	-	\$ -
Total company normal cost and required special payments until next mandated valuation (B)	\$	-	\$ 3,893,400
(2) Asset adjustment Lesser of (A) and (B)	\$	-	\$ -
(3) Hypothetical wind up liabilities	\$	64,241,000	\$ 79,884,000
Transfer Ratio [(1)-(2)] / (3)		0.85	0.74

¹ Split of assets provided by the City in email dated February 24, 2020

Section 5: Contribution Requirements

Contribution Requirements in Respect of the Normal Cost

There are no active members in the Plan, and as such, there are no Normal Cost contributions for the purposes of this valuation.

As there is a going concern and solvency surplus, no special payments are required as of December 31, 2019.

Prior Year Credit Balance ("PYCB")

The PYCB is nil.

Available Actuarial Surplus

As at December 31, 2019 the Available Actuarial Surplus is calculated as follows:

Going Concern Basis

(A)	Total assets	\$	54,821,000
(B)	Total liabilities		48,526,000
(C)	Additional liabilities due to PfAD		4,304,000
(D)	Prior year credit balance		-
(E)	Available surplus: maximum (A – B – C – D); 0)	\$	1,991,000

Hypothetical Wind-Up Basis

(F)	Assets in excess of a transfer ratio of 105%	\$	-
(G)	Available Actuarial Surplus: minimum (E; F)	\$	-

Under Regulations 7.0.3(1), 7.0.3(3) and 7.0.3(4) of the *Pension Benefits Act (Ontario)*, a contribution holiday may be permissible if an actuarial cost certificate is filed within the first 90 days of the fiscal year and the amount of the contribution holiday is less than the amount of the Available Actuarial Surplus.

Excess Surplus

The *Income Tax Act* requires that any excess surplus first be applied to reduce or eliminate the company contribution requirements. Excess surplus is defined in Section 147.2(2)(d) of the *Income Tax Act*, as the portion of surplus (if any) that exceeds 25% of the going concern liabilities.

Since the surplus is less than 25% of the going concern liabilities plus to Provision for Adverse Deviation, there is no excess surplus and therefore it does not impact the development of the company contribution requirements.

Development of Minimum Required Company Contribution

The table below presents the development of the minimum required company contribution for each of the plan years covered by this report.

	Jan 1, 2020 to Dec 31, 2020	Jan 1, 2021 to Dec 31, 2021	Jan 1, 2022 to Dec 31, 2022
Company normal cost	\$ -	\$ -	\$ -
Special payments toward amortizing unfunded liability	-	-	-
Special payments toward amortizing solvency deficiency	-	-	-
Contribution exempt from increase under transitional rules	-	-	-
Required application of excess surplus	-	-	-
Permitted application of available actuarial surplus	-	-	-
Minimum Required Company Contribution, Prior to Application of Prior Year Credit Balance	\$ -	\$ -	\$ -
Permitted application of prior year credit balance	-	-	-
Minimum Required Company Contribution	\$ -	\$ -	\$ -

Required City contributions are zero for the next 3 years.

Development of Maximum Deductible Company Contribution

The table below presents the development of the maximum deductible company contribution for each of the plan years covered by this report.

The maximum deductible company contribution presented in the table below for a given plan year is calculated assuming that the City makes the maximum deductible company contribution in the first plan year covered by this report.

	Jan 1, 2020 to Dec 31, 2020	Jan 1, 2021 to Dec 31, 2021	Jan 1, 2022 to Dec 31, 2022
Company normal cost	\$ -	\$ -	\$ -
Greater of the Unfunded liability and the hypothetical wind up deficiency	9,490,000	-	-
Required application of excess surplus	-	-	-
Maximum Deductible Company Contribution	\$ 9,490,000	\$ -	\$ -

If the City wishes to make the maximum deductible company contribution, it is advisable to contact the Plan's actuary before making such contribution to ensure that the contribution will be permissible and deductible and that any regulatory requirements are considered.

Section 6: Actuarial Certificate

Actuarial Opinion, Advice and Certification for the Hamilton-Wentworth Retirement Fund

Canada Revenue Agency Registration Number: 1073352

Opinion

This actuarial certification forms an integral part of the actuarial valuation report for the Plan as at December 31, 2019. I confirm that I have prepared an actuarial valuation of the Plan as at December 31, 2019 for the purposes outlined in the Introduction section to this report and consequently:

My advice on funding is the following:

- The City should contribute the amounts within the range of minimum and maximum contribution amounts as outlined in Section 5 of this report, in accordance with legislative requirements.
- The next actuarial valuation for the purpose of developing funding requirements should be performed no later than as at December 31, 2022.

I hereby certify that, in my opinion:

- The contribution range as outlined in this report is expected to be sufficient to satisfy the Plan's funding requirements.
- The company contribution range outlined in this report qualifies as eligible contributions under Section 147.2(2) of the *Income Tax Act*.
- The pre-1990 maximum pension restrictions in Subsection 8504(6) of the Regulations to the *Income Tax Act* do not apply to any members of the Plan.
- For the purposes of the valuation:
 - The data on which this valuation is based are sufficient and reliable;
 - The assumptions used are appropriate; and
 - The actuarial cost methods and the asset valuation methods used are appropriate.

- This report and its associated work have been prepared, and my opinion given, in accordance with accepted actuarial practice in Canada and in compliance with the requirements outlined in subparagraphs 147.2(2)(a)(iii) and (iv) of the *Income Tax Act*.
- Notwithstanding the above certifications, emerging experience differing from the assumptions will result in gains or losses that will be revealed in subsequent valuations.

Mark Pearson, FCIA, FSA
Associate Partner

Aon
20 Bay Street, Suite 2300
Toronto, ON M5J 2N9

November 2020

Appendix A: Assets

Asset Data

The Plan's assets are combined in a pooled fund under a Master Trust agreement administered by RBC Investor Services Trust and are managed by a number of different investment managers. This type of arrangement governs only the investment of the assets deposited into the trust fund in no way "guarantees" the benefits provided under the Plan or the costs of providing such benefits. The asset information presented in this report is based on the financial statements of the pension fund prepared by KPMG LLP.

Tests of the sufficiency and reliability of the asset data were performed and the results were satisfactory. The tests included:

- A reconciliation of actual cash flow with expected cash flow from the previous actuarial report; and
- A reconciliation of any anticipated benefit payments (for retirees, terminated, or deceased members) against the financial statements of the pension fund for confirmation of payments.

Market Value of Assets

The following is a summary of the composition of the Plan's assets by asset type as reported by RBC Investor Services Trust as at December 31, 2019. For comparison purposes, the composition at the previous valuation date of December 31, 2016 is also shown.

	December 31, 2019		December 31, 2016	
	\$	%	\$	%
Cash and short term	775,012	1.4%	559,513	0.9%
Canadian fixed income	26,150,980	47.7%	25,672,370	43.2%
Canadian equities	17,568,336	32.1%	18,449,388	31.1%
Foreign equities	<u>10,326,547</u>	<u>18.8%</u>	<u>14,762,078</u>	<u>24.8%</u>
Total Invested Assets	54,820,875	100.0%	59,443,349	100.0%

Target Asset Mix

The target asset mix of the Plan is contained in the Plan's Statement of Investment Policies and Procedures. The Plan is currently on a glide path based on the funded ratio on a wind-up basis. As the funded ratio increases, the target mix changes in increments with an increase to fixed income and a corresponding decrease to return seeking equities. The below is the current target asset mix based on the wind-up results of the combined City defined benefit pension plans held in the Master Trust:

	Target
Short term	0.0%
Fixed income (including Real Return Bonds)	52.0%
Canadian equities	24.0%
Foreign equities	<u>24.0%</u>
	100.0%

Based on the glide path, the ultimate target asset mix is as follows:

	Target
Short term	0.0%
Fixed income (including Real Return Bonds)	85.0%
Canadian equities	8.0%
Foreign equities	<u>7.0%</u>
	100.0%

Reconciliation of Changes in Adjusted Market Value of Assets

The table below reconciles changes in the market value of assets between December 31, 2016 and December 31, 2019.

	Jan 1, 2017 to Dec 31, 2017	Jan 1, 2018 to Dec 31, 2018	Jan 1, 2019 to Dec 31, 2019
Adjusted Market Value of Assets, Beginning of Plan Year	\$ 59,443,000	\$ 59,418,000	\$ 52,248,000
Cash Flows During Plan Year			
City contributions	\$ 1,107,000	\$ 1,294,000	\$ 1,430,000
Benefit disbursements	(6,317,000)	(6,009,000)	(5,861,000)
Investment fees/expenses	(97,000)	(116,000)	(115,000)
Non-investment fees/expenses	(109,000)	(105,000)	(92,000)
Total	\$ (5,416,000)	\$ (4,936,000)	\$ (4,638,000)
Investment Income	\$ 5,391,000	\$ (2,234,000)	\$ 7,211,000
Adjusted Market Value of Assets, End of Plan Year	\$ 59,418,000	\$ 52,248,000	\$ 54,821,000
Rate of return, net of fees/expenses	9.1%	-4.3%	14.0%

Development of Actuarial Value of Assets

The actuarial value of assets is equal to the adjusted market value of assets.

Appendix B: Membership Data

Source of Data

This valuation was based on member data provided by the Company as of December 31, 2019. Tests of the sufficiency and reliability of the member data were performed and the results were satisfactory. The tests included:

- A reconciliation of membership status against the membership status at the last valuation. This test was performed to ensure that all members were accounted for. A summary of this reconciliation follows on the next page;
- A reconciliation of birth, hire, and participation dates against the corresponding dates provided for the last valuation to ensure consistency of data;
- A reconciliation of any stated benefit payments since December 31, 2016 (for retired, terminated, or deceased members) against the financial statements of the pension fund for confirmation of the payments; and
- A reconciliation of inactive member benefit amounts against the corresponding amounts provided for the last valuation to ensure consistency of data.

There was no information missing from the data, so no assumptions were required with respect to such data.

A copy of the administrator certification certifying the accuracy and completeness of the member data (and the Plan provisions summarized in this report) is included in Appendix G of this report.

Membership Reconciliation

The table below reconciles the number of members as of December 31, 2019 with the number of members as of December 31, 2016 and the changes due to experience in the period.

	Retirees	Beneficiaries	Total
Members, December 31, 2016	92	79	171
Changes due to:			
New members	-	-	-
Terminations	-	-	-
Deceased with spouse	(9)	9	-
Deceased or benefits ended	(8)	(23)	(31)
Data correction	<u>-</u>	<u>-</u>	<u>-</u>
Net change	(17)	(14)	(31)
Members, December 31, 2019	75	65	140

Membership Summary

Below is a summary of information as at December 31, 2019. Information as at December 31, 2016 is shown for comparison purposes.

Retirees

Group	December 31, 2019**			December 31, 2016***		
	Police	Other	Total	Police	Others	Total
Number of members	74	1	75	89	3	92
Average age	83.3	93.8	83.4	81.2	92.1	81.5
Average annual pension (excluding bridge)	\$51,581	\$ *	\$ 50,971	\$ 48,215	\$ 5,704	\$ 46,829
Proportion female	4%	0%	4%	4%	67%	7%

Beneficiaries

Group	December 31, 2019**			December 31, 2016***		
	Police	Other	Total	Police	Others	Total
Number of members	63	2	65	77	2	79
Average age	86.6	93.5	86.8	84.7	90.5	84.9
Average annual pension (excluding bridge)	\$ 30,524	\$ 12,838	\$ 29,980	\$ 28,274	\$ 12,137	\$ 27,865
Proportion female	100%	100%	100%	96%	100%	96%

* Data suppressed for confidentiality reasons

**Pension includes increase of 1.89% granted January 1 of the following year

***Pension includes increase of 1.45% granted January 1 of the following year

Retirees and Beneficiaries Distribution

The following table provides a breakdown of the information used at December 31, 2019. The table shows the number and total monthly lifetime pension of retirees and beneficiaries as at December 31, 2019, grouped by age and number of years of retirement.

Age	Years Retired				Total
	15–19.9	20–24.9	25–29.9	>=30	
65–69.9					
70–74.9	2	6	1	2	11
	\$ *	\$ 4,410	\$ *	\$ 2,286	\$ 3,610
75–79.9	1	3	16	2	22
	\$ *	\$ 4,961	\$ 4,068	\$ *	\$ 4,133
80–84.9		1	26	6	33
		\$ *	\$ 3,756	\$ *	\$ 3,494
85–89.9			19	23	42
			\$ 4,001	\$ 3,189	\$ 3,557
90–94.9			3	23	26
			\$ 1,775	\$ 2,721	\$ 2,611
60–99.9				6	6
				\$ 2,955	\$ 2,955
>=100					
Count	3	10	65	62	140
Total Monthly Lifetime Pension	\$ 4,152	\$ 4,577	\$ 3,793	\$ 2,842	\$ 3,435

* Data suppressed for confidentiality reasons

Appendix C: Going Concern Assumptions and Methods

Assumptions and Methods

A member's entitlements under a pension plan are generally funded during the period over which service is accrued by the member. The cost of each member's benefits is allocated in some fashion over the member's service. An actuarial valuation provides an assessment of the extent to which allocations relating to periods prior to a valuation date (often referred to as the actuarial liabilities) are covered by the plan's assets.

The going concern valuation provides an assessment of a pension plan on the premise that the plan continues on into the future indefinitely based on assumptions in respect of future events upon which a plan's benefits are contingent and methods that effectively determine the way in which a plan's costs will be allocated over the members' service. The true cost of a plan, however, will emerge only as experience develops, investment earnings are received, and benefit payments are made.

This appendix summarizes the going concern assumptions and methods that have been used for the going concern valuation of the Plan at the valuation date. The going concern assumptions and methods have been chosen to reflect our understanding of the Plan's funding objectives with due respect to accepted actuarial practice and regulatory constraints. For purposes of this valuation, the going concern methods and assumptions were reviewed and changes as indicated were made.

The actuarial assumptions and methods used in the current and previous valuations are summarized below and described on the following pages.

	December 31, 2019	December 31, 2016
Economic Assumptions		
Discount rate	4.40% per year	4.50% per year
Inflation rate	2.00% per year	2.25% per year
Indexation rate	2.00% per year	0.00% per year
Investment expenses	0.20% per year (taken into account in the discount rate assumption)	0.27% per year (taken into account in the discount rate assumption)
Non-investment expenses	0.20% per year (taken into account in the discount rate assumption)	0.17% per year (taken into account in the discount rate assumption)
Provision for adverse deviation	9.80% of non-indexed liabilities	Not Applicable
Margin for adverse deviation	Not Applicable	0.30% per year (taken into account in the discount rate assumption)

	December 31, 2019	December 31, 2016
Demographic Assumptions		
Mortality table	115% of the 2014 Canadian Public Pensioner Mortality Table with generational improvements using CPM Scale B ¹ (sex-distinct rates)	100% of the 2014 Canadian Public Pensioner Mortality Table with generational improvements using CPM Scale B (sex-distinct rates)
Retirement rates	Not Applicable	Same
Termination rates	Not Applicable	Same
Disability rates	Not Applicable	Same
Proportion married		
Non-retired proportion with spouse	Not Applicable	Same
Non-retired spousal age differential	Not Applicable	Same
Retired members	Actual marital status and ages are used	Same
Methods		
Actuarial cost method	Unit credit	Same
Asset valuation method	Market value of assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit as of the valuation date	Same

¹ No preretirement mortality was applied

Justification of Actuarial Assumptions and Methods

Margins for Adverse Deviations

The actuary has discussed the Plan's experience with the City and compared it to the expected experience. This review indicates that the use of the PfAD achieves the Company's desire to maintain safety cushions; therefore the decision was made to not to include any additional margins for conservatism. The Provisions for PfAD that is required by Ontario Regulation is discussed later in this section.

Economic Assumptions

Discount Rate

The overall expected return was developed using best-estimate returns for each major asset class in which the pension fund is invested. A Monte Carlo simulation is performed where the portfolio returns are projected assuming annual rebalancing. Expected plan cash flows are projected for a maximum of 30 years reflecting the plan's time horizon and discounted using the simulated returns. The internal rate of return is then calculated for each scenario and the results are used to develop an overall best-estimate rate of return for the entire pension fund. Gains from rebalancing and diversification are implicit to this return.

In determining the expected return, we have taken into account the current Master Trust target asset mix of 48% equities / 52% fixed income (including all details of asset categories) as well as the City's policy of intending to increase the investment in bonds and decrease the investment in equities as the funded position of the plan improves. We have assumed that the plan's investment will be 45% equities / 55% fixed income by the year 2035 and have assumed a smooth transition of assets during that time.

The overall expected return has been established based on the City's investment policy and its funding policy (whether formal or informal) and objectives. There may be some barriers to achieving this return such as inflation higher than expected, asset returns lower than expected, and assets and liabilities that are mismatched.

The following table lays out the adjustments that have been made to the overall expected rate of return in order to arrive at our going concern discount rate assumption:

Development of Discount Rate

Overall expected return				4.67%
Non-investment expenses				(0.20)%
Investment expenses				
Passive	(1)	(0.07)%		
Actively managed	(2)	<u>(0.13)%</u>		
			(1)+(2)	(0.20)%
Additional returns due to active management				<u>0.13%</u>
Discount Rate				4.40%

Inflation Rate

The inflation rate is assumed to be 2.00% per year. The inflation rate assumption reflects our best estimate of future inflation considering current economic and financial market conditions.

Increases in the Maximum Pension Limit

Pensions are limited to the maximum limits under the *Income Tax Act*. The *Income Tax Act* specifies both a dollar limit, and in addition pensions cannot exceed 2% of indexed highest average compensation per year of credited service. The assumed increase in the dollar limit reflects the assumed rate of inflation plus the productivity increase assumption.

Expenses

Since the discount rate has been established net of all/investment expenses, no explicit assumption is required for all/investment expenses.

Provision for Adverse Deviation

For the purpose of this valuation, the PfAD is established based on the target asset allocation for each category of investments set out in the Plan's Statement of Investment Policies and Procedures (SIPP) in effect at the date of this report.

Asset Mix Component	Investment Categorization under Regulation 76 (12)	Categorization under Regulation 11.2 (8)¹	Target Asset Allocation(%)
Cash and short term	4	Fixed Income ("L")	0.0%
Fixed-income	15	Fixed Income ("L")	52.0%
Canadian equities	13	Non-Fixed Income	24.0%
Foreign equities	14	Non-Fixed Income	24.0%
			100.0%
Fixed income ("L")			52.0%
Alternative Investment ("M")			0.0%
(a) Percentage of fixed income for PfAD ["L" + 50% * "M"]			52.00%
(b) Percentage of non-fixed income for PfAD [100%-(a)]			48.00%
(c) Asset mix component (see table below) ²			4.80%

Percent of Non-Fixed Income Assets	PfAD for Closed Plans	PfAD for Open Plans
0%	0%	0%
20%	2%	1%
40%	4%	2%
50%	5%	3%
60%	7%	4%
70%	11%	6%
80%	15%	8%
100%	23%	12%

¹ The fixed income investments satisfy the minimum credit rating requirements prescribed by the Regulation.

² Based on linear interpolation.

Benchmark Discount Rate (BDR)

(d) V39056 rate at the valuation date	1.76%
(e) BDR [(d)+1.5%*(a)+5.0%*(b)+0.5%]	5.44%
(f) Best estimate discount rate ¹	4.67%
(g) Plan duration	6.26

PfAD is Determined as Follows:

Fixed component (open 4% or closed 5%)	5.00%
Asset mix component	4.80%
BDR component [Max [0, (g)*((f)-(e))]]	<u>0.00%</u>
Total	9.80%

¹ Gross of non-investment expenses and passive investment management fees.

Demographic Assumptions

Mortality

At the last valuation, 100% of the 2014 Canadian Public Sector Pensioner Mortality Table with mortality improvements in accordance with CPM-B was used. After reviewing recent Plan experience, in addition to Plan member demographics, there is evidence to warrant changing to 115% of the 2014 Canadian Public Sector Pensioner Mortality Table with mortality improvements in accordance with CPM-B.

In 2017, the CIA released a research paper introducing a new Mortality Improvement Scale (MI-2017) and subsequently published an Education Note stating that both the MI-2017 and CPM-B Scales "constitute broad and relevant mortality improvement studies for the Canadian population." The continued use of the CPM-B mortality table and CPM-B projection scale are considered reasonable.

Retirement

As all members are retired, a retirement age assumption is not needed.

Termination of Employment

As all members are retired, an assumption regarding pre-retirement termination is not needed.

Other

Actuarial Cost Method

An actuarial cost method is a technique used to allocate in a systematic and consistent manner the expected cost of a pension plan over the years of service during which Plan members earn benefits under the Plan. By funding the cost of a pension plan in an orderly and rational manner, the security of benefits provided under the terms of the Plan in respect of service that has already been rendered is significantly enhanced.

The accrued benefit (or unit credit) actuarial cost method has been used for this valuation. Under this method, the accrued liability at the valuation date is determined as the lump sum required to provide the accrued pension benefit earned to that date. The normal cost for the Plan is the amount required to fund the benefits expected to accrue in the year following the valuation date.

The pattern of future contributions necessary to pre-fund future benefit accruals for any one particular individual will increase steadily as the individual approaches retirement. For a stable population (i.e., one where the average demographics of the group remain relatively constant from year to year), the normal cost will increase modestly over time. The accrued benefit actuarial cost method, therefore, allocates contributions among different periods in an orderly and rational manner for a stable population group.

In the event of future adverse experience, contributions in addition to the normal cost calculated under the accrued benefit actuarial cost method may be required to ensure that the Plan's assets are adequate to provide the benefits. Conversely, favourable experience may generate surplus which may serve to reduce future contribution requirements.

Asset Valuation Method

Market value, adjusted by in-transit cash flows was used as the actuarial value of assets for this valuation.

Appendix D: Solvency and Hypothetical Wind Up Assumptions and Methods

Valuation Assumptions

	December 31, 2019	December 31, 2016
Economic Assumptions		
Discount rate		
Transfer value basis	Not Applicable	Not Applicable
Annuity purchase basis — <i>Without indexation</i>	2.86% per year	2.91% per year
Duration used to determine annuity purchase basis	6.7	7.1
Transfer value basis — <i>With indexation</i>	Not Applicable	Not Applicable
Annuity purchase basis — <i>With indexation</i>	-0.29% per year	-0.09% per year
<i>Income Tax Act</i> dollar limit	\$3,092.22 per year	\$2,914.44 per year
Weighted solvency discount rate	2.86% per year	2.91% per year

	December 31, 2019	December 31, 2016
Demographic Assumptions		
Mortality table	2014 Canadian Pension Mortality Table with generational improvements using CPM Scale B ¹ (sex-distinct rates)	Same
Withdrawal rates	Not Applicable	Same
Retirement age	Not Applicable	
Termination of employment	Not Applicable	Same
Marital status		
Non-retired spousal proportion	Not Applicable	Same
Non-retired spousal age differential	Not Applicable	Same
Retired members	Actual marital status and ages are used	Same
Other		
Wind up expenses	\$70,000	Same
Actuarial cost method	Unit credit	Same
Asset valuation method	Market value of assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in transit as of the valuation date	Same
Incremental Cost		
The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings	Same as going concern	Same

¹ No preretirement mortality was applied

Based on the CIA's Guidance and information such as pension legislation, Plan provisions and Plan experience, we have made the following assumptions regarding how the Plan's benefits would be settled on Plan wind up:

	Percent of Liability Assumed to be Settled By Purchase of Annuities	Percent of Liability Assumed to be Settled By Lump-Sum Transfer
Active Members		
Not retirement eligible	Not Applicable	Not Applicable
Retirement eligible	Not Applicable	Not Applicable
Deferred Vested Members		
Not retirement eligible	Not Applicable	Not Applicable
Retirement eligible	Not Applicable	Not Applicable
Retired Members and Beneficiaries	100%	0%

Postulated Scenario

The postulated scenario is the assumption of immediate termination of employment for the active group at the valuation date. Therefore, no allowance for future salary increases or demographic experience are reflected.

Benefits Valued

	Solvency Valuation	Hypothetical Wind Up Valuation
Vesting	We have treated all accrued benefits as vested on Plan wind up.	We have treated all accrued benefits as vested on Plan wind up.
Grow-in Benefits	No longer relevant	No longer relevant
Exclusions	Post-retirement indexing was excluded from the valuation	Post-retirement indexing was excluded from the valuation
Post-valuation Date Benefit Increases	None were assumed	None were assumed
Indexing	Excluded from the valuation	Included in the valuation

Justification for Valuation Assumptions

We have set the aforementioned assumptions based on guidance prepared by the CIA Committee on Pension Plan Financial Reporting ("PPFRC") in Educational Note – Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates between December 31, 2019 and December 30, 2020 ("CIA Guidance") released on January 30, 2020.

For benefit entitlements that are expected to be settled by lump-sum transfer, we based the assumptions on Section 3500 (Pension Commuted Values) of the CIA Standards of Practice, using rates corresponding to a valuation date of December 31, 2019.

For benefit entitlements that are expected to be settled by purchase of annuities, we based the assumptions on information compiled by the PPFRC from insurance companies active in the group annuity market as described in the educational note.

Development of Discount Rates

The development of the discount rates is shown below.

Solvency annuity purchase discount rate	= V39062 + Duration Adjustment
	= 1.76% + 1.10%
	= 2.86% per year

Mortality Table

The derivation of the discount rate above is in conjunction with CPM2014 in accordance with the CIA Guidance.

Preretirement Mortality

We have made no allowance for preretirement mortality as all members are retired.

Assumptions Not Needed

The following are not relevant to the solvency or hypothetical wind up valuation:

- Increases in pensionable earnings;
- Termination of employment rates;
- Increases in CPP and OAS benefits;
- Increases in *Income Tax Act* maximum pension limit (we used the 2020 maximum); and
- Disability rates.

Estimated Wind Up Expenses

Plan wind up expenses would normally include such items as fees related to preparation of the actuarial wind up report, fees imposed by a pension supervisory authority, legal fees, administration, custodial and investment management expenses. We have assumed these fees would be \$70,000.

Calculation of Special Solvency Payments

To calculate the special payments necessary to liquidate the Solvency deficiency we used a weighted average of the solvency discount rates based on the relative proportions of benefit entitlements that are expected to be settled by purchase of annuities and lump-sum transfer.

Actuarial Cost Methods

Unit credit (accrued benefit) cost method as prescribed.

Asset Valuation Method Considerations

Assets for solvency purposes have been determined using market value, adjusted by in-transit cash flows.

Incremental Cost

The incremental cost represents the present value, at the calculation date (time 0), of the expected aggregate change in the liabilities between time 0 and the next calculation date (time t), adjusted upwards for expected benefit payments between time 0 and time t.

An educational note was published in December 2010 by the CIA Committee on PPFRC to provide guidance for actuaries on the calculation of this new information.

The calculation methodology can be summarized as follows:

- The present value at time 0 of expected benefit payments between time 0 and time t, discounted to time 0,
plus
- Projected liabilities at time t, discounted to time 0, allowing for, if applicable to the pension plan being valued:
 - expected decrements and related changes in membership status between time 0 and time t,
 - accrual of service to time t,
 - expected changes in benefits to time t,
 - a projection of pensionable earnings to time t,
 minus
- The liabilities at time 0.

The projection calculations take into account the following assumptions and additional considerations:

- The assumptions for the expected benefit payments and decrement probabilities, service accruals, and projected changes in benefits and/or pensionable earnings would be consistent with the assumptions used in the pension plan's going concern valuation.
- The assumptions used to calculate the projected liability at time t are consistent with the assumptions for the liabilities at time 0, assuming that interest rates remain at the levels applicable at time 0, that the select period is reset at time t for interest rate assumptions that are select and ultimate and that the Standards of Practice for the calculation of commuted values and the guidance for estimated annuity purchase costs in effect at time 0 remain in effect at time t.
 - Active and inactive Plan members as of time 0 are considered in calculating the incremental cost.

Appendix E: Summary of Plan Provisions

The following is a brief summary of the provisions of the Plan as at December 31, 2019.

Normal Retirement Age

Age 60 for Police employees, age 65 for all others.

Amounts of Annual Pension

Normal and Disability Retirement: 2% of average annual earnings in best 5 years before retirement for each year of credited service up to 35 years reduced by 0.675% of the 5-year average earnings up to the average YMPE over the last five years for each year of contributory service after January 1, 1966. Reduction suspended from date of retirement to age 65 for CPP benefit.

Death Benefits

After retirement: Based on election made within range of allowable options.

Pension Increases

The Plan was amended effective January 1, 2008 to provide indexation equal to the inflation related adjustment formula used to increase pension benefits, pensions and deferred pensions under the Ontario Municipal Employees Retirement System Act, 2006, as amended from time to time. Such inflation adjustment shall not be less than zero no more than 6%. Any inflation adjustment in excess of 6% shall be carried forward for use in a subsequent year.

Bridge Benefit

A bridge benefit is payable on early retirement in the amount of the estimated CPP benefit until age 65.

Appendix F: Glossary of Terms

- The **actuarial value of assets** is the asset value used for going concern valuation purposes. Smoothing methods are sometimes used to smooth investment gains and losses over a certain period.
- The **estimated wind up expenses** is an estimate of the administrative and other expenses expected to be charged against the pension fund if the Plan were to terminate on the valuation date.
- The **going concern excess/(unfunded liability)** is the difference between the actuarial value of assets and sum of the going concern liabilities, the amount equal to the provision for adverse deviations in respect of the going concern liabilities of the pension plan, and the prior year credit balance of the pension plan.
- The **going concern funded ratio** compares the value of the assets of the pension plan determined on the basis of a going concern valuation, including accrued and receivable income but excluding the amount of any letter of credit held in trust for the pension plan, exceeds the prior year credit balance to the total amount of the going concern liabilities of the pension plan.
- The **going concern liabilities** are the actuarial present value of benefits earned in respect of service prior to the valuation date. The going concern liabilities are calculated using the going concern assumptions and methods summarized in Appendix C of this report.
- The **going concern position** is the difference between the actuarial value of assets and the going concern liabilities.
- The **maximum deductible company contribution** refers to an eligible contribution pursuant to Section 147.2(2) of the *Income Tax Act*. Under Subsection 8502(b) of the Regulations to the *Income Tax Act*, each Company contribution made after January 1, 1991 in respect of a defined benefit provision of a registered pension plan must be such eligible contribution.

In a company's fiscal year, the following contributions are eligible under Section 147.2(2) of the *Income Tax Act*.

- The company normal cost, eligible under Section 147.2(2) subject to certification by the actuary and approval by the Canada Revenue Agency; plus
- Special payments eligible under Section 147.2(2) up to the amount of the unfunded liability, the solvency deficiency, or the hypothetical wind up deficiency, whichever is greater, subject to certification by the actuary and approval by the Canada Revenue Agency; less
- Required application of excess surplus.

The company normal cost and special payments for this Plan will be deductible under Section 147.2(2) of the *Income Tax Act*, subject to the approval of the Canada Revenue Agency.

Note that contributions to a plan are still permissible and deductible if there is an excess surplus, providing there is simultaneously a solvency or hypothetical wind up deficiency in the Plan or the contributions are required as minimum contributions under provincial or federal *Act* legislation, pursuant to Subsections 8516(2) and (3) of the Regulations to the *Income Tax Act*.

One restriction under the *Income Tax Act* is that if there is an excess surplus, and a solvency or hypothetical wind up deficiency, the maximum deductible contribution is restricted to the full amount of the deficiency without allowance for interest or any other contributions such as company normal cost and/or transfer deficiency payments.

In order to be deductible in a given fiscal year, company contributions must be made not later than 120 days after the end of the fiscal year.

- The **minimum required company contribution** for each plan year is equal to:
 - The company normal cost; plus
 - Special payments toward amortizing any unfunded liability over ten (10) years beginning one year from the date on which the unfunded liability was established; plus
 - Special payments toward amortizing any solvency deficiency over five years beginning no later than 12 months (24 months if the company elected temporary funding relief option 8) from the date on which the solvency deficiency was established (this period of years may be longer if the Company has elected temporary funding relief options 3, 5, and/or 7); less
 - Required application of excess surplus; less
 - Permitted application of surplus; less
 - Permitted application of PYCB.

In order to satisfy the requirements of the *Act* and its Regulations, contributions to the fund must be made in accordance with the following rules:

- Required member contributions (if any) must be remitted to the pension fund within 30 days following the month in which the contributions were received from the member or deducted from his or her remuneration.
- Company normal cost contributions must be remitted to the pension fund within 30 days after the end of the month for which the contributions are payable.
- Special payments must be remitted to the pension fund in the month for which they are payable.
- The **prior year credit balance** is
 - The PYCB stated in the last report in respect of the Plan under the Regulation; plus
 - The total amount of contributions made to the Plan by the Company after the valuation date of the last report in respect of the Plan and before the valuation date for the report being prepared; less
 - The total minimum amount of contributions required to have been made after the valuation date of the last report in respect of the Plan and before the valuation date for the report being prepared, if the contributions had been calculated without reference to any PYCB.

The Company may choose to set the PYCB between nil and the amount as calculated above, but may not recapture the amount forfeited at any time.

- **Reduced solvency deficiency** the difference between the sum of 85% of the solvency liability, 85% of solvency liability adjustment and the PYCB to the sum of the solvency asset and solvency asset adjustment.
- **Solvency/Hypothetical wind up assets** are the market value of pension fund assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in-transit at the valuation date.

- The **solvency asset adjustment** is an adjustment that may be made to the solvency assets to reflect:
 - The impact of using an averaging method that stabilizes short-term fluctuations in the market value of the Plan's assets calculated over a period of not more than five years; plus
 - The present value of any remaining special payments required to liquidate any unfunded liability (for service not previously recognized for benefit determination purposes) established after December 31, 1987; plus
 - The present value of any remaining special payments other than those above that are scheduled for payment within six years after the valuation date. This period of years may be longer if the Company has elected temporary funding relief options 3, 5, 7, and/or 8.
- The **solvency liabilities** are the actuarial present value of benefits earned in respect of service prior to the valuation date determined as if the Plan were wound up on the valuation date and taking into account Section 74 of the *Act* (i.e., grow-in). In calculating the solvency liabilities, which includes plant closure benefits or permanent layoff benefits that would be immediately payable if the Plan sponsor's business was discontinued on the valuation date, the *Act* and its Regulations permit the exclusion of the following benefits:
 - Any escalated adjustments;
 - "Excluded plant closure benefits" that the City elected on November 26, 1992 to exclude;
 - "Excluded permanent layoff benefits" that the City elected on November 26, 1992 to exclude;
 - Special allowances other than those where the member has met all age and service eligibility requirements;
 - Consent benefits other than those where the member has met all eligibility requirements except the consent of the employer, or in the case of a jointly sponsored pension plan, the consent of the employer or the administrator;
 - Prospective benefit increases;
 - Potential early retirement window benefit values; and
 - Pension and ancillary benefits payable under a qualifying annuity contract.

The solvency liabilities are determined using benefit entitlements on the assumption that the Plan has neither a surplus nor a deficit. The solvency liabilities are calculated using the solvency valuation assumptions summarized in Appendix D of this report.

- The **solvency liability adjustment** is an adjustment that may be made to the solvency liabilities to reflect the impact of using a solvency valuation discount rate for discounting the liability that is the average of market discount rates calculated over the same period of time as that used in the calculation of the solvency asset adjustment.
- The **solvency position** is the difference between the solvency assets (net of estimated wind up expenses) and the solvency liabilities.
- The **solvency ratio** compares the solvency assets (plus any letters of credit held in trust exceeding the prior year credit balance) to the solvency liabilities for purposes of Subsections 14(2) and (3) of the Regulations of the *Act* to determine the latest effective date of the next required valuation.
- The **solvency excess/(deficiency)** is the solvency position, increased by the solvency asset adjustment and the solvency liability adjustment, then decreased by the PYCB.

- The **special payments** are payments required to liquidate the unfunded liability and/or reduced solvency deficiency:
 - The going concern special payments are payments required to liquidate the unfunded liability, with interest at the going concern valuation discount rate, by equal monthly instalments over a period of ten (10) years beginning one year from the valuation date of the report in which the going concern unfunded liability was determined.
 - The solvency special payments are payments required to liquidate the reduced solvency deficiency, with interest at the solvency valuation discount rate, by equal monthly instalments over a period of five years beginning no later than 12 months (24 months if company elected temporary funding relief option 8) from the valuation date of the report in which the solvency deficiency was determined. This period of years may be longer if the City has elected temporary funding relief options 3, 5, and/or 7.
- The **total normal cost** is the actuarial present value of benefits expected to be earned in respect of service for each year starting on the valuation date. Required member contributions (if any) are deducted from the total normal cost to determine the company normal cost. The total normal cost is calculated using the going concern valuation assumptions and methods summarized in Appendix C of this report.
- The **transfer ratio** compares the solvency assets, minus the lesser of the PYCB and the required company contributions until the next required valuation (before application of the PYCB), to the solvency liabilities plus the liability of any excluded benefits (except for pension benefits and ancillary benefits payable under a qualifying annuity contract). If the transfer ratio is less than 1.00, lump-sum transfers from the pension fund under Section 42 of the *Act* are limited to the commuted value of the member's pension multiplied by the transfer ratio. The administrator may transfer the entire commuted value if:
 - The administrator is satisfied that an amount equal to the transfer deficiency has been remitted to the pension fund; or
 - The aggregate of transfer deficiencies for all transfers made since the last valuation date does not exceed 5% of the Plan's assets at that time.

In June 2009, Subsection 19 of the Regulations of the *Act* was amended and Policy T800-402 was released. The Policy imposes additional restrictions for payment of commuted values under certain circumstances.

Appendix G: Administrator Certification

With respect to the Hamilton-Wentworth Retirement Fund, forming part of the actuarial report as at December 31, 2019, I hereby certify that, to the best of my knowledge and belief:

- The asset data provided or made available to the actuary is complete and accurate;
- The membership data and subsequent query answers provided or made available to the actuary are complete and accurate for all persons who are entitled to benefits under the terms of the Plan in respect of service up to the date of the valuation;
- The Plan provisions provided or made available to the actuary are complete and accurate;
- The actuary has been notified of all relevant events subsequent to the valuation measurement date; and
- The terms of engagement contained in Section 1 of this report are accurate and reflect the plan administrator's direction.

Name (print) of Authorized Signatory

Title

Signature

Date

About Aon

Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.

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