THE CORPORATION OF THE CITY OF HAMILTON

HAMILTON MUNICIPAL RETIREMENT FUND

Actuarial Valuation as at December 31, 2017

October 29, 2018

Registration Number: 0275123

DISCLAIMERS

This document is an actuarial valuation report of a pension plan. It is technical in nature and the reader should seek expert advice to fully understand it. The actuarial results presented here are based on numerous economic and demographic assumptions as to future events. Emerging experience, differing from the assumptions, will result in gains or losses that will be revealed in future actuarial valuations.

This report is based on the terms of engagement listed in Appendix A.

This report is based on the premise that all the plan's assets, including any letters of credit, are available to meet the plan's liabilities included in this valuation.

This report is based on the premise that the plan remains a going concern. This report does not address the disposition of any surplus assets remaining in the event of plan windup. If an applicable pension regulator or other entity with jurisdiction directs otherwise, certain financial measures contained in this report, including contribution requirements, may be affected.

The results presented in this report have been developed using a particular set of actuarial assumptions. Other results could have been developed by selecting different actuarial assumptions. The results presented in this report are reasonable actuarial results based on actuarial assumptions reflecting our expectation of future events.

Future contribution levels may change as a result of future changes in the actuarial methods and assumptions, the membership data, the plan provisions and the legislative rules, or as a result of future experience gains or losses, none of which have been anticipated at this time.

The results were developed with various data as at the valuation date that were provided to us: plan membership data, plan assets data, plan provisions, funding policy and statement of investment policy. Towers Watson Canada Inc. (“Willis Towers Watson”) has relied on these data after verifying them and assessing their reasonableness. However, Willis Towers Watson has not independently audited these data.

The information contained in this report was prepared for The Corporation of the City of Hamilton, for its internal use and for filing with the Pension authorities, in connection with the actuarial valuation of the plan prepared by Willis Towers Watson. This report is not intended, nor necessarily suitable, for other parties or for other purposes. Furthermore, some results in this report are based on assumptions mandated by legislation. These results may not be appropriate for purposes other than those for which they were prepared. Further distribution of all or part of this report to other parties (except where such distribution is required by applicable legislation) or other use of this report is expressly prohibited without Willis Towers Watson's prior written consent. Willis Towers Watson is available to provide additional information with respect to this report to the above-mentioned intended users upon request.

Definitions:

DB means the defined benefit ("DB") provision of the plan. Refer to the summary of plan provisions in Appendix F for further details.

Pension authorities means the Financial Services Commission of Ontario and the Canada Revenue Agency ("CRA").

Pension legislation means the *Pension Benefits Act (Ontario)* and Regulation thereto and the *Income Tax Act (Canada)* and Regulations thereto ("ITA").

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Introduction

Purpose

This report with respect to the Hamilton Municipal Retirement Fund has been prepared for The Corporation of the City of Hamilton, the plan administrator, and presents the results of the actuarial valuation of the plan as at December 31, 2017.

The principal purposes of the report are:

- to present information on the financial position of the plan on going concern, solvency and hypothetical windup bases;
- to provide the basis for employer contributions.

Significant Events since Previous Actuarial Valuation (December 31, 2014)

There have been no changes to the plan provisions, the legislative and actuarial standards having an impact on the valuation results. Changes to the going concern basis, if any, are described in Appendix C. Changes to the solvency basis are described in Appendix D.

In 2016, the Pension legislation was amended to provide temporary solvency relief. This is the first valuation of the plan on or after December 31, 2015. No relief is exercisable due to the results of the valuation.

On May 19, 2017, the Ontario Ministry of Finance announced proposed reforms to the funding framework for defined benefit pension plans. On April 20, 2018, final regulations were released, and apply to reports with valuation dates on and after December 31, 2017 which are filed after April 30, 2018. As this report has an effective date on or after December 31, 2017 it has been prepared on the basis of the new funding rules.

Effective June 15, 2015, the *Standards of Practice for Pension Commuted Values* published by the Canadian Institute of Actuaries require the use of the CPM2014 mortality rates combined with the mortality improvement scale CPM-B. The updated mortality rates have been reflected for purposes of the solvency and hypothetical windup valuations.

Subsequent Events

We completed this actuarial valuation on October 29, 2018.

To the best of our knowledge and on the basis of our discussions with The Corporation of the City of Hamilton, no events which would have a material financial effect on the actuarial valuation occurred between the actuarial valuation date and the date this actuarial valuation was completed.

Next Valuation

The next actuarial valuation of the plan must be performed with an effective date not later than December 31, 2020.

Section 1: Going Concern Financial Position

1.1 Statement of Financial Position

	December 31, 2017			December 31, 2014
	Fire	Others	Total	Total
Going Concern Value of Assets	$ 72,234,100	$ 5,445,400	$ 77,679,500	$ 82,150,100
Actuarial Liability				
Active members	$ 0	$ 0	$ 0	$ 0
Retired members	40,599,200	1,281,800	41,881,000	50,066,500
Beneficiaries	17,119,800	1,430,400	18,550,200	17,305,300
Terminated vested members	0	126,400	126,400	122,100
Provision for future pension increases	8,873,200	270,500	9,143,700	10,327,200
Total actuarial liability	$ 66,592,200	$ 3,109,100	69,701,300	$ 77,821,100
Actuarial Surplus (Unfunded Actuarial Liability)	$ 5,641,900	$ 2,336,300	$ 7,978,200	$ 4,329,000
Funded Ratio			111.4%	105.6%
Provision for Adverse Deviation (PfAD)	$ 4,040,300	$ 198,700	$ 4,239,000	N/A
Actuarial Surplus (Unfunded Actuarial Liability) After PfAD	$ 1,601,600	$ 2,137,600	$ 3,739,200	$ 4,329,000
Excess Actuarial Surplus[1]			$ 0	$ 0

Notes:

[1] Considered to be nil if there is a hypothetical windup or solvency deficit.

[2] The PfAD was not applied to the provision for future pension increases.

Comment:

- The split of assets between “Fire” and “Other” groups is provided by The Corporation of the City of Hamilton, based on the pension payroll in effect at the valuation date.

1.2 Reconciliation of Financial Position

Actuarial surplus (unfunded actuarial liability) as at December 31, 2014			$	4,329,000
Net special payments				0
Expected interest on:				
■ Actuarial surplus (unfunded actuarial liability)	$	682,400		
■ Net special payments		0		682,400
Plan experience:				
■ Investment gains (losses)	$	3,756,600		
■ Mortality gains (losses)		4,780,300		
■ Pension increases less than 2% per annum assumed		1,094,900		
■ Gains (losses) from miscellaneous sources		(1,700)		9,630,100
Change in actuarial basis:				
■ Demographic assumptions		(547,100)		
■ Economic assumptions		(6,116,200)		(6,663,300)
Impact of PfAD				(4,239,000)
Actuarial surplus (unfunded actuarial liability) as at December 31, 2017			$	3,739,200

1.3 Contributions (Ensuing Year)

There are no current active members in the plan and therefore no contributions required for current service.

Section 2: Solvency and Hypothetical Windup Financial Position

2.1 Statement of Solvency and Hypothetical Windup Financial Position

	December 31, 2017			December 31, 2014
	Fire	Others	Total	Total
Solvency Value of Assets				
Market value of assets	$ 72,234,100	$ 5,445,400	$ 77,679,500	$ 82,150,100
Provision for plan windup expenses	(93,000)	(7,000)	(100,000)	(100,000)
Total solvency value of assets	$ 72,141,100	$ 5,438,400	$ 77,579,500	$ 82,050,100
Solvency Liability				
Active members	$ 0	$ 0	$ 0	$ 0
Retired members	42,671,700	1,301,200	43,972,900	57,064,800
Beneficiaries	18,194,600	1,490,600	19,685,200	19,436,300
Terminated vested members	0	126,400	126,400	122,100
Total actuarial liability	$ 60,866,300	$ 2,918,200	63,784,500	76,623,200
Solvency Surplus (Unfunded Solvency Liability)	$ 11,274,800	$ 2,520,200	$ 13,795,000	$ 5,426,900
Solvency ratio			Not less than 100%	Not less than 100%
Total hypothetical windup liability	$ 76,573,900	$ 3,386,300	$ 79,960,200	$ 96,664,100
Hypothetical Windup Surplus (Unfunded Hypothetical Windup Liability)	$ (4,432,800)	$ 2,052,100	$ (2,380,700)	$ (14,614,000)
Transfer ratio			97.15%	84.99%

Comments:

- As a result of Ontario Regulation 73/95, coverage under the Pension Benefit Guarantee Fund (PBGF) is exempted and PBGF assessment is not required.

- The solvency actuarial valuation results presented in this report are determined under a scenario where, following a plan windup, the employer continues its operations.

- The split of assets between “Fire” and “Others” groups is provided by The Corporation of the City of Hamilton, based on the pension payroll in effect at the valuation date.

- The hypothetical windup valuation results presented in this report are determined under a scenario where, following a plan windup, the employer continues its operations.

- As the transfer ratio is less than 1.00, transfer deficiencies must be paid over a maximum period of five years unless the cumulative transfer deficiencies are within the limits prescribed by the Pension legislation or the employer remits additional contributions in respect of the transfer deficiencies. Pursuant to Regulations 19(4) or 19(5) to the Pension legislation, approval of the Superintendent will be required to make commuted value transfers if there has been a significant decline in the transfer ratio after the actuarial valuation date.

2.2 Determination of the Statutory Solvency Excess (Deficiency)

In calculating the statutory solvency excess (deficiency), various adjustments can be made to the solvency financial position.

	December 31, 2017	December 31, 2014
Solvency surplus (unfunded solvency liability)	$ 13,795,000	$ 5,426,900
Adjustments to solvency position:		
■ Present value of existing amortization payments	$ 0	$ 0
■ Smoothing of asset value	0	0
■ Averaging of liability discount rate	0	0
■ Adjustment to reflect reduced solvency deficiency [1]	9,567,700	n.a.
■ Prior year credit balance	0	0
■ Total	$ 9,567,700	$ 0
Statutory solvency excess (deficiency)	$ 23,362,700	$ 5,426,900

Note:

[1] Equals 15% of the solvency liability after averaging of discount rate.

Section 3: Contributions

3.1 Estimated Minimum Employer Contribution (Ensuing Years)

The 2018 minimum employer required contributions under the new funding rules are as follows:

	December 31, 2017	December 31, 2014
Employer Normal actuarial cost (including the PfAD under the new rules)	$ 0	$ 0
Going concern amortization payments	0	0
Solvency amortization payments	0	0
Total	$ 0	$ 0

Based on the above, the the estimated minimum employer contributions for the next three years are as follows:

Year	2018	2019	2020
Employer Normal Actuarial Cost (including the PfAD)	$ 0	$ 0	$ 0
Amortization Payments			
Going concern	$ 0	$ 0	$ 0
Solvency	0	0	0
Sub-total	$ 0	$ 0	$ 0
Application of Prior Year Credit Balance	(0)	(0)	(0)
Available actuarial surplus [1]	$ 0	$ 0	$ 0
Estimated Minimum Employer Contribution	$ 0	$ 0	$ 0

Note:

[1] The available actuarial surplus is the lesser of the going concern actuarial surplus after PfAD and the amount that, if it were deducted from the solvency assets of the plan, would reduce the solvency ratio to 1.05.

3.2 Estimated Maximum Employer Contribution (Ensuing Year)

		December 31, 2017
Employer Normal Actuarial Cost	$	0
Greater of the Unfunded Actuarial Liability and the Unfunded Hypothetical Windup Liability		2,380,700
Estimated Maximum Employer Contribution	$	2,380,700

Comment:

- In general terms, the employer can contribute its total normal actuarial cost plus the largest of the going concern and hypothetical windup deficits and accrued interest. This amount shall be reduced by any excess actuarial surplus and any contributions made since the valuation date. The provincial Pension legislation may require that certain minimum contributions be nevertheless remitted.

3.3 Timing of Contributions

Amortization payments: monthly before the end of the month to which they pertain (or replaced by an equivalent letter of credit), if applicable.

Adjustment to contributions made since the valuation date: within 60 days from the date that this report is filed with the Pension authorities.

Section 4: Actuarial Opinion

In our opinion, for the purposes of the going concern, solvency and hypothetical windup valuations:

- the membership data on which the actuarial valuations are based are sufficient and reliable,
- the assumptions are appropriate, and
- the methods employed in the actuarial valuations are appropriate.

This report has been prepared, and our opinion has been given, in accordance with accepted actuarial practice in Canada. The actuarial valuations have been conducted in accordance with our understanding of the funding and solvency standards prescribed by the Pension legislation.

Towers Watson Canada Inc.

Bill Liu	Chat Le
Fellow of the Canadian Institute of Actuaries	Fellow of the Canadian Institute of Actuaries

Toronto, Ontario
October 29, 2018

Appendix A: Significant Terms of Engagement and Certificate of the Plan Administrator

A.1 Significant Terms of Engagement

For purposes of preparing this actuarial valuation report, the plan administrator has directed that:

- The actuarial valuation is to be prepared as at December 31, 2017.
- No margins for adverse deviation are to be used.
- For the purpose of determining the going concern discount rate, the investment policy dated October 2017, which is the most up-to-date version, should be considered. There are no expectations that the target asset class distribution will be modified in the future.
- For purposes of determining the Provision for Adverse Deviation level as at December 31, 2017, the target asset allocation should be that contained in the investment policy statement in effect at October 2017 and funded ratio on a windup basis as at December 31, 2017.
- For purposes of determining the Provision for Adverse Deviation level, the DB provisions of the plan are to be considered closed to new entrants.
- The going concern value of assets is to be determined using the market value of assets described in the Asset Valuation Method section in Appendix C.
- The going concern actuarial cost method to be used is the projected unit credit cost method.
- For purposes of determining the solvency liabilities of the plan, certain benefits are to be excluded without requiring an election from the employer.
- The solvency and hypothetical windup valuation results are to be determined under a scenario where all expenses are paid from the pension fund.
- This report is to be prepared on the basis that the employer is entitled to apply the available actuarial surplus, if any, to meet its contribution requirements under the plan.

Should these directions from the plan administrator be amended or withdrawn, Willis Towers Watson reserves the right to amend or withdraw this report.

A.2 Certificate of the Plan Administrator

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

- the significant terms of engagement contained in Appendix A of this report are accurate and reflect the plan administrator's judgement of the plan provisions and/or an appropriate basis for the actuarial valuation of the plan;
- the information on plan assets, including the information on the investment policy and intended changes to the asset mix distribution after the valuation date, if any, forwarded to Towers Watson Canada Inc. and summarized in Appendix B of this report is complete and accurate;
- the data forwarded to Towers Watson Canada Inc. and summarized in Appendix E of this report are a complete and accurate description of all persons who are members of the plan, including beneficiaries who are in receipt of a retirement income, in respect of service up to the date of the actuarial valuation;
- the summary of plan provisions contained in Appendix F of this report is accurate; and
- there have been no events which occurred between the actuarial valuation date and the date this actuarial valuation was completed that may have a material financial effect on the actuarial valuation.

Signature

NOV 6, 2018
Date

RICHARD MALE
Name

DIRECTOR of FINANCIAL SERVICE & TAXATION
Title

Appendix B: Assets

B.1 Statement of Market Value

	December 31, 2017	December 31, 2014
Invested assets:		
■ Canadian equities	$ 30,201,900	$ 22,815,300
■ Foreign equities	15,890,900	25,562,600
■ Cash and short-term investments	955,500	1,454,900
■ Fixed income	30,618,600	32,342,000
■ Total invested assets	$ 77,666,900	$ 82,174,800
Net outstanding amounts:		
■ Investment income receivable	78,500	85,300
■ Expenses and other payables	(65,900)	(110,000)
■ Total net outstanding amounts	$ 12,600	$ (24,700)
Total Assets	$ 77,679,500	$ 82,150,100

Comment:

- The data relating to the invested assets and net outstanding amounts are based on the audited financial statements issued by KPMG.

B.2 Asset Class Distribution

The following table shows the target asset allocation stipulated by the plan's investment policy in respect of major asset classes and the actual asset allocation as at December 31, 2017.

	Target asset allocation	Actual asset allocation as at December 31, 2017
Canadian equities	10%	39%
Foreign equities	10%	20%
Cash and short-term investments	0%	1%
Fixed income	80%	40%
Total	100%	100%

B.3 Reconciliation of Total Assets (Market Value)

Assets as at December 31, 2014			$	82,150,100
Receipts:				
■ Contributions:				
– Employer normal actuarial cost	$	0		
– Employer amortization payments		0		
– Provision for non-investment expenses		0	$	0
■ Investment return				16,087,900
■ Total receipts			$	16,087,900
Disbursements:				
■ Benefit payments:				
– Pension payments	$	(19,637,400)		
– Lump sum settlements		0		
– Other benefit payments		0	$	(19,637,400)
■ Fees				(921,100)
■ Total disbursements			$	(20,558,500)
Assets as at December 31, 2017			$	77,679,500

Comments:

- This reconciliation is based on the financial statements issued by KPMG.
- The rate of return earned on the market value of assets, net of all expenses, from December 31, 2014 to December 31, 2017 is approximately 6.55% per annum.

Appendix C: Actuarial Basis - Going Concern Valuation

C.1 Methods

Asset Valuation Method

The going concern value of assets was calculated as the market value of invested assets at the actuarial valuation date, adjusted for net outstanding amounts.

Actuarial Cost Method

The actuarial liability and the normal actuarial cost were calculated using the projected unit credit cost method.

C.2 Actuarial Assumptions

	December 31, 2017	December 31, 2014
Economic Assumptions (per annum)		
Liability discount rate	3.75%	5.00%
Rate of inflation	2.00%	2.00%
Post-retirement pension increases	2.00%	2.00%
Demographic Assumptions		
Mortality	2014 Public Sector Canadian Pensioners' Mortality Table (CPM2014Pub), projected generationally using MI-2017	2014 Public Sector Canadian Pensioners' Mortality Table (CPM2014Pub), projected generationally using Scale B
Other		
Years male spouse older than female spouse	3	3
Provision for non-investment expenses	None; return on plan assets is net of all expenses	None; return on plan assets is net of all expenses

C.3 Rationale for Actuarial Assumptions

The rationale for the material actuarial assumptions used in the going concern valuation is summarized below.

The going concern assumptions do not include margins for adverse deviations, as a separate Provision for Adverse Deviations has been applied to the actuarial liability and normal actuarial cost

Liability discount rate

Actuarial valuation economic assumptions used for establishing the liability discount rate have been developed based on Willis Towers Watson's capital market model which simulates economic variables and asset class returns. For purposes of calculating the expected long-term returns for each asset class, it has been assumed that key economic variables (such as price inflation and bond yields) transition over time from initial conditions to long-term normative assumptions. Normative assumptions are established based on a blend of historical capital market data and future expectations and do not change frequently. In current capital market conditions, the normative assumptions reflect the expectation that bond yields will increase in the long-term.

■ Best estimate long term nominal rate of return before adjustments based on the plan target asset allocation (actual and including anticipated changes)	3.94%
■ Adjustment for expenses paid by the plan	(0.30)%
■ Rounding	0.11%
■ Net discount rate	3.75%

Rate of inflation

Estimate of future rates of inflation considering economic and financial market conditions at the valuation date.

Post-retirement pension increases

The assumption has been determined by applying the post-retirement increase provision specified in the plan to the inflation assumption.

Mortality

Base mortality rates from the CPM2014Public table are considered reasonable for the actuarial valuation of the plan given that the mortality experience of the plan membership is insufficient to assess plan-specific experience, and there is no reason to expect the mortality experience of the plan to differ significantly from that of other pension plans. Applying improvement scale MI-2017 generationally provides

allowance for improvements in mortality after 2014 and is considered reasonable for projecting mortality experience into the future.

No allowance has been made for mortality prior to retirement with respect to terminated vested members in order to approximate the value of pre-retirement death benefits.

Years male spouse older than female spouse

When provided, the actual data on the spouse were used for retired members. For other members, the assumption is based on surveys of the age difference in the general population and an assessment of future expectations for members of the plan.

Provision for expenses

The liability discount rate is net of all expenses. The assumed level of expenses reflected in the liability discount rate is based on recent experience of the plan and an assessment of future expectations.

Appendix D: Actuarial Basis - Solvency and Hypothetical Windup Valuations

D.1 Methods

Asset Valuation Method

The market value of invested assets, adjusted for net outstanding amounts, has been used for the solvency and hypothetical windup valuations. The resulting value has been reduced by a provision for plan windup expenses.

Liability Calculation Method

The solvency and hypothetical windup liabilities for members were calculated using the unit credit cost method.

Other Considerations

The solvency and hypothetical windup valuations have been prepared on a hypothetical basis. In the event of an actual plan windup, the plan assets may have to be allocated between various classes of plan members or beneficiaries as required by applicable Pension legislation. Such potential allocation has not been performed as part of these solvency and hypothetical windup valuations.

D.2 Solvency Incremental Cost Actuarial Method

To calculate the Solvency Incremental Cost ("SIC"), we used the same method as for the solvency valuation.

No decrements and no new entrants have been considered on the basis that the plan is closed to new entrants. The benefits and members' contributions were projected using the going concern valuation assumptions and the plan provisions.

We assumed that the same settlement method would apply at the end of the projection period as at the valuation date for each plan member.

D.3 Actuarial Assumptions

	December 31, 2017	December 31, 2014
Economic Assumptions (per annum)		
Liability discount rate		
■ Annuity purchase (solvency)	2.80%	2.20%
■ Annuity purchase (windup)	(0.10)%	(0.60)%
Demographic Assumptions		
Mortality	CPM2014 Canadian Pensioners' Mortality Table, projected generationally using Scale CPM-B	1994 Uninsured Pensioner Mortality Table, projected generationally using Scale AA
Other		
Years male spouse older than female spouse	3	3
Provision for expenses		
■ Solvency	$100,000	$100,000
■ Hypothetical windup	$100,000	$100,000

D.4 Rationale for Actuarial Assumptions

The rationale for the material actuarial assumptions used in the solvency and hypothetical windup valuations is summarized below.

The actuarial assumptions used in the solvency and hypothetical windup valuations do not include margins for adverse deviations.

Liability discount rate

Portion of the solvency and hypothetical windup liabilities expected to be settled by a group annuity purchase: based on the CIA annuity purchase guidance applicable at the valuation date which corresponds to an approximation of the annuity purchase rate. The duration of the liabilities assumed to be settled through the purchase of non-indexed annuities is 7.1. As this duration is below the range of durations covered in the guidance, we have extrapolated downwards the spreads from the medium and low durations to determine the approximate annuity purchase rate.

Mortality

For the benefits that are expected to be settled by a group annuity purchase: based on CIA annuity purchase guidance.

For benefits that are expected to be settled by commuted value transfer: determined in accordance with the *Standards of Practice for Pension Commuted Values* in effect at the valuation date. No pre-retirement mortality has been assumed in order to approximate the value of pre-retirement death benefits.

Years male spouse older than female spouse

See rationale for going concern assumptions in Appendix C.

Provision for expenses

Allowance was made for normal administrative, actuarial, legal and other costs which would be incurred if the plan were to be wound up (excluding costs relating to the resolution of surplus or deficit issues). The actuarial valuation is premised on a scenario in which all costs incurred as a result of plan windup were assumed to be paid from the pension fund.

Appendix E: Membership Data

Active and Disabled Members

There are no remaining active members.

Retired Members

	FIRE December 31, 2017	OTHERS December 31, 2017
■ Number	97	7
■ Average age	81.2	89.9
■ Average Annual Lifetime Pension	$41,080	$30,537

Comment:

The lifetime pension as at December 31, 2017 includes the January 1, 2018 pension increase of 1.49%.

Age Group	Fire			Others		
	December 31, 2017			December 31, 2017		
	Number		Monthly Pension	Number		Monthly Pension
50-54	0	$	0	0	$	0
55-59	0		0	0		0
60-64	0		0	0		0
65-69	0		0	0		0
70-74	6		24,816	0		0
75-79	30		97,670	0		0
80+	61		209,578	7		17,813
TOTAL	97	$	332,064	7	$	17,813

Beneficiaries

	FIRE December 31, 2017	OTHERS December 31, 2017
■ Number	66	16
■ Average age	79.5	88.9
■ Average Annual Lifetime Pension	$27,183	$13,887

Comment:

The lifetime pension as at December 31, 2017 includes the January1, 2018 pension increase of 1.49%.

Age Group	Fire		Others	
	December 31, 2017		December 31, 2017	
	Number	Monthly Pension	Number	Monthly Pension
60-64	1	2,142	0	-
65-69	3	8,543	0	-
70-74	9	20,661	0	-
75-79	25	53,810	2	5,698
80+	28	64,349	14	12,818
TOTAL	66	$ 149,505	16	$ 18,516

Terminated Vested Members

	December 31, 2017	December 31, 2014
■ Number	3	3
■ Average age	96.2	93.2
■ Average Annual Pension	$1,239	$1,190
■ Average Accumulated Employee Contributions	$42,119	$40,707

Review of Membership Data

The membership data were supplied by The Corporation of The City of Hamilton as at December 31, 2017.

Elements of the data review included the following:

- ensuring that the data were intelligible (i.e., that an appropriate number of records was obtained, that the appropriate data fields were provided and that the data fields contained valid information);
- preparation and review of membership reconciliations to ascertain whether the complete membership of the plan appeared to be accounted for;
- review of consistency of individual data items and statistical summaries between the current actuarial valuation and the previous actuarial valuation;
- review of reasonableness of individual data items, statistical summaries and changes in such information since the previous actuarial valuation date; and
- comparison of the membership data and the plan's financial statements for consistency.

However, the tests conducted as part of the membership data review may not have captured certain deficiencies in the data. We have also relied on the certification of the plan administrator as to the quality of the data.

Membership Reconciliation

	Active	Terminated vested	Retired	Beneficiaries	Total
As at December 31, 2014	0	3	131	88	222
■ New entrants					
■ Non-vested termination					
■ Vested termination					
■ Settlement					
■ Transfer					
■ Retirement					
■ New beneficiaries					
■ Deceased (with beneficiary)			(15)	15	0
■ Deceased (without beneficiary)			(12)		(12)
■ Deceased survivors				(21)	(21)
■ Data correction					
■ Net change	0	0	(27)	(6)	(33)
As at December 31, 2017	0	3	104	82	189

Appendix F: Summary of Plan Provisions

The following is an outline of the principal features of the plan which are of financial significance to valuing the plan benefits. This summary is based on the plan document as at December 31, 2017 including the 2007 amendment with an effective date of January 1, 2006, as provided by The Corporation of the City of Hamilton, and does not make any provisions for the possibility that a change or action (retroactive or otherwise) could be imposed by order of a regulatory body or a court. As the plan consists entirely of pensioners, and deferred vested members, plan provisions relating to active members have not been include. It is not a complete description of the plan terms and should not be relied upon for administration or interpretation of benefits. For detailed description of the benefits, please refer to the plan document.

Normal Retirement Age

Age 60 for Fire employees other than Fire Chief, 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 Benefit

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

Withdrawal Benefit

Deferred pensions commence at the normal retirement age.

Inflation Protection

Pension benefits, pensions and deferred pensions shall be indexed beginning on January 1, 2006, by an inflation related adjustment formula equal to the inflation related adjustment formula used to increase pension benefits, pensions and deferred pensions under the Ontario Municipal Employees Retirement Systems Act, 2006, as amended from time to time, subject to the Income Tax Act.

Appendix G: Sensitivity Analysis and Other Disclosures

G.1 Sensitivity Information

Amounts determined with a discount rate 1% lower:

Going concern actuarial liability	$	75,350,600
■ As percent increase		8.13%
Solvency actuarial liability	$	68,673,200
■ As percent increase		7.66%

G.2 Solvency Incremental Cost

Solvency Incremental Cost (up to next valuation date)	$	3,257,000

G.3 Provision for Adverse Deviation Level

Target Asset Allocation for Fixed Income Assets

The information below as at December 31, 2017 has been used to determine the Provision for Adverse Deviation level. The fixed income investments listed below meet the minimum credit rating prescribed by the Pension legislation.

	Target asset allocation	Fixed income allocation	Non-fixed income allocation	Fixed income weight
Asset classes				
- Canadian Equity	10.0%	0.0%	10.0%	0.0%
- Global Equity	10.0%	0.0%	10.0%	0.0%
- Fixed income	80.0%	80.0%	0.0%	80.0%
Total	100%	80.0%	20.0%	

Benchmark Discount Rate

Components	Rate
CANSIM V39056	2.26%
Risk Premium on Non-Fixed Income Assets[1]	1.00%
Risk Premium on Fixed Income Assets[2]	1.20%
Diversification Allowance	0.50%
Benchmark Discount Rate	4.96%

Note:

[1] 5.00% of the non-fixed proportion of the assets.

[2] 1.50% of the fixed proportion of the assets.

Provision for Adverse Deviation Level

Components	**Provision for Adverse Deviation level**
Fixed	5.0%
Asset mix based	*2.0%*
Benchmark discount rate based[1]	*0.0%*
Provision for Adverse Deviation Level[2]	7.0%

Note:

[1] Reflects going concern discount rate less benchmark discount rate (subject to a minimum of zero), multiplied by the going concern liabilities duration (refer to sub-section G.1)

[2] The Provision for Adverse Deviation is applied to the going concern actuarial liability and total normal cost, excluding any portion for future indexation.