



Actuarial Valuation as at January 1, 2020 for The Hamilton Street Railway Company Pension Plan (1994)

Canada Revenue Agency Registration Number: 0253344

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Executive Summary

An actuarial valuation has been prepared for the The Hamilton Street Railway Company Pension Plan (1994) (the "Plan") as at January 1, 2020 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 January 1, 2023.

Summary of Principal Results

Financial Position

	January 1, 2020	January 1, 2017
Going Concern		
Assets	\$ 211,167,500	\$ 193,491,200
Liabilities	<u>211,592,100</u>	<u>214,681,400</u>
Financial Position	\$ (424,600)	\$ (21,190,200)
Adjustments ²	<u>(17,103,300)</u>	<u>-</u>
Surplus/(Unfunded Liability)	\$ (17,527,900)	\$ (21,190,200)
Solvency		
Assets ¹	\$ 210,967,500	\$ 193,291,200
Liabilities	<u>216,314,100</u>	<u>219,410,700</u>
Financial Position	\$ (5,346,600)	\$ (26,119,500)
Adjustments ²	<u>11,281,800</u>	<u>20,969,500</u>
Surplus/(Unfunded Liability)	\$ 5,935,200	\$ (5,150,000)
Hypothetical Wind Up		
Assets ¹	\$ 210,967,500	\$ 193,291,200
Liabilities	<u>315,487,000</u>	<u>318,997,500</u>
Surplus/(Unfunded Liability)	\$ (104,519,500)	\$ (125,706,300)

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

	January 1, 2020	January 1, 2017
Funded ratio (Before PfAD)	1.00	0.90
Solvency ratio	0.98	0.88
Transfer ratio	0.67	0.61

Minimum Contribution Requirements

Considering the funding and solvency status of the Plan, the minimum City contributions for the period from January 1, 2020 to January 1, 2023 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
City normal cost	\$ -	\$ -	\$ -
Special payments toward amortizing unfunded liability	2,470,800	1,956,000	1,956,000
Adjustments	<u>(1,328,400)</u>	<u>(185,800)</u>	<u>(66,500)</u>
Minimum Required City Contribution	\$ 1,142,400	\$ 1,770,200	\$ 1,889,500

Key Assumptions

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

Going Concern	January 1, 2020	January 1, 2017
Discount rate	4.50% per year	Same
Provision for adverse deviation	9.80% of non-indexed liabilities	Not applicable
Inflation rate	2.00% per year	2.25% per year
Indexing	2.00% per year	1.50% per year
Pensionable earnings	2.00% per year	3.25% per year
Mortality table	110% of 2014 Public Canadian Pensioners' Mortality Table ("CPM2014Publ") with generational improvement using CPM Scale B2D ("CPM-B")	Same
Retirement rates	50% of members retire at the earliest unreduced retirement age and 50% at age 65.	50% of members retire at the earliest unreduced retirement age and 50% at age 62.

Solvency/ Hypothetical Wind Up	January 1, 2020	January 1, 2017
Discount rate		
Solvency	Annuity purchases: 2.93% per year Transfers: 2.50% per year for 10 years, 2.60% per year thereafter	Annuity purchases: 3.08% per year Transfers: 2.30% per year for 10 years, 3.70% per year thereafter
Hypothetical Wind Up	Annuity purchases:-0.29% per year Transfers: 1.20% per year for 10 years, 1.20% per year thereafter	Annuity purchases: -0.09% per year Transfers: 1.30% per year for 10 years, 1.60% per year thereafter
Inflation rate	Not applicable	Not applicable
Pensionable earnings increase	Not applicable	Not applicable
Mortality table	2014 Canadian Pensioners' Mortality Table ("CPM2014") with generational improvement using CPM-B Scale	Same
Retirement rates	Age that produces the highest lump-sum value	Same

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 January 1, 2020 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 January 1, 2020;
- Determine the financial position of the Plan as at January 1, 2020 on a solvency and hypothetical wind up basis; and
- Provide the necessary actuarial certification required under the *Pension Benefits Act (Ontario)* (the "Act") and the *Income Tax Act*.

In accordance with Regulation, the City has elected to defer all new solvency special payments established as at January 1, 2020 by 12 months.

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 January 1, 2023.

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 January 1, 2017. 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, 2020; and
- Ontario Regulation 250/18 came into effect.

City 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 January 1, 2017;
- 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 January 1, 2020 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 January 1, 2020.

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.

As a result of a Settlement Agreement dated March 12, 2009, the Plan was amended to include a conditional increase to the joint and survivor normal form of pension to 66 2/3% from 50%. The benefit improvement is conditional upon an actuarial report being filed that discloses a plan surplus on either a going concern, solvency or wind-up basis. All HSR Plan members who were employees on December 31, 2008 would be entitled to this benefit improvement when it comes into effect, if they continue to be entitled to a pension from the plan. For the purposes of this report, the conditional benefit improvement has not been reflected in the results that have been reported.

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 January 1, 2020 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 January 1, 2020 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 January 1, 2020 is shown in the following table. The results as at January 1, 2017 are also shown for comparison purposes.

Going Concern Financial Position

	January 1, 2020	January 1, 2017
Actuarial Value of Assets	\$ 211,167,500	\$ 193,491,200
Going Concern Liabilities¹		
Active Members	\$ 51,900,100	\$ 73,380,900
Deferred Vested Members	1,204,000	1,118,100
Retired Members and Beneficiaries	158,317,300	140,182,400
Pending Payouts	<u>170,700</u>	<u>-</u>
Total Liabilities	\$ 211,592,100	\$ 214,681,400
Going Concern Position	\$ (424,600)	\$ (21,190,200)
Additional liabilities due to PfAD	<u>17,103,300</u>	-
Surplus/(Unfunded Liability) (before prior year credit balance)	\$ (17,527,900)	\$ (21,190,200)
Prior year credit balance	<u>-</u>	<u>-</u>
Surplus/(Unfunded Liability)	\$ (17,527,900)	\$ (21,190,200)

The PfAD is not required to be applied to the liabilities in respect of post retirement indexation of \$37,068,600 as at January 1, 2020.

¹ Going concern liabilities reported at January 1, 2017 exclude the cost of future indexation of \$38,966,400, assuming indexing at 2.25% per annum.

Change in Financial Position

The major components of the change in the Surplus/(Unfunded Liability)¹ for the period from January 1, 2017 to January 1, 2020 are summarized in the following table.

Surplus/(Unfunded Liability) as at January 1, 2017	\$ (21,190,200)
Expected interest on Surplus/(Unfunded Liability)	(2,991,300)
City special payments in inter-valuation period with interest	18,583,200
Surplus/(Unfunded Liability) as at January 1, 2020	\$ (5,598,300)
Change in liabilities due to experience gains/(losses)	
Gain/(loss) from investment earnings greater/lower than expected	\$ 7,579,400
Gain/(loss) due to salary increases lower/greater than expected	1,740,900
Gain/(loss) due to indexation experience	1,882,700
Gain/(loss) due to retirement experience	2,536,900
Gain/(loss) due to mortality experience	3,072,200
Gain/(loss) due to termination experience	187,800
Gain/(loss) on data correction	(2,709,300)
Gain/(loss) on YMPE/Maximum pension	(232,400)
Net gain/(loss) due to other experience and miscellaneous items	(120,900)
Surplus/(Unfunded Liability) After Experience Gains/(Losses) as at January 1, 2020	\$ 8,339,000
Change due to the inclusion of the value of post-retirement indexation as per Ontario funding reform	\$ (20,275,800)
Change due to the Provision for Adverse Deviation	(17,103,300)
Change due to indexation assumption	5,721,600
Change due to ITA assumption	-
Change due to YMPE assumption	(106,100)
Change due to retirement decrement assumption	3,756,900
Change due to discount rate assumption	-
Change due to salary scale assumption	2,139,800
Surplus/(Unfunded Liability) as at January 1, 2020	\$ (17,527,900)

¹ Prior to the application of the Prior Year Credit Balance

Discussion of Changes in Assumptions

Effective January 1, 2020 the following assumptions have been changed:

- The inflation rate has been changed from 2.25% per year to 2.00% per year. This change decreased the going concern liabilities by \$5,721,600.
- The pensionable earnings increase has been change from 3.25% to 2.00% per year. This change has decreased the going concern liabilities by \$2,139,800.
- The retirement decrement assumption has gone from 50% at earliest unreduced retirement date and 50% at age 62 to 50% at earliest unreduced retirement date and 50% at age 65. This change has decreased the liabilities by \$3,756,900.

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.

January 1, 2020	Effect		
		\$	%
Going concern liabilities	\$ 211,592,100		
Going concern liabilities (discount rate – 1%)	\$ 239,007,100	27,415,000	13.0%
Going concern liabilities (discount rate + 1%)	\$ 189,064,200	(22,527,900)	(10.6)%
Normal cost	\$ -		
Normal cost (discount rate – 1%)	\$ -	-	N/A
Normal cost (discount rate + 1%)	\$ -	-	N/A

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	\$ 211,167,500	\$ 227,347,800	\$ 16,180,300
Going concern liabilities	<u>211,592,100</u>	<u>239,007,100</u>	<u>27,415,000</u>
Going concern position	\$ (424,600)	\$ (11,659,300)	\$ (11,234,700)
Additional liabilities due to PfAD	<u>17,103,300</u>	<u>19,058,400</u>	<u>1,955,100</u>
Surplus/(Unfunded Liability)¹	\$ (17,527,900)	\$ (30,717,700)	\$ (13,189,800)
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

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	\$ 211,167,500	\$ 195,030,400	\$ (16,137,100)
Going concern liabilities	<u>211,592,100</u>	<u>211,592,100</u>	<u>-</u>
Going concern position	\$ (424,600)	\$ (16,561,700)	\$ (16,137,100)
Additional liabilities due to PfAD	<u>17,103,300</u>	<u>17,103,300</u>	<u>-</u>
Surplus/(Unfunded Liability)¹	\$ (17,527,900)	\$ (33,665,000)	\$ (16,137,100)

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 10% improvement to the base mortality rates. For the purposes of this analysis, we have used 100% of the rates of the base table used in the going concern valuation.

	Base Scenario	Adverse Scenario	Impact (\$)
Actuarial value of assets	\$ 211,167,500	\$ 211,167,500	\$ -
Going concern liabilities	<u>211,592,100</u>	<u>217,367,000</u>	<u>5,774,900</u>
Going concern position	\$ (424,600)	\$ (6,199,500)	\$ (5,774,900)
Additional liabilities due to PfAD	<u>17,103,300</u>	<u>17,491,000</u>	<u>387,700</u>
Surplus/(Unfunded Liability)²	\$ (17,527,900)	\$ (23,690,500)	\$ (6,162,600)

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 January 1, 2020 is shown in the following table. The solvency financial position of the Plan as at January 1, 2017 is shown for comparison purposes.

Solvency Financial Position

	January 1, 2020	January 1, 2017
Assets		
Solvency assets	\$ 211,167,500	\$ 193,491,200
Estimated wind up expenses	<u>(200,000)</u>	<u>(200,000)</u>
Total Assets	\$ 210,967,500	\$ 193,291,200
Solvency Liabilities		
Active Members	\$ 59,759,600	\$ 76,398,200
Deferred Vested Members	1,348,500	1,256,400
Retired Members and Beneficiaries	155,035,300	141,756,100
Pending Payouts	<u>170,700</u>	<u>-</u>
Total Liabilities	\$ 216,314,100	\$ 219,410,700
Solvency Position	\$ (5,346,600)	\$ (26,119,500)
Prior year credit balance	-	-
Present value of special payments	11,281,800	20,969,500
Solvency liability adjustment	<u>-</u>	<u>-</u>
Solvency Surplus/(Deficiency)	\$ 5,935,200	\$ (5,150,000)
Solvency ratio ¹	0.98	0.88

¹ Solvency Assets divided by Solvency Liabilities

Solvency Asset Adjustment

The present value of scheduled special payments for solvency valuation purposes has been calculated by discounting the annual special payments to be remitted up to the end of their amortization period, at the weighted solvency discount rate.

Nature of Deficiency	Effective Date	End Date	Months Included	Annual Special Payment	Present Value as of January 1, 2020
Going concern	January 1, 2009	December 31, 2020	12	\$ 273,600	\$ 269,400
Going concern	January 1, 2010	December 31, 2020	12	142,800	140,600
Going concern	January 1, 2011	December 31, 2020	12	800,400	788,200
Going concern	January 1, 2015	December 31, 2020	12	831,600	818,900
Going concern	January 1, 2018	December 31, 2020	12	422,400	415,900
Going concern	January 1, 2021 ¹	December 31, 2030	60	1,956,000	<u>8,848,800</u>
Present Value of Special Payments					\$ 11,281,800

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.

	January 1, 2020
The amount by which the sum of:	
85% of solvency liabilities	\$ 183,867,000
85% of solvency liability adjustment	-
Prior year credit balance	-
	<u>\$ 183,867,000</u>
Exceeds the sum of:	
Solvency assets net of wind-up expenses	\$ 210,967,500
Solvency asset adjustment	<u>11,281,800</u>
	<u>\$ 222,249,300</u>
Reduced Solvency Deficiency	\$ 0

¹ In accordance with Regulation, the City has decided to defer new going concern and solvency special payments established as at January 1, 2020 by 12 months

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 0.98, 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.

January 1, 2020	Effect	
	\$	%
Solvency liabilities	\$ 216,314,100	
Solvency liabilities (discount rate – 1%)	\$ 243,672,000	\$ 27,357,900 12.6%
Solvency liabilities (discount rate + 1%)	\$ 193,874,100	\$ (22,440,000) (10.4)%

Incremental Cost on a Solvency Basis

The incremental cost on a solvency basis represents the present value at January 1, 2020 of the expected aggregate change in the solvency liabilities between January 1, 2020 and the next calculation date, that is January 1, 2023. 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	\$ 2,484,300	\$ 2,414,300	\$ 2,518,900

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 January 1, 2020 is shown in the following table. The hypothetical wind up financial position of the Plan as at January 1, 2017 is shown for comparison purposes.

Hypothetical Wind Up Financial Position

	January 1, 2020	January 1, 2017
Assets		
Hypothetical wind up assets	\$ 211,167,500	\$ 193,491,200
Estimated wind up expenses	<u>(200,000)</u>	<u>(200,000)</u>
Total Assets	\$ 210,967,500	\$ 193,291,200
Hypothetical Wind Up Liabilities		
Active Members	\$ 91,710,400	\$ 115,284,600
Deferred Vested Members	2,311,900	2,149,200
Retired Members and Beneficiaries	221,294,000	201,563,700
Pending Payouts	<u>170,700</u>	<u>-</u>
Total Liabilities	\$ 315,487,000	\$ 318,997,500
Hypothetical Wind Up Surplus/(Deficiency)	\$ (104,519,500)	\$ (125,706,300)

Transfer Ratio

The transfer ratio is determined as follows:

		January 1, 2020	January 1, 2017
(1) Hypothetical wind up assets		\$ 211,167,500	\$ 193,491,200
Prior year credit balance	(A)	\$ -	\$ -
Total city normal cost and required special payments until next mandated valuation	(B)	\$ 6,382,800	\$ 17,695,000
(2) Asset adjustment	Lesser of (A) and (B)	\$ -	\$ -
(3) Hypothetical wind up liabilities		\$ 315,487,000	\$ 318,997,500
Transfer Ratio [(1)-(2)] / (3)		0.67	0.61

Section 5: Contribution Requirements

Contribution Requirements in Respect of the Normal Cost

Active members no longer accrue further credited service, and as such, there are no current service contributions required.

Development of Special Payments

The following table summarizes previously established amortization schedules of special payments before adjustment to reflect any gains or losses due to the going concern and solvency valuation results.

Nature of Deficiency	Effective Date	End Date	Annual Special Payment	
Going concern	January 1, 2009	December 31, 2023	\$	273,600
Going concern	January 1, 2010	December 31, 2024		142,800
Going concern	January 1, 2011	December 31, 2025		800,400
Going concern	January 1, 2015	December 31, 2029		831,600
Going concern	January 1, 2018 ¹	December 31, 2032		422,400
Solvency	January 1, 2015	December 31, 2019		2,726,400
Solvency	January 1, 2018	December 31, 2022		1,142,400
			\$	6,339,600

The following table summarizes the amortization schedules of special payments after adjustment to reflect any gains or losses due to the going concern and solvency valuation results. In accordance with Regulation, the City has decided to defer all new going concern and solvency special payments established as at January 1, 2020 by 12 months. The following table summarizes the amortization schedules of special payments after the aforementioned adjustments.

Nature of Deficiency	Effective Date	Revised End Date	Revised Annual Special Payment	Present Value as of January 1, 2020	
				For Going Concern Valuation ²	For Solvency Valuation ³
Going concern	January 1, 2009	December 31, 2020	\$ 273,600	\$ 267,200	\$ 269,400
Going concern	January 1, 2010	December 31, 2020	142,800	139,400	140,600
Going concern	January 1, 2011	December 31, 2020	800,400	781,600	788,200
Going concern	January 1, 2015	December 31, 2020	831,600	812,100	818,900
Going concern	January 1, 2018	December 31, 2020	422,400	412,500	415,900
Going concern	January 1, 2021	December 31, 2030	1,956,000	15,115,100	8,848,800
			\$ 4,426,800	\$ 17,527,900	\$ 11,281,800

¹ In accordance with Regulation, the City has decided to defer new solvency special payments established as at January 1, 2020 by 12 months

² The values in the table were developed using the going concern discount rate compounded monthly in arrears.

³ The values in the table were developed using the weighted average solvency discount rate compounded monthly in arrears.

Prior Year Credit Balance ("PYCB")

The City has elected not to track or apply any PYCB to reduce the special payments.

Available Actuarial Surplus

As at January 1, 2020 the Available Actuarial Surplus is calculated as follows:

Going Concern Basis

(A)	Total assets	\$	211,167,500
(B)	Total liabilities		211,592,100
(C)	Additional liabilities due to PfAD		17,103,300
(D)	Prior year credit balance		-
(E)	Available surplus: maximum (A – B – C – D); 0)	\$	-

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 City 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 City contribution requirements.

Transitional Rules

	2020	2021	2022
Under Rules Applicable Prior to May 1, 2018			
City normal cost	\$ -	\$ 77,700	\$ 157,000
Going concern special payments	-	-	-
Solvency special payments	<u>1,142,400</u>	<u>1,599,600</u>	<u>1,599,600</u>
Total	\$ 1,142,400	\$ 1,677,300	\$ 1,756,600
Under Rules Applicable as at May 1, 2018			
City normal cost	\$ -	\$ -	\$ -
Going concern special payments	2,470,800	1,956,000	1,956,000
Solvency special payments	<u>-</u>	<u>-</u>	<u>-</u>
Total	\$ 2,470,800	\$ 1,956,000	\$ 1,956,000
Increase in Contribution Requirement Due to New Rules	\$ 1,328,400	\$ 278,700	\$ 199,400

According to Section 4 of the Regulations, should the contribution requirements including any required payments due to the PfAD established under the rules in effect as at May 1, 2018 exceed the contribution requirements under the rules in effect prior to May 1, 2018 for each year of the period covered by this report, the increase in contribution requirement can be phased in over a three-years period. The table below shows the contribution requirement that can be exempt from increases from 2020 to 2022:

	2020	2021	2022
Contribution to be Exempt from Increases	\$ 1,328,400	\$ 185,800	\$ 66,500

Development of Minimum Required City Contribution

The table below presents the development of the minimum required City 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
City normal cost	\$ -	\$ -	\$ -
Special payments toward amortizing unfunded liability	2,470,800	1,956,000	1,956,000
Special payments toward amortizing solvency deficiency	-	-	-
Contribution exempt from increase under transitional rules	(1,328,400)	(185,800)	(66,500)
Required application of excess surplus	-	-	-
Permitted application of available actuarial surplus	-	-	-
Minimum Required City Contribution, Prior to Application of Prior Year Credit Balance	\$ 1,142,400	\$ 1,770,200	\$ 1,889,500
Permitted application of prior year credit balance	-	-	-
Minimum Required City Contribution	\$ 1,142,400	\$ 1,770,200	\$ 1,889,500

Development of Maximum Deductible City Contribution

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

The maximum deductible City contribution presented in the table below for a given plan year is calculated assuming that the City makes the maximum deductible City 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
City normal cost	\$ -	\$ -	\$ -
Greater of the Unfunded liability and the hypothetical wind up deficiency	104,519,500	-	-
Required application of excess surplus	<u>-</u>	<u>-</u>	<u>-</u>
Maximum Deductible City Contribution	\$ 104,519,500	\$ -	\$ -

If the City wishes to make the maximum deductible City 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 Street Railway Company Pension Plan (1994)

Canada Revenue Agency Registration Number: 0253344

Opinion

This actuarial certification forms an integral part of the actuarial valuation report for the Plan as at January 1, 2020. I confirm that I have prepared an actuarial valuation of the Plan as at January 1, 2020 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 January 1, 2023.

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 City 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 January 1, 2020. For comparison purposes, the composition at the previous valuation date of January 1, 2017 is also shown.

	January 1, 2020		January 1, 2017	
	\$	%	\$	%
Cash and short term	2,757,900	1.3%	1,781,700	1.0%
Canadian fixed income	100,829,200	47.7%	83,582,200	43.2%
Canadian equities	67,764,800	32.1%	60,066,100	31.0%
Foreign equities	<u>39,815,600</u>	<u>18.9%</u>	<u>48,061,200</u>	<u>24.8%</u>
Total Invested Assets	211,167,500	100.0%	193,491,200	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 adjusted market value of assets between January 1, 2017 and January 1, 2020.

	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	\$ 193,491,200	\$ 204,658,400	\$ 190,957,400
Contributions During Plan Year			
Employee contributions	\$ -	\$ -	\$ -
City normal cost	-	54,300	138,100
City special payments	4,774,800	6,339,600	6,339,600
Total	\$ 4,774,800	\$ 6,393,900	\$ 6,477,700
Benefit Payments During Plan Year			
Non-retired members ¹	\$ 240,300	\$ 135,600	\$ 55,200
Retired members	10,858,200	11,019,300	11,384,300
Total	\$ 11,098,500	\$ 11,154,900	\$ 11,439,500
Transfers During Plan Year			
Into plan	\$ -	\$ -	\$ -
Out of plan	-	-	-
Total	\$ -	\$ -	\$ -
Fees/Expenses			
Investment fees/expenses	\$ 326,100	\$ 410,900	\$ 437,400
Non-investment fees/expenses	237,400	296,800	235,100
Total	\$ 563,500	\$ 707,700	\$ 672,500
Investment Income	\$ 18,054,400	\$ (8,232,300)	\$ 25,844,400
Adjusted Market Value of Assets, End of Plan Year	\$ 204,658,400	\$ 190,957,400	\$ 211,167,500
Rate of return, net of fees/expenses	9.2%	-4.4%	13.4%

Development of Actuarial Value of Assets

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

¹ Includes members who have terminated employment or died

Appendix B: Membership Data

Source of Data

This valuation was based on member data provided by the Company as of January 1, 2020. 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 credited service against the corresponding amount provided for the last valuation to ensure that no member accrued any credited service from January 1, 2017;
- A reconciliation of pensionable earnings against the corresponding amounts provided for the last valuation to identify any unusual increases or decreases;
- A reconciliation of accrued benefits against the corresponding amounts provided for the last valuation to identify any unusual benefit accruals;
- A reconciliation of any stated benefit payments since January 1, 2017 (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 H of this report.

Membership Summary

The table below reconciles the number of members as of January 1, 2020 with the number of members as of January 1, 2017 and the changes due to experience in the period.

	Active and Disabled Members	Deferred Vested	Retired Members and Beneficiaries	Total
As at January 1, 2017	388	26	599	1,013
New members	0	0	0	0
Paid out	(5)	0	0	(5)
Terminations	(4)	4	0	0
Deaths	(2)	0	(71)	(73)
No Further Benefits	0	0	(3)	(3)
Retired	(62)	(1)	63	0
New spouses	0	0	22	22
Transferred	0	0	0	0
Data corrections	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
As at January 1, 2020	315	29	610	954

Active and Disabled Members

	January 1, 2020	January 1, 2017
Number	315	388
Average age	54.3	52.8
Average pensionable service	9.3	10.5
Average pensionable earnings	\$ 70,474	\$ 66,849
Proportion female	23.8%	24.2%

Deferred Vested Members

	January 1, 2020	January 1, 2017
Number	29	26
Average age	55.8	54.2
Average deferred pension	\$ 3,317	\$ 3,714
Proportion female	41.4%	42.3%

Retired Members and Beneficiaries

	January 1, 2020	January 1, 2017
Number	610	599
Average age	75.3	75.5
Average annual lifetime pension	\$ 18,587	\$ 17,319
Average annual bridge pension	\$ 547	\$ 535
Proportion female	33.0%	31.6%

Active/Disabled Membership Distribution

The following table provides a detailed summary of the active/disabled membership at the valuation date by years of credited service and by age group. For privacy reasons, average pensionable earnings is not shown for groups with two or less members.

Age	< 5	5–10	10–15	15–20	20–25	25–30	>=30	Total
<40	10							10
	\$ 67,044	\$	\$	\$	\$	\$	\$	\$ 67,044
40–45	10	7						17
	\$ 77,617	\$ 77,268	\$	\$	\$	\$	\$	\$ 77,473
45–50	34	27	1					62
	\$ 70,518	\$ 69,678	\$ *	\$	\$	\$	\$	\$ 70,424
50–55	32	21	5	8	2			68
	\$ 69,111	\$ 70,063	\$ 80,388	\$ 69,459	\$ *	\$	\$	\$ 70,738
55–60	25	29	3	19	18			94
	\$ 68,597	\$ 69,433	\$ 75,814	\$ 69,694	\$ 68,935	\$	\$	\$ 69,372
60–65	8	15	3	14	7	2		49
	\$ 68,034	\$ 68,547	\$ 64,058	\$ 76,072	\$ 73,610	\$ *	\$	\$ 71,037
>=65	2	2	1	1	3	5	1	15
	\$ *	\$ *	\$ *	\$ *	\$ 80,106	\$ 67,800	\$ *	\$ 68,907
Total								
Count	121	101	13	42	30	7	1	315
Average Salary	\$ 69,689	\$ 70,011	\$ 74,928	\$ 71,733	\$ 72,204	\$ 67,838	\$ *	\$ 70,474

* Omitted for privacy reasons

Deferred Vested/Retired Membership Distribution

The following table provides a detailed summary of the deferred vested/retired membership at the valuation date by age group. For privacy reasons, average pensions are not shown for groups with two or less members.

Age	Deferred Vested Members	Retired Members and Beneficiaries
< 50	7 \$ 2,628	1 \$ *
50–55	5 \$ 2,515	\$
55–60	9 \$ 3,475	21 \$ 21,280
60–65	6 \$ 4,674	52 \$ 22,674
65 ¹ –70	2 \$ *	101 \$ 20,319
70–75	\$	143 \$ 22,649
75–80	\$	106 \$ 17,864
>=80	\$	186 \$ 13,569
Total Count	29	610
Average Lifetime Pension	\$ 3,317	\$ 18,587

* Omitted for privacy reasons

¹ Includes all deferred vested members over age 65

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.

	January 1, 2020	January 1, 2017
Economic Assumptions		
Discount rate	4.50% per year	Same
Inflation rate	2.00% per year	2.25% per year
Post-retirement indexing rate	2.00% per year	1.50% per year
Increases in pensionable earnings	2.00% per year	3.25% per year
Increases in year's maximum pensionable earnings ("YMPE")	2.50% per year	2.75% per year
Increases in maximum pension limit	\$3,092.22 in 2020; then 2.50% per year	\$2,914.44 in 2017; then 2.75% per year
Investment expenses	0.20% per year (taken into account in the discount rate assumption)	Same
Non-investment expenses	0.20% per year (taken into account in the discount rate assumption)	Same
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)

	January 1, 2020	January 1, 2017
Demographic Assumptions		
Mortality table	110% of 2014 Public Canadian Pensioners' Mortality Table ("CPM2014Publ") with generational improvement using CPM-B Scale	Same
Retirement rates	50% of members retire at the earliest unreduced retirement age and 50% at age 65.	50% of members retire at the earliest unreduced retirement age and 50% at age 62.
Termination rates	Not applicable	Same
Disability rates	Not applicable	Same
Proportion married		
Non-retired proportion with spouse	85% with opposite-sex spouse	Same
Non-retired spousal age differential	Males three years older	Same
Retired members	Actual marital status and ages are used	Same
Margin for adverse deviation	Not applicable	Same
Methods		
Actuarial cost method	Projected 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

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				4.77%
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				4.50%

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 Pensionable Earnings

The assumption for increases in pensionable earnings of 2.00% per year reflects the assumed rate of inflation, plus allowances for the effect of productivity growth.

Increases in YMPE

As the benefits paid to a member from the Plan are dependent on the future YMPE, it is necessary to make an assumption regarding the future increases in the YMPE.

The assumed increase in the YMPE reflects the assumed rate of inflation plus the productivity increase assumption.

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 expenses, no explicit assumption is required for all 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	<u>24.0%</u>
			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	4.77%
(g) Plan duration	11.43

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 current and last valuation, we are using the 2014 Public Canadian Pensioners' Mortality Table and with generational improvement with CPM-B. We have adjusted the base rates of the table by 110% to account for the size of the pensions members are receiving.

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 projection scale is considered reasonable.

Retirement

Retirement rates are typically developed taking into account the past experience of the Plan. Accordingly, the rates of retirement have been developed as our expectation of the best-estimate rates of retirement based on the Plan provisions and our experience with other similar plans.

Termination of Employment

No allowance has been made for termination of employment prior to retirement on the basis that the impact of including such an assumption would not have a material impact on the valuation results.

Proportion of Members with Spouses and Spousal Age Differential

These assumptions are relevant to the valuation of benefits since there is a subsidized joint and survivor benefit available for members with a spouse. The proportion of members who will have a spouse is based on broad population statistics. The spousal age difference was based on broad population statistics.

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 projected unit credit actuarial cost method has been used for this valuation. Under this method, the actuarial present value of benefits in respect of service prior to the valuation date, but based on pensionable earnings projected to retirement, is compared with the actuarial asset value, revealing either a surplus or an unfunded actuarial liability.

With respect to service after the valuation date, the expected value of benefits for service in the year following the valuation date (i.e., the normal cost) net of any required employee contributions is expressed as a percentage of the expected value of participating payroll for that year. The employer normal cost contributions are determined each year by applying this percentage to the actual participating payroll for the year.

When calculating the actuarial present value of benefits at the valuation date, the present value of all retirement, withdrawal and preretirement death benefits are included. For each member, the retirement, withdrawal and preretirement death benefits for a particular period of service are first projected each year into the future taking into account future vesting, early retirement entitlements and minimum pension/value entitlements. These projected benefits for each future year are then capitalized, multiplied by the probability of the member leaving the Plan in that year and discounted with interest and survivorship to the valuation date. The actuarial present value of benefits for the particular period of service is then determined by summing the present values of these projected benefits.

The pattern of future contributions necessary to pre fund future benefit accruals for any one particular individual will increase gradually as a percentage of their pensionable earnings as the individual approaches retirement. For a stable population (i.e., one where the demographics of the group remain constant from year to year), the normal cost will remain relatively level as a percentage of payroll. The projected unit credit 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 projected unit credit 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

	January 1, 2020	January 1, 2017
Economic Assumptions		
Discount rate		
Transfer value basis — <i>Without indexation</i>	2.50% per year for 10 years; 2.60% per year thereafter	2.30% per year for 10 years; 3.70% per year thereafter
Annuity purchase basis — <i>Without indexation</i>	2.93% per year	3.08% per year
Duration used to determine annuity purchase basis	10.51	10.63
Transfer value basis — <i>With indexation</i>	1.20% per year for 10 years; 1.20% per year thereafter	1.30% per year for 10 years; 1.60% per year thereafter
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	2.89% per year	3.00% per year

	January 1, 2020	January 1, 2017
Demographic Assumptions		
Mortality table	2014 Canadian Pensioners' Mortality Table ("CPM2014") with generational improvement using CPM-B ¹ Scale (sex-distinct rates)	Same
Withdrawal rates	Not applicable	Same
Retirement age		
Active and deferred vested members	Ages that produces the highest value	
Retired members and beneficiaries	Not applicable	Same
Termination of employment	Terminate with full vesting	Same
Marital status		
Non-retired spousal proportion	85% with spouses	Same
Non-retired spousal age differential	Males three years older	Same
Retired members	Actual marital status and ages are used	Same
Other		
Wind up expenses	\$200,000	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	0%	100%
Retirement eligible	100%	0%
Deferred Vested Members		
Not retirement eligible	0%	100%
Retirement eligible	100%	0%
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	Grow-in to early retirement and other benefits were included	Grow-in to early retirement and other benefits were included
Exclusions	Post-retirement indexing was excluded from the valuation	No Plan benefits were excluded from the valuation
Post-valuation Date Benefit Increases	None were assumed	None were assumed
Indexing	Excluded from the valuation	Included from 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 January 1, 2020.

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 lump-sum discount rate for 10 years	$= V122542^1 + 90 \text{ bps}$ $= 1.64\% + 0.90\%$ = 2.54% (rounded to 2.50%) per year
Solvency lump-sum discount rate thereafter	$= V122544^1 + 0.5 \times (V122544^1 - V122542^1) + 90 \text{ bps}$ $= 1.68\% + 0.5 \times (1.68\% - 1.64\%) + 0.90\%$ = 2.60% per year
Solvency annuity purchase discount rate	$= V39062 + \text{Duration Adjustment}$ $= 1.76\% + 1.17\%$ = 2.93% 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. The impact of including such an assumption would not have a material impact on the valuation, since the value of the death benefit is approximately equal to the value of the accrued pension.

Pensionable Earnings

To estimate active and disabled members' best average earnings, we have used actual historical member earnings.

¹ CANSIM Series (annualized)

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; 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 \$200,000.

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.

Unisex Assumption

The liabilities are valued on a sex-distinct basis. The determination of the unisex percentage used in the payment of commuted values to non-Quebec members eligible for portability is based on the proportion of non-Quebec active and deferred vested liabilities for males and females. As such, the determination of commuted value liabilities on a sex-distinct basis in the solvency/hypothetical wind-up valuation is appropriate.

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

This funding valuation was based on Plan design information provided by the City as of January 1, 2020. The following is a summary of the main provisions of the Plan.

Effective Date

July 1, 1980 (Prior plans, running continuously, applied before this date).

Eligibility

Prior to January 1, 2009, full time employees must join on completion of six months of continuous service.

Part time employees are eligible to join after two years of service, provided, they have either:

- Earnings of at least 35% of the Canada Pension Plan (CPP) Year's Maximum Pensionable Earnings (YMPE), or
- 700 hours of employment

in each of two consecutive calendar years immediately prior to joining the Pension Plan.

Effective January 1, 2009, the Plan has been closed to new members.

Retirement

Normal Retirement Date

Age 65.

Unreduced Retirement Date

Members may retire with no reduction in accrued pension following attainment of age plus service (including OMERS service) totalling 85 years, but not earlier than age 55.

Early Retirement Date

Members may retire after their 55th birthday. In this case, the pension will be reduced as per the table below:

Age at Retirement	Adjustment Between Age Reached and Initial Date of Unreduced Retirement
Active member	<p>1/2% for each month (up to 60 months) preceding the earlier of the date the member's age reaches 65, or the member's age plus service* reaches 85.</p> <p>Plus</p> <p>1/3% for each month (greater than 60 but less than 120 months) preceding the earlier of the date the member's age reaches 65, or the member's age plus service* reaches 85.</p>
Member entitled to a deferred pension	Actuarial equivalent of the deferred pension payable at age 65

* including OMERS service

Credited Pension

Normal Retirement Pension

Members receive a pension equal to 1.5% of average pensionable earnings up to the average Year's Maximum Pensionable Earnings (YMPE) as established under the Canada Pension Plan, plus 2% of the excess, multiplied by years of credited service. The "average pensionable earnings" are defined as the average of best five years' earnings. The average YMPE is the average of the YMPE for the last thirty-six months of the Plan membership.

In the event that pensions accrued under the prior plan exceed the pension accrued under this Plan for service prior to July 1, 1980, then the pension is increased accordingly.

Credited service includes an additional six months of past service for all active members as at January 1, 2009, subject to satisfying certain employment continuation requirements.

Active members accrue no credited service under this Plan with respect to service on and after January 1, 2009.

Bridge Benefit

A bridge benefit is payable on early retirement in the amount of \$18.00 per month per year of employment service up to January 1, 2009 to a maximum of 30 years of employment service, reduced by the early retirement reduction as described above. The bridge benefit stops at age 65 or death, if earlier, and is fully indexed.

Normal Form of Pension

The normal form of Pension Benefit is payable for life with a five year guarantee. A 50% continuation is provided to a surviving spouse. The spouse is defined to be the spouse as of the date of death or retirement subject to only one spouse having entitlements and the spouse at retirement taking precedence if more than one spouse would otherwise exist. If the age difference between the member and the spouse is greater than five years, the pension is actuarially reduced.

Indexing

Effective January 1, 2009, pension benefits payable following retirement and surviving spouse pensions are to be increased at the same rate provided under OMERS (100% of inflation up to a maximum of 6% each year) for both lifetime and bridge pensions in payment on and after January 1, 2009.

Benefits Paid Following Termination of Employment

The member may elect to receive a cash settlement as specified in the Plan rules, or a deferred pension (subject to provincial legislation regarding locking-in requirements).

For current active members, all pre-1987 entitlements are 100% vested. For members with at least 2 years of membership, all entitlements are 100% vested.

Death Benefits Prior to Retirement

In the event of death in service, a member's beneficiary will receive a return of contributions according to the description in the Plan rules, or a spousal pension equal to 50% of the member's accrued entitlement. The "50% rule" for post 1986 accruals applies.

Death Benefits After Retirement

Optional forms of pension are available on an actuarially equivalent basis to the normal form of pension.

50% Rule (Excess Contributions)

Upon a member's termination of service or death after two years of membership in the Plan, or retirement, the employer must fund at least 50% of the value of any benefits resulting from years of credited service after January 1, 1987.

Contributions

Prior to 2003, a member contributed 7.5% of earnings less contributions which are made to the Canada Pension Plan. However, for calendar years 1999-2002 the employees were not required to contribute because by Plan terms employee contributions cannot occur without equal City contributions. Effective January 1, 2009, members are neither required nor permitted to make contributions to the Plan.

A copy of a letter from the City certifying the accuracy and completeness of the Plan provisions summarized in this report is included in Appendix H of this report.

Appendix F: History of Plan

Predecessor plans were established with effect from July 1, 1980, which succeeded plans originally established in the mid-to-late 1940s. The current Plan dates from January 1, 1994 when two predecessor plans were merged.

Prior to July 1, 1980, pension benefits were provided through group annuity policies with the Prudential Assurance Company Limited. Benefits with respect to service during this period together with these group annuity policies were transferred to this Plan. These annuities were placed on a paid-up basis. Most of the insured benefits were provided through participating annuities; the rest were provided through non-participating annuities. The participating annuities were credited with bonuses as established by Prudential from time to time.

In September 1986, except for pensions in the course of payment and certain deferred vested members, these group annuities were cashed out, with the proceeds being added to the invested assets of the Plan.

At the prior plan's inception, annuity contracts were purchased by the Plan when a member retired. Assets and liabilities in respect of such purchased annuities are excluded from this report. With effect from June 1986, new retirees were paid out of the fund on a monthly basis. For administrative reasons, since January 1988 pension payments are now made by the City of Hamilton (and were formerly made by the Region of Hamilton-Wentworth) subject to reimbursement by the Plan. Such actions are merely flow-through transactions, with no financial consequences whatsoever to the Plan. In fact, such actions save the Plan any costs of cheque issuance, etc., and as such, have a beneficial effect on the Plan.

Early Retirement windows have been effected at several dates under predecessor plans between 1991 and 1993 inclusive.

Effective January 1, 1999 the Plan was amended as follows:

- A. The early retirement reduction is equal to
 - a. the lesser of
 - i. $\frac{1}{2}$ % for each month (up to 60 months) by which age is less than age 65, and
 - ii. $\frac{1}{2}$ % for each month (up to 60 months) by which age plus service is less than 85 years,
 - plus
 - b. the lesser of
 - i. $\frac{1}{3}$ % for each month (in excess of 60 months, but not in excess of 120 months) by which age is less than age 65, and
 - ii. $\frac{1}{3}$ % for each month (in excess of 60 months, but not in excess of 120 months) by which age plus service is less than 85 years.
- B. A bridging benefit is payable on early retirement in the amount of \$18.00 per month per year of employment service, to a maximum of 30 years of employment service (accrued to December 31, 2008), reduced by the early retirement reduction as described above.

- C. Indexing on May 1, 1999, May 1, 2000 and May 1, 2001 will be based on the greater of the current formula or 1% for all pensioners and beneficiaries who are paid from the Plan.
- D. During 1999 and 2000 members are not required to contribute. During 2001 members were scheduled to contribute 1% of pensionable earnings with a minimum equal employer contribution. Employer contributions during 1999-2001 will equal member contributions, contingent upon the amounts being within amount required and permitted by applicable authorities. Since Employer contributions cannot occur due to restrictions in the *Income Tax Act*, no employee contributions will occur in 2001, with further review scheduled thereafter.

Effective May 1, 2002 the Plan was amended to provide that indexing on May 1, 2002 will be based on the greater of the current formula or 1% for all pensioners and beneficiaries who are paid from the Plan.

Effective January 1, 2003, the Plan was amended to reflect agreement (as per the current Collective Bargaining Agreement, effective April 1, 1998) which provides that contributions by members and the City shall be equal annually, unless member contributions are constrained by the Income Tax Act.

Effective January 1, 2009, the Plan was amended to provide the following:

- Post-retirement indexation that mirrors the indexation provided under OMERS (100% of inflation up to a maximum of 6% each year);
- No future service accruals;
- Six months additional credited service, subject to certain employment continuation requirements;
- OMERS service used for eligibility for certain benefits;
- An increase in the joint and survivor normal form of pension to 66 2/3% from 50%; conditional upon an actuarial report being filed that discloses a plan surplus. All HSR Plan members who were employees on December 31, 2008 would be entitled to this benefit improvement when it comes into effect if they continue to draw a pension from the plan.

Appendix G: 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 H: Administrator Certification

With respect to the The Hamilton Street Railway Company Pension Plan (1994), forming part of the actuarial report as at January 1, 2020, 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 up to the latest Amendment;
- 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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