City of Hamilton

HMRF-HWRF PENSION ADMINISTRATION

SUB-COMMITTEE
AGENDA

Meeting #:	20-001
Date:	November 24, 2020
Time:	9:30 a.m.
Location:	Due to the COVID-19 and the Closure of City Hall All electronic meetings can be viewed at: City’s YouTube Channel: https://www.youtube.com/user/InsideCityofHamilton

Angela McRae, Legislative Coordinator (905) 546-2424 ext. 5987

8. STAFF PRESENTATIONS

9. DISCUSSION ITEMS

10. MOTIONS

11. NOTICES OF MOTION

12. GENERAL INFORMATION / OTHER BUSINESS

13. PRIVATE AND CONFIDENTIAL

14. ADJOURNMENT

Hamilton

HMRF/HWRF PENSION ADMINISTRATION SUB-COMMITTEE MINUTES 19-001

1:00 p.m.
Tuesday, December 10, 2019
Hamilton City Hall, Room 192
71 Main Street West

Present:	Councillors M. Pearson (Chair) and L. Ferguson HMRF Members: D. Skarratt (Co-Vice Chair) and D. Alford HWRF Members: H. Hicks and R. Slack
Regrets:	HWRF Members: J. Garchinski (Co-Vice Chair)

THE FOLLOWING ITEMS WERE REFERRED TO THE AUDIT, FINANCE AND ADMINISTRATION COMMITTEE FOR CONSIDERATION:

1. **HMRF/HWRF/HSR Pension Plan Possible Transfer to OMERS (FCS18093(a)) (City Wide) (Item 10.1)**

   (Skarratt/Alford)
   That Report FCS18093(a) respecting the HMRF/HWRF/HSR Pension Plan Possible Transfer to OMERS, be received.

   CARRIED

2. **Master Trust Pension Investment Performance Report as at December 31, 2018 (FCS18091(a)) (City Wide) (Item 10.2)**

   (Alford/Skarratt)
   That Report FCS18091(a) respecting the Master Trust Pension Investment Performance Report as at December 31, 2018, be received.

   CARRIED

3. **Master Trust Pension Investment Performance Report as at June 30, 2019 (FCS19075) (City Wide) (Item 10.3)**

   (Slack/Hicks)
   That Report FCS19075 respecting the Master Trust Pension Investment Performance Report as at June 30, 2019, be received.

   CARRIED

4. 2019 Master Trust Pension Statement of Investment Policies and Procedures (FCS19073) (City Wide) (Item 10.4)

(Skarratt/Alford)

(a) That Appendix "A" attached to Report FCS19073 respecting the 2019 City of Hamilton Defined Benefit Pension Plans Master Trust Statement of Investment Policies and Procedures be approved and replace the previous 2018 City of Hamilton Defined Benefit Pension Plans Master Trust Statement of Investment Policies and Procedures contained in Report FCS18090 and approved by Council on January 23, 2019.

(b) That Appendix "A" attached to Report FCS19073 respecting the 2019 City of Hamilton Defined Benefit Pension Plans Master Trust Statement of Investment Policies and Procedures be forwarded to the Hamilton Street Railway Pension Advisory Committee for their information.

CARRIED

FOR INFORMATION:

(a) APPROVAL OF AGENDA (Item 2)

The Committee Clerk advised that there were no changes to the agenda.

(Skarratt/Alford)
That the agenda for the December 10, 2019 meeting of the HMRF/HWRF Pension Administration Sub-committee be approved, as presented.

CARRIED

(b) DECLARATIONS OF INTEREST (Item 3)

There were no declarations of interest.

(c) APPROVAL OF MINUTES OF PREVIOUS MEETING (Item 4)

(i) December 18, 2018 (Item 4.1)

(Ferguson/Slack)
That the December 18, 2018 Minutes of the HMRF / HWRF Pension Administration Sub-Committee meeting be approved, as presented.

CARRIED

(d) ADJOURNMENT (Item 15)

(Ferguson/Hicks)
That there being no further business, the HMRF/HWRF Pension Administration Sub-Committee be adjourned at 1:21 p.m.

CARRIED

Respectfully submitted,

Councillor M. Pearson, Chair
HMRF/HWRF Pension Administration
Sub-Committee

Angela McRae
Legislative Coordinator
Office of the City Clerk

CITY OF HAMILTON
CORPORATE SERVICES DEPARTMENT
Financial Planning, Administration and Policy Division

TO:	Chair and Members HMRF / HWRF Pension Administration Sub-Committee
COMMITTEE DATE:	November 24, 2020
SUBJECT/REPORT NO:	2020 Master Trust Pension Statement of Investment Policies and Procedures (FCS20074) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Rosaria Morelli (905) 546-2424 Ext. 1390
SUBMITTED BY: **SIGNATURE:**	Mike Zegarac General Manager, Finance and Corporate Services Corporate Services Department

RECOMMENDATIONS

(a) That Appendix "A" attached to Report FCS20074 respecting the 2020 City of Hamilton Defined Benefit Pension Plans Master Trust Statement of Investment Policies and Procedures be approved and replace the previous 2019 City of Hamilton Defined Benefit Pension Plans Master Trust Statement of Investment Policies and Procedures contained in Report FCS19073 and approved by Council on January 22, 2020.

(b) That Appendix "A" attached to Report FCS20074 respecting the 2020 City of Hamilton Defined Benefit Pension Plans Master Trust Statement of Investment Policies and Procedures be forwarded to the Hamilton Street Railway Pension Advisory Committee for their information.

EXECUTIVE SUMMARY

The Statement of Investment Policies and Procedures for the City of Hamilton Defined Benefit Pension Plans Master Trust (the "Master Trust SIPP") has been updated as a result of the annual formal review required under the Master Trust SIPP. The updated Master Trust SIPP is attached as Appendix "A" to Report FCS20074.

The Master Trust SIPP comprises the investment policies of the Hamilton Municipal Retirement Fund (HMRF), the Hamilton Street Railway Company Pension Plan, 1994 (HSR) and the Hamilton-Wentworth Retirement Fund (HWRF) pension plans.

The following data were updated and incorporated into the Master Trust SIPP:

- Data pertaining to the Provision for Adverse Deviations (PfAD);
- Data related to the liabilities of the HMRF, HSR and HWRF pension plans; and
- The year of the effective date for the indexation of benefits in the HWRF pension plan was corrected to January 1, 2006 from January 1, 2008, due to a typographical error.

The PfAD is a reserve that pension plans are required to establish and fund on a going-concern basis and which is part of the pension funding regime for Ontario defined benefit pension plans effective as of May 1, 2018. Amendments pertaining to the PfAD were made to the Master Trust SIPP in Report FCS18090 respecting the 2018 Master Trust Pension Statement of Investment Policies and Procedures (City Wide) in order to comply with regulatory disclosure requirements.

For this annual formal review, there were no changes in the applicable pension legislation affecting the Master Trust SIPP since the preceding review that was undertaken and described in Report FCS19073 respecting the 2019 City of Hamilton Defined Benefit Pension Plans Master Trust Statement of Investment Policies and Procedures.

Alternatives for Consideration – Not Applicable

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: Not Applicable

Staffing: Not Applicable

Legal: Not Applicable

HISTORICAL BACKGROUND

The Master Trust SIPP provides the framework for the investment of the assets of the City of Hamilton's three non-OMERS defined-benefit pension plans: HMRF, HSR and HWRF. Assets for the three pension plans (the "Plans") have been aggregated for investment purposes in a private pooling vehicle structure or master trust structure (the "Master Trust") which was approved and adopted by Council on May 18, 1999. Each of the pension plans participates in the Master Trust.

Appendices "A", "B" and" "C to the Master Trust SIPP contain details of the individual statement of investment policies and procedures for the HMRF, HSR and HWRF pension plans, respectively.

Since 2006, a policy review of the Master Trust SIPP has been completed annually except for fiscal years 2010 and 2013. For each review, the applicable Master Trust SIPP was replaced with the amended version adopted and approved by Council.

Details of each review can be found in the following staff reports: Report FCS07096; Report FCS08111; Report FCS09093; Report FCS11033; Report FCS12084; Report FCS14080; Report FCS15083; Report FCS16081; Report FCS17079; Report FCS18090; and Report FCS19073.

The review for the year of 2010 was constrained because of the City's decision to implement the Dynamic Investment Policy (Report FCS09112) which was approved by Council on February 10, 2010. Similarly, in 2013, unplanned pressures resulted in the deferral of the annual review.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Ontario Regulation 909 (the "Regulation") made under the *Pension Benefits Act* (PBA) requires that the administrator of a provincially regulated pension plan establish a written statement of investment policies and procedures that complies with requirements of the federal investment regulations as modified in Sections 47.8 and 79 of the Regulation.

RELEVANT CONSULTATION

The City's investment consultant, Aon, undertook a review of the Master Trust SIPP from a compliance and governance perspective. Aon took account of all applicable regulatory guidance and addressed any relevant changes, where appropriate, in the Master Trust SIPP.

ANALYSIS AND RATIONALE FOR RECOMMENDATIONS

Data Pertaining to the Provision for Adverse Deviations (PfAD)

The calculation of the PfAD is based, in part, on a pension plan's asset allocation (as defined by the Regulation) generally summarized in a pension plan's PfAD Table.

The addition of a PfAD Table for the Plans was one of the amendments made to the Master Trust SIPP in Report FCS18090 respecting the "2018 Master Trust Pension Statement of Investment Policies and Procedures", in order to comply with a new disclosure requirement – "As of May 1, 2018, the SIPPs of Ontario defined benefit pension plans must disclose the percentage values of a pension plan's target asset allocation for each investment category listed in subsection 76(12) in the Regulation".

In this formal annual review, the Plans' PfAD Table on Page 5 in Section 2.03 of the Master Trust SIPP has been updated with the most current available percentage values, as of June 30, 2020, for the Target Asset Allocations. Table 1 shows the Plans' PfAD Table.

Table 1
Target Asset Allocations for Investment Categories (PfAD Table)

Investment Category under subsection 76(12) of Regulation 909	Target Asset Allocation[1]	Accessed Through Mutual or Pooled or Segregated Funds
1. Insured contracts	0.0%	-
2. Mutual or pooled funds or segregated funds	N/A	-
3. Demand deposits and cash on hand	0.0%	-
4. Short-term notes and treasury bills	0.0%	-
5. Term deposits and guaranteed investment certificates	0.0%	-
6. Mortgage loans	0.0%	-
7. Real estate	0.0%	-
8. Real estate debentures	0.0%	-
9. Resource properties	0.0%	-
10. Venture capital	0.0%	-
11. Corporations referred to in subsection 11(2) of Schedule III to the federal investment regs	0.0%	-
12. Employer issued securities	0.0%	-
13. Canadian stocks other than investments referred to in 1 to 12 above	28.0%	Yes
14. Non-Canadian stocks other than investments referred to in 1 to 12 above	28.0%	Yes
15. Canadian bonds and debentures other than investments referred to in 1 to 12 above	44.0%	Yes
16. Non-Canadian bonds and debentures other than investments referred to in 1 to 12 above	0.0%	-
17. Investments other than investments referred to in 1 to 16 above	0.0%	-

[1] The target asset allocation indicated in the PfAD table is based on the glidepath positioning as of June 30, 2020

The percentage values for the Target Asset Allocation in the PfAD Table were derived from the Plans' actual target asset mix as of June 30, 2020.

Under the Plans' dynamic investment strategy, the Plans' actual target asset mix, as of June 30, 2020, is determined from the glidepath set out on Pages 6 and 7 in Section 2.03 of the Master Trust SIPP using the value for the Plans' funded status (73% as of June 30, 2020, as reported in Report FCS20075 respecting the "Master Trust Pension Investment Performance Report as at June 30, 2020").

Hence, the Plans' actual target asset mix, as of June 30, 2020, is shown in Table 2.

Table 2
Plans' Actual Target Asset Mix
As of June 30, 2020

Canadian Equity:	28%
Global Equity:	28%
Fixed Income:	44%
(Funded Status:	73%)

Thus, in the PfAD Table, the investment categories 13 and 14 are allocated percentage values of 28% and investment category 15 is allocated a percentage value of 44%.

Previously in the PfAD Table, the percentage values for investment categories 13, 14 and 15 were equal to 30%, 30% and 40%, respectively, reflecting the Plans' actual target asset mix (30% Canadian equity, 30% global equity, 40% fixed income) at inception of the dynamic investment strategy under Section 2.03(a) of the Master Trust SIPP. The implicit understanding was that the percentage values in the PfAD Table would need to be updated as the Plans' funded status (and, therefore, the actual target asset mix) changed over time.

Data Related to the Liabilities of the HMRF, HSR and HWRF Pension Plans

Liability information on the HMRF pension plan has been updated in Section 1.03 Plan Profile, Subsection (c) Liabilities, of Appendix "A" of the Master Trust SIPP (Statement of Investment Policies and Procedures Hamilton Municipal Retirement Fund) found on Pages 25 and 26 of the Master Trust SIPP.

Liability information on the HSR pension plan has been updated in Section 1.03 Plan Profile, Subsection (c) Liabilities, of Appendix "B" of the Master Trust SIPP (Statement of Investment Policies and Procedures Hamilton Street Railway Pension Plan (1994)) found on Page 28 of the Master Trust SIPP.

Liability information on the HWRF pension plan has been updated in Section 1.03 Plan Profile, Subsection (c) Liabilities, of Appendix "C" of the Master Trust SIPP (Statement of Investment Policies and Procedures Hamilton-Wentworth Retirement Fund) found on Page 31 of the Master Trust SIPP.

Correction of Typographical Error

The effective date of the indexation of benefits in the HWRF pension plan was corrected to January 1, 2006 from January 1, 2008 in Section 1.03 Plan Profile, Subsection (b) Benefits, of Appendix “C” of the Master Trust SIPP (Statement of Investment Policies and Procedures Hamilton-Wentworth Retirement Fund) found on Page 30 of the Master Trust SIPP.

ALTERNATIVES FOR CONSIDERATION

Not Applicable.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Our People and Performance
Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report FCS20074 – Statement of Investment Policies and Procedures – City of Hamilton Defined Benefit Pension Plans Master Trust, November 2020

RM/dt

Statement of Investment Policies and Procedures

City of Hamilton Defined Benefit Pension Plans Master Trust

November 2020

APPROVED on this day of November, 2020

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Contents

Section 1—Overview

1.01 Purpose of Statement

This Statement of Investment Policies and Procedures (the "Policy" or "Master Trust SIPP") provides the framework for the investment of the assets of the City of Hamilton Defined Benefit Pension Plans Master Trust (the "Master Trust").

This Policy is based on the "prudent person portfolio approach" to ensure the prudent investment and administration of the assets of the Master Trust are within the parameters set out in the *Pension Benefits Act,* (Ontario) and the Regulations thereunder.

1.02 Background of the Master Trust

The inception date of the Master Trust is November 1, 1999, when three defined benefit pension plans, the "Plans", (the Hamilton Municipal Retirement Fund (Registration number 0275123), the Hamilton Street Railway Pension Plan (1994) (Registration number 0253344), and the Hamilton Wentworth Retirement Fund (Registration number 1073352)) invested in units of the Master Trust. The portfolio of assets in the Master Trust is referred to as "the Fund". These Plans hold units of the Master Trust and share, on a pro-rata basis, in all income, expenses and capital gains and losses of the Master Trust.

For reference purposes, the details of the Statement of Investment Policies and Procedures for each of the above mentioned Plans participating in the Master Trust have been attached to Appendix A of this Policy.

1.03 Objective of the Plan

The objective of the Plans is to provide members of the Plans with retirement benefits prescribed under the terms thereof.

1.04 Investment and Risk Philosophy

The primary investment objective is to provide an economic return on assets sufficient to fund Plan liabilities over the long-term, while adhering to prudent investment practices.

The investment philosophies and strategies must take into account both return and risk objectives of the Plans and the City of Hamilton (the "City").

In recognition of the risk and return objectives of the Plans and the City, an initial asset allocation policy was developed by the Investment Consultant in consultation with both the Chief Investments Officer and the Treasurer of the City (the "Treasurer") based on the Plans' current (at that time) funded status and the characteristics of the Plans and City. It is recognized, however, that the Plans' return requirements and risk tolerance will change over time, and the intent is to reallocate the portfolio to lower risk allocations dynamically as the Plans' funded statuses improve.

1.05 Administration

The General Manager of Finance and Corporate Services for the City ("General Manager of Finance and Corporate Services") is the designated contact person at the City for administrative purposes.

Section 2—Asset Mix and Diversification Policy

2.01 Master Trust Return Expectations

Each of the investment managers appointed to invest the assets of the Master Trust (the “Investment Managers”) is directed to achieve a satisfactory long-term real rate of return through a diversified portfolio, consistent with acceptable risks, performance objectives and prudent management.

In order to achieve their long-term investment goals, the Plans must invest in assets that have uncertain returns, such as Canadian equities, foreign equities and bonds. However, the City attempts to reduce the overall level of risk by diversifying the asset classes and further diversifying within each individual asset class. Based on historical data and reasonable expectations for future returns, the City believes that a diversified portfolio of Canadian equities, nominal bonds, real return bonds and foreign equities will likely outperform over the long term.

The overall goal of this Policy is to maximize the return of the Fund while bearing a reasonable level of risk relative to the liabilities in order to ensure the solvency of the Fund over time. The assets of the Plans are sufficiently liquid to make payments which may become due from the Plans. The weights applied to each of the asset classes are based on the targets in the initial asset allocation outlined in Section 2.03 and adjusted based on the target allocation in the Dynamic Investment Policy Schedule in Section 2.03.

2.02 Expected Volatility

The volatility of the Master Trust is directly related to its asset mix, specifically, the balance between Canadian bonds, Canadian equities and foreign equities. Since the Investment Managers do not have the authority to make any type of leveraged investment on behalf of the Master Trust, the volatility of the Master Trust should be similar to the volatility of the Benchmark Portfolio set out in Section 4.02 (Performance Measurement).

2.03 Asset Mix

(a) In order to achieve the long-term objective within the risk/return considerations described in Section 1.04, the following asset mix policy (Benchmark Portfolio) and ranges were selected for the initial asset allocation:

Assets	Minimum %	Initial Target Weight %	Maximum %	Asset Category
Canadian Equity	25	30	35	Return-Seeking
Global Equity	25	30	35	Return-Seeking
Total Equities	50	60	70	Return-Seeking
Fixed Income	30	40	50	Liability-Hedging

For purpose of the total asset mix described above, the Investment Managers' asset class pooled funds are deemed to be 100% invested, even though these funds may contain a portion held in cash and cash equivalent instruments.

The Plan's target asset allocation[1] for each investment category listed in subsection 76(12) of the Regulation 909 to the Pension Benefits Act (Ontario) is as follows:

PfAD Table

Investment Category under subsection 76(12) of Regulation 909	Target Asset Allocation[1]	Accessed through mutual or pooled or segregated funds
1. Insured Contracts	0.0%	-
2. Mutual or pooled funds or segregated funds	N/A	-
3. Demand deposits and cash on hand	0.0%	-
4. Short-term notes and treasury bills	0.0%	-
5. Term Deposits and guaranteed investment certificates	0.0%	-
6. Mortgage Loans	0.0%	-
7. Real Estate	0.0%	-
8. Real Estate Debentures	0.0%	-
9. Resource properties	0.0%	-
10. Venture Capital	0.0%	-
11. Corporations referred to in subsection 11(2) of Schedule III to the federal investment regs	0.0%	-
12. Employer issued securities	0.0%	-
13. Canadian stocks other than investments referred to in 1 to 12 above	28.0%	Yes
14. Non-Canadian stocks other than investments referred to in 1 to 12 above	28.0%	Yes
15. Canadian bonds and debentures other than investments referred to in 1 to 12 above	44.0%	Yes
16. Non-Canadian bonds and debentures other than investments referred to in 1 to 12 above	0.0%	-
17. Investments other than investments referred to in 1 to 16 above	0.0%	-

For inclusion within a fixed income investment category in the above table, the minimum ratings for target asset allocations of fixed income assets are outlined below. This framework is used to inform whether the target asset allocation to an investment category qualifies as fixed income for purposes of calculating the Provision for Adverse Deviations (PfAD) as defined under Regulation 909.

Credit Rating Agency	Rating – Bond Market Securities	Rating – Money Market Securities
DBRS	BBB	R-2 (middle)
Fitch Ratings	BBB-	F-3
Moody's Investors Services	Baa3	P-3
Standard & Poor's	BBB-	A-3

(b) Return-Seeking Assets: These assets generally will consist of all non-fixed income investments, such as equities and alternatives, with a main focus on price appreciation with generally higher expected long-term returns.

(c) Liability-Hedging Assets: These assets generally will be fixed-income investments, such as bonds, with similar duration characteristics as the pension liabilities (i.e., these assets generally behave like pension liabilities). Since these assets focus mainly on current income, their expected long-term returns will generally be lower than return-seeking assets.

(d) Sub-Allocations and Rebalancing Ranges: The sub-allocations and rebalancing ranges within the return-seeking portfolio will be reviewed from time to time as the total

[1] The target asset allocation indicated in the PfAD table is based on the glidepath positioning as of June 30, 2020.

return-seeking allocation changes due to the Dynamic Investment Policy Schedule below. The rebalancing ranges for the total return-seeking assets and liability-hedging assets (fixed income) are also determined by the Dynamic Investment Policy Schedule below.

(e) In recognition of the risk and return objectives of the Plans and the City, an initial asset allocation policy was developed by the Investment Consultant in consultation with both the Chief Investments Officer and the Treasurer based on the Plans' current (at that time) funded status and the characteristics of the Plans and City. It is recognized, however, that the Plans' return requirements and risk tolerance will change over time, and the intent is to reallocate the portfolio to lower risk allocations dynamically as the Plans' funded statuses improve.

Based on an assessment of the Plans' long-term goals and desired risk levels, the HMRF/HWRF Pension Administration Sub-Committee (following advice from the Investment Consultant) recommended to City Council a "Dynamic Investment Policy" which was subsequently approved by City Council. The Dynamic Investment Policy was developed by the Investment Consultant in consultation with the Chief Investments Officer and the Treasurer, and is based on the 2010 Dynamic Investment Policy Study which was conducted by the Investment Consultant.

The Dynamic Investment Policy dynamically adjusts the allocation to return-seeking assets and liability-hedging assets as the Plans' funded statuses improve. Funded status may change due to any combination of investment returns, contributions, benefit payments, fund expenses, and changes to liabilities (including discount rate changes).

This Policy is based on the results of the 2010 Dynamic Investment Policy Study and the Dynamic Investment Policy Schedule is as follows:

	Return -Seeking Allocation		
Funded Ratio[1 2]	**Minimum**	**Target**	**Maximum**
<65%	50%	60%	70%
65%	50%	60%	70%
66%	50%	60%	70%
67%	50%	60%	70%
68%	50%	60%	70%
69%	50%	60%	70%
70%	50%	60%	70%
71%	49%	59%	69%
72%	47%	57%	67%
73%	46%	56%	66%
74%	44%	54%	64%
75%	43%	53%	63%
76%	41%	51%	61%
77%	40%	50%	60%
78%	38%	48%	58%
79%	37%	47%	57%
80%	35%	45%	55%
81%	34%	44%	54%
82%	32%	42%	52%
83%	31%	41%	51%

	Return -Seeking Allocation		
Funded Ratio[1 2]	**Minimum**	**Target**	**Maximum**
84%	29%	39%	49%
85%	28%	38%	48%
86%	26%	36%	46%
87%	25%	35%	45%
88%	23%	33%	43%
89%	22%	32%	42%
90%	20%	30%	40%
91%	19%	29%	39%
92%	17%	27%	37%
93%	16%	26%	36%
94%	14%	24%	34%
95%	13%	23%	33%
96%	11%	21%	31%
97%	10%	20%	30%
98%	8%	18%	28%
99%	7%	17%	27%
100%	5%	15%	25%
>100%	5%	15%	25%

[1] Funded ratio defined on a Wind-up basis.

[2] Funded ratio will change based on any combination of investment returns, contributions, benefits payments, expenses and changes in liabilities.

Sub-Allocations: The sub-allocations within the liability hedging and return seeking categories will be drawn down approximately based on the table below. However, allocations to illiquid assets may be adjusted at a slower rate. Sub-allocations should be within 5% of their targets. The sub-allocations will be adjusted proportionately when the return-seeking allocation is between the levels listed in the table below.

	Return Seeking		Liability Hedging	
	Canadian Equity	Global Equity	Long-Term Bonds	Real Return Bonds
15% return seeking	8%	7%	11%	74%
20% return seeking	10%	10%	12%	68%
25% return seeking	13%	12%	14%	61%
30% return seeking	15%	15%	15%	55%
35% return seeking	18%	17%	17%	48%
40% return seeking	20%	20%	18%	42%
45% return seeking	23%	22%	20%	35%
50% return seeking	25%	25%	21%	29%
55% return seeking	28%	27%	23%	22%
60% return seeking	30%	30%	25%	15%

Duration Strategy: Based on the Dynamic Investment Policy Study completed in 2010, the portfolio interest rate dollar duration will increase as the funded status improves and the allocation to liability hedging assets increases. Interest rate derivatives may be used on either a strategic or opportunistic basis to mitigate risk by increasing the hedge ratio up to 100%. This will be at the discretion of the Administrator and based on the duration of the Plan's liabilities.

Rebalancing and Monitoring: A systematic rebalancing procedure will be utilized to ensure that the asset allocation of the Fund stays within the ranges defined above. As the return-seeking asset allocation changes, the sub-category allocations will be kept approximately proportional to the Initial allocation specified above. However, the allocations to illiquid investments may be adjusted more slowly. The funded ratio and asset allocation of the Fund will be reviewed regularly or when significant cash flows occur, and will be monitored and reported on at least an annual basis, or upon such more frequent basis as may be requested by City Council or its delegates from time to time. The Fund will be rebalanced as necessary, making use of benefit payments and contributions to the extent possible and considering the transaction costs involved in the rebalancing.

2.04 Management Structure

The Master Trust may employ a mix of active and passive management styles. Active management provides the opportunity to outperform specific investment benchmarks and it can provide lower absolute volatility of returns. Passive, or index, management minimizes the risk of underperformance relative to a benchmark index and is generally less expensive than active management. This approach also diversifies the manager risk, making the Master Trust less reliant on the skills of a single Investment Manager.

Because holding large amounts of foreign assets can expose the Master Trust to fluctuations in the level of the Canadian dollar, a portion of the foreign assets may be hedged back into Canadian dollars.

2.05 Environmental, Social and Governance (ESG) Issues

The Administrator's primary responsibility is to make decisions in the best interest of the Plan beneficiaries. This responsibility requires that there be an appropriate balance between the need to seek long-term investment returns to help build better pensions for all members of the Plans and the needs for those returns to be delivered in as stable a manner as possible (given the behaviour of the investment markets).

The Administrator neither favours nor avoids managers and investments based on ESG integration. In keeping with the foregoing, and having regard to the size of the Plans and the pension fund, the Administrator does not take ESG factors into account when making investment decisions. As previously noted, the Administrator has delegated the search for investment managers to its Investment Consultant. On the direction of the Administrator, the Investment Consultant is directed to search and select the best investment managers for investing the assets of the Plans considering factors such as business, staff, historical performance and investment process, since the Administrator believes that these factors will contribute to higher investment returns in the long run and manage risk. Investment Managers are not prohibited from considering ESG factors if they believe that it will have a positive impact on the Plans' investment returns.

Section 3—Permitted and Prohibited Investments

3.01 General Guidelines

The investments of the Master Trust must comply with the requirements and restrictions set out in the *Income Tax Act* (Canada) and the *Pension Benefits Act* (Ontario), and their respective Regulations.

3.02 Permitted Investments

In general, and subject to the restrictions in this Section 3, the Investment Managers may invest in any of the following asset classes and in any of the investment instruments listed below:

(a) **Canadian and Foreign Equities**

(i) Common and convertible preferred stock the shares of which are (a) listed on a prescribed stock exchange in Canada; or (b) listed on a prescribed stock exchange outside Canada;

(ii) Debentures convertible into common or convertible preferred stock, provided such instruments are traded on a recognized public exchange or through established investment dealers;

(iii) Rights, warrants and special warrants for common or convertible preferred stock the shares of which are (a) listed on a prescribed stock exchange in Canada; or (b) listed on a prescribed stock exchange outside Canada;

(iv) Private placement equities, where the security will be eligible for trading on a recognized public exchange within a reasonable and defined time frame;

(v) Instalment receipts, American Depository Receipts, Global Depository Receipts and similar exchange traded instruments;

(vi) Units of real estate investment trusts (REITs);

(vii) Exchange traded index-participation units (e.g., iUnits; SPDRs);

(viii) Income trusts registered as reporting issuers under the Securities Act, domiciled in a Canadian jurisdiction that provides limited liability protection to unit holders; and

(ix) Units of limited partnerships which are listed on the TSX exchange.

(b) **Canadian and Foreign Fixed Income**

(i) Bonds, debentures, notes, non-convertible preferred stock and other evidence of indebtedness of Canadian or developed market foreign issuers whether denominated and payable in Canadian dollars or a foreign currency, provided such instruments are traded on a recognized public exchange or through established investment dealers, subject to Section 3.04 below;

(ii) Real return bonds, subject to Section 3.04 below;

(iii) Mortgages secured against Canadian real estate subject to Section 3.05 below;

(iv) Mortgage-backed securities, guaranteed under the *National Housing Act*;

(v) Term deposits and guaranteed investment certificates;

(vi) Private placements of bonds subject to Section 3.03 below; and,

(vii) Investment in bond and debenture issues of the City and affiliated bodies is neither encouraged nor discouraged. The decision by the Investment Manager(s) to invest in such issues is entirely their responsibility and they should be governed by the same degree of due diligence and prudence that they would apply when assessing any other investment in respect of a registered pension plan.

(c) **Cash and Short Term Investments**

(i) Cash on hand and demand deposits;

(ii) Canadian and U.S. Treasury bills and bonds (with remaining maturities not exceeding 365 days) issued by the federal (Canada & U.S., as applicable) and provincial governments and their agencies;

(iii) Sovereign short-term debt instruments of developed countries, with maturities not exceeding 365 days;

(iv) Obligations of trust companies and Canadian and foreign banks chartered to operate in Canada, including bankers' acceptances;

(v) Commercial paper and term deposits; and

(vi) Other money market instruments (maturity not exceeding 365 days).

(d) **Derivatives**

Assets are not invested in derivative instruments and the trust will not invest in derivatives directly (including options and futures). In the event that a pooled fund invests in derivatives, prior to investing in such pooled fund, appropriate risk management processes and procedures will be in place in order to help mitigate any risks associated with derivatives. Specifically, all derivative investments will be made in accordance with applicable legislation and regulatory policies relating to the investment of pension plan assets in derivatives. The following uses of non-leveraged derivative instruments are permitted:

(i) Covered put and/or call options with respect to publicly traded securities that are held in the portfolio;

(ii) The Investment Manager of an index portfolio may utilize fully backed, i.e. non-leveraged, derivative strategies designed to replicate the performance of specific market indices, i.e.- exchange-traded equity index futures contracts;

(iii) Investment Managers may use currency futures contracts and forward contracts to hedge foreign currency exposure; and

(iv) Interest rate derivatives can be used to hedge the interest rate risk in the liabilities.

(e) **Other Investments**

(i) Investments in open-ended or closed-ended pooled funds provided that the assets of such funds are permissible investments under this Policy, and

(ii) Deposit accounts of the Custodian can be used to invest surplus cash holdings.

(f) **Index Mandates**

(i) For managers of index mandates, permitted investment vehicles may include all instruments that may form part of the respective index.

3.03 Minimum Quality Requirements

(a) **Quality Standards**

Within the investment restrictions for individual portfolios, all portfolios should hold a prudently diversified exposure to the intended market.

(i) The minimum quality standard for individual bonds and debentures is 'BBB-' or equivalent as rated by a Recognized Bond Rating Agency, at the time of purchase.

(ii) The minimum quality standard for individual short term investments is 'R-1' low or equivalent as rated by a Recognized Bond Rating Agency, at the time of purchase.

(iii) The minimum quality standard for individual preferred shares is 'P-1' or equivalent as rated by a Recognized Bond Rating Agency, at the time of purchase.

(iv) All investments shall be reasonably liquid (i.e. in normal circumstances they should be capable of liquidation within 1 month).

(b) **Split Ratings**
In cases where the Recognized Bond Rating Agencies do not agree on the credit rating, the bond will be classified according to the following methodology:

(i) If two agencies rate a security, use the lower of the two ratings;

(ii) If three agencies rate a security, use the most common; and if four agencies rate a security, use the lowest most common; and

(iii) If three agencies rate a security and all three agencies disagree, use the middle rating; if four agencies rate a security and all four agencies disagree, use the lowest middle rating.

(c) **Downgrades in Credit Quality**
Each Investment Manager will take the following steps in the event of a downgrade in the credit rating of a portfolio asset by a Recognized Rating Agency to below the purchase standards set out in Section 3.03 (a) Quality Standards:

(i) The Chief Investments Officer will be notified of the downgrade by telephone at the earliest possible opportunity;

(ii) Within ten business days of the downgrade, the Investment Manager will advise the Chief Investments Officer in writing of the course of action taken or to be taken by the Investment Manager, and its rationale; and

(iii) Immediately upon downgrade, the Investment Manager will place the asset on a Watch List subject to monthly review by the Investment Manager with the Chief Investments Officer until such time as the security matures, is sold or until it is upgraded to a level consistent with the purchase quality standards as expressed in the above guidelines.

(d) Rating Agencies
For the purposes of this Policy, the following rating agencies shall be considered to be 'Recognized Bond Rating Agencies':

(i) Dominion Bond Rating Service Limited;

(ii) Standard and Poor's;

(iii) Moody's Investors Services Inc.; and

(iv) Fitch Ratings

(e) Private Placement Bonds
Private placement bonds are permitted subject to **all** of the following conditions:

(i) The issues acquired must be 'A' or equivalent rated;

(ii) The total investment in such issues must **not** exceed 10% of the market value of the Investment Manager(s) bond portfolio;

(iii) The Investment Manager's portfolio may **not** hold more than 5% of the market value of any one private placement;

(iv) The Investment Manager(s) must be satisfied that there is sufficient liquidity to ensure sale at a reasonable price; and

(v) The minimum issue size for any single security must be at least $150 million.

3.04 Maximum Quantity Restrictions

(a) Total Fund Level

No one equity holding shall represent more than 10% of the total market value of the Master Trust's assets.

(b) Individual Investment Manager Level

The Investment Manager(s) shall adhere to the following restrictions:

(i) Equities

(A) No one equity holding shall represent more than 10% of the market value of any one Investment Manager's equity portfolio.

(B) No one equity holding shall represent more than 10% of the voting shares of a corporation.

(C) No one equity holding shall represent more than 10% of the available public float of such equity security.

(D) Income Trusts shall not comprise more than 15% of any Investment Manager's Canadian equity portfolio.

(ii) Bonds and Short Term

(A) Except for federal and provincial bonds (including government guaranteed bonds), no more than 10% of an Investment Manager's bond portfolio may be invested in the bonds of a single issuer and its related companies.

(B) Except for federal and provincial bonds, no one bond holding shall represent more than 10% of the market value of the total outstanding for that bond issue.

(C) No more than 8% of the market value of an Investment Manager's bond portfolio shall be invested in bonds rated BBB (this includes all of BBB's: BBB+, BBB, and BBB-) or equivalent.

(D) This Policy will permit the continued holding of instruments whose ratings are downgraded below BBB- after purchase, provided that such instruments are disposed of in an orderly fashion.

(E) No more than 10% of the market value of an Investment Manager's bond portfolio shall be invested in bonds denominated in a currency other than Canadian dollars.

(F) Except for the dedicated real return bond mandate, no more than 10% of the market value of the bond portfolio may be held in real return bonds.

(iii) Other
The use of derivative securities shall be supported at all times by the explicit allocation of sufficient assets to back the intended derivative strategy. For greater certainty, Investment Managers are not permitted to leverage the assets of the Master Trust. The use of derivative securities is only permitted for the uses described in this Policy. Purchase or sale of any of these instruments for speculative purposes is prohibited.

Notwithstanding the limits described in this Section, the single security limits do not apply to an Investment Manager's index mandate.

3.05 Prior Permission Required

The following investments are permitted **provided that** prior permission for such investments has been obtained from the Administrator:

(a) Investments in private placement equities (except for the foreign equity investment managers investing in pooled funds where the pooled fund policy permits private placement equities).

(b) Direct investments in mortgages.

(c) Direct investments in any one parcel of real property that has a book value less than or equal to 5% of the book value of the Master Trust's assets. The aggregate book value of all investments in real property and Canadian resource properties shall not exceed 25% of the book value of the Master Trust's assets. (Previously, the overall 25% limit in respect of real and resource properties was a requirement under the *Pension Benefits Act* (Ontario).*)*

(d) Direct investments in venture capital financing or private equity partnerships; and

(e) Derivatives other than those described in 3.02(d).

3.06 Prohibited Investments

The Investment Managers shall not:

(a) Invest in companies for the purpose of managing them;

(b) Invest in securities that would result in the imposition of a tax on the Fund under the *Income Tax Act* (Canada) unless they provide a prior written acknowledgement that such investments will result in a tax and receive prior written permission for such investments from the Administrator or;

(c) Make any investments not specifically permitted by this Policy.

3.07 Securities Lending

The investments of the Master Trust may be loaned, for the purpose of generating revenue for the Fund, subject to the provisions of the *Pension Benefits Act* (Ontario) and the *Income Tax Act* (Canada), and applicable regulations.

For securities held in segregated accounts, such loans must be secured by cash and/or readily marketable government bonds, treasury bills and/or letters of credit, discount notes and bankers' acceptances of chartered banks. For loaned securities, the security held or collateral must have an aggregate market value which shall never be less than the percentage of the aggregate market value of the loaned securities which is the highest of: (i) the minimum percentage required by any applicable legislation, regulatory authority or prevailing market practice; or (ii) 105%. The aggregate market value of the loaned securities and of the collateral shall be monitored and calculated by the Custodian daily.

The terms and conditions of any securities lending program will be set out in a contract with the custodian. The custodian shall, at all times, ensure that the Chief Investments Officer has a current list of those institutions that are approved to borrow the Fund's investments.

Lending of the portion of the Master Trust's assets held in a pooled fund is governed by the terms of the conditions set out in the pooled fund Statement of Investment Policies and Procedures or similar document.

3.08 Borrowing

The Master Trust shall not borrow money, except to cover short-term contingency and the borrowing is for a period that does not exceed ninety days, subject to the *Pension Benefits Act* (Ontario), the *Income Tax Act* (Canada) and the written permission of the General Manager of Finance and Corporate Services.

3.09 Conflicts between the Policy and Pooled Fund Investment Policies

While the guidelines in this Policy are intended to guide the management of the Master Trust, it is recognized that, due to the use of pooled funds, there may be instances where there is a conflict between the Policy and the investment policy of a pooled fund. In that case, the Investment Manager is expected to notify Chief Investments Officer upon the initial review of the Policy and whenever a change in the pooled fund policy creates a conflict. However, it is understood that any ambiguity will be interpreted in favour of the pooled fund policy, provided such interpretation complies with all applicable laws.

Section 4—Monitoring and Control

4.01 Delegation of Responsibilities

The General Manager of Finance and Corporate Services is the designated contact person for administrative matters. However, City Council has delegated certain administrative duties and responsibilities to internal and external agents, including to the HMRF/HWRF Pension Administration Sub-committee, the Chief Investments Officer and the General Manager of Finance and Corporate Services. Overall responsibility for the Master Trust ultimately rests with City Council, and the City (acting through Council) is the pension plan administrator of the Plans (for each Plan, the "Administrator")**.**

(a) Chief Investments Officer

The Chief Investments Officer has been delegated the following responsibilities:

(i) monitoring the Master Trust asset mix and rebalancing as required, including executing asset mix changes required per the Dynamic Policy Schedules outlined in section 2.03;

(ii) day-to-day liaison including contract management with external Investment Managers, the Investment Consultant, and the Custodian/Trustee;

(iii) monitoring and budgeting for cash flow within the pension fund;

(iv) researching, recommending and implementing improvements to asset management of the Master Trust;

(v) directing and implementing strategy for self-managed portfolios, if any; and

(vi) preparing and presenting to City Council and the HMRF/HWRF Pension Administration Sub-Committee a report on the Plan's investment performance and asset mix, and such other information as City Council may require and/or other such information as the Chief Investments Officer considers appropriate to include in the report, on at least an annual basis, or upon such more frequent basis as may be requested by City Council or its delegates from time to time.

(b) Investment Managers

The Investment Managers have been delegated the following responsibilities:

(i) invest the assets of the Master Trust in accordance with this Policy;

(ii) meet with the Chief Investments Officer as required and provide written reports regarding the Investment Manager's past performance, their future strategies and other issues as requested;

(iii) notify the Chief Investments Officer, in writing of any significant changes in the Investment Manager's philosophies and policies, personnel or organization and procedures;

(iv) will provide periodically, but no less than on an annual basis, or upon such more frequent basis as may be requested by City Council or its delegates from time to time, lists of assets and such other information as may be requested by the Chief Investments Officer; and,

(v) file, on at least an annual basis, or upon such more frequent basis as may be requested by City Council or its delegates from time to time compliance reports (see Section 4.03).

(c) Custodian/Trustee

The custodian/trustee will:

(i) Fulfil the regular duties of a Custodian/Trustee as required by law;

(ii) maintain safe custody over the assets of the Master Trust Plans;

(iii) execute the instructions of the Chief Investments Officer and the Investment Managers; and

(iv) record income and provide financial statements to the Chief Investments Officer on at least an annual basis, or upon such more frequent basis as may be requested by City Council or its delegates from time to time, or as otherwise required.

(d) Investment Consultant

The investment consultant has been delegated the following responsibilities:

(i) assist the Chief Investments Officer in developing a prudent long-term asset mix, and specific investment objectives and policies;

(ii) monitor, analyse and report on the Master Trust's investment performance and to support the Chief Investments Officer on any investment related matters;

(iii) monitor and report the funded status of the Plans to the Chief Investments Officer on at least an annual basis, or upon such more frequent basis as may be requested by City Council or its delegates from time to time;

(iv) assist with the selection of Investment Managers, custodians and other suppliers; and

(v) meet with the Chief Investments Officer as required.

(e) Actuary

The actuary has been delegated the following responsibilities:

(i) perform actuarial valuations of the Plan as required; and

(ii) advise the Chief Investments Officer and the Investment Consultant on any matters relating to Plan design, membership and contributions, and actuarial valuations.

4.02 Performance Measurement

For the purpose of evaluating the performance of the Master Trust and the Investment Managers, all rates of returns are measured over moving four-year periods. Return objectives are net of fees and include realized and unrealized capital gains or losses plus income from all sources. Returns will be measured quarterly and will be calculated as time-weighted rates of return.

(a) Active and Index Canadian Equity Managers

Investment results of the active and index Canadian Equity Managers are to be tested regularly against a Benchmark Portfolio comprising:

Benchmark	%
S&P/TSX Composite Index	100

(b) Active and Index Global Equity Managers

Investment results of the active and index Global Equity Managers are to be tested regularly against a long-term Benchmark Portfolio comprising:

Benchmark	%
MSCI World Index (C$)	100

(c) Active and Index Canadian Bond Managers – Long Bonds

Investment results of the active and index Canadian Bond Managers for Long Bonds are to be tested regularly against a Benchmark Portfolio comprising:

Benchmark	%
FTSE Canada Long Bond Index	100

(d) Active and Index Canadian Bond Managers – Real Return Bonds

Investment results of the active and index Canadian Bond Managers for Real Return Bonds are to be tested regularly against a Benchmark Portfolio comprising:

Benchmark	%
FTSE Canada Real Return Bond Index	100

4.03 Compliance Reporting by Investment Manager

The Investment Managers are required to complete and deliver a compliance report to the Chief Investments Officer and the Investment Consultant on at least an annual basis, or upon such more frequent basis as may be requested by City Council or its delegates from time to time. The compliance report will indicate whether or not the Investment Manager was in compliance with this Policy during the period covered in the report.

In the event that an Investment Manager is not in compliance with this Policy, the Investment Manager is required to advise the Chief Investments Officer immediately, detail the nature of the non-compliance and recommend an appropriate course of action to remedy the situation.

The Master Trust invests in pooled funds with separate investment policies. In that case, the Investment Manager must confirm compliance to the pooled fund policy. In addition, should a conflict arise between a pooled fund policy and this Policy, the Investment Manager is required to advise the Chief Investments Officer immediately and detail the nature of the conflict.

4.04 Standard of Professional Conduct

The Investment Managers are expected to comply, at all times and in all respects, with a written code of ethics that is no less stringent in all material respects than the Code of Ethics and Standards of Professional Conduct as promulgated by the CFA Institute.

The Investment Managers will manage the assets with the care, diligence and skill that an investment manager of ordinary prudence would use in dealing with pension plan assets. The Investment Managers will also use all relevant knowledge and skill that they possess or ought to possess as prudent investment managers.

Section 5—Administration

5.01 Conflicts of Interest

(a) Responsibilities

This standard applies to the City's staff, as well as to all agents employed by the City, in the execution of their responsibilities under the *Pension Benefits Act* (Ontario) (the "Affected Persons").

An "agent" is defined to mean a company, organization, association or individual, as well as its employees who are retained by the Administrator to provide specific services with respect to the investment, administration and management of the assets of the Master Trust.

(b) Disclosure

In the execution of their duties, the Affected Persons shall disclose any material conflict of interest relating to them, or any material ownership of securities, which could impair their ability to render unbiased advice, or to make unbiased decisions, affecting the administration of the Master Trust assets.

Further, it is expected that no Affected Person shall make any personal financial gain (direct or indirect) because of his or her fiduciary position. However, normal and reasonable fees and expenses incurred in the discharge of their responsibilities are permitted in accordance with City policies as approved by Council.

No Affected Person shall accept a gift or gratuity or other personal favour, other than one of nominal value, from a person with whom the employee deals in the course of performance of his or her duties and responsibilities for the Master Trust.

It is incumbent on any Affected Person who believes that he or she may have a conflict of interest, or who is aware of any conflict of interest, to disclose full details of the situation to the attention of the General Manager of Finance and Corporate Services and/or the Treasurer immediately. The General Manager of Finance and Corporate Services and/or the Treasurer, in turn, will decide what action is appropriate under the circumstances.

No Affected Person who has or is required to make a disclosure as contemplated in this Policy shall participate in any discussion, decision or vote relating to any proposed investment or transaction in respect of which he or she has made or is required to make disclosure, unless otherwise determined permissible by decision of the General Manager of Finance and Corporate Services and/or the Treasurer.

5.02 Related Party Transactions

The Chief Investments Officer shall not, on behalf of the Plans or the Master Trust, directly or indirectly,

(i) lend the moneys of the Plans to a related party or use those moneys to hold an investment in the securities of a related party; or

(ii) enter into a transaction with a related party.

The Chief Investments Officer may enter into a transaction with a related party:

(i) for the operation or administration of the Plans if it is under terms and conditions that are not less favourable to the Plans than market terms and conditions and such transaction does not involve the making of loans to, or investments in, the related party or

(ii) the value of the transaction is nominal or the transaction is immaterial. In assessing whether the value of the transaction is nominal or immaterial, two or more transactions with the same related party shall be considered as a single transaction.

For the purposes of Section 5.02, only the market value of the combined assets of the Fund shall be used as the criteria to determine whether a transaction is nominal or immaterial. Transactions less than 0.5% of the combined market value of the assets of the Fund are considered nominal.

The following investments are exempt from the related party rules:

(i) investments in an investment fund or a segregated fund (as those terms are used in the *Pension Benefits Standards Regulations*) in which investors other than the administrator and its affiliates may invest and that complies with Section 9 and Section 11 of Schedule III to the *Pension Benefits Standards Regulations*;

(ii) investments in an unallocated general fund of a person authorized to carry on a life insurance business in Canada;

(iii) investments in securities issued or fully guaranteed by the Government of Canada, the government of a province, or an agency of either one of them;

(iv) investments in a fund composed of mortgage-backed securities that are fully guaranteed by the Government of Canada, the government of a province, or an agency of either one of them;

(v) investments in a fund that replicates the composition of a widely recognized index of a broad class of securities traded at a marketplace (as that term is used in the *Pension Benefits Standards Regulations*); or

(vi) investments that involve the purchase of a contract or agreement in respect of which the return is based on the performance of a widely recognized index of a broad class of securities traded at a marketplace (as that term is used in the *Pension Benefits Standards Regulations*).

A "related party" is defined to mean the Administrator of the Plans, including any officer, director or employee of the Administrator. It also includes, the Investment Managers and their employees, a union representing employees of the employer, a member of the Master Trust, a spouse or child of the persons named previously, or a corporation that is directly or indirectly controlled by the persons named previously, and any other person constituting a "related party" under the *Pension Benefits Act* (Ontario). Related party does not include government or a government agency, or a bank, trust company or other financial institution that holds the assets of the Master Trust.

5.03 Selecting Investment Managers

In the event that a new Investment Manager must be selected or additional Investment Manager(s) added to the existing Investment Manager(s), the Chief Investments Officer will undertake an Investment Manager search with or without the assistance of a third-party investment consultant depending on the expertise required. The criteria used for selecting an Investment Manager will be consistent with the investment and risk philosophy set out in Section 1.04 (Investment and Risk Philosophy).

5.04 Directed Brokerage Commissions

Investment Managers may use directed brokerage to pay for research and other investment related services provided they comply with, and provide the disclosure required by, the Soft Dollar Standards promulgated by the CFA Institute.

5.05 Monitoring of Asset Mix

In order to ensure that the Master Trust operates within the minimum and maximum guidelines stated in this Policy as outlined in Section 2, the Chief Investments Officer shall monitor the asset mix on at least an annual basis, or upon such more frequent basis as may be requested by City Council or its delegates from time to time. Rebalancing between the investment mandates can take place over a reasonably short period of time after an imbalance has been identified. Rebalancing may be effected by redirecting the net cash flows to and from the Master Trust, or by transferring cash or securities between portfolios and/or Investment Managers.

5.06 Monitoring of Investment Managers

An important element in the success of this Policy is the link between the Investment Managers and the Chief Investments Officer. It is expected that the Investment Managers will communicate with the Chief Investments Officer whenever necessary. Periodic, written investment reports from the Investment Managers are sent to and reviewed by the Chief Investments Officer and form part of the monitoring process.

Meetings including telephone conference call meetings between the Investment Managers and the Chief Investments Officer will be scheduled as required. At each meeting or telephone conference call meeting, it is expected that the Investment Managers will prepare a general economic and capital markets overview, which will be distributed prior to or during the meeting. They should also include the following in their presentations:

- review of the previous period's strategy and investment results,
- discussion of how the condition of the capital markets affects the investment strategy of their respective portfolios,
- economic and market expectations,
- anticipated changes in the asset mix within the limits provided in this Policy, and,
- discussion of compliance and any exceptions.
- discussion of any votes that were cast against the wishes of company management by the Investment Managers in exercising voting rights (Section 5.08).

5.07 Dismissal of an Investment Manager

Reasons for considering the termination of the services of an Investment Manager include, but are not limited to, the following factors:

(a) performance results which are below the stated performance benchmarks;

(b) changes in the overall structure of the Master Trusts' assets such that the Investment Manager's services are no longer required;

(c) change in personnel, firm structure or investment philosophy which might adversely affect the potential return and/or risk level of the portfolio; and/or

(d) failure to adhere to this Policy.

5.08 Voting Rights

The Administrator has delegated voting rights acquired through the investments held by the Master Trust to the custodian of the securities to be exercised in accordance with the Investment Manager's instructions. Investment Managers are expected to exercise all voting rights related to investments held by the Master Trust in the interests of the members of the underlying pension plans. The Investment Managers shall report when they vote against the wishes of the company management to the Chief Investments Officer, providing information as to the reasons behind this vote.

5.09 Valuation of Investments Not Regularly Traded

The following principles will apply for the valuation of investments that are not traded regularly:

(a) Equities
Average of bid-and-ask prices from two major investment dealers, at least once every calendar quarter.

(b) Bonds
Same as for equities.

(c) Mortgages
Unless in arrears, the outstanding principal plus/minus the premium/discount resulting from the differential between face rate and the currently available rate for a mortgage of similar quality and term, determined at least once every month.

(d) Real Estate
A certified written appraisal from a qualified independent appraiser at least once every two years.

5.10 Policy Review

This Policy may be reviewed and revised at any time, but at least once every calendar year it must be formally reviewed. Should the Investment Manager(s) wish to review this Policy at any time, it is his/her responsibility to contact the Chief Investments Officer with specific recommendations.

The appropriateness of the Dynamic Investment Policy asset allocation parameters should be reviewed on an ongoing basis. A new Dynamic Investment Policy Study (Dynamic Asset-Liability Modeling Study) may be undertaken if any of the following events occur:

(a) The plan gets significantly closer to the end-state of the flight path, including if the flight path funded ratio measurement changes significantly (to over 84%) from the starting point of the 2010 study, which was 69%.

(b) There are significant changes to the regulations that affect the key metrics used in making decisions in the 2010 Dynamic Investment Policy Study or should affect the asset allocation in the future;

(c) Capital market conditions change significantly such that the assumptions embedded in the 2010 Dynamic Investment Policy Study are no longer reasonable; or

(d) The plan sponsor's risk posture changes significantly.

Appendix A - Statement of Investment Policies & Procedures Hamilton Municipal Retirement Fund

Overview

1.01 Purpose of Statement

This Statement of Investment Policies and Procedures (the "Hamilton Municipal Retirement Fund SIPP") provides the framework for the investment of the assets of the Hamilton Municipal Retirement Fund, registration number 0275123 (the "Plan");

The objective of the Hamilton Municipal Retirement Fund SIPP is to ensure that the assets of the Plan, together with expected contributions made by both the City and the Plan members, shall be invested in a continued prudent and effective manner.

The Hamilton Municipal Retirement Fund SIPP is based on the "prudent person portfolio approach" to ensure the prudent investment and administration of the assets of the Plan (the "Fund") are within the parameters set out in the *Pension Benefits Act,* (Ontario) and the Regulations thereunder.

All provisions in the Master Trust SIPP apply to this Appendix.

1.02 Background of the Plan

The Hamilton Municipal Retirement Fund is a contributory defined benefit plan. The plan has been closed to new entrants since 1965. Municipal employees hired after June 30, 1965 participate in the OMERS Pension Plan. Therefore, this is a closed fund and will terminate upon the death of the last retiree or successor. Effective July 1, 2001, the last active member retired from the Plan.

1.03 Plan Profile

a) Contributions

There are no active members in the Plan.

b) Benefits

2% of average annual earnings in best consecutive 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 final year's YMPE for each year of contributory service after January 1, 1966. CPP Offset suspended from date of retirement to age 65. Effective Jan 1, 2006 annual increases will not be less than the increase provided to retirees under the OMERS plan. .

c) Liabilities

As of the most recent actuarial valuation of the Plan as at December 31, 2019 there were no active members, 3 deferred members and 177 retirees and beneficiaries.

As of December 31, 2019, the going-concern liability of the plan was $68,912,831, including a Provision for Adverse Deviation (PfAD) of $3,700,990, compared to the actuarial value of assets of $71,445,290. On a solvency basis, the liability was $57,859,942, while the assets (at market) were $71,295,290 (net of a provision for plan windup expenses of $150,000). On a windup basis, the liability was $72,819,924.

1.04 Objective of the Plan

The objective of the Plans is to provide members of the Plans with retirement benefits prescribed under the terms thereof.

1.05 Investment and Risk Philosophy

The primary investment objective is to provide an economic return on assets sufficient to fund plan liabilities over the long-term, while adhering to prudent investment practices.

The investment philosophies and strategies must take into account both return and risk objectives of the Plan and the City.

In recognition of the risk and return objectives of the Plan and the City, an initial Asset Allocation Policy was developed based on the Plan's current funded status and the characteristics of the Plan and City. It is recognized, however, that the Plan return requirements and risk tolerance will change over time, and the intent is to reallocate the portfolio to lower risk allocations dynamically as the Plan's funded status improves.

1.06 Administration

The General Manager of Finance and Corporate Services for the City of Hamilton is the designated contact at the City for administrative purposes.

1.07 Pooling of Assets

For investment purposes, certain assets of the Plan are invested in units of the City of Hamilton Defined Benefit Plans Master Trust, along with certain assets of the Hamilton-Wentworth Retirement Fund and the Hamilton Street Railway Pension Plan (1994).

Up to 2 % of Plan assets may be invested outside of the City of Hamilton Defined Benefit Plans Master Trust for operating expenses and liquidity purposes, in accordance with the parameters set out in Section 3.02 (c) and (e) of the City of Hamilton Defined Benefit Plans Master Trust SIPP. The provisions of the City of Hamilton Defined Benefit Plans Master Trust SIPP apply to the investment of these assets.

1.08 Master Trust SIPP

The Master Trust SIPP is the policy that should be followed while investing the pooled assets of the Hamilton Municipal Retirement Fund.

Appendix B - Statement of Investment Policies & Procedures Hamilton Street Railway Pension Plan (1994)

Overview

1.01 Purpose of Statement

This Statement of Investment Policies and Procedures (the " Hamilton Street Railway Pension Plan SIPP") provides the framework for the investment of the assets of the Hamilton Street Railway Pension Plan (1994), registration number 0253344 (the "Plan");

The objective of the Hamilton Street Railway Pension Plan SIPP is to ensure that the assets of the Plan, together with expected contributions made by both the City and the Plan members, shall be invested in a continued prudent and effective manner.

The Hamilton Street Railway Pension Plan SIPP is based on the "prudent person portfolio approach" to ensure the prudent investment and administration of the assets of the Plan (the "Fund") are within the parameters set out in the *Pension Benefits Act,* (Ontario) and the Regulations thereunder.

All provisions in the Master Trust SIPP apply to this Appendix.

1.02 Background of the Plan

The current Plan dates from January 1, 1994 when two former plans – Canada Coach Lines and Hamilton Street Railway plans were merged. Effective January 1, 2009 this contributory defined benefit plan was closed to new members and active members stopped contributing and accruing service under the plan.

1.03 Plan Profile

a) Contributions

Under the terms of the Plan text, members' contributions prior to 1999 were 7.5% of earnings less contributions made to Canada Pension Plan. For the calendar years 1999 through 2008, members (depending on the year) either enjoyed a contribution holiday or were limited to contribution rates of 1% of earnings. Effective January 2009, as members became City employees, no member contributions have been required or permitted to be made to the Plan.

b) Benefits

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 accrued up to December 31, 2008. The "average pensionable earnings" are defined as the average of best five years' earnings during the member's credited service and OMERS credited service, if any. The "average YMPE" is defined as the average of the YMPE for the last thirty-six complete months of plan membership.

In the event that pensions accrued under the prior plan exceed the pension accrued under the current plan for service prior to July 1, 1980, then the pension is increased accordingly. Pensions are subject to annual indexing equal to the indexing provided to retirees under the OMERS plan (100% of inflation to a maximum of 6% per annum).

c) Liabilities

As of the most recent actuarial valuation of the Plan as at January 1, 2020, there were 315 active members, 29 deferred members and 610 retirees and beneficiaries. The average age of the active members was approximately 54.3 years with average pensionable earnings of $70,474.

As of January 1, 2020, the going-concern liability of the plan was $228,695,400, including a Provision for Adverse Deviation (PfAD) of $17,103,300, compared to the actuarial value of assets of $211,167,500. On a solvency basis, the liability was $216,314,100 while the assets (at market) were $210,967,500 (net of a provision for plan windup expenses of $200,000). On a windup basis the liability was $315,487,000.

The going-concern deficit is being eliminated through a series of special payments. No special payments are required for the solvency deficit since the solvency ratio exceeds .85.

1.04 Objective of the Plan

The objective of the Plan is to provide members of the Plan with retirement benefits prescribed under the terms thereof.

1.05 Investment and Risk Philosophy

The primary investment objective is to provide an economic return on assets sufficient to fund plan liabilities over the long-term, while adhering to prudent investment practices.

The investment philosophies and strategies must take into account both return and risk objectives of the Plan and the City.

In recognition of the risk and return objectives of the Plan and the City, an initial Asset Allocation Policy was developed based on the Plan's current funded status and the characteristics of the Plan and City. It is recognized, however, that the Plan return requirements and risk tolerance will change over time, and the intent is to reallocate the portfolio to lower risk allocations dynamically as the Plan's funded status improves.

1.06 Administration

The General Manager of Finance and Corporate Services for the City of Hamilton is the designated contact at the City for administrative purposes.

1.07 Pooling of Assets

For investment purposes, certain assets of the Plan are invested in units of the City of Hamilton Defined Benefit Plans Master Trust, along with certain assets of the Hamilton-Wentworth Retirement Fund and the Hamilton Municipal Retirement Fund.

Up to 2 % of Plan assets may be invested outside of the City of Hamilton Defined Benefit Plans Master Trust for operating expenses and liquidity purposes, in accordance with the parameters set out in Section 3.02 (a), (c) and (e) of the City of Hamilton Defined Benefit Plans Master Trust SIPP. The provisions of the City of Hamilton Defined Benefit Plans Master Trust SIPP apply to the investment of these assets.

1.08 Master Trust SIPP

The Master Trust SIPP is the policy that should be followed while investing the pooled assets of the Hamilton Street Railway Pension Plan (1994).

Appendix C - Statement of Investment Policies & Procedures The Hamilton-Wentworth Retirement Fund

Overview

1.01 Purpose of Statement

This Statement of Investment Policies and Procedures (the “ Hamilton-Wentworth Retirement Fund SIPP”) provides the framework for the investment of the assets of the Hamilton-Wentworth Retirement Fund, registration number 1073352 (the “Plan”);

The objective of the Hamilton-Wentworth Retirement Fund SIPP is to ensure that the assets of the Plan, together with expected contributions made by both the City and the Plan members, shall be invested in a continued prudent and effective manner.

The Hamilton-Wentworth Retirement Fund SIPP is based on the “prudent person portfolio approach” to ensure the prudent investment and administration of the assets of the Plan (the “Fund”) are within the parameters set out in the *Pension Benefits Act,* (Ontario) and the Regulations thereunder.

All provisions in the Master Trust SIPP apply to this Appendix.

1.02 Background of the Plan

The Plan is a contributory, defined benefit Plan. Effective January 1, 1985 all active Region Other Participants, excluding Police Civilians, were transferred to OMERS. The liability to transfer such members to OMERS was met by monthly payments of $115,187 until December 31, 2000 and monthly payments of $361 thereafter, concluding September 30, 2003. Effective January 1, 2002, the last active member retired from the plan.

1.03 Plan Profile

a) Contributions

Under the terms of the Plan text:

For normal retirement age 60 class:

1) Senior Police Officers: contributions should be 7% of earnings up to the YMPE plus 8.5% of contributory earnings in excess of YMPE.

2) Other Police Officers: contributions should be 6.5% of earnings up to YMPE plus 8% of contributory earnings in excess of YMPE.

For a normal retirement age of 65 contributions should be 5.75% of earnings.

b) Benefits

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 final year’s YMPE for each year of contributory service after January 1, 1966. CPP Offset suspended from date of retirement to age 65. Effective Jan 1, 2006 annual increases will not be less than the increase provided to retirees under the

OMERS plan, which is currently equal to 100% of the increase in the Consumer Price Index to a maximum of 6.0% per annum.

c) ***Liabilities***

As of the most recent actuarial valuation of the Plan as at December 31, 2019, there were no active members, no deferred members and 140 retirees and beneficiaries.

As of December 31, 2019, the going-concern liability of the plan was $52,830,000, including a Provision for Adverse Deviation (PfAD) of $4,304,000, compared to the actuarial value of assets of $54,821,009. On a solvency basis, the liabilities were $50,907,000 while the assets were $54,751,000 (net of a provision for plan windup expenses of $70,000). On a windup basis the liability was $64,241,000.

1.04 Objective of the Plan

The objective of the Plan is to provide members of the Plan with retirement benefits prescribed under the terms thereof.

1.05 Investment and Risk Philosophy

The primary investment objective is to provide an economic return on assets sufficient to fund plan liabilities over the long-term, while adhering to prudent investment practices.

The investment philosophies and strategies must take into account both return and risk objectives of the Plan and the City.

In recognition of the risk and return objectives of the Plan and the City, an initial Asset Allocation Policy was developed based on the Plan's current funded status and the characteristics of the Plan and City. It is recognized, however, that the Plan return requirements and risk tolerance will change over time, and the intent is to reallocate the portfolio to lower risk allocations dynamically as the Plan's funded status improves.

1.06 Administration

The General Manager of Finance and Corporate Services for the City of Hamilton is the designated contact at the City for administrative purposes.

1.07 Pooling of Assets

For investment purposes, certain assets of the Plan are invested in units of the City of Hamilton Defined Benefit Plans Master Trust, along with certain assets of the Hamilton Street Railway Pension Plan (1994) and the Hamilton Municipal Retirement Fund.

Up to 2 % of Plan assets may be invested outside of the City of Hamilton Defined Benefit Plans Master Trust for operating expenses and liquidity purposes, in accordance with the parameters set out in Section 3.02 (c) and (e) of the City of Hamilton Defined Benefit Plans Master Trust SIPP. The provisions of the City of Hamilton Defined Benefit Plans Master Trust SIPP apply to the investment of these assets.

1.08 Master Trust SIPP

The Master Trust SIPP is the policy that should be followed while investing the pooled assets of the Hamilton-Wentworth Retirement Fund Pension Plan.

Appendix D – Compliance Reports

The City of Hamilton Master Trust
Index Bond Manager

Compliance Report for the Quarter Ended _____________
(date)

		GUIDELINES	POLICY COMPLIED WITH
ASSET MIX (at Market Value)		%	**YES/NO ***
FIXED INCOME	BONDS	100%	
CASH	SHORT-TERM & CASH	0%	
CONSTRAINTS			
GENERAL	Investment Policy Section 3.01 – General Guidelines		
BONDS	Investment Policy Section 3.02 (b) – Bonds		
CASH	Investment Policy Section 3.02 (c) – Cash		
DERIVATIVES	Investment Policy Section 3.02 (c) – Derivatives		
OTHER	Investment Policy Section 3.02 (e) – Other Investments		
INDEX	Investment Policy Section 3.02 (f) – Index Mandates		
QUALITY REQUIREMENTS	Investment Policy Section 3.03 – Minimum Quality Requirements		
QUANTITY RESTRICTIONS	Investment Policy Section 3.04 – Maximum Quantity Restrictions		
PRIOR PERMISSION	Investment Policy Section 3.05 – Prior Permission Required		
PROHIBITED INVESTMENTS	Investment Policy Section 3.06 – Prohibited Investments		
SECURITIES LENDING	Investment Policy Section 3.07 – Securities Lending		
RESPONSIBILITIES	Investment Policy Section 4.01 (b) – Delegation of Responsibilities – Investment Managers		
STANDARDS OF PROFESSIONAL CONDUCT	Investment Policy Section 4.04 - Standards of Professional Conduct		
CONFLICTS OF INTEREST	Investment Policy Section 5.01 - Conflicts of Interest		
VOTING RIGHTS	Investment Policy Section 5.08 - Voting Rights		

* If policy not complied with, comment on specifics

COMPLETED BY:________________________ SIGNED BY:_______________________

The City of Hamilton Master Trust
Index Equity Manager

Compliance Report for the Quarter Ended ______________
(date)

		GUIDELINES	POLICY COMPLIED WITH
ASSET MIX (at Market Value)		%	YES/NO *
EQUITIES			
	U.S.		
	EAFE		
	TOTAL FOREIGN		
CASH	SHORT-TERM & CASH		
CONSTRAINTS			
GENERAL	Investment Policy Section 3.01 – General Guidelines		
EQUITIES	Investment Policy Section 3.02 (a) – Canadian and Foreign Equities		
CASH	Investment Policy Section 3.02 (c) – Cash and Short Term Investments		
DERIVATIVES	Investment Policy Section 3.02 (d) – Derivatives		
OTHER INVESTMENTS	Investment Policy Section 3.02 (e) – Other Investments		
INDEX	Investment Policy Section 3.02 (f) – Index Mandates		
QUALITY REQUIREMENTS	Investment Policy Section 3.03 – Minimum Quality Requirements		
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RESPONSIBILITIES	Investment Policy Section 4.01 (b) – Delegation of Responsibilities – Investment Managers		
STANDARDS OF PROFESSIONAL CONDUCT	Investment Policy Section 4.04 - Standards of Professional Conduct		
CONFLICTS OF INTEREST	Investment Policy Section 5.01 - Conflicts of Interest		
VOTING RIGHTS	Investment Policy Section 5.08 - Voting Rights		

* If policy not complied with, comment on specifics

COMPLETED BY:________________________ **SIGNED BY:________________________**

The City of Hamilton Master Trust
Active Bond Manager

Compliance Report for the Quarter Ended _____________
(date)

		GUIDELINES	POLICY COMPLIED WITH
ASSET MIX (at Market Value)		%	**YES/NO ***
FIXED INCOME	BONDS	100%	
CASH	SHORT-TERM & CASH	0%	
CONSTRAINTS			
GENERAL	Investment Policy Section 3.01 – General Guidelines		
BONDS	Investment Policy Section 3.02 (b) – Bonds		
CASH	Investment Policy Section 3.02 (c) – Cash		
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VOTING RIGHTS	Investment Policy Section 5.08 - Voting Rights		

* If policy not complied with, comment on specifics

COMPLETED BY:________________________ SIGNED BY:_______________________

The City of Hamilton Master Trust
Active Equity Manager

Compliance Report for the Quarter Ended ______________
(date)

		GUIDELINES	POLICY COMPLIED WITH
ASSET MIX (at Market Value)		%	**YES/NO ***
EQUITIES	CANADIAN		
	U.S.		
	EAFE		
	TOTAL FOREIGN		
CASH	SHORT-TERM & CASH		
CONSTRAINTS			
GENERAL	Investment Policy Section 3.01 – General Guidelines		
EQUITIES	Investment Policy Section 3.02 (a) – Canadian and Foreign Equities		
CASH	Investment Policy Section 3.02 (c) – Cash and Short Term Investments		
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* If policy not complied with, comment on specifics

COMPLETED BY:_________________________ **SIGNED BY:________________________**

Asset Liability Modeling (ALM) Study for the **City of Hamilton** pension plans

November 24, 2020

AON
Empower Results®

Table of Contents

Empower Results®

Why do an Asset-Liability Modeling Study (AL Study) now?

- **Review/calibrate investment strategy for the pension assets**
  - Review the investment objectives and risks
  - Incorporate most recent regulations
  - Incorporate current capital market assumptions

- **Fulfill the requirements of the Statement of Investment Policies and Procedures (SIPP) which requires AL study when:**
  - There are significant changes to the regulations (2019 Ontario Funding Reform)
  - Capital market conditions change significantly compared with the ones used in the previous study (performed in 2010)

1

Asset-Liability Model and Process

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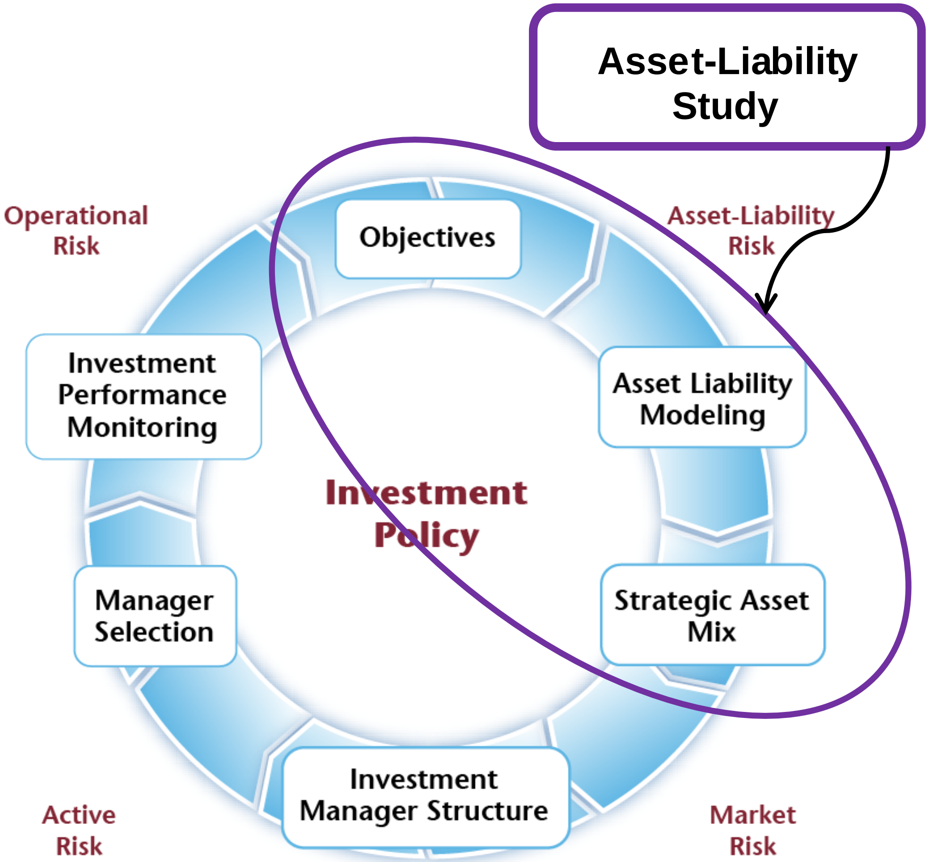
Investment Policy Governance Process



- The Asset-Liability Study is the first step in setting and monitoring the investment policy
  - Purpose is to determine an asset mix that best meets the risk and return objectives
  - The Study starts with setting the objectives for the investment policy
  - The outcome is a decision on strategic asset mix policy
- Once the asset mix strategy is set, implementation follows, including selection of investment managers and ultimately monitoring the funds' managers and strategy

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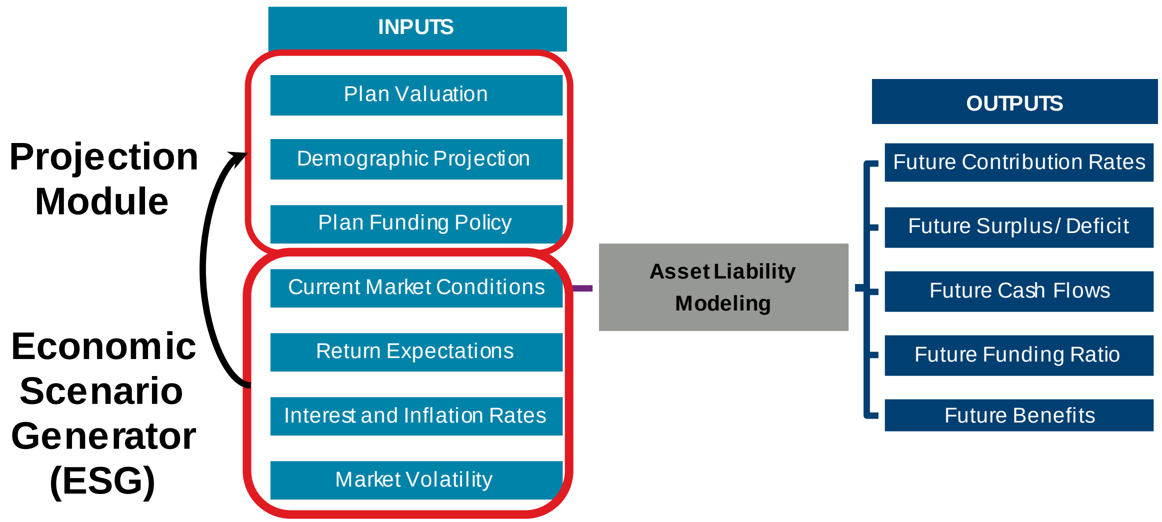
Asset-Liability Model

Projection Module and Economic Scenario Generator



- Produces 1,000 scenarios of interest rates, asset returns and inflation
- Projection model allows maximum flexibility in projecting plan demographics, funding policy and any outputs or metrics
- Demographic and liability projections performed

Empower Results®

ALM Assumptions

Capital Market Assumptions Setting Process

- Established by a global committee of Aon Investment and Risk Management Practitioners
  - Qualitative and Quantitative analysis of historical returns, research articles, state of the market
  - Judgment of the committee
  - Reflect analyses and research by colleagues in the US and UK for global consistency
- Inputs to the capital market simulations:
  - Expected value – CPI, asset class returns and yields
    - Combination of qualitative and quantitative analysis
    - Most asset classes based on historical spread analysis, discounted cash flow approach or risk premium approach
  - Correlations and Standard deviations:
    - Models are calibrated to historical data
- Continuously updated and improved

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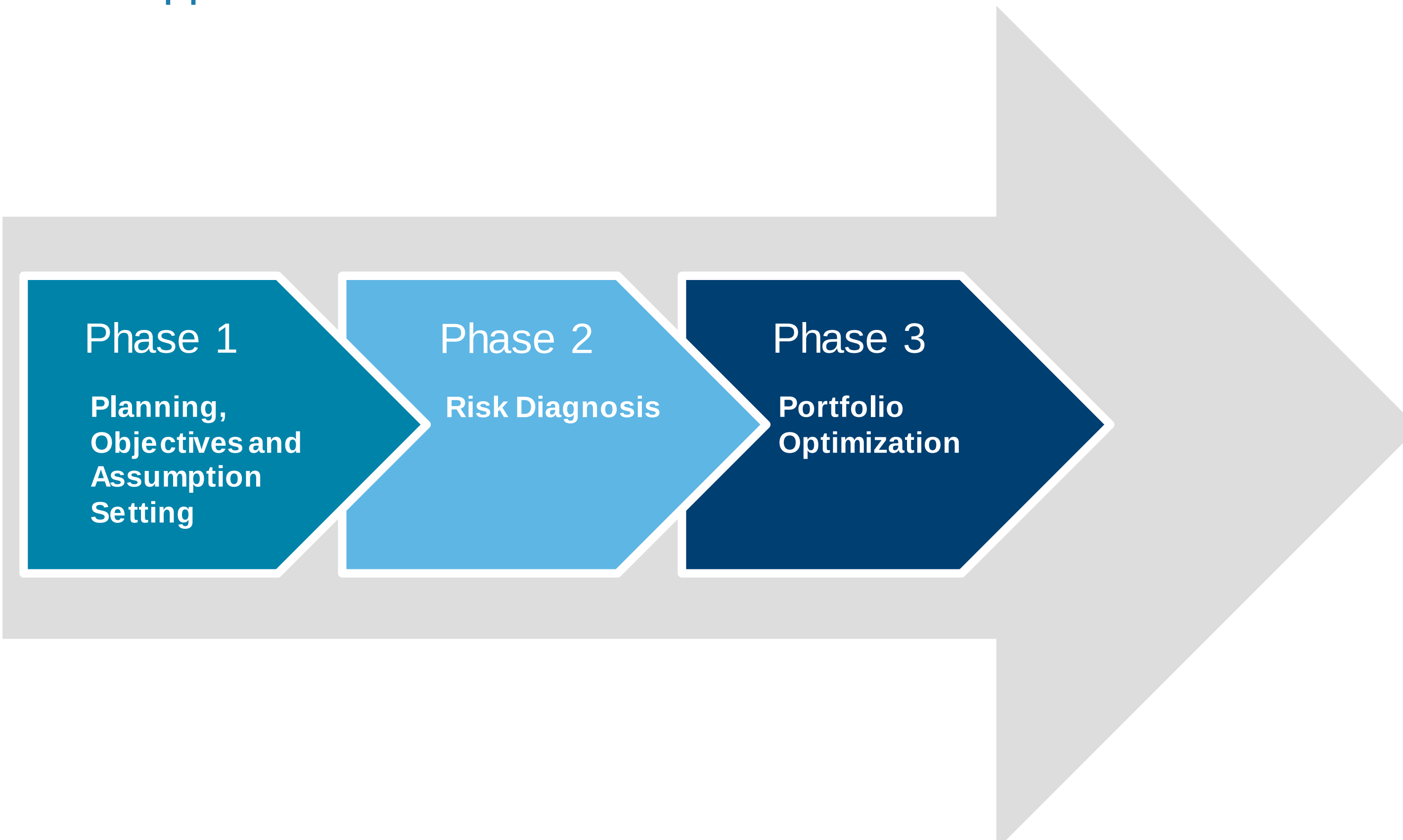
Asset-Liability Process

Overview of Approach



Asset-Liability Process

Phase 1

Planning, Objectives and Assumption Setting

- Discuss work plan and objectives
- Discuss and confirm assumptions
- Discuss asset classes for inclusion
- Assess the Trustees' risk tolerance
  - Discuss risk-tolerance and preferences
    - What are the main risks to be managed?
    - What are the investment beliefs that should be considered?
  - Clearly establish the Trustees' objectives in terms of risk management
  - Identify potential strategies to improve risk management
    - What's in the toolbox?
    - What are the constraints?
    - What kind of de-risking strategies should be tested?

Asset-Liability Process

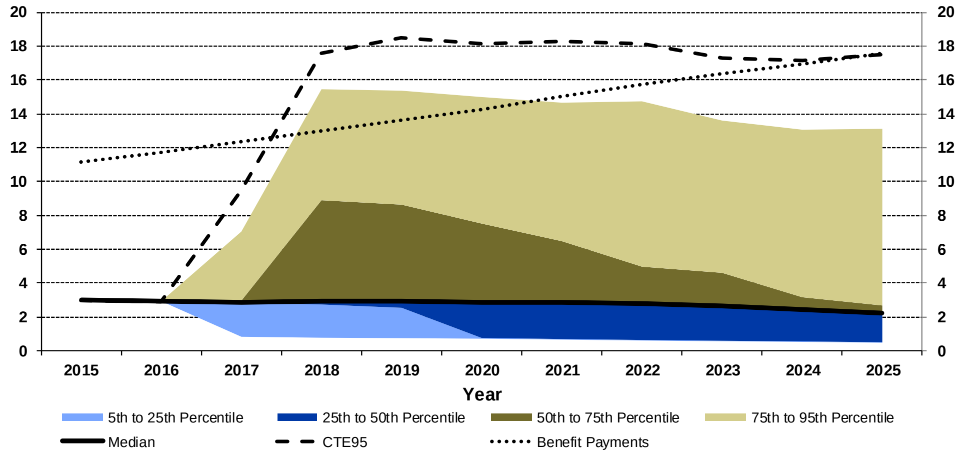
Phase 2

Risk Diagnosis

Risk Diagnosis

- Obtain a clear picture of the plans' risks under the current investment strategy
  - – Tested against the risk tolerance and objectives identified in Phase 1
- This phase will allow the Trustees to quantify risk tolerance
- Also includes a demographic projection of the plans

Contributions ($ millions)



Helps steer portfolio design discussion and serves as reference for alternative investment strategies

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Asset-Liability Process

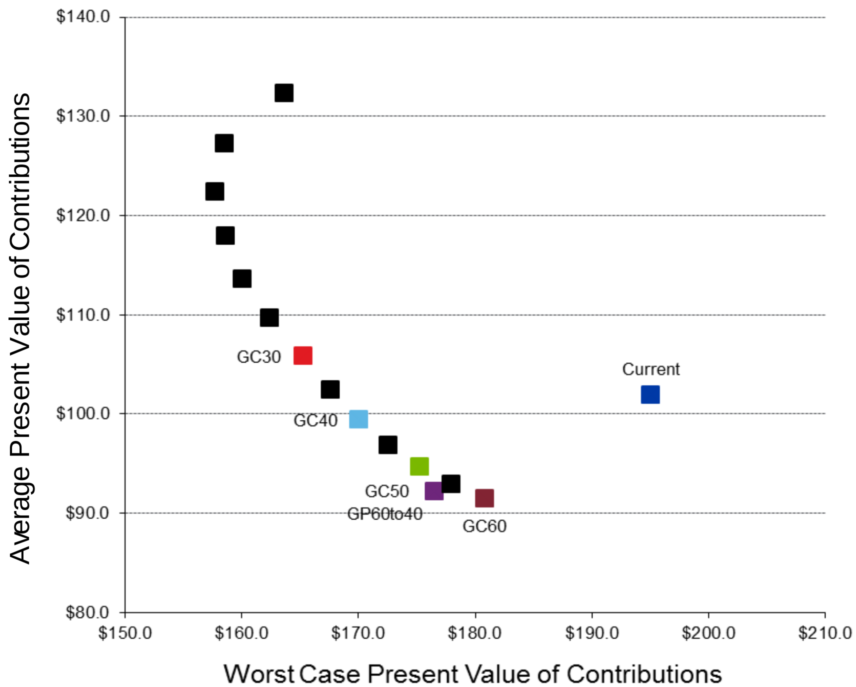
Phase 3

Portfolio Optimization

Optimization

- Risk-reward trade-off tested for any combination of variables that depend on both assets and liabilities
  - – e.g. we can construct an efficient frontier that optimizes based on plan contributions

Present Value of Contributions ($ millions)



	Present Value of Contributions plus Present Value of Notional Capital			
	Average	Δ from Current	CTE	Δ from Current
Current	$101.9		$195.0	
GC60	$91.4	-$10.5	$180.9	-$14.1
GC50	$94.7	-$7.2	$175.3	-$19.7
GC40	$99.4	-$2.5	$170.1	-$24.9
GC30	$105.9	$4.0	$165.2	-$29.8
GC60to40	$92.2	-$9.7	$176.6	-$18.4

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2

Project Timeline and Deliverables

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Project Timeline

Meeting	Preparatory Activities	Meeting Outcomes	Timeline
Planning	• Prepare discussion document for Planning Meeting	• Discuss asset liability methodology • Review current status of plans • Identify asset classes to include in analysis • Confirm asset and liability assumptions and metrics for the study • **Outcome: Assumptions set and objectives understood and agreed upon**	TBD
Risk Diagnosis	• Run projection of plans demographics and stochastic projection of liabilities and assets • Prepare discussion document for Risk Diagnosis Meeting	• Review projected evolution of the plans' demographics • Review the projection of plan liabilities • Review the projection of the plans' funded statuses under current asset mix policy • Review the projection of contributions under the current asset mix • **Outcomes:** • **Determine the appropriate reward and risk measures for the Optimization**	6 Weeks after Planning Meeting

Project Timeline

Meeting	Preparatory Activities	Meeting Outcomes	Timeline
Optimization Meeting	• Run stochastic projections for a large number of portfolios • Rank portfolios according to the reward and risk variable(s) and draw an efficient frontier line • Prepare Optimization document	• Determine the optimal asset allocation while taking into account the plans' commitments and the trustees' risk tolerance level • Optimization of growth component of portfolio • Optimization of liability matching component of study • **Outcome: Determine the mix between growth and liability matching components, including possible glide paths**	6 Weeks after Risk Diagnosis

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Legal Disclaimer

CITY OF HAMILTON
CORPORATE SERVICES DEPARTMENT
Financial Services and Taxation Division

TO:	Chair and Members HMRF/HWRF Pension Administration Committee
COMMITTEE DATE:	November 24, 2020
SUBJECT/REPORT NO:	Hamilton Wentworth Retirement Fund (HWRF) Valuation at December 31, 2019 (FCS20064) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Barb Howe (905) 546-2424 Ext. 5599
SUBMITTED BY: **SIGNATURE:**	Rick Male Director, Financial Services, Taxation and Corporate Controller Corporate Services Department

RECOMMENDATION

That the December 31,2019 actuarial valuation for the Hamilton Wentworth Retirement Fund (HWRF) per Appendix "A" to Report FCS20064 be received for information.

EXECUTIVE SUMMARY

The December 31, 2019 has shown improvements since the last valuation. The funded status on a going concern basis is a $2.0 million surplus compared to the previous surplus of $4.2 million. Although less than the previous valuation, there have been significant legislative changes which requires new valuations to include the cost of future indexing and a provision for adverse deviation. Despite this $13.3 million cost, the plan is still in a surplus on a going concern basis.

On a solvency basis, the plan currently has a surplus of $3.8 million compared to a $3.6 million deficit at December 31, 2016. And on a windup basis the plan has a $9.5 million deficit compared to the previous $20.5 million deficit.

Since the solvency ratio is currently 1.08 (0.94 – 2016) there are no solvency concerns and consequently no funding is required. Further, since the solvency ratio is not less than 0.85, the next valuation will not be required until December 31, 2022.

Alternatives for Consideration – Not Applicable

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The HWRF plan has no solvency issues, consequently no special funding payments are required for 2020-2022, and therefore there are no financial implications to the City at this time.

Based on the previous valuation annual special payments were required until December 31, 2022. Prior to the completion of this valuation the City of Hamilton (City) had contributed $368,944 as at October 2020. Since the current valuation indicates that no special payments are required, then the contribution of $368,944 has resulted in an excess contribution for 2020. This excess contribution was unavoidable since current legislation does not allow plan administrators to suspend contributions required based on the funding requirements of a previous valuation pending the outcome of a current valuation, nor can any excess contributions be refunded. Therefore, the excess contribution will be applied to the next valuation.

Staffing: None.

Legal: None.

HISTORICAL BACKGROUND

The last valuation filed was as at December 31, 2016, and a new valuation is required no later than every three years and within nine months of the valuation date. Under the Pension Benefits Act, if a report indicates solvency concerns, whereby the ratio of solvency assets to the solvency liabilities is less than 0.85, then actuarial valuations must be completed annually. Since, the solvency ratio at December 31, 2019, was 1.08, there are no solvency concerns; therefore, a valuation will not be required until December 31, 2022. For valuations dated December 31, 2019 and January 1, 2020, the regulators have introduced COVID measures to assist plan administrators, by extending the filing deadline from September 30, 2020 to December 31, 2020.

Each valuation requires the plan to be valued using three different methods:

(i) Going Concern Basis – this valuation assumes that the plan will continue indefinitely. Consequently, to calculate funding requirements, an actuary selects an interest rate for the pension fund based on an assumed long-term average return. Any funding deficiencies must be eliminated through payments made over a period of 10 years. Under current legislation, post retirement indexation is included from the going concern valuation as well as a provision for adverse deviation.

(ii) Solvency basis – is intended to calculate the funding required to pay for all benefits if the plan were to wind up on the valuation date. To determine solvency funding requirements, an actuary selects a rate that is an approximation of the annuity purchase rate. On a solvency basis the plan must be at least 85% funded. If the funded status falls below this level, then solvency special payments are required for the unfunded portion below 85%. The unfunded portion can be eliminated through payments made over a period of 5 years. Under current legislation, post retirement indexation can be excluded from the solvency valuation.

(iii) Wind-up Basis – similar to the solvency basis, this valuation assumes that the plan would be wound up at the valuation date, but includes <u>all benefit</u> obligations, such as post-retirement indexing.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

This valuation is the first valuation reflecting the new funding rules under Regulation 250/18 which came into effect May 1, 2018.

Key changes to the funding rules include:

Effective Date: The new funding rules apply to actuarial valuation reports dated on or after December 31, 2017.

Solvency Funding: A pension plan is required to be funded at 85% (previously 100%) on a solvency basis. If the funded level is less than 85%, then solvency special payments are required and must be amortized over a five-year period. In addition, these payments must begin one year after the date of the valuation report.

Going Concern Funding: A pension plan must still be funded at 100% on a going concern basis however now it must include the estimated cost of indexation in the going concern liabilities. In addition, the amortization period has been reduced from 15 years to 10 years with a fresh start each valuation and any special payments required will commence one year after the date of the valuation report. Further, the going concern valuation must include a **Provision for Adverse Deviation (PfAD).**

Provision for Adverse Deviation (PfAD). Under Reg. 250/18, the PfAD is a formula that is applied to the going concern liabilities. It is the sum of three percentages:

(a) a fixed percentage depending on whether the plan is a closed plan,
(b) a percentage depending on the asset mix of the plan, as allocated between fixed and non-fixed income in accordance with the plan's Statement of Investment Policies and Procedures (SIPP).
(c) a percentage reflecting the excess of the pension plan's going concern discount rate over a benchmark discount rate.

Although the cost of indexation must be included in the going concern liabilities, it may be excluded when determining the value of the PfAD.

Restrictions on Benefit Improvements: Restrictions on plan amendments that would negatively impact the funding of a plan have been introduced. Immediate funding will trigger if the pension plan is not funded at 80% on both a solvency and going concern basis. The additional unfunded liability associated with the benefit improvement must be funded on a going concern basis over 8 years rather than 10 years.

Plan Documents and Member Communications: As a result of the new rules, changes will be required to a number of plan documents, including the Plan Text and Statement of Investment Policies and Procedures (SIPP). Moreover, additional disclosures will need to be made to members and former and retired members in the annual and biennial statements.

RELEVANT CONSULTATION

AON Hewitt, the fund’s Actuary, prepared the December 31, 2019, actuarial valuation. As required by legislation, the valuation will be filed with the Financial Services Regulatory Authority of Ontario (FSRA) and Canada Revenue Agency (CRA).

ANALYSIS AND RATIONALE FOR RECOMMENDATION

The HWRF plan is a closed plan and is comprised mainly of police personnel and some non-police former City of Hamilton employees hired prior to July 1, 1965. The following chart provides a synopsis of the plan position and membership data as of December 31, 2019, compared to the December 31, 2016 valuation:

	($ in millions)	
	2019	**2016**
Going Concern Basis		
Valuation Assets	$54.8	$59.4
Less: Accrued Liabilities	$48.5	$55.2
Actuarial Surplus/(Deficit) before PfAD	$ 6.3	$ 4.2
Less: Provision for Adverse Deviation (PfAD)	$ 4.3	N/A
Actuarial Surplus/(Deficit)	$ 2.0	$ 4.2
Solvency Basis		
Solvency Assets[1]	$54.8	$59.4
Less: Solvency Liabilities	$50.9	$63.0
Solvency Surplus/(Deficit)	$ 3.8	$(3.6)
Solvency Ratio	1.08	0.94
Windup Basis		
Market Value of Assets[1]	$54.8	$59.4
Less: Windup Liabilities	$64.2	$79.9
Windup Surplus/(Deficit)	$(9.5)	$(20.5)
# of members	140	171

[1] Market value of assets reduced by windup expenses of $70,000

Since the going concern funded status is in a surplus position and the solvency ratio is greater than 0.85 there are no funding issues and therefore no special payments are required during the three-year valuation period.

ALTERNATIVES FOR CONSIDERATION

None.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Community Engagement and Participation
Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.

Economic Prosperity and Growth
Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report FCS20064 – HWRF Actuarial Valuation at December 31, 2019.

BH/dw

Proprietary and Confidential

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

Canada Revenue Agency Registration Number: 1073352

November 2020

Empower Results®

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Executive Summary

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

Summary of Principal Results

Financial Position

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

[1] Net of estimated wind up expenses
[2] Adjustments include Provision for Adverse Deviation, prior year credit balance, and all solvency liability and solvency asset adjustments, where applicable

Legislative Ratios

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

Minimum Contribution Requirements

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

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

Required City contributions are zero for the next 3 years.

Key Assumptions

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

Going Concern	**December 31, 2019**	**December 31, 2016**
Discount rate	4.40% per year	4.50% per year
Provision for adverse deviation	9.80% of non-indexed liabilities	Not Applicable
Inflation rate	2.00% per year	2.25% per year
Indexing Rate	2.00% per year	0.00% per year
Mortality table	115% of the 2014 Canadian Pensioner Public Mortality with generational improvements using CPM Scale B	2014 Canadian Pensioner Public Mortality with generational improvements using CPM Scale B
Retirement rates	Not Applicable	Not Applicable

Solvency/ Hypothetical Wind Up	**December 31, 2019**	**December 31, 2016**
Discount rate	Solvency Annuity purchases: 2.86% per year Hypothetical Wind-Up Annuity purchases: -0.29% per year	Solvency Annuity purchases: 2.91% per year Hypothetical Wind-Up Annuity purchases: -0.09% per year
Inflation rate	Not Applicable	Not Applicable
Indexing rate	Not Applicable	Not Applicable
Mortality table	2014 Canadian Pensioner Mortality Table with generational improvements using CPM Scale B	2014 Canadian Pensioner Mortality Table with generational improvements using CPM Scale B
Retirement rates	Not Applicable	Not Applicable

Section 1: Introduction

Purpose and Terms of Engagement

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

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

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

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

Ontario Funding Reform

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

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

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

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

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

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

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

Summary of Changes Since the Last Valuation

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

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

Company Information and Inputs

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

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

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

Subsequent Events

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

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

Section 2: Going Concern Valuation Results

Going Concern Financial Position of the Plan

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

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

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

Going Concern Financial Position

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

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

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

Going Concern Financial Position Breakdown

	Police	Others	Total
Actuarial Value of Assets[1]	**$ 54,525,000**	**$ 296,000**	**$ 54,821,000**
Going Concern Liabilities			
Retirees	$ 36,225,000	$ 47,000	$ 36,272,000
Beneficiaries	12,165,000	89,000	12,254,000
Total Liabilities	**$ 48,390,000**	**$ 136,000**	**$ 48,526,000**
Going Concern Position	**$ 6,135,000**	**$ 160,000**	**$ 6,295,000**

Change in Financial Position

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

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

[1] Split of assets provided by the City in email dated February 24, 2020
[2] Prior to the application of the Prior Year Credit Balance

Discussion of Changes in Assumptions

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

- The mortality table has been changed from 100% of the 2014 Canadian Pensioner Public Mortality with generational improvements using CPM Scale B to 115% of the 2014 Canadian Pensioner Public Mortality with generational improvements using CPM Scale B. This change decreased the going concern liabilities by $3,101,000.

- The nominal discount rate has been changed from 4.50% per year to 4.40% per year. This change increased the going concern liabilities by $313,000.

- The inflation rate has been changed from 2.25% per year to 2.00% per year. This change decreased the going concern liabilities by $637,000.

Plan Amendments

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

Going Concern Valuation Sensitivity Results

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

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

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

Plausible Adverse Scenarios

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

Interest Rate Sensitivity

The table below presents the sensitivity of the going concern position of using interest rates 1% lower than the current level. In order to calculate the impact on the Actuarial Value of Assets, the decrease in interest rates only impacts fixed income assets (47.7% of total assets) and a duration of 15.62[1] was considered.

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

[1] From the 2019 Audited Financial Statements
[2] Before application of PYCB

Deterioration in Asset Value

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

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

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 54,821,000	$ 50,637,000	$ (4,184,000)
Going concern liabilities	48,526,000	48,526,000	-
Going concern position	$ 6,295,000	$ 2,111,000	$ (4,184,000)
Additional liabilities due to PfAD	4,304,000	4,304,000	-
Surplus/(Unfunded Liability)[1]	**$ 1,991,000**	**$ (2,193,000)**	**$ (4,184,000)**
Total Normal Cost			
Jan 1, 2020 to Dec 31, 2020	$ -	$ -	$ N/A
Jan 1, 2021 to Dec 31, 2021	$ -	$ -	$ N/A
Jan 1, 2022 to Dec 31, 2022	$ -	$ -	$ N/A

Mortality Sensitivity

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

	Base Scenario	Adverse Scenario	Impact ($)
Actuarial value of assets	$ 54,821,000	$ 54,821,000	$ -
Going concern liabilities	48,526,000	50,504,000	1,978,000
Going concern position	$ 6,295,000	$ 4,317,000	$ 1,978,000
Additional liabilities due to PfAD	4,304,000	4,462,000	158,000
Surplus/(Unfunded Liability)[2]	**$ 1,991,000**	**$ (145,000)**	**$ 2,136,000**
Total Normal Cost			
Jan 1, 2020 to Dec 31, 2020	$ -	$ -	$ N/A
Jan 1, 2021 to Dec 31, 2021	$ -	$ -	$ N/A
Jan 1, 2022 to Dec 31, 2022	$ -	$ -	$ N/A

[1] Before application of PYCB
[2] Before application of PYCB

Section 3: Solvency Valuation Results

Solvency Financial Position of the Plan

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

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

Solvency Financial Position

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

[1] Solvency Assets divided by Solvency Liabilities

Solvency Financial Position Breakdown

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

Statutory Solvency Financial Position

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

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

[1] Split of assets provided by the City in email dated February 24, 2020
[2] 100% of total liabilities under regulations in effect prior to May 1, 2018
[3] 100% of solvency liability adjustment under regulations in effect prior to May 1, 2018

Solvency Concerns

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

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

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

Solvency Valuation Sensitivity Results

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

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

Incremental Cost on a Solvency Basis

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

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

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

Pension Benefits Guarantee Fund (“PBGF”)

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

Section 4: Hypothetical Wind Up Valuation Results

Hypothetical Wind Up Financial Position of the Plan

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

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

Hypothetical Wind Up Financial Position

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

Wind Up Financial Position Breakdown

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

Transfer Ratio

The transfer ratio is determined as follows:

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

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

Section 5: Contribution Requirements

Contribution Requirements in Respect of the Normal Cost

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

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

Prior Year Credit Balance (“PYCB”)

The PYCB is nil.

Available Actuarial Surplus

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

Going Concern Basis			
(A)	Total assets	$	54,821,000
(B)	Total liabilities		48,526,000
(C)	Additional liabilities due to PfAD		4,304,000
(D)	Prior year credit balance		-
(E)	**Available surplus: maximum (A – B – C – D); 0)**	**$**	**1,991,000**
Hypothetical Wind-Up Basis			
(F)	**Assets in excess of a transfer ratio of 105%**	**$**	**-**
(G)	**Available Actuarial Surplus: minimum (E; F)**	**$**	**-**

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

Excess Surplus

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

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

Development of Minimum Required Company Contribution

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

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

Required City contributions are zero for the next 3 years.

Development of Maximum Deductible Company Contribution

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

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

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

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

Section 6: Actuarial Certificate

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

Canada Revenue Agency Registration Number: 1073352

Opinion

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

My advice on funding is the following:

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

I hereby certify that, in my opinion:

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

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

Mark Pearson, FCIA, FSA
Associate Partner

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

November 2020

Appendix A: Assets

Asset Data

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

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

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

Market Value of Assets

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

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

Target Asset Mix

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

	Target
Short term	0.0%
Fixed income (including Real Return Bonds)	52.0%
Canadian equities	24.0%
Foreign equities	24.0%
	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	7.0%
	100.0%

Reconciliation of Changes in Adjusted Market Value of Assets

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

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

Development of Actuarial Value of Assets

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

Appendix B: Membership Data

Source of Data

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

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

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

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

Membership Reconciliation

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

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

Membership Summary

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

Retirees

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

Beneficiaries

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

* Data suppressed for confidentiality reasons
**Pension includes increase of 1.89% granted January 1 of the following year
***Pension includes increase of 1.45% granted January 1 of the following year

Retirees and Beneficiaries Distribution

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

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

* Data suppressed for confidentiality reasons

Appendix C: Going Concern Assumptions and Methods

Assumptions and Methods

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

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

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

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

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

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

[1] No preretirement mortality was applied

Justification of Actuarial Assumptions and Methods

Margins for Adverse Deviations

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

Economic Assumptions

Discount Rate

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

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

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

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

Development of Discount Rate

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

Inflation Rate

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

Increases in the Maximum Pension Limit

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

Expenses

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

Provision for Adverse Deviation

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

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

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

[1] The fixed income investments satisfy the minimum credit rating requirements prescribed by the Regulation.
[2] Based on linear interpolation.

Benchmark Discount Rate (BDR)

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

PfAD is Determined as Follows:

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

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

Demographic Assumptions

Mortality

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

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

Retirement

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

Termination of Employment

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

Other

Actuarial Cost Method

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

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

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

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

Asset Valuation Method

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

Appendix D: Solvency and Hypothetical Wind Up Assumptions and Methods

Valuation Assumptions

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

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

[1] No preretirement mortality was applied

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

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

Postulated Scenario

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

Benefits Valued

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

Justification for Valuation Assumptions

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

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

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

Development of Discount Rates

The development of the discount rates is shown below.

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

Mortality Table

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

Preretirement Mortality

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

Assumptions Not Needed

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

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

Estimated Wind Up Expenses

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

Calculation of Special Solvency Payments

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

Actuarial Cost Methods

Unit credit (accrued benefit) cost method as prescribed.

Asset Valuation Method Considerations

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

Incremental Cost

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

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

The calculation methodology can be summarized as follows:

- The present value at time 0 of expected benefit payments between time 0 and time t, discounted to time 0,

  plus

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

  minus

- The liabilities at time 0.

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

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

Appendix E: Summary of Plan Provisions

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

Normal Retirement Age

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

Amounts of Annual Pension

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

Death Benefits

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

Pension Increases

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

Bridge Benefit

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

Appendix F: Glossary of Terms

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

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

  – The company normal cost, eligible under Section 147.2(2) subject to certification by the actuary and approval by the Canada Revenue Agency; plus

  – Special payments eligible under Section 147.2(2) up to the amount of the unfunded liability, the solvency deficiency, or the hypothetical wind up deficiency, whichever is greater, subject to certification by the actuary and approval by the Canada Revenue Agency; less

  – Required application of excess surplus.

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

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

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

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

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

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

  The Company may choose to set the PYCB between nil and the amount as calculated above, but may not recapture the amount forfeited at any time.
- **Reduced solvency deficiency** the difference between the sum of 85% of the solvency liability, 85% of solvency liability adjustment and the PYCB to the sum of the solvency asset and solvency asset adjustment.
- **Solvency/Hypothetical wind up assets** are the market value of pension fund assets adjusted to reflect contributions, benefit payments, transfers and fees/expenses in-transit at the valuation date.

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

  The solvency liabilities are determined using benefit entitlements on the assumption that the Plan has neither a surplus nor a deficit. The solvency liabilities are calculated using the solvency valuation assumptions summarized in Appendix D of this report.
- The **solvency liability adjustment** is an adjustment that may be made to the solvency liabilities to reflect the impact of using a solvency valuation discount rate for discounting the liability that is the average of market discount rates calculated over the same period of time as that used in the calculation of the solvency asset adjustment.
- The **solvency position** is the difference between the solvency assets (net of estimated wind up expenses) and the solvency liabilities.
- The **solvency ratio** compares the solvency assets (plus any letters of credit held in trust exceeding the prior year credit balance) to the solvency liabilities for purposes of Subsections 14(2) and (3) of the Regulations of the *Act* to determine the latest effective date of the next required valuation.
- The **solvency excess/(deficiency)** is the solvency position, increased by the solvency asset adjustment and the solvency liability adjustment, then decreased by the PYCB.

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

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

Appendix G: Administrator Certification

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

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

Name (print) of Authorized Signatory	Title
Signature	Date

About Aon

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

CITY OF HAMILTON
CORPORATE SERVICES DEPARTMENT
Financial Services and Taxation Division

TO:	Chair and Members HMRF/HWRF Pension Administration Committee
COMMITTEE DATE:	November 24, 2020
SUBJECT/REPORT NO:	Hamilton Municipal Retirement Fund (HMRF) Valuation at December 31, 2019 (FCS20065) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Barb Howe (905) 546-2424 Ext. 5599
SUBMITTED BY: **SIGNATURE:**	Rick Male Director, Financial Services, Taxation and Corporate Controller Corporate Services Department

RECOMMENDATION

That the December 31,2019 actuarial valuation for the Hamilton Municipal Retirement Fund (HMRF) per Appendix “A” to Report FCS20065 be received for information.

EXECUTIVE SUMMARY

The December 31, 2019 valuation indicates that the plan has a $2.5 million surplus on a going concern basis compared to a $3.7 million surplus at December 31, 2017. The decrease is due to the losses arising from actuarial assumptions.

On a solvency basis, the plan currently has a surplus of $13.4 million compared to a $13.8 million surplus at December 31, 2017. And on a windup basis the plan has a $1.5 million deficit compared to the previous $2.4 million deficit.

Since the solvency ratio is currently 1.23 (1.22 – 2017) there are no solvency concerns and consequently no funding is required. Further, since the solvency ratio is not less than 0.85, the next valuation will not be required until December 31, 2022.

Alternatives for Consideration – Not Applicable

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The HMRF plan has no solvency issues, consequently no special funding payments are required and therefore there are no financial implications to the City of Hamilton (City) at this time.

Staffing: None

Legal: None

HISTORICAL BACKGROUND

The last valuation filed was as at December 31, 2017, and a new valuation is required no later than every three years and within nine months of the valuation date. Under the Pension Benefits Act, if a report indicates solvency concerns, whereby the ratio of solvency assets to the solvency liabilities is less than 0.85, then actuarial valuations must be completed annually. Since, the solvency ratio at December 31, 2019, was 1.23, there are no solvency concerns; therefore, a valuation will not be required until December 31, 2022. For valuations dated December 31, 2019 and January 1, 2020, the regulators have introduced COVID measures to assist plan administrators, by extending the filing deadline from September 30, 2020 to December 31, 2020.

Each valuation requires the plan to be valued using three different methods:

(i) Going Concern Basis – this valuation assumes that the plan will continue indefinitely. Consequently, to calculate funding requirements, an actuary selects an interest rate for the pension fund based on an assumed long-term average return. Any funding deficiencies must be eliminated through payments made over a period of 10 years. Under current legislation, post retirement indexation is included from the going concern valuation as well as a provision for adverse deviation.

(ii) Solvency basis – is intended to calculate the funding required to pay for all benefits if the plan were to wind up on the valuation date. To determine solvency funding requirements, an actuary selects a rate that is an approximation of the annuity purchase rate. On a solvency basis the plan must be at least 85% funded. If the funded status falls below this level, then solvency special payments are required for the unfunded portion below 85%. The unfunded portion can be eliminated through payments made over a period of 5 years. Under current legislation, post retirement indexation can be excluded from the solvency valuation.

(iii) Wind-up Basis – similar to the solvency basis, this valuation assumes that the plan would be wound up at the valuation date, but includes all benefit obligations, such as post-retirement indexing.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Both the previous valuation and the current reflect the funding rules under Regulation 250/18 which came into effect May 1, 2018.

Key changes to the funding rules include:

Effective Date: The new funding rules apply to actuarial valuation reports dated on or after December 31, 2017.

Solvency Funding: A pension plan is required to be funded at 85% (previously 100%) on a solvency basis. If the funded level is less than 85%, then solvency special payments are required and must be amortized over a five-year period. In addition, these payments must begin one year after the date of the valuation report.

Going Concern Funding: A pension plan must still be funded at 100% on a going concern basis, however now it must include the estimated cost of indexation in the going concern liabilities. In addition, the amortization period has been reduced from 15 years to 10 years with a fresh start each valuation and any special payments required will commence one year after the date of the valuation report. Further, the going concern valuation must include a **Provision for Adverse Deviation (PfAD).**

Provision for Adverse Deviation (PfAD). Under Reg. 250/18, the PfAD is a formula that is applied to the going concern liabilities. It is the sum of three percentages:

(a) a fixed percentage depending on whether the plan is a closed plan,
(b) a percentage depending on the asset mix of the plan, as allocated between fixed and non-fixed income in accordance with the plan’s Statement of Investment Policies and Procedures (SIPP).
(c) a percentage reflecting the excess of the pension plan’s going concern discount rate over a benchmark discount rate.

Although the cost of indexation must be included in the going concern liabilities, it may be excluded when determining the value of the PfAD

Restrictions on Benefit Improvements: Restrictions on plan amendments that would negatively impact the funding of a plan have been introduced. Immediate funding will trigger if the pension plan is not funded at 80% on both a solvency and going concern basis. The additional unfunded liability associated with the benefit improvement must be funded on a going concern basis over 8 years rather than 10 years.

Plan Documents and Member Communications: As a result of the new rules, changes will be required to several plan documents, including the Plan Text and Statement of Investment Policies and Procedures (SIPP). Moreover, additional disclosures will need to be made to members and former and retired members in the annual and biennial statements.

RELEVANT CONSULTATION

Willis Towers Watson, the fund's Actuary, prepared the December 31, 2019, actuarial valuation. As required by legislation, the valuation was filed with the Financial Services Regulatory Authority of Ontario (FSRA) and Canada Revenue Agency (CRA).

ANALYSIS AND RATIONALE FOR RECOMMENDATION

The HMRF plan is a closed plan and is comprised mainly of fire personnel and some non-fire former City of Hamilton employees hired prior to July 1, 1965. The following chart provides a synopsis of the plan position and membership as at December 31, 2019, compared to the December 31, 2017 valuation:

	($ in millions)	
	2019	**2017**
Going Concern Basis		
Valuation Assets	$71.4	$77.7
Less: Accrued Liabilities	$65.2	$69.7
Actuarial Surplus/(Deficit) before PfAD	$ 6.2	$ 8.0
Less: Provision for Adverse Deviation (PfAD)	$ 3.7	$ 4.2
Actuarial Surplus/(Deficit)	$ 2.5	$ 3.7
Solvency Basis		
Solvency Assets[1]	$71.3	$77.6
Less: Solvency Liabilities	$57.9	$63.8
Solvency Surplus/(Deficit)	$13.4	$13.8
Solvency Ratio	1.23	1.22
Windup Basis		
Market Value of Assets[1]	$71.3	$ 77.6
Less: Windup Liabilities	$72.8	$ 80.0
Windup Surplus(Deficit)	($ 1.5)	($ 2.4)
# of members	177	189

[1] Market value of assets reduced by windup expenses of $150,000

The going concern valuation decreased by $1.2 million and most of the decrease is attributed to the change in the discount rate from 3.75% to 3.3%. Since the plan is a surplus on both a going concern and solvency basis there are no solvency concerns and therefore no funding requirements. Although a valuation was not required until

December 31, 2020, because of the COVID-19 pandemic and resulting market volatility of 2020, it was determined that it would be prudent to file an early valuation at December 31, 2019.

ALTERNATIVES FOR CONSIDERATION

None.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Community Engagement and Participation
Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.

Economic Prosperity and Growth
Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report FCS20065 – HMRF Actuarial Valuation at December 31, 2019.

BH/dw

THE CORPORATION OF THE CITY OF HAMILTON

HAMILTON MUNICIPAL RETIREMENT FUND

Actuarial Valuation as at December 31, 2019

September 25,2020

Registration Number: 0275123

WillisTowersWatson

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.

The numbers in this report are not rounded. The fact that numbers are not rounded does not imply a greater level of precision than if the numbers had been rounded.

Definitions:

CIA means the Canadian Institute of Actuaries.

Pension Authorities means the Financial Services Regulatory Authority 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").

Table of Contents

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, 2019.

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, 2017)

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.

Subsequent Events

We completed this actuarial valuation on September 25, 2020.

Subsequent to the valuation date, both pension plan asset values and bond yields have been volatile and, as a result, the financial position of the pension plan may have deteriorated. The effects of this volatility have not been reflected in this report but will, together with other subsequent experience, be reflected at the next valuation date.

To the best of our knowledge and on the basis of our discussions with City of Hamilton, no other 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, 2022.

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Section 1: Going Concern Financial Position

1.1 Statement of Financial Position

	December 31, 2019			December 31, 2017
	Fire	Others	Total	Total
Going Concern Value of Assets	$ 66,444,120	$ 5,001,170	$ 71,445,290	$ 77,679,500
Actuarial Liability				
Active members	$ 0	$ 0	$ 0	$ 0
Retired members	37,339,388	1,132,375	38,471,763	41,881,000
Beneficiaries	17,062,032	1,275,039	18,337,071	18,550,200
Terminated vested members	0	129,484	129,484	126,400
Provision for future pension increases	8,048,757	224,766	8,273,523	9,143,700
Total actuarial liability	$ 62,450,177	$ 2,761,664	$ 65,211,841	$ 69,701,300
Actuarial Surplus (Unfunded Actuarial Liability)	$ 3,993,943	$ 2,239,506	$ 6,233,449	$ 7,978,200
Funded Ratio			109.6%	111.4%
Provision for Adverse Deviation (PfAD)	$ 3,536,092	$ 164,898	$ 3,700,990	4,239,000
Actuarial Surplus (Unfunded Actuarial Liability) After PfAD	$ 457,851	$ 2,074,608	$ 2,532,459	$ 3,739,200
Excess Actuarial Surplus[1]			$ 0	$ 0

Note:

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

Comments:

- The plan provides for indexation (escalated adjustments, as defined in the Pension Legislation). The actuarial liability as at December 31, 2019 shown above includes $8,273,523 in respect of indexation. The actuarial liability in respect of indexation has not been included in determining the PfAD.
- 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, 2017		$ 3,739,200
Net special payments		0
Expected interest on:		
■ Actuarial surplus (unfunded actuarial liability)	$ 285,698	
■ Net special payments	0	285,698
Plan experience:		
■ Investment gains (losses)	$ 454,833	
■ Mortality gains (losses)	(502,016)	
■ Pension increases less (more) than 2.00% per annum assumed	(98,783)	
■ Data correction and gains (losses) from miscellaneous sources	(103,720)	(249,686)
Change in actuarial basis:		
■ Economic assumptions		(2,104,649)
Impact of PfAD		861,896
Actuarial surplus (unfunded actuarial liability) as at December 31, 2019		$ 2,532,459

1.3 Contributions (Ensuing Year)

	December 31, 2019	December 31, 2017
Employer Normal Actuarial Cost		
Normal actuarial cost in respect of benefit accruals	$ 0	$ 0
Provision for adverse deviations (PfAD)	0	0
Estimated member contributions	(0)	(0)
Employer normal actuarial cost	$ 0	$ 0

Section 2: Solvency and Hypothetical Windup Financial Position

2.1 Statement of Solvency and Hypothetical Windup Financial Position

	December 31, 2019			December 31, 2017
	Fire	Others	Total	Total
Solvency Value of Assets				
Market value of assets	$ 66,444,120	$ 5,001,170	$ 71,445,290	$ 77,679,500
Provision for plan windup expenses	(139,500)	(10,500)	(150,000)	(100,000)
Total solvency value of assets	$ 66,304,620	$ 4,990,670	$ 71,295,290	$ 77,579,500
Solvency Liability				
Active members	$ 0	$ 0	$ 0	$ 0
Retired members	37,823,540	1,118,252	38,941,792	43,972,900
Beneficiaries	17,496,496	1,292,170	18,788,666	19,685,200
Terminated vested members	0	129,484	129,484	126,400
Total actuarial liability	$ 55,320,036	$ 2,539,906	$ 57,859,942	$ 63,784,500
Solvency Surplus (Unfunded Solvency Liability)	$ 10,984,584	$ 2,450,764	$ 13,435,348	$ 13,795,000
Solvency ratio			123.48%	121.78%
Value of excluded benefits	$ 14,557,969	$ 402,013	$ 14,959,982	$ 16,175,700
Total hypothetical windup liability	$ 69,878,005	$ 2,941,919	$ 72,819,924	$ 79,960,200
Hypothetical Windup Surplus (Unfunded Hypothetical Windup Liability)	$ (3,573,385)	$ 2,048,751	$ (1,524,634)	$ (2,380,700)
Lesser of estimated employer contributions for the period until the next actuarial valuation and the prior year credit balance			$ 0	$ 0
Transfer ratio			98.11%	97.15%

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 the same scenario used for the solvency valuation.
- 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.

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2.2 Determination of the Statutory Solvency Excess (Deficiency)

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

	December 31, 2019	December 31, 2017
Solvency surplus (unfunded solvency liability)	$ 13,435,348	$ 13,795,000
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
■ Prior year credit balance	0	0
Pre-adjustment solvency excess (solvency deficiency)	$ 13,435,348	$ 13,795,000
■ Adjustment to reflect reduced solvency deficiency [1]	8,678,991	9,567,700
Solvency excess (reduced solvency deficiency)	$ 22,114,339	$ 23,362,700

Note:

[1] Equals 15% of the solvency liability.

Section 3: Contributions

3.1 Estimated Minimum Employer Contribution (Ensuing Years)

The estimated minimum employer contributions for the next three years are as follows:

Year	2019	2020	2021
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)
Application of 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, 2019
Employer Normal Actuarial Cost	$	0
Greater of the Unfunded Actuarial Liability and the Unfunded Hypothetical Windup Liability		1,524,634
Estimated Maximum Employer Contribution	$	1,524,634

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

Employer normal cost and member contributions: monthly and within 30 days of the month to which they pertain.

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.

Contributions that are remitted to the plan in the taxation year or within 120 days after the end of such taxation year are deductible in such taxation year provided they were made to fund benefits in respect of periods preceding the end of the taxation year.

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	Geoffrey Melbourne
Fellow of the Canadian Institute of Actuaries	Fellow of the Canadian Institute of Actuaries

Toronto, Ontario
September 25, 3020

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, 2019.
- No margins for adverse deviation are to be used.
- For the purpose of determining the going concern discount rate, the investment policy dated January 22, 2020, which is the most up-to-date version, should be considered. The current investment policy does not provide for any changes to the target asset class distribution in the future.
- For purposes of determining the Provision for Adverse Deviation level as at December 31, 2019, the target asset allocation should be that contained in the investment policy statement dated January 22, 2020, which was the version in effect at the valuation date.
- 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 the employer continues to operate and certain expenses are paid from the pension fund (consistent with past practice) while the employer pays other plan expenses.
- 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;
- for purposes of determining the Provision for Adverse Deviations level, the fixed income allocation for each asset class shown in Appendix G is appropriate; and
- except as noted in the introduction of the report, 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	Date
Name	Title

Appendix B: Assets

B.1 Statement of Market Value

	December 31, 2019	December 31, 2017
Invested assets:		
■ Canadian equities	$ 22,910,445	$ 30,201,900
■ Foreign equities	13,466,602	15,890,900
■ Cash and short-term investments	946,932	955,500
■ Fixed income	34,102,866	30,618,600
■ Total invested assets	$ 71,426,845	$ 77,666,900
Net outstanding amounts:		
■ Investment income receivable	$ 66,040	$ 78,500
■ Expenses and other payables	(47,595)	(65,900)
■ Total net outstanding amounts	$ 18,445	$ 12,600
Total Assets	$ 71,445,290	$ 77,679,500

Comment:

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

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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, 2019.

	Target asset allocation	**Actual asset allocation as at December 31, 2019**
Canadian equities	8%	32.1%
Foreign equities	7%	18.9%
Cash and short-term investments	0%	1.3%
Fixed income	85%	47.7%
Total	100%	100.0%

B.3 Reconciliation of Total Assets (Market Value)

Assets as at December 31, 2017			$	77,666,900
Receipts:				
■ Contributions:				
– Employer normal actuarial cost	$	0		
– Employer amortization payments		0		
– Provision for non-investment expenses		0	$	0
■ Investment return				6,516,973
■ Total receipts			$	6,516,973
Disbursements:				
■ Benefit payments:				
– Pension payments	$	(12,164,205)		
– Lump sum settlements		0		
– Other benefit payments		0	$	(12,164,205)
■ Fees				(592,823)
■ Total disbursements			$	(12,757,028)
Assets as at December 31, 2019			$	71,426,845

Comments:

- This reconciliation is based on the audited financial statements issued by KPMG.
- The rate of return earned on the market value of assets, net of all expenses, from December 31, 2017 to December 31, 2019 is approximately 4.06% 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 was calculated using the unit credit cost method.

The terminated vested members are unlocated and are at advanced ages. The actuarial liability has been estimated as the members' contributions with interest at the valuation date.

C.2 Actuarial Assumptions

	December 31, 2019	December 31, 2017
Economic Assumptions (per annum)		
Liability discount rate	3.30%	3.75%
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)	3.58%
■ Adjustment for expenses paid by the plan	(0.30)%
■ Rounding	0.02%
■ Net discount rate	3.30%

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 because the plan membership consists mainly of employees formerly employed in the public sector, and there is no reason to expect the mortality experience of the plan to differ significantly from that of other public sector 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.

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 (with the exception of any fees associated with employing an active investment management strategy). 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.

The terminated vested members are unlocated and are at advanced ages. The actuarial liability has been estimated as the members' contributions with interest at the valuation date.

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 and there are no current active members in the plan. The benefits 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, 2019	December 31, 2017
Economic Assumptions (per annum)		
Liability discount rate		
■ Annuity purchase (solvency)	2.80%	2.80%
■ Annuity purchase (windup)	(0.30)%	(0.10)%
Demographic Assumptions		
Mortality	CPM2014 Canadian Pensioners' Mortality Table, projected generationally using Scale CPM-B	CPM2014 Canadian Pensioners' Mortality Table, projected generationally using Scale CPM-B
Other		
Years male spouse older than female spouse	3	3
Provision for expenses		
■ Solvency	$150,000	$100,000
■ Hypothetical windup	$150,000	$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 6.8. 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.

Portion of the solvency and hypothetical windup liabilities expected to be settled by commuted value transfer

Not applicable.

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

Not applicable.

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 the employer continues to operate after the windup date. In establishing the allowance for plan windup costs, certain administrative costs were assumed to be paid from the pension fund (consistent with past practice) while other costs were assumed to be borne directly by the employer.

Appendix E: Membership Data

Active and Disabled Members

There are no remaining active members.

Retired Members

	FIRE December 31, 2019	OTHERS December 31, 2019
■ Number	89	7
■ Average age	82.7	91.9
■ Average Annual Lifetime Pension	$ 42,970	$ 31,827

Comment:

The lifetime pension as at December 31, 2019 includes the January 1, 2020 pension increase of 1.89%.

Age Group	Fire		Others	
	December 31, 2019		December 31, 2019	
	Number	Monthly Pension	Number	Monthly Pension
<70	0	$ 0	0	$ 0
70-74	1	*	0	0
75-79	23	*	0	0
80-84	37	130,279	0	0
85+	28	102,176	7	18,566
TOTAL	89	$ 318,698	7	$ 18,566

*Suppressed for confidentiality.

Beneficiaries

	FIRE December 31, 2019	OTHERS December 31, 2019
■ Number	65	13
■ Average age	80.8	89.0
■ Average Annual Lifetime Pension	$ 28,414	$ 15,716

Age Group	Fire		Others	
	December 31, 2019		December 31, 2019	
	Number	Monthly Pension	Number	Monthly Pension
60-64	1	*	0	-
65-69	2	*	0	-
70-74	4	11,296	0	-
75-79	19	44,477	1	*
80-84	21	46,781	2	*
85+	18	44,877	10	10,759
TOTAL	65	$ 153,908	13	$ 17,026

*Suppressed for confidentiality.

Comment:

The lifetime pension as at December 31, 2019 includes the January 1, 2020 pension increase of 1.89%.

Terminated Vested Members

	December 31, 2019	December 31, 2017
■ Number	3	3
■ Average age	98.2	96.2
■ Average Annual Pension	$ 1,291	$ 1,239
■ Average Accumulated Employee Contributions	$ 43,162	$ 42,119

Comment:

The lifetime pension as at December 31, 2019 includes the January 1, 2020 pension increase of 1.89%.

Review of Membership Data

The membership data were supplied by The Corporation of The City of Hamilton as at December 31, 2019.

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.

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Membership Reconciliation

	Active	Terminated vested	Retired	Beneficiaries	Total
As at December 31, 2017	0	3	104	82	189
■ Deceased (without beneficiary)			(2)		(2)
■ Deceased (with beneficiary)			(6)	6	
■ Deceased survivors				(10)	(10)
■ Data correction					
■ Net change	0	0	(8)	(4)	(12)
As at December 31, 2019	0	3	96	78	177

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, 2019 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 included. 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	$	70,356,886
▪ As percent increase		7.89%
Solvency actuarial liability	$	62,045,865
▪ As percent increase		7.23%

G.2 Past-Service Benefit Restriction

The pension benefits provided under the plan are not subject to the limitation imposed under Section 8504(6) of the Regulations to the Income Tax Act (Canada).

G.3 Solvency Incremental Cost

Solvency Incremental Cost (up to next valuation date)	$	2,947,667

G.4 Provision for Adverse Deviations Level

Target Asset Allocation for Fixed Income Assets

The information below as at December 31, 2019 has been used to determine the Provision for Adverse Deviations 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 equities	8.0%	0.0%	8.0%	0.0%
– Foreign equities	7.0%	0.0%	7.0%	0.0%
– Fixed income	85.0%	85.0%	0.0%	100.0%
Total	100%	85.0%	15.0%	

Benchmark Discount Rate

Components	Rate
CANSIM V39056	1.76%
Risk premium on non-fixed income assets[1]	0.75%
Risk premium on fixed income assets[2]	1.28%
Diversification allowance	0.50%
Benchmark Discount Rate	4.29%

Notes:

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

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

Provision for Adverse Deviations Level

Components	Provision for Adverse Deviations level
Fixed	5.0%
Asset mix based	1.5%
Benchmark discount rate based[1]	0.0%
Provision for Adverse Deviations Level[2]	6.5%

Notes:

[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 Deviations is applied to the going concern actuarial liability and total normal cost, excluding any portion for future indexation.

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G.5 Effects of Plausible Adverse Scenarios

In accordance with CIA Standards of Practice, the risk assessments below have been performed only for the going concern valuation of the plan.

Interest Rate Risk

Yields on the plan's fixed income investments have been assumed to decline immediately by 96 basis points on a weighted average basis, resulting in a reduction in the going concern discount rate of 71 basis points. For this purpose, fixed income investments have been deemed to include only Canadian government and corporate bonds. The market values and expected returns for equities and real estate have been assumed to be unaffected by the bond yield changes.

The adverse scenario for interest rate risk is based on the capital market assumptions from Willis Towers Watson's capital market model, with a 10th percentile scenario used for each relevant asset class independently.

No allowance has been made for any other effects on the going concern actuarial liability due to the change in bond yields.

Deterioration of Asset Values

Market values of equities have been assumed to decline immediately by 21.58% on a weighted average basis. Market values of Canadian government and corporate bonds, expected future returns for all asset classes, as well as the going concern discount rate, have been assumed to be unaffected by this deterioration of asset values.

No allowance has been made for any other effects of the deterioration of asset values.

The adverse scenario for a deterioration of asset values is based on the capital market assumptions from Willis Towers Watson's capital market model, with a 10th percentile scenario used for each relevant asset class independently.

Longevity Risk

Longevity risk has been assessed by applying a multiplier of 87.5% to the base mortality rates disclosed in Appendix C, while leaving the assumed mortality improvement rates unchanged.

No allowance has been made for any effects on asset values or any effects on the going concern actuarial liability other than the mortality assumption change.

Effects

The effects of the plausible adverse scenarios above on the funded status of the plan and on the total normal cost is shown in the following table. For this purpose, the going concern actuarial liability and total normal cost reflect application of the PfAD.

Scenario	Baseline	Interest Rate Risk	Deterioration of Asset Values	Longevity Risk
Going concern discount rate	3.30 %	2.59 %	3.30 %	3.30 %
Weighted average fixed income yield change	N/A	(0.96)%	N/A	N/A
Fixed income asset value change	N/A	14.62 %	N/A	N/A
Non-fixed income asset value deterioration	N/A	N/A	(21.58)%	N/A
Market value of assets	$ 71,445,290	$ 76,426,412	$ 63,383,813	$ 71,445,290
Going concern actuarial liability (including PfAD)	$ 68,912,831	$ 72,730,528	$ 68,912,831	$ 73,638,750
Actuarial surplus (unfunded actuarial liability) after PfAD	$ 2,532,459	$ 3,695,885	$ (5,529,018)	$ (2,193,460)

The Corporation of the City of Hamilton

Hamilton Municipal Retirement Fund

December 31, 2019 Funding Valuation Results

November 24, 2020

Agenda

Executive Summary

Valuation Results

- Membership data
- Assets
- Valuation Results
- Funding requirements

Risk Assessment

Actuarial Certification

Background

Assumptions & Membership

- Going concern
- Solvency

Next Steps

Executive Summary

December 31, 2019 Valuation Highlights

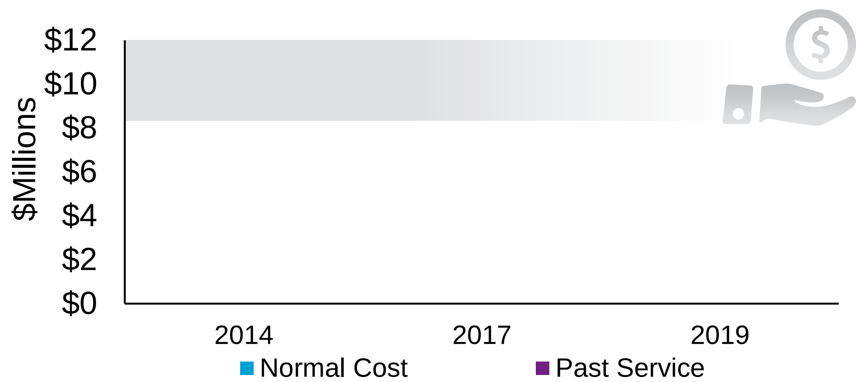
Key Results

Solvency Funded Ratio	▲ 1.7%
December 31, 2019	123.5%
December 31, 2017	121.8%
Going Concern Funded Ratio	▼ -1.8%
December 31, 2019	109.6%
December 31, 2017	111.4%
Minimum Required Contributions	**No Change**
December 31, 2019	$ 0
December 31, 2017	$ 0

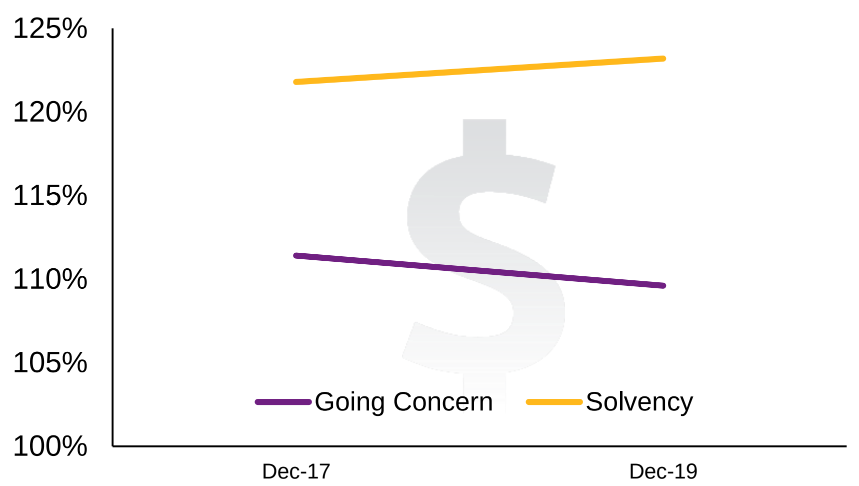
Commentary

- Assumption and demographic experience losses, partially offset by favourable investment returns, have led to a decline in the going concern funded status
- Favourable investment returns have led to an improvement in the solvency funded status

Contributions



Funded Ratio



Hamilton Municipal Retirement Fund Valuation Results

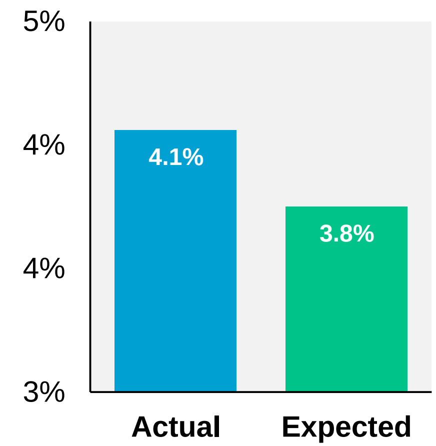
Assets

Reconciliation (Accrued basis)

(in 000's)	2018	2019
As at beginning of year	$ 77,679	$ 68,307
Company contributions	$ 0	$ 0
Benefit payments	(6,128)	(6,037)
Investment income, net of all expenses	(2,924)	9,448
Expenses	(320)	(273)
As at end of year	$ 68,307	$ 71,445
Rate of return, net of all expenses	**(4.4)%**	**14.1%**

Annualized return 2018 to 2019

The actual return exceeded the expected return, resulting in an actuarial gain of $0.5 million.



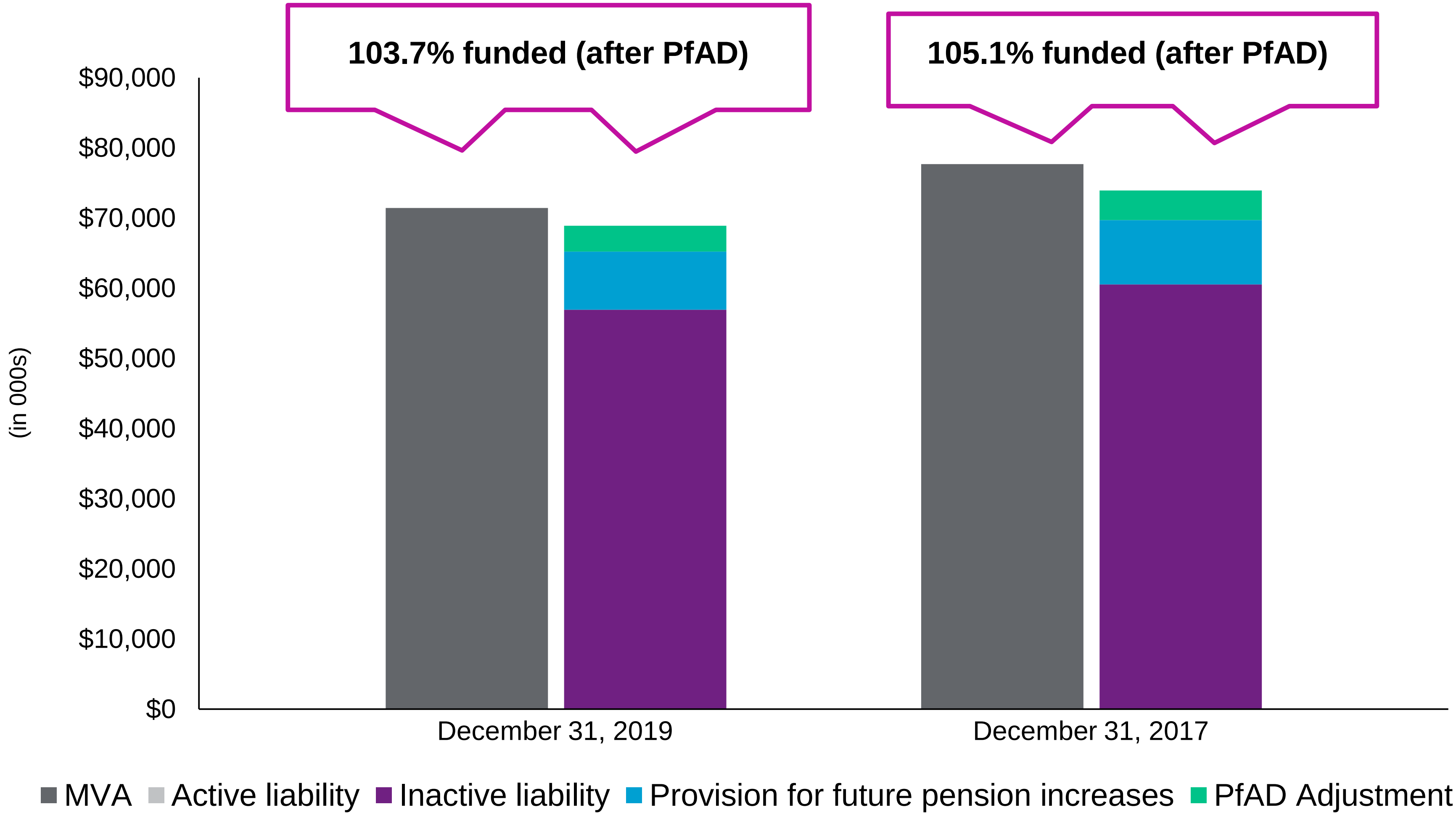
Going concern valuation

Financial position

(in 000's)	December 31, 2019	December 31, 2017
Going concern value of assets		
▪ Market value of invested assets	$ 71,445	$ 77,679
Going concern actuarial liability		
▪ Active and disabled members	$ 0	$ 0
▪ Terminated vested members	129	126
▪ Retired members and beneficiaries	56,809	60,431
▪ Provision for future pension increases	8,274	9,144
▪ Total	$ 65,212	$ 69,701
Going concern surplus (deficit)	$ 6,233	$ 7,978
Funded ratio	1.096	1.114
Provision for adverse deviations	$ 3,701	$ 4,239
Going concern surplus (deficit) after PfAD	$ 2,532	$ 3,739
Funded ratio after PfAD	1.037	1.051

Going concern valuation

Financial position



Going concern valuation

Reconciliation of financial position

(in 000's)	Plan Experience
Surplus (deficit) as at December 31, 2017	$ 3,739
Special payments towards deficits	0
Interest on deficit and special payments	286
Investment gains (losses), net of all expenses	455
Membership experience	
▪ Mortality gains (losses)	(502)
▪ Pension increase gains (losses)	(99)
▪ Other liability gains (losses)	(104)
Change in demographic assumptions	0
Change in assumed liability discount rate	(2,105)
Impact of PfAD	862
Surplus (deficit) as at December 31, 2019	$ 2,532

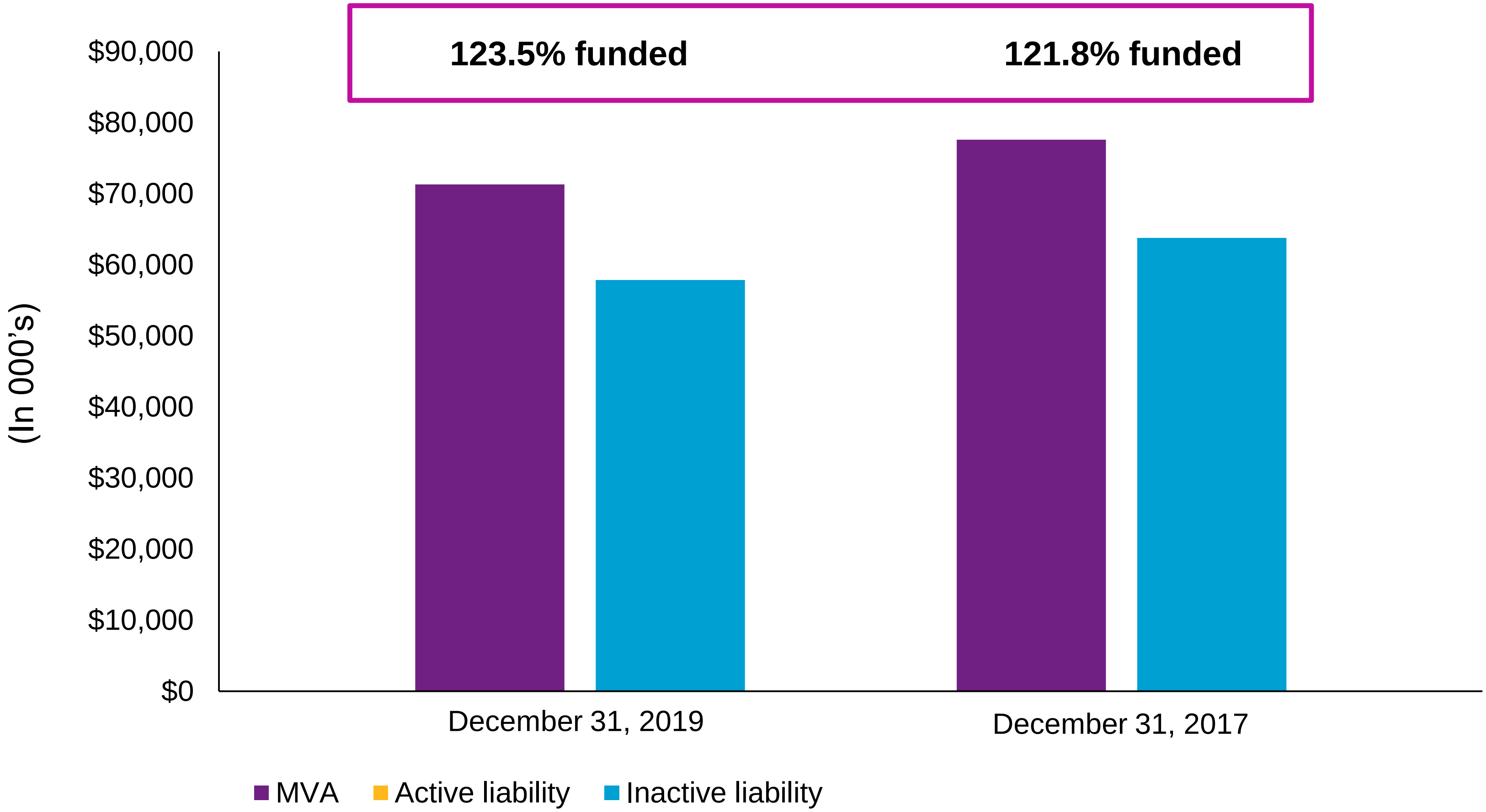
Solvency / Windup valuation

Financial position

(in 000's)	December 31, 2019	December 31, 2017
Solvency value of assets		
▪ Market value of invested assets	$ 71,445	$ 77,679
▪ Provision for windup expenses	(150)	(100)
▪ Total value of assets	$ 71,295	$ 77,579
Solvency liability		
▪ Active and disabled members	$ 0	$ 0
▪ Terminated vested members	129	126
▪ Retired members	38,942	43,973
▪ Beneficiaries	18,789	19,685
▪ Total	$ 57,860	$ 63,784
Solvency surplus (deficit)	**$ 13,435**	**$ 13,795**
Solvency ratio	1.235	1.218
▪ Provision for future pension increases	$ 14,960	$ 16,176
Transfer ratio	0.981	0.972

Solvency valuation

Financial position



Notes:

- Market value of assets is net of windup expenses of $150,000 ($100,000 last valuation)
- Hypothetical windup (transfer) ratio is 98.1% as at December 31, 2019 (97.2% funded last valuation)

Funding requirements

Minimum funding requirements

- Minimum funding requirements
  - No contributions required until the next required funding valuation report is filed as at December 31, 2022
- Maximum funding allowed
  - $1,524,634 until the next required funding valuation report is filed as at December 31, 2022

Risk Assessment

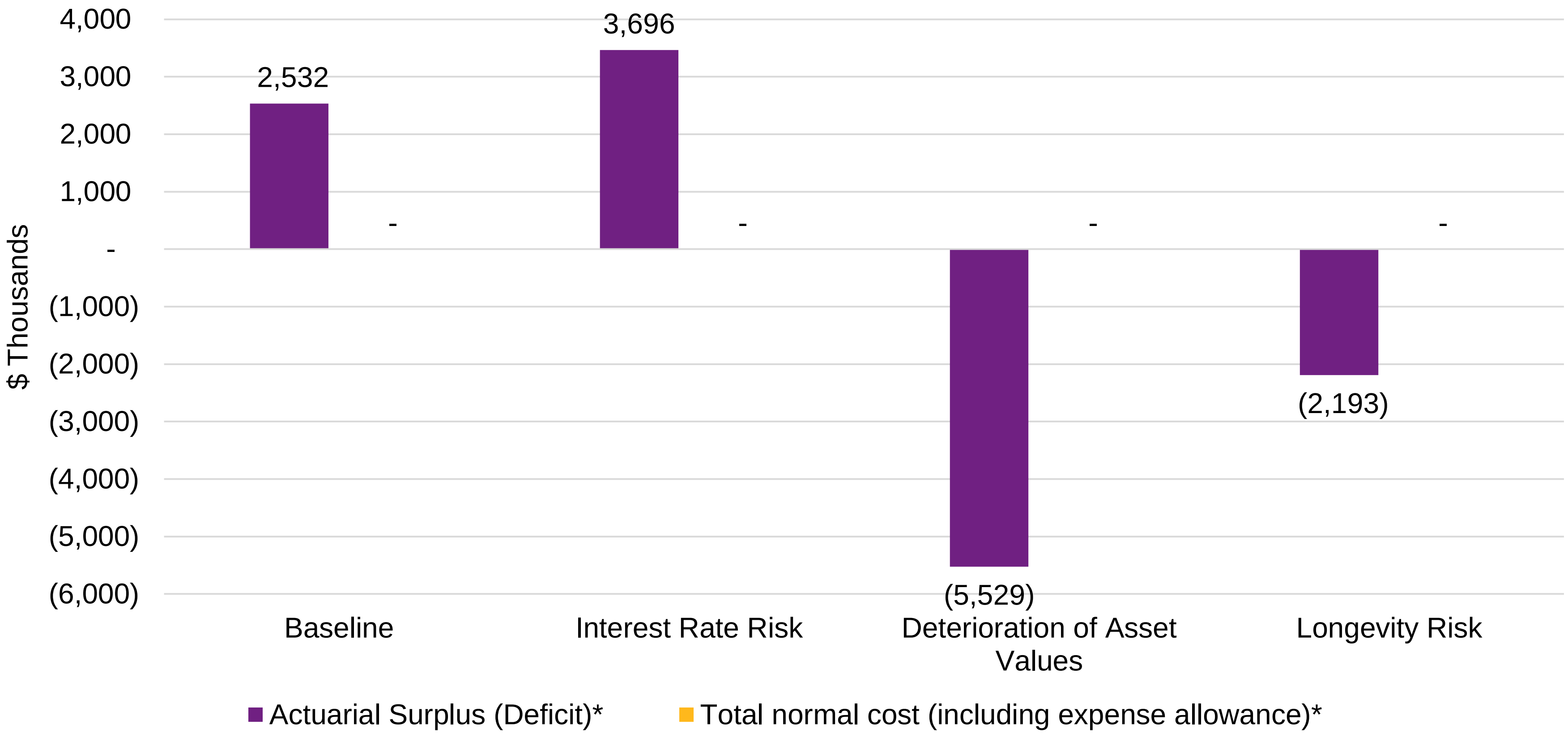
Stress testing on Going Concern Basis

- Canadian Institute of Actuaries' Standards of Practice now require valuation reports to include disclosure of the effects of certain "plausible adverse scenarios" on the going concern funded status and normal cost
  - Applicable for valuations on or after March 1, 2019
- Must consider the following risks:
  - Interest rate risk (the potential that interest rates will be lower than expected)
  - Deterioration of asset values
  - Longevity risk (the potential that pension plan members will live longer than expected)
  - *For pension plans where contributions are fixed or restricted by the terms of the plan or other governing documents, the potential that the contribution base will be lower than expected (N/A for HMRF)*
- A plausible adverse scenario would have a non-trivial probability of occurring within the short term (immediately to one year)
  - Would generally be consistent with a likelihood of between 1 in 10 and 1 in 20

Risk Assessment

Stress testing on Going Concern Basis

- Scenarios shown below reflect stress testing on underlying assets and assumptions in isolation
- Effects on assets, liabilities and normal cost are determined as at the valuation date



* Includes provision for adverse deviations

Actuarial certification

The results presented in this presentation are based on the membership data and assumptions included in this presentation and on the methods, plan provisions and other information outlined in the actuarial valuation report to determine funding requirements for the pension plan prepared as at December 31, 2019. Therefore, such information, and the reliances and limitations of the valuation report and its use, should be considered part of this presentation.

The information provided in this presentation has been prepared solely for the benefit of the City of Hamilton, for its internal use in connection with the actuarial valuations of the plans prepared by Willis Towers Watson. This presentation should not be used for other purposes and we accept no responsibility for any such use. It should not be shared with or relied upon by any other person without Willis Towers Watson’s prior written consent.

The results presented in this presentation 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 presentation are reasonable actuarial results based on actuarial assumptions reflecting our expectation of future events.

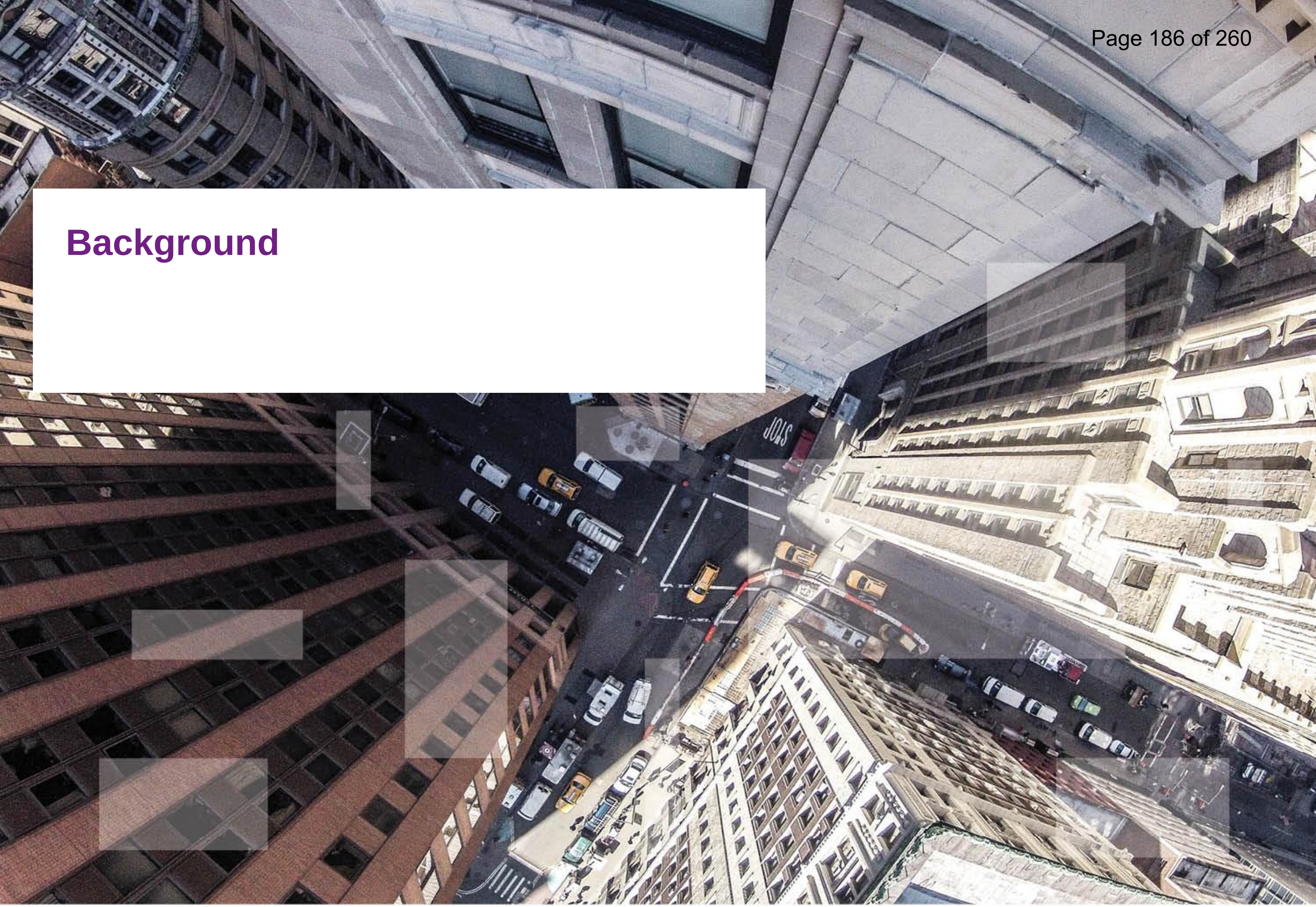
Future contribution levels may change as a result of future changes in the actuarial methods and assumptions, the membership data, the plan provisions and the legislative rules, or as a result of future experience gains or losses, none of which have been anticipated at this time. Subsequent to the valuation date, both pension plan asset values and bond yields have been volatile and, as a result, the financial position of the pension plan may have deteriorated. The effects of this volatility have not been reflected in this presentation.

In our opinion, for the purposes of this presentation, the data are sufficient and reliable, the assumptions are appropriate and the methods employed in the valuation are appropriate. This presentation has been prepared, and our opinion has been given, in accordance with:

- The funding and solvency standards prescribed by the Pension Benefits Standards Act (Ontario) and Regulation thereto;
- The requirements of the Income Tax Act (Canada) and Regulation thereto; and
- Accepted actuarial practice in Canada, except that this presentation has been appropriately abbreviated.

Bill Liu, FCIA

Geoffrey Melbourne, FCIA



Background

Plan

Hamilton Municipal Retirement Fund

Purpose

- Legislation requires that an actuary conduct a funding valuation of the plan at least every three years
  - The last valuation as of December 31, 2017
  - This valuation has been undertaken as of December 31, 2019
- The Ontario Pension Benefits Act requires an actuarial valuation as part of the requirements to provide benefit security
- The Income Tax Act requires an actuarial valuation to approve tax deductible contributions

Types of Valuations

Two types of valuations are required for funding purposes:

Type	Going Concern	Solvency
Scenario	Plan continues indefinitely	Plan winds up
Assumptions	Long term assumptions, selected by actuary	Largely prescribed, based on market conditions on valuation date
Timing for amortization of deficits	10 years	5 years

Funding requirements

Minimum funding requirements

Normal Cost + **Amortization of Going Concern Deficits** + **Amortization of Reduced Solvency Deficits**

Normal Cost

- Cost of benefits that accrue during the year, including PfAD
- Administrative expenses including PfAD, if applicable

Amortization of Going Concern Deficits

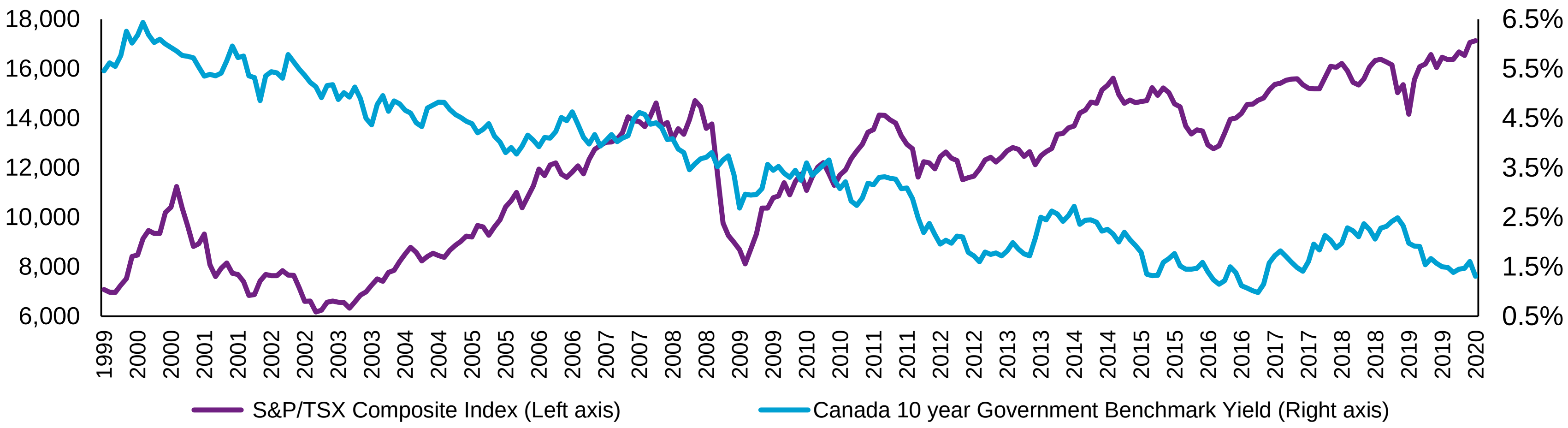
- Going concern deficit including PfAD amortized over 10 years
- "Fresh start" each year
- Schedule established at previous valuation date is maintained for one year

Amortization of Reduced Solvency Deficits

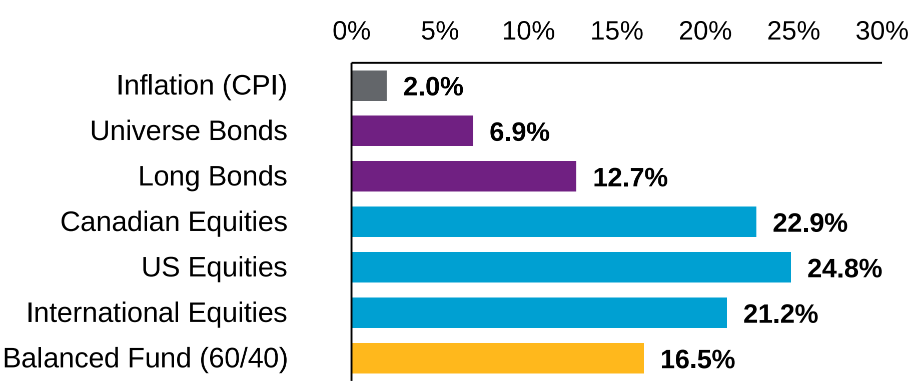
- Funding required to bring solvency assets up to 85% of solvency liabilities
- Net of going concern amortization payments

Financial markets backdrop

Prolonged period of declining interest rates and volatile equity markets (at January 1)



2019 Benchmark asset returns (in $CAD)



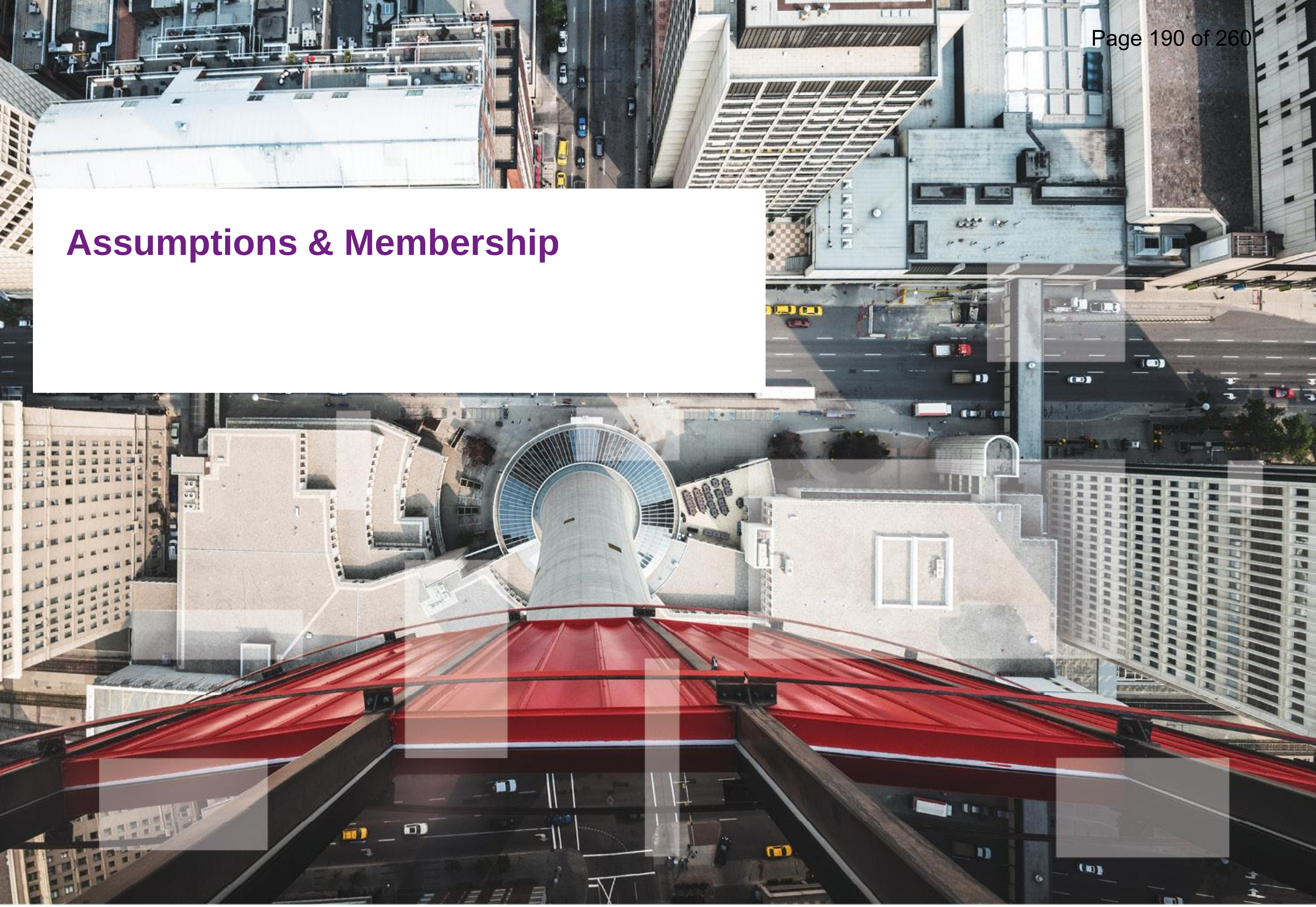
Solvency discount rates

0 bps

Annuity purchase rate - Solvency
- 2.8% at Dec. 31, 2017
- 2.8% at Dec. 31, 2019

20 bps

Annuity purchase rate - Windup
- (0.1)% at Dec. 31, 2017
- (0..3)% at Dec. 31, 2019



Assumptions & Membership

Assumptions

Overview

Two types of funding valuations are undertaken:

- **Going concern valuation** assumes the plan continues indefinitely (long-term outlook)
  - Best estimate assumptions are selected by actuary in accordance with professional actuarial standards and prescribed provincial regulations
  - Best estimate assumptions were reviewed and selected
- **Solvency valuation** assumes the plan terminated and all benefits were settled on the valuation date
  - Assumptions are based on current market conditions and are effectively prescribed by CIA
  - Excludes value of future pension increases

Going concern valuation

Key assumption changes

Discount Rate

- Going concern discount rate reflects the long-term expectation of investment returns (no margin for conservatism as at December 31, 2019)
- Discount rate decreased from 3.75% to 3.30% per annum to reflect lower return expectations and target asset mix

Other

- Same as prior valuation

Solvency valuation

Key assumption changes

Annuity Purchase Discount Rate

- Prior assumption:
  2.8% per year for solvency, (0.1)% per year for windup
- New assumption:
  2.8% per year for solvency, (0.3)% per year for windup

Other

- Same as prior valuation

Membership data

Reconciliation

	Active and Disabled Members	Terminated Vested Members	Retired Members	Beneficiaries
As at December 31, 2017	0	3	104	82
Deaths				
▪ With survivor benefits	0	0	(6)	0
▪ Without survivor benefits	0	0	(2)	0
▪ Deceased survivors	0	0	0	(10)
New beneficiaries	0	0	0	6
Data corrections	0	0	0	0
As at December 31, 2019	0	3	96	78

Next Steps

Next Steps

- Make a decision on whether to file the funding valuation report as at December 31, 2019
  - The next required funding valuation is as at December 31, 2020
  - The advantages of filing the December 31, 2019 valuation is to lock-in the funded status of the plan as at December 31, 2019 with nil contributions for the next three years (2020 to 2022)
  - If the December 31, 2019 funding valuation is filed, the next required funding valuation will be as at December 31, 2022

- Adjusting the asset allocation based on funded status of the plan and SIPP
  - The investment manager to review and adjust the asset allocation based on the updated funded ratio on windup basis
  - WTW to provide future cash-flows to the investment manager for asset allocation monitoring purposes

Mortality Assumption Review

- We recommend reviewing the mortality assumption using Willis Towers Watson's new Canadian Postal Code Mortality Tool (PMT) – see next slide
  - The selection of appropriate assumptions is an important component of good governance and sound risk management
  - Plan membership is too small to enable credible mortality analysis based on the plan experience
  - PMT provides useful, straightforward indication of mortality profile of plan membership, notwithstanding low headcount

Willis Towers Watson Canadian Postal Code Mortality Tool

It's about health and wealth

Introduce **lifestyle factors** in the assessment of your longevity risk

About **1M** Years of life exposure based on organizations **across Canada**, mostly from the **private sector**

10 Years of experience with our analytics in the **UK**

Supplement **experience study**

Only need **~50** members to use the tool

Assess **competitiveness** of insurers' annuity purchase quotes with similar analytics

3% Impact on liabilities if change of +/- one year of life expectancy

Member data

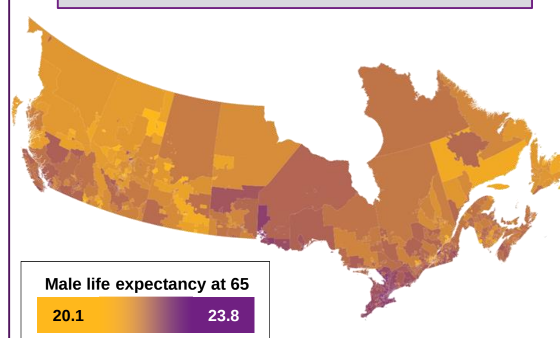
Age | Gender | Pension Amount | Collar Type

\+

Postal code based lifestyle factors supplied by Environics

Savings | Regular Doctor | Tobacco Expenditure | Alcohol Expenditure

Postal code level adjustment to mortality



850,000 As many possible **adjustments to mortality** as there are postal codes in Canada

Hamilton

INFORMATION REPORT

TO:	Chair and Members HMRF / HWRF Pension Administration Sub-Committee
COMMITTEE DATE:	November 24, 2020
SUBJECT/REPORT NO:	Master Trust Pension Investment Performance Report as at December 31, 2019 (FCS19075(a)) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Gerald T. Boychuk (905) 546-2424 Ext. 4321
SUBMITTED BY: **SIGNATURE:**	Brian McMullen Director, Financial Planning, Administration and Policy Corporate Services Department

COUNCIL DIRECTION

Not applicable.

INFORMATION

Attached, as Appendix "A" to Report FCS19075(a), is Aon Hewitt's investment performance report for the Hamilton Municipal Retirement Fund (HMRF), the Hamilton-Wentworth Retirement Fund (HWRF) and the Hamilton Street Railway (HSR), as at December 31, 2019. Together, the three pension funds make up the Master Trust, which is referred to as the "Plan" throughout Report FCS19075(a).

As of December 31, 2019, the market value of the assets of the Plan was $337.5 M, an increase of $26.0 M compared with $311.5 M as at December 31, 2018.

For the one-year period ending December 31, 2019, the Plan's return was 13.8%, underperforming its benchmark return of 16.4% by 2.6%. The benchmark return is based on the benchmark asset mix for the Plan. The Plan return overall of 13.8% outperformed the OMERS (Gross) plan return of 11.9% by 1.9%.

Table 1 shows the Plan's one-year (ending December 31 in each year) return for the last five years.

Table 1
Plan's 1 year (ended Dec. 31) Returns

	12 Months Ended Dec. 31/19	12 Months Ended Dec. 31/18	12 Months Ended Dec. 31/17	12 Months Ended Dec. 31/16	12 Months Ended Dec. 31/15
Plan Return	13.8%	-4.2%	9.5%	9.3%	2.6%
Benchmark	16.4%	-2.6%	8.3%	8.0%	4.2%
Value Added	-2.6%	-1.6%	1.2%	1.3%	-1.6%
Market Value	$337.5 M	$311.5 M	$341.9 M	$330.3 M	$320.6 M
Funded Ratio	78.6%	73.4%	75.2%	68.4%	64.8%

The Plan's performance may be compared to the return earned in the broader pension market in Canada. Attached as Appendix "B" to Report FCS19075(a), RBC Investor & Treasury Service (I&TS) reports its universe of pension funds, which totals C$650 B and had an average annual return of 14.0% in the year ended December 31, 2019. The Plan's return of 13.8% underperformed the RBC I&TS annual return by 0.2%. Fixed income and global equity returns were major contributors to the Plan's overall return.

Table 2 compares the Plan's returns to OMERS fund's gross returns over one, five and ten-year periods, all ending December 31, 2019. The Plan's gross returns are less than OMERS for all three periods. This is to be expected due to OMERS strategy of emphasizing private investments and minimizing public securities, which remained stable with generally better returns except in 2019 where OMERS returned 16.4% on capital markets investments.

Table 2
Annualized Returns

	Dec.31/19 One-Year Annualized Return	5-Year Annualized Return	10-Year Annualized Return
Plan (HSR, HMRF, HWRF)	13.8%	6.0%	7.5%
Plan Benchmark	16.4%	6.8%	7.6%
OMERS (Gross)	11.9%	8.5%	8.2%
OMERS Benchmark (Gross)	7.5%	N/A	N/A
OMERS Capital Markets	16.4%	N/A	N/A
OMERS Capital Markets Benchmark	6.0%	N/A	N/A

The Plan's ten-year gross annualized return for the period ending December 31, 2019 is 7.5% underperforming the benchmark return of 7.6% by 0.1% and underperforming OMERS return of 8.2% by 0.7%.

The Plan's five-year gross annualized return for the period ending December 31, 2019 is 6.0% underperforming the benchmark return of 6.8% by 0.8% and underperforming OMERS return of 8.5% by 2.5%.

OMERS return in public market securities (OMERS Capital Markets in Table 2) is 16.4% for the one-year ending December 31, 2019. The Plan's gross return for the period ending December 31, 2019 is 13.8% and underperformed OMERS 16.4%. OMERS financial reports in 2019 reported this and confirmed the 2018 estimate at -4.6%.

OMERS invests in public market securities (such as public equities and bonds) and in private market investments (such as private equity, real estate, infrastructure and strategic investments). The Plan invests only in public market securities. Private market investments require expertise developed over many years, have limited liquidity, require significant administrative costs and current valuations may or may not be realized. OMERS gross return included private equity, infrastructure, public securities and real estate which netted a gross return of 11.9% which was reduced from the capital markets return overall of 16.4%.

Asset Mix

Table 3 shows the percentage of Plan assets in each asset class of December 31, 2019 compared to December 31, 2018.

Table 3
Percentage of Plan Assets in Each Asset Class

Asset Class	Dec.31, 2019	Dec.31, 2018	Change
Canadian Equity	29.9%	28.3%	+1.6%
Global Equity	21.8%	24.4%	-2.6%
Total Equity	51.7%	52.7%	-1.0%
Canadian Fixed Income	47.8%	46.7%	+1.1%
Cash	0.5%	0.6%	

Note: Anomalies due to rounding.

Total equity decreased by 1.0% to 51.7% and total fixed income increased by a corresponding 1.1% to 47.8%. Global equity decreased by 2.6% to 21.8%. Canadian equity holdings increased by 1.6% to 29.9%. Canadian fixed income increased by 1.1% to 47.8%. The year saw equity returns domestically and internationally in the portfolio ranging from 15.6% to 18.5%. The fixed income portfolios incurred significant gains for the year ranging from 8.4% to 13.0% a 10.8% overall fixed income return holding 25.2% Long bonds and 22.5% Real Return bonds and cash for disbursement.

The Master Trust at year-end was not within its prescribed boundaries set by the Plan's investment policy given the funded ratio at 78.6%. The fund will be rebalanced in 2020.

Managers' Performance

Managers' investment performance relative to their benchmark and peer group is summarized in Table 4. One-year rates of return, percentages of plan assets and rankings in terms of quartile performance are as of December 31, 2019.

Table 4
Managers' Performance

	Manager Return	Benchmark Return	Value Added (Manager Return less Benchmark Return)	Percentage Total Assets
Period Ending Dec.31/19				
Canadian Equity:				
Guardian	18.5%	22.9%	-4.4%	13.3%
Letko	15.6%	22.9%	-7.3%	16.6%
Global Equity				
Aberdeen[(1)]	18.7%	21.4%	-2.7%	4.5%
GMO[(2)]	19.5%	21.4%	-1.9%	17.4%
Fixed Income:				
TDAM Long Bonds[(3)]	13.0%	12.7%	+0.3%	25.2%
TDAM Real Return Bonds	8.4%	8.0%	+0.4%	22.5%

Notes: [(1)] *Engaged in April 2010*
[(2)] *Engaged in July 2010*
[(3)] *Toronto Dominion Asset Management (TDAM) engaged in March 2012*

Guardian, one of the two Canadian active equity managers, had a return of 18.5% and underperformed its benchmark return of 22.9% by 4.4% an added value of -4.4%. Its performance is fourth quartile (82.0%) over the one-year and third quartile (55%) over the four-year period, with a benchmark return of 10.3% and an actual return of 9.6%. Guardian manages 13.3% of Plan assets and added value of -0.7% over four years.

Letko, the second Canadian active equity manager, had a return of 15.6% and underperformed its benchmark return of 22.9% by 7.3% which is an added value of -7.3%. Its performance is fourth quartile (92%) over the one-year period and second quartile over the four-year period (10.1% and 10.3%, respectively). Letko manages 16.6% of the Plan assets and added value of -0.2% over four years.

Aberdeen is the first active global equity manager. Its return was 18.7% underperforming the benchmark return of 21.4% by 2.7%. Aberdeen's performance is third quartile (61%) over the one-year period and added value of -2.7%. Aberdeen manages 4.4% of the Plan assets. The firm's performance is second quartile (49%) over four years, underperforming the benchmark of 9.4% by -0.2% with a return of 9.2%.

Brandes, was one of three active global equity managers. However, due to both ongoing performance and the fact that the Plan was the last participant in their fund, they were redeemed in June. They managed about 5.6% of the Plan's assets at December 2018 and staff are actively looking to replace them with a less volatile management firm subject to establishing a new asset mix and potentially new investment policy.

GMO is the second active global equity manager as Brandes had been redeemed in the year. GMO's return was 19.5%, underperforming the benchmark return of 21.4% by -1.9%. GMO's performance is third quartile (57%) over the one-year period and added value of -1.9%. GMO manages 17.3% of Plan assets and is third quartile (61%) over four years yet returned 8.6% vs 9.4% benchmark a value added of -0.8%.

TDAM Long Bonds - The active long bond fund manager has 25.2% of the portfolio holdings under management. Performance over one year is a return of 13.0% compared to the benchmark return of 12.7%. This is a second quartile (39%) ranking with an added value of +0.3%. The four-year return was 5.5% compared to the benchmark of 5.5% and an added value of 0.0%.

TDAM Real Return Bonds – The passively managed fund has 22.5% of the portfolio under management and returned 8.4% over the one-year period compared to the benchmark return of 8.0%. Value added was +0.4%.

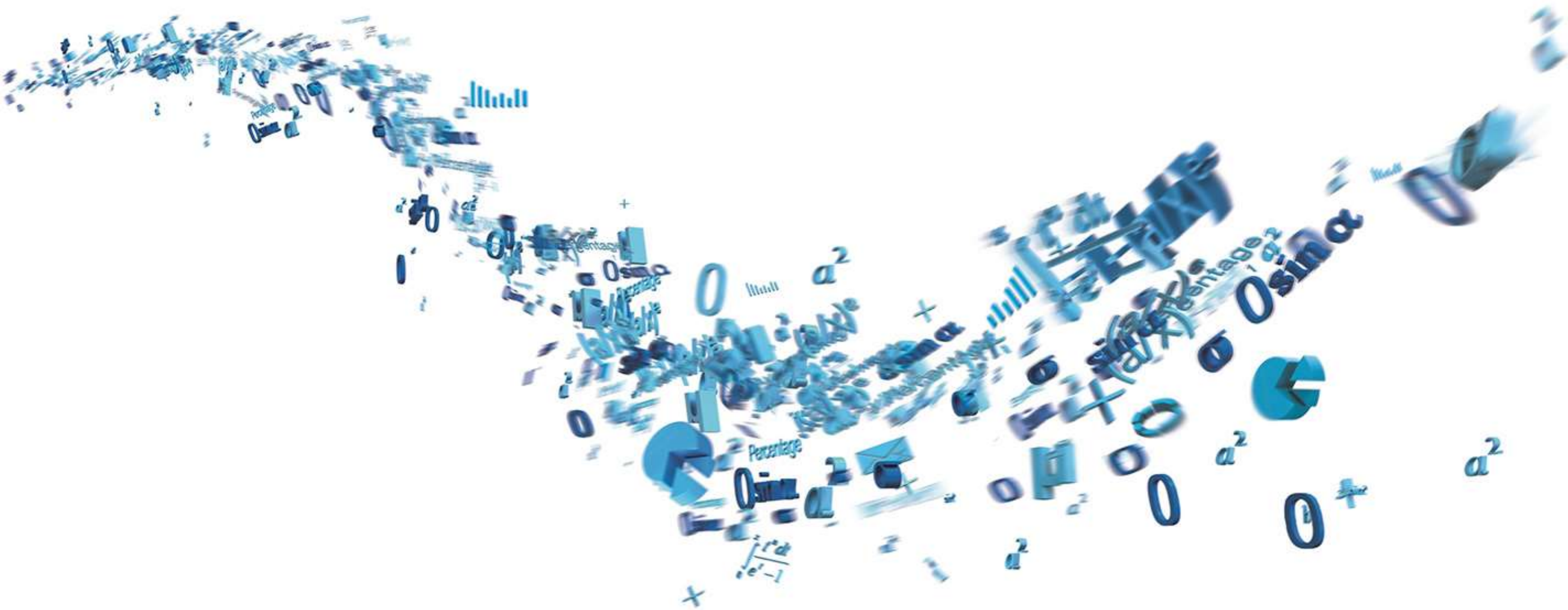
In summary, the Plan's gross return of 13.8% outperformed OMERS' gross return of 11.9% by 1.9% and its funding ratio increased to 78.6% from last year's 73.4%. However, OMERS Capital Markets return was 16.4% while the Plan's 13.8% return underperformed OMERS comparable return. Through the upcoming year (2020), equities are expected to be emphasized over bonds if interest rates decrease and / or the trigger point of 78.6% changes. All returns were positive and close to their benchmarks with a range of -0.2% to -7.3% contributing to overall positive returns. The highest return was 19.5%(GMO) and the lowest was 8.4% (Real Return Bonds) at year end.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A" to Report FCS19075(a) – The City of Hamilton Master Trust Period Ending December 31, 2019 – AON Performance Review and Investment Manager Evaluation

Appendix "B" to Report FCS19075(a) – Canadian defined pension returns generated second-highest returns in a decade: RBC Investor & Treasury Services Release

GB/dt



The City of Hamilton Master Trust Period Ending 31 December 2019

Performance Review and Investment Manager Evaluation

Visit the Aon Hewitt Retirement and Investment Website *(https://retirement-investment-insights.aon.com/canada); sharing our best thinking.*

Empower Results®

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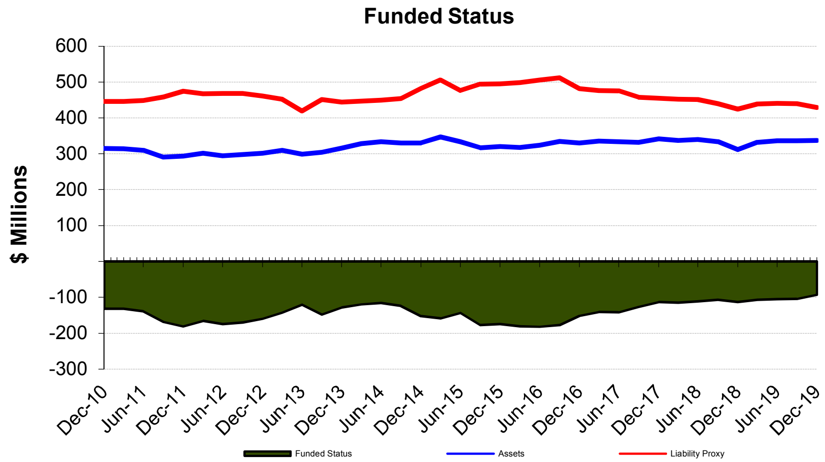
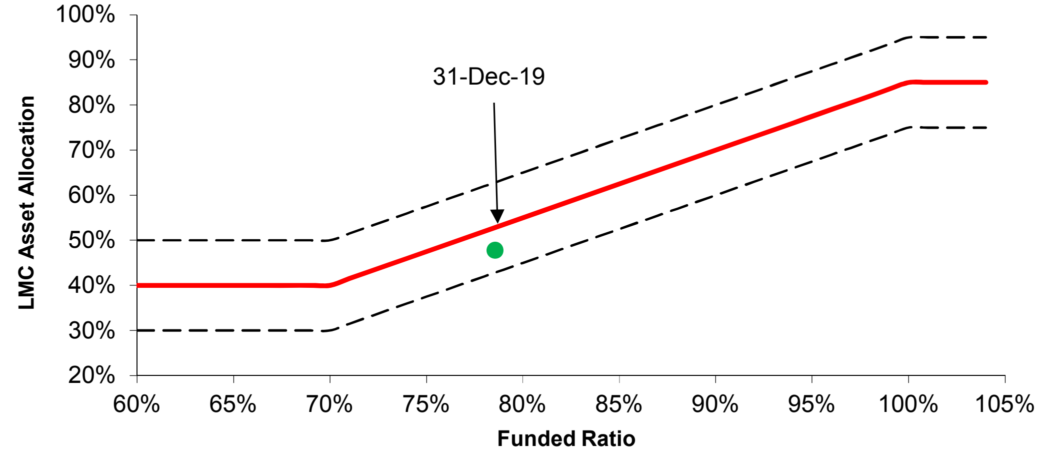
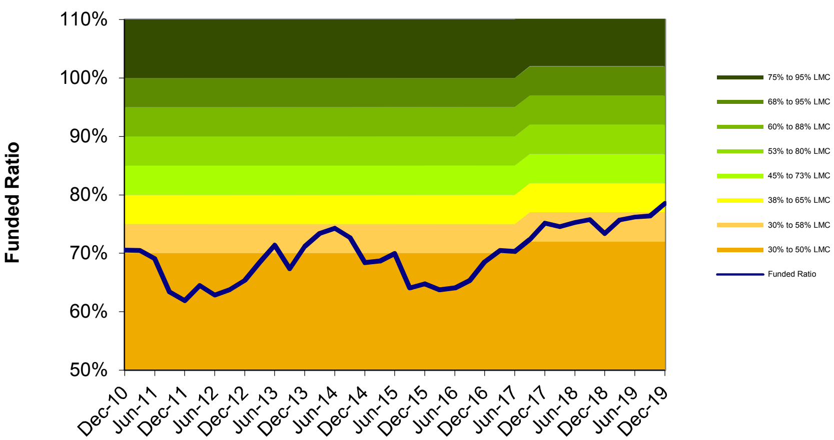
Executive Summary

Empower Results®

Quarterly Performance Report for the City of Hamilton
Funded Status and Glide Path Information for December 31, 2019







Snapshot (Wind-Up)	31-Mar-19	30-Jun-19	30-Sep-19	31-Dec-19
Market value of assets ($ Millions)	$332.4	$336.4	$336.3	$337.5
Liability proxy ($ Millions)	$439.0	$441.3	$440.3	$429.6
Funded status ($ Millions)	($106.6)	($104.9)	($104.0)	($92.1)
Funded ratio	75.7%	76.2%	76.4%	78.6%
Current LMC Asset Allocation	46.5%	48.0%	48.9%	47.8%

Rebalancing

- The rebalancing strategy for this plan requires that assets be rebalanced to the target allocation (indicated by the red line) whenever the LMC Asset Allocation falls outside of the range deemed acceptable for a given funded ratio (indicated by the dashed lines).
- The LMC Asset Allocation as of December 31, 2019 is within the range determined acceptable for the current funded ratio (78.6%), however the the LMC allocation consists of Long Bonds and Real Return Bonds, and due to the recent change in funded status the Real Return Bonds are out of bounds and therefore rebalancing is required.

Executive Summary

Trailing Period Performance

As of 31 December 2019

	Allocation		Performance (%)						
	Market Value ($000)	%	1 Quarter	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
Total Fund	337,452	100.0	1.5 (86)	13.8 (74)	4.4 (90)	6.1 (73)	6.9 (54)	6.0 (84)	7.5 (77)
Benchmark			1.4 (86)	16.4 (25)	6.5 (23)	7.2 (29)	7.5 (30)	6.8 (42)	7.6 (71)
Value Added			0.1	-2.6	-2.1	-1.1	-0.6	-0.8	-0.1
Canadian Equity	100,788	29.9	3.0 (49)	16.7 (91)	2.5 (84)	5.7 (68)	10.0 (43)	6.8 (45)	9.1 (32)
Guardian (including cash)	44,837	13.3	1.4 (94)	18.5 (82)	5.4 (58)	6.9 (42)	9.6 (55)	6.7 (45)	7.9 (61)
S&P/TSX Composite			3.2 (40)	22.9 (31)	5.8 (40)	6.9 (39)	10.3 (30)	6.3 (59)	6.9 (80)
Value Added			-1.8	-4.4	-0.4	0.0	-0.7	0.4	1.0
Letko (including cash)	55,951	16.6	4.4 (8)	15.6 (92)	0.4 (93)	4.7 (83)	10.1 (41)	6.7 (49)	9.6 (17)
S&P/TSX Composite			3.2 (40)	22.9 (31)	5.8 (40)	6.9 (39)	10.3 (30)	6.3 (59)	6.9 (80)
Value Added			1.2	-7.3	-5.4	-2.2	-0.2	0.4	2.7
Global Equities	73,716	21.8	8.1 (21)	18.3 (62)	6.6 (70)	9.6 (65)	8.3 (68)	8.8 (86)	9.8 (90)
Aberdeen	14,934	4.4	6.9 (41)	18.7 (61)	7.4 (63)	10.5 (55)	9.2 (49)	8.4 (89)	-
MSCI World (Net)			6.4 (52)	21.4 (42)	9.8 (39)	11.3 (47)	9.4 (45)	11.2 (50)	11.8 (63)
Value Added			0.5	-2.7	-2.4	-0.8	-0.2	-2.8	-
GMO	58,781	17.4	8.4 (18)	19.5 (57)	6.4 (73)	10.1 (60)	8.6 (61)	9.5 (78)	-
MSCI World (Net)			6.4 (52)	21.4 (42)	9.8 (39)	11.3 (47)	9.4 (45)	11.2 (50)	11.8 (63)
Value Added			2.0	-1.9	-3.4	-1.2	-0.8	-1.7	-

*GMO returns are reported net-of-fees.
Parentheses contain percentile rankings.

Trailing Period Performance

As of 31 December 2019

	Allocation		Performance (%)						
	Market Value ($000)	%	1 Quarter	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
Canadan Fixed Income	161,260	47.8	-2.0	10.8	5.1	4.6	4.2	4.0	4.8
TDAM Long Bonds	85,132	25.2	-1.9	13.0	6.2	6.5	5.5	5.1	-
FTSE Canada Long Term Overall Bond			-1.9	12.7	6.3	6.6	5.5	5.2	7.1
Value Added			0.0	0.3	-0.1	-0.1	0.0	-0.1	-
TDAM Real Return Bonds	76,074	22.5	-2.1	8.4	4.0	2.8	2.9	2.8	-
FTSE Canada Real Return Bond			-2.0	8.0	3.9	2.8	2.8	2.8	4.3
Value Added			-0.1	0.4	0.1	0.0	0.1	0.0	-
TDAM Cash	54	0.0	-	-	-	-	-	-	-
Operating Account	1,688	0.5							

*GMO returns are reported net-of-fees.
Parentheses contain percentile rankings.

Executive Summary

Trailing Period Performance

As of 31 December 2019

	2019		2018		2017		2016		2015		2014		2013		2012		2011		2010		2009	
Total Fund	13.8	(74)	-4.2	(85)	9.5	(35)	9.3	(22)	2.6	(93)	12.0	(28)	13.0	(91)	10.5	(24)	0.5	(39)	9.6	(70)	14.3	(83)
Benchmark	16.4	(25)	-2.6	(56)	8.6	(57)	8.4	(33)	4.3	(81)	13.9	(1)	9.7	(97)	8.4	(71)	0.4	(42)	10.3	(54)	16.7	(53)
Value Added	-2.6		-1.6		0.9		0.9		-1.7		-1.9		3.3		2.1		0.1		-0.7		-2.4	
Canadian Equities	16.7	(91)	-10.0	(71)	12.3	(8)	24.1	(18)	-5.3	(49)	11.9	(41)	25.3	(16)	17.1	(2)	-9.1	(51)	14.8	(78)	32.0	(61)
Guardian (including cash)	18.5	(82)	-6.3	(12)	9.9	(31)	18.3	(59)	-4.0	(42)	13.0	(23)	13.8	(92)	13.7	(15)	-8.3	(46)	15.3	(72)	27.5	(88)
S&P/TSX Composite	22.9	(31)	-8.9	(53)	9.1	(52)	21.1	(36)	-8.3	(82)	10.6	(57)	13.0	(95)	7.2	(81)	-8.7	(49)	17.6	(43)	35.1	(47)
Value Added	-4.4		2.6		0.8		-2.8		4.3		2.4		0.8		6.5		0.4		-2.3		-7.6	
Letko (including cash)	15.6	(92)	-12.7	(92)	13.8	(2)	28.1	(6)	-5.9	(55)	11.5	(45)	31.5	(3)	18.4	(1)	-9.1	(51)	14.3	(85)	32.8	(57)
S&P/TSX Composite	22.9	(31)	-8.9	(53)	9.1	(52)	21.1	(36)	-8.3	(82)	10.6	(57)	13.0	(95)	7.2	(81)	-8.7	(49)	17.6	(43)	35.1	(47)
Value Added	-7.3		-3.8		4.7		7.0		2.4		0.9		18.5		11.2		-0.4		-3.3		-2.3	
Global Equities	18.3	(62)	-3.9	(71)	15.8	(52)	4.7	(35)	10.4	(92)	10.2	(82)	26.3	(92)	12.8	(69)	-0.1	(31)	6.6	(65)	1.5	(94)
Aberdeen	18.7	(61)	-2.8	(62)	17.1	(43)	5.4	(31)	5.3	(97)	10.5	(81)	21.3	(98)	14.0	(57)	2.0	(19)	-		-	
MSCI World (Net)	21.4	(42)	-0.6	(41)	14.4	(64)	3.8	(44)	18.9	(54)	14.4	(45)	35.1	(54)	13.3	(64)	-3.2	(51)	5.9	(74)	10.6	(70)
Value Added	-2.7		-2.2		2.7		1.6		-13.6		-3.9		-13.8		0.7		5.2		-		-	
Brandes	-		-1.4	(48)	9.3	(92)	4.6	(35)	16.3	(73)	15.1	(37)	41.0	(20)	10.9	(81)	-2.9	(48)	6.2	(70)	1.5	(94)
MSCI World (Net)	21.4	(42)	-0.6	(41)	14.4	(64)	3.8	(44)	18.9	(54)	14.4	(45)	35.1	(54)	13.3	(64)	-3.2	(51)	5.9	(74)	10.6	(70)
Value Added	-		-0.8		-5.1		0.8		-2.6		0.7		5.9		-2.4		0.3		0.3		-9.1	
GMO	19.5	(57)	-5.3	(80)	18.1	(37)	4.2	(40)	12.9	(88)	8.1	(91)	29.1	(84)	12.5	(71)	0.9	(25)	-		-	
MSCI World (Net)	21.4	(42)	-0.6	(41)	14.4	(64)	3.8	(44)	18.9	(54)	14.4	(45)	35.1	(54)	13.3	(64)	-3.2	(51)	5.9	(74)	10.6	(70)
Value Added	-1.9		-4.7		3.7		0.4		-6.0		-6.3		-6.0		-0.8		4.1		-		-	
Canadian Fixed Income	10.8		-0.3		3.8		3.0		3.1		14.8		-7.4		5.5		9.5		7.1		7.7	
TDAM Long Bonds	13.0	(39)	-0.2	(88)	7.0	(62)	2.8	(45)	3.4	(80)	16.8	(71)	-5.7	(55)	-		-		-		-	
FTSE Canada Long Term Overall Bond	12.7	(62)	0.3	(45)	7.0	(61)	2.5	(80)	3.8	(48)	17.5	(31)	-6.2	(86)	5.2	(78)	18.1	(26)	12.5	(51)	5.5	(83)
Value Added	0.3		-0.5		0.0		0.3		-0.4		-0.7		0.5		-		-		-		-	
TDAM Real Return Bonds	8.4		-0.3		0.6		3.1		2.6		13.0		-11.5		-		-		-		-	
FTSE Canada Real Return Bond	8.0		0.0		0.7		2.9		2.8		13.2		-13.1		2.9		18.3		11.1		14.5	
Value Added	0.4		-0.3		-0.1		0.2		-0.2		-0.2		1.6		-		-		-		-	

Parentheses contain percentile rankings.

AON
Empower Results®

Capital Markets Performance

Capital Market Performance

Major Capital Markets' Returns

As of 31 December 2019

	1 Quarter	Year To Date	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
Equity								
S&P/TSX Composite	3.2	22.9	22.9	5.8	6.9	10.3	6.3	6.9
S&P 500	6.9	25.0	25.0	14.1	14.0	12.5	14.3	16.0
S&P 500 (USD)	9.1	31.5	31.5	12.1	15.3	14.4	11.7	13.6
MSCI EAFE (Net)	6.0	16.0	16.0	4.3	8.3	5.5	8.1	7.8
MSCI World (Net)	6.4	21.4	21.4	9.8	11.3	9.4	11.2	11.8
MSCI ACWI (Net)	6.7	20.2	20.2	8.9	11.2	9.4	10.9	11.1
MSCI Emerging Markets (Net)	9.5	12.4	12.4	2.3	10.3	9.6	8.0	5.9
Real Estate								
MSCI/REALPAC Canada Annual Property	1.9	6.7	6.7	7.2	7.1	6.9	7.1	9.2
MSCI/REALPAC Canada Quarterly Property Fund	2.9	9.0	9.0	8.7	8.4	7.9	7.5	9.0
Fixed Income								
FTSE Canada Universe Bond	-0.9	6.9	6.9	4.1	3.6	3.1	3.2	4.3
FTSE Canada Long Term Overall Bond	-1.9	12.7	12.7	6.3	6.6	5.5	5.2	7.1
FTSE Canada 91 Day TBill	0.4	1.6	1.6	1.5	1.2	1.0	0.9	0.9
Consumer Price Index								
Canadian CPI, unadjusted	0.1	2.2	2.2	2.1	2.0	1.9	1.8	1.7

Canadian Equities

The S&P/TSX Composite Index returned +3.2% in the fourth quarter of 2019. Performance was mixed across sectors. Information Technology (+10.8%) was the best performing sector, followed by Materials (+7.8%) and Energy (+7.1%). Negative performing sectors included Health Care (-5.9%), Consumer Staples (-3.9%), and Real Estate (-2.4%). Growth stocks underperformed value stocks over the past quarter (+2.5% vs.+3.3% respectively). In the year, growth stocks outperformed value stocks (+22.3% vs.+21.6% respectively). The S&P/TSX Composite Index returned +22.9% in the year. The best performing sectors in the year were Information Technology (+64.9%), Utilities (+37.5%) and Industrials (+25.5%), while Health Care (-10.9%) was the worst performer.

U.S. Equities

The S&P 500 Index returned +6.9% in the quarter in Canadian dollar terms. Performance was positive across most sectors. Healthcare (+12.0%) and Information Technology (+12.0%) were the best performing sectors while Real Estate (-2.6%) and Utilities (-1.3%) were the worst performing sectors. The S&P 500 Index returned +25.0% in the year in Canadian dollar terms. The best performing sectors in the year were Information Technology (+42.7%) and Communication Services (+26.0%) while Energy (+6.2%) was the worst performer.

Non-North American Equities

The MSCI EAFE Index returned +6.0% in the quarter in Canadian dollar terms. Sector returns were mixed with the best performers being Information Technology (+10.3%) and Health Care (+10.1%) while the worst being Consumer Staples (-0.2%). In the year, the Index returned +16.0% in Canadian dollar terms. The best performing sector in 2019 was Information Technology (+30.7%) while the worst performer was Energy (+2.2%).

Fixed Income

The Canadian bond market, as measured by the FTSE Canada Universe Bond Index, returned -0.9% over the last quarter. Bond market negative performance was led by Provincial bonds (-1.3%) which underperformed both Corporate bonds (+0.1%) and Federal bonds (-1.1%). From a term perspective, long duration bonds (-1.9%) underperformed both medium duration (-1.1%) and short duration (+0.1%) bonds in the quarter. In the year, the FTSE Canada Universe Bond Index returned +6.9%. Bond market performance in 2019 was led by Provincial bonds (+9.1%), outperforming both Corporate bonds (+8.1%) and Federal bonds (+3.7%) while from a term perspective, long duration bonds (+12.7%) outperformed both medium duration bonds (+5.8%) and short duration bonds (+3.1%).

Returns for periods greater than one year are annualized. Sector returns are sourced from MSCI.

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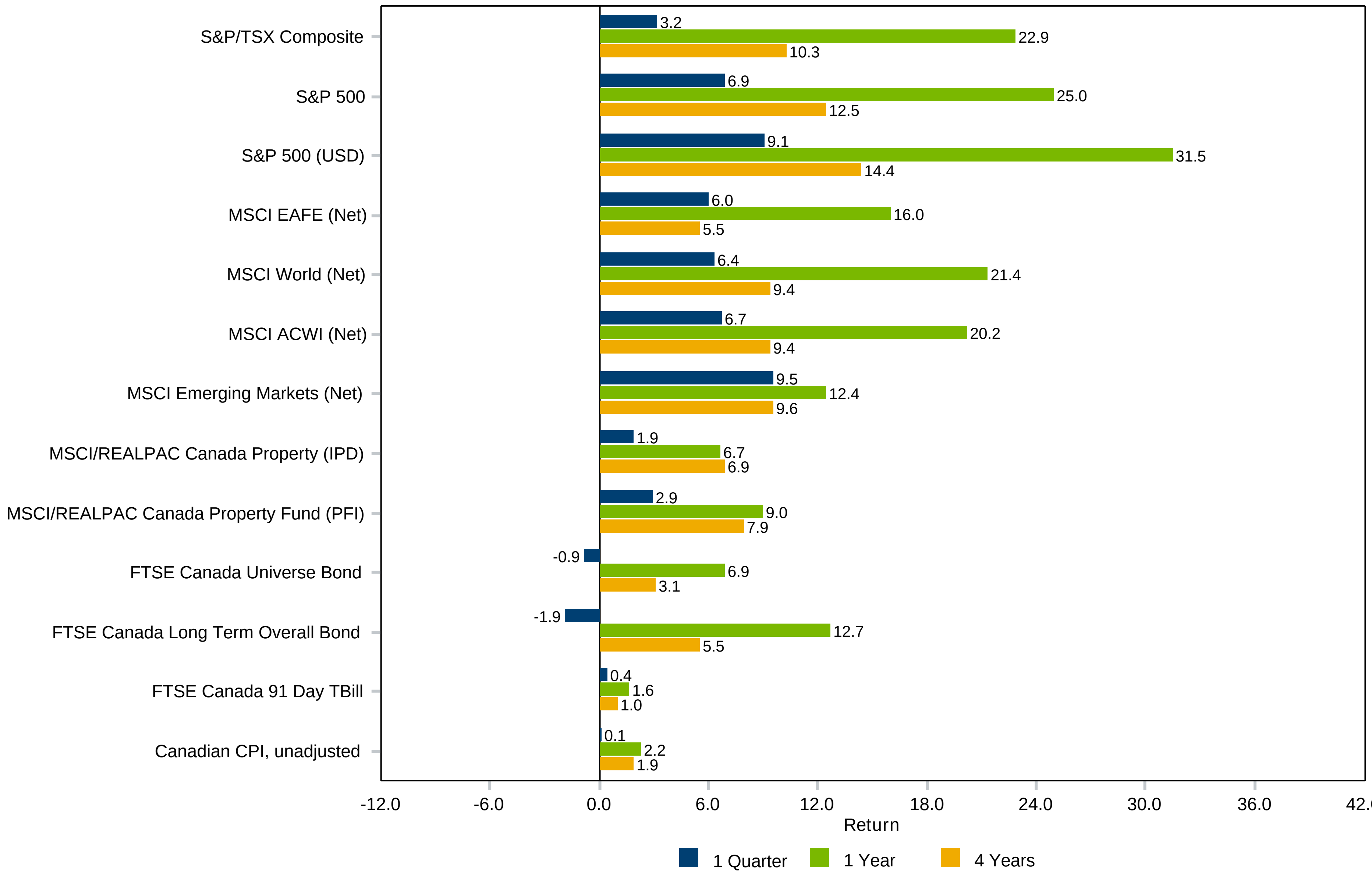
Comparative Performance

As of 31 December 2019



Empower Results®

Total Fund Analysis

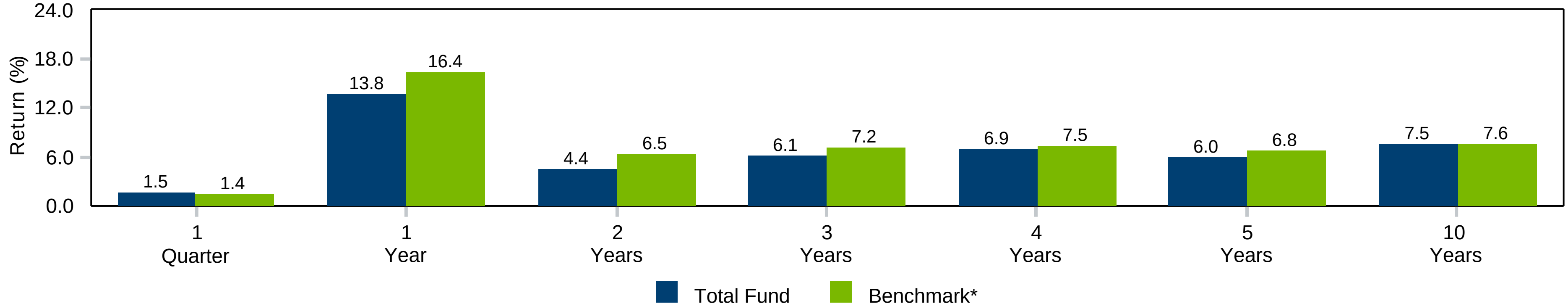
Empower Results®

Total Fund

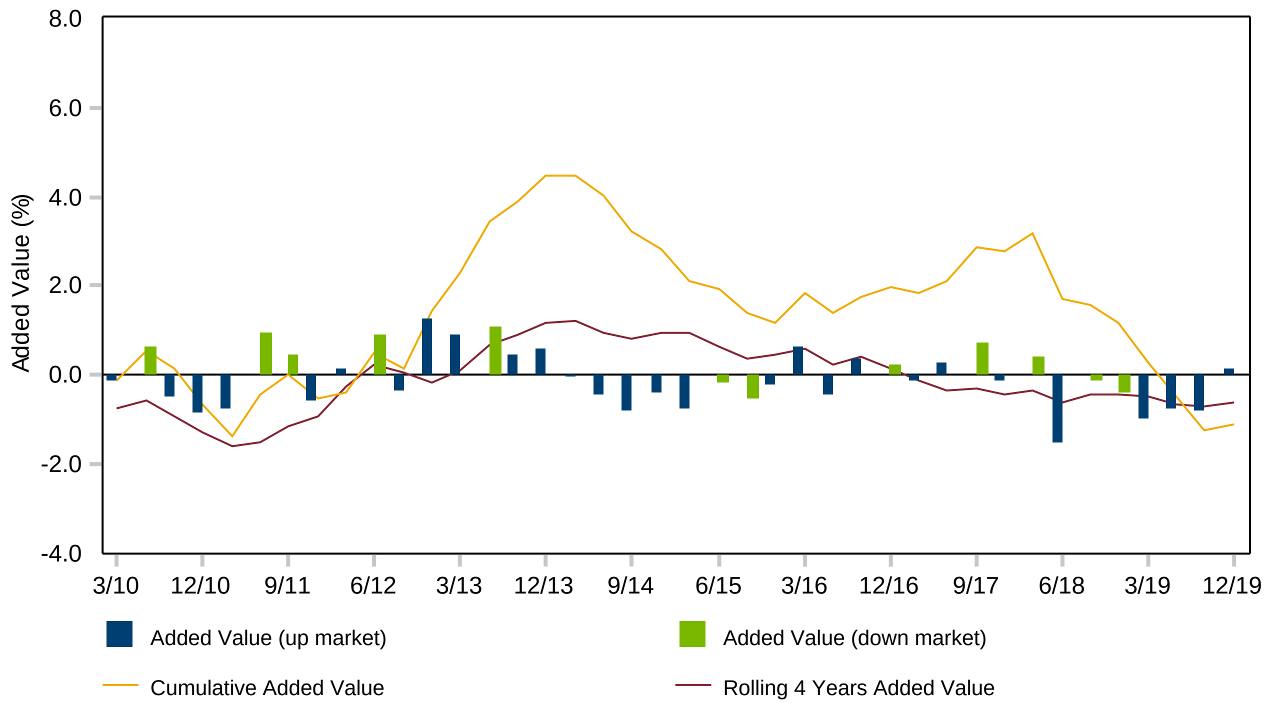
Total Fund Performance Summary

As of 31 December 2019

Return Summary



Added Value History (%)



Performance Statistics

	Quarters	%
Market Capture		
Up Markets	28	94.4
Down Markets	12	82.2
Batting Average		
Up Markets	28	32.1
Down Markets	12	66.7
Overall	40	42.5

* See Appendix A for benchmark components.

AON Empower Results®

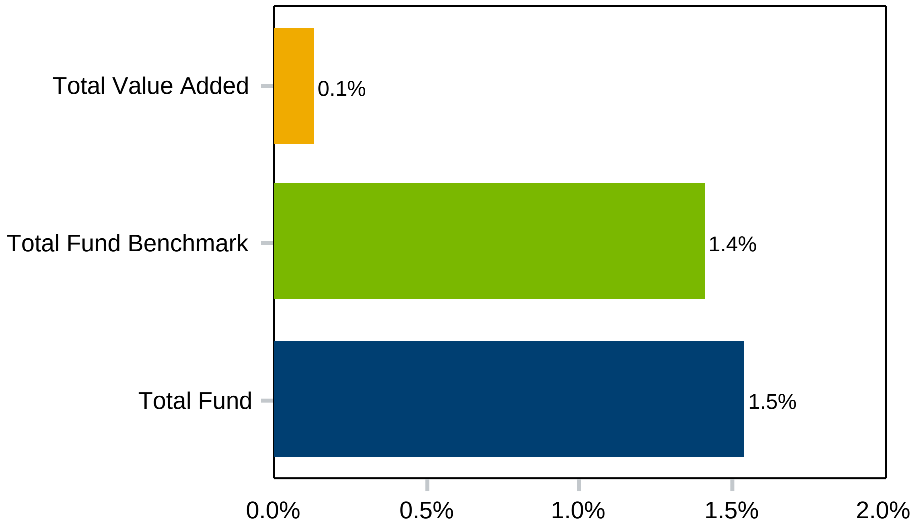
Total Fund

Total Fund Performance Attribution

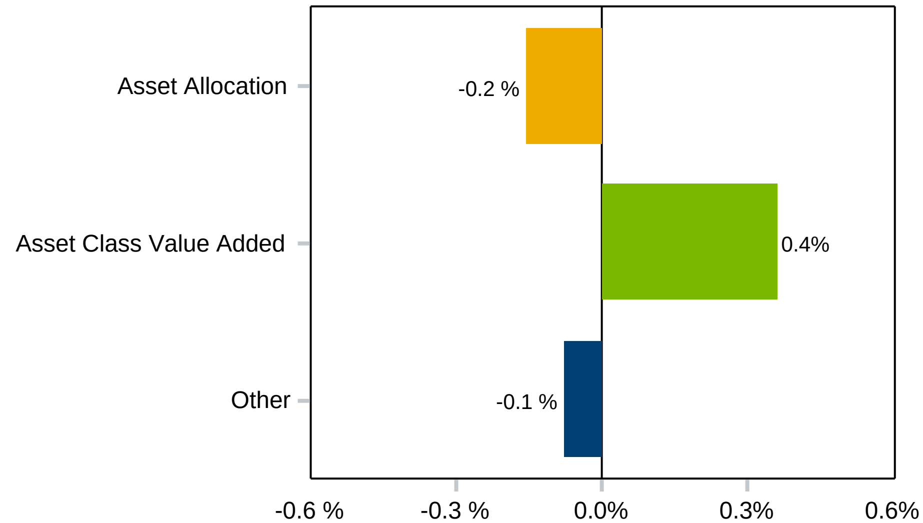
1 Quarter Ending 31 December 2019

Total Fund vs. Benchmark

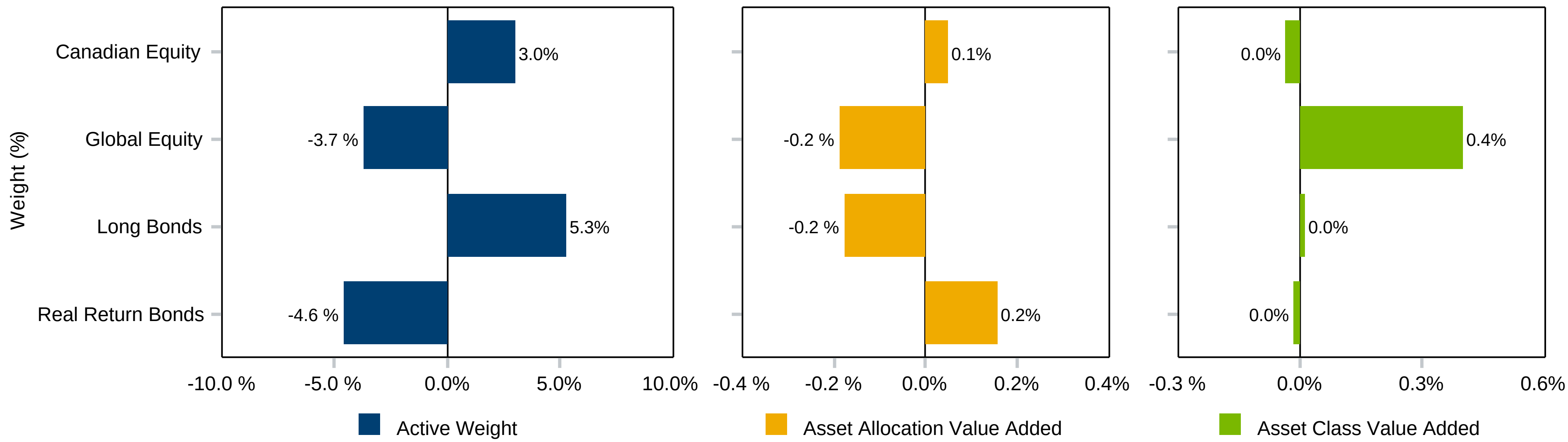
Total Fund Performance



Total Value Added: 0.1%



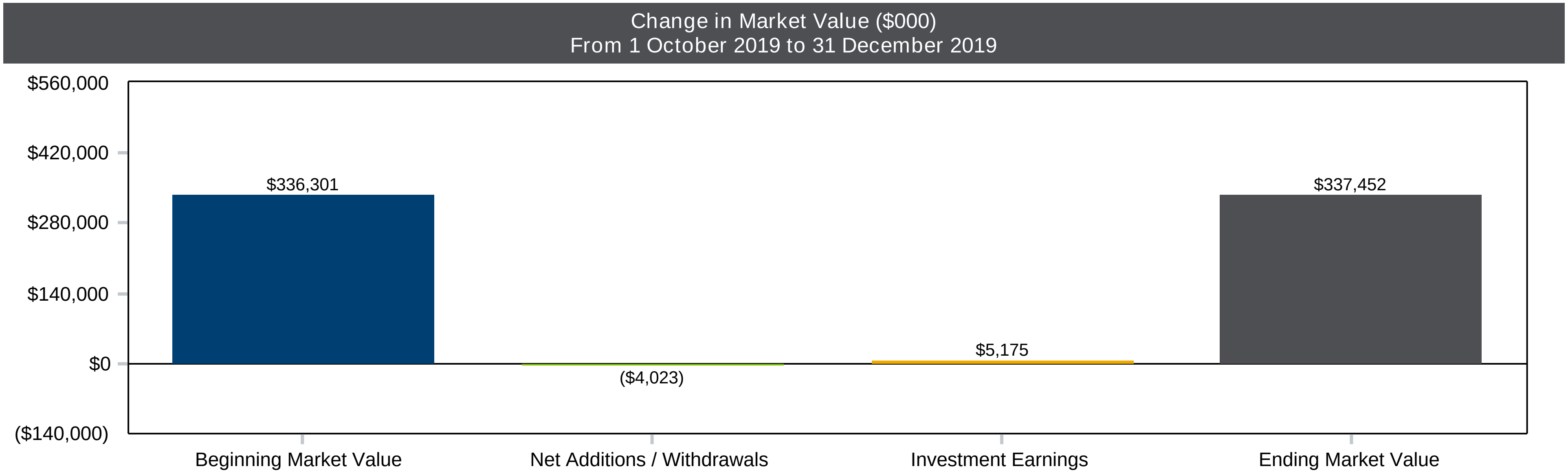
1 Quarter | Total Asset Allocation: -0.2 % | Total Asset Class Value Added: 0.4%



Total Fund

Total Fund Asset Summary

As of 31 December 2019



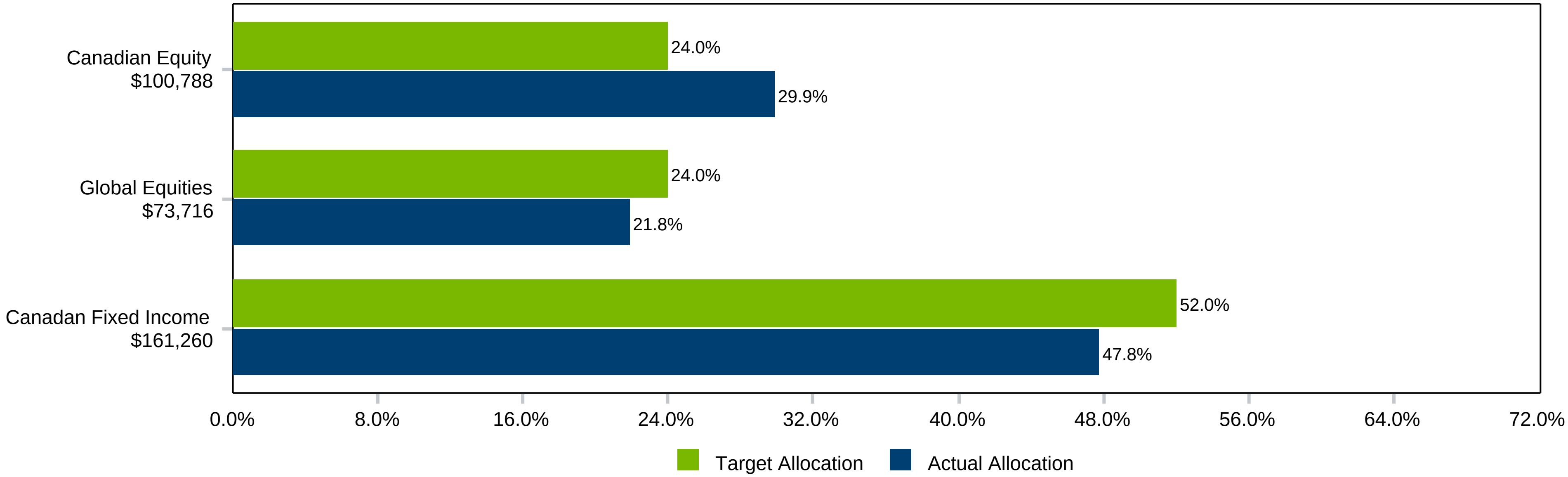
Summary of Cash Flows ($000)

	1 Quarter	Year To Date	1 Year	4 Years
Total Fund				
Beginning Market Value	336,301	311,511	311,511	320,603
+/- Net Cash Flows	-4,023	-4,047	-4,047	-58,687
+/- Income	23,890	26,823	26,823	75,355
+/- Capital Gains / Losses	-18,715	3,165	3,165	181
= Ending Market Value	337,452	337,452	337,452	337,452

Total Fund

Asset Allocation Compliance

As of 31 December 2019 ($000)



	Market Value ($000)	Market Value (%)	Target Allocation (%)	Differences (%)	Minimum Allocation (%)	Maximum Allocation (%)	Within Range
Total Fund	337,452	100.0	100.0	0.0			
Canadian Equity	100,788	29.9	24.0	5.9	19.0	29.0	No
Global Equities	73,716	21.8	24.0	-2.2	19.0	29.0	Yes
Canadian Fixed Income	161,260	47.8	52.0	-4.2	42.0	62.0	Yes

Canadian Fixed Income comprises of Long Bonds and Real Return Bonds. Even though at aggregate level, Canadian Fixed Income is within the target ranges, Real Return Bonds are out of compliance and underweight relative to their minimum policy target.

Empower Results®

Appendix A - Plan Information

Empower Results®

Plan Information

Summary of Investment Objective

The investment policy contains specific performance objectives for the fund and the investment managers.
All investment rates of return are measured over moving four-year periods. Return objectives are net of fees and include realized and unrealized capital gains or losses plus income from all sources.

Returns will be calculated on a time-weighted basis and compared to the objectives described below.

The *objective* of the total fund is to outperform a benchmark portfolio that is comprised of the following weightings:

	31 December 2019 onwards	1 April 2019 to 31 December 2019	1 January 2019 to 31 March 2019	1 October 2018 to 31 December 2018	1 April 2018 to 30 September 2018	1 January 2018 to 31 March 2018	1 October 2017 to 31 December 2017	1 July 2014 to 30 September 2017	1 April 2012 to 30 June 2014	1 July 2011 to 31 March 2012	1 January 2008 to 30 June 2011	1 July 2006 to 31 December 2007	Up to 30 June 2006
S&P/TSX Composite	24.00%	26.00%	27.00%	28.00%	27.00%	27.00%	27.00%	28.00%	30.00%	30.00%	30.00%	30.00%	25.00%
MSCI World (C$)	25.00%	25.00%	26.00%	28.00%	26.00%	27.00%	26.00%	28.00%	30.00%	30.00%	0.00%	0.00%	0.00%
MSCI World ex. Cda (C$)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.00%	15.00%	17.50%
S&P 500 - hedged to C$	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	7.50%	8.75%
MSCI EAFE - hedged to C$	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	7.50%	8.75%
FTSE Canada Universe Bond	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	45.00%	40.00%	40.00%
FTSE Canada Long Bond	21.00%	21.00%	22.00%	23.00%	22.00%	23.00%	22.00%	22.00%	25.00%	0.00%	0.00%	0.00%	0.00%
FTSE Canada Real Return Bond	31.00%	28.00%	25.00%	21.00%	25.00%	23.00%	25.00%	22.00%	15.00%	0.00%	0.00%	0.00%	0.00%
	100.00%	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Appendix B - Manager Updates

Manager Updates

As of 31 December 2019

Aberdeen Standard Investments

Q4 2019

Business
There were no significant events during the quarter.

Staff
On October 2, 2019, it was announced that Martin Gilbert will retire from his role as Vice Chairman of SLA, formally leaving the company on September 30, 2020. Mr. Gilbert remains Chairman of ASI until then.

Brandes Investment Partners

Q4 2019

Business
There were no significant events.

Staff
There were no significant events.

Manager Updates

As of 31 December 2019

GMO

Q4 2019

Business

In October 2019, GMO launched the Quality Spectrum Strategy which is a long/short quality strategy that expects to generate equity-like returns while providing protection against market drawdowns.

Staff

In November, Malcolm Brown, Portfolio Manager of the Special Opportunities Team left the firm.

In January 2020 GMO hired Hylton Socher as the firms new Chief Technology Officer.

Guardian Capital

Q4 2019

Business

There were no significant events.

Staff

There were no significant events.

Letko, Brosseau & Associates Inc. ("Letko, Brosseau")

Q4 2019

Business

There were no significant events.

Staff

During the fourth quarter of 2019, Isabelle Godin was appointed Vice President - Operations and Chief Financial Officer. David Després was appointed Vice President - Investment Services. Lastly, both Rohit Khuller and Stéphane Lebrun were appointed Vice President - Investment Management.

Empower Results®

Manager Updates

As of 31 December 2019

TD Asset Management ("TDAM")

Q4 2019

Business
The legal amalgamation of the acquisition of Greystone Capital Management Inc. by Toronto-Dominion Bank was effective November 1, 2019.

Staff
Over the quarter, Christopher Case and Charles Edwardes-Ker, Portfolio Managers in the Active Fixed Income and Global Equity groups, respectively, have left the firm.

Appendix C - Disclosure

Empower Results®

Statement of Disclosure

As of 31 December 2019

Aon Hewitt Inc. reconciles the rates of return with each investment manager quarterly. Aon Hewitt Inc. calculates returns from the custodian/trustee statements while the managers use different data sources. Occasionally discrepancies occur because of differences in computational procedures, security prices, "trade date" versus "settlement date" accounting, etc. We monitor these discrepancies closely and find that they generally do not tend to persist over time. However, if a material discrepancy arises or persists, we will bring the matter to your attention after discussion with your money manager.

This report may contain slight discrepancies due to rounding in some of the calculations. All data presented is in Canadian dollars unless otherwise stated.

Canadian defined benefit pension plans generated second-highest returns in a decade: RBC Investor & Treasury Services

Equity markets advanced in all regions

TORONTO, February 12, 2020 — To mark the end of a decade characterized by fintech disruptors, geopolitical tensions and regulatory changes, Canadian defined benefit pension plans returned 14.0 per cent in 2019, according to the RBC Investor & Treasury Services All Plan Universe. This was the second highest annual return over the past 10 years, in large part due to an upsurge in Canadian and global equity markets.

Quote
"Over the past 10 years, the average Canadian Defined Benefits plan has generated an annualized return of 8.0 per cent on its assets. These results are quite impressive, though we can't discount the impact of global uncertainty and trade tensions in the years ahead," indicated David Linds, Managing Director and Head of Asset Servicing, Canada. "While the performance of equity markets suggests that investors expect to see continued growth, plan sponsors need to continue building robust strategies to prepare for higher volatility as earnings and fundamentals begin to slow."

RBC I&TS Defined Benefit Pension Plan Survey results
An RBC Investor & Treasury Services report based on survey data from 119 Canadian defined benefit pension plans indicates a small increase in the plans' median funded status to 101 per cent (as compared to 100 per cent in 2018). The report, Preparing for the Silver Tsunami, reveals that a significant majority of pension plans (71 per cent) now hold alternative investments within their portfolios, with real estate and infrastructure cited as the most popular (95 per cent and 91 per cent respectively). The overall outlook of respondents has improved regardless of plan size or type.

Additional results
- Canadian defined benefit pension plans returned 2.0 per cent in Q4 2019, versus 1.7 per cent in Q3 2019 and a loss of 3.5 per cent in Q4 2018.
- Canadian equities returned 3.1 per cent in the quarter (+21.4 per cent for the year), while global equities returned 6.8 per cent (+20.7 per cent for the year). The TSX composite rose to 3.2 per cent in the quarter (+22.9 per cent for the year) and the MSCI World Index to 6.3 per cent (+21.2 per cent for the year).
- Canadian bonds decreased 1.6 per cent over the quarter, but were up 10.3 per cent for the year.
- Canadian fixed income broad market benchmark fell 0.9 per cent in the quarter (+6.9 per cent for the year).

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Historic quarterly performance

Period	Return (%)	Period	Return (%)
Q4 2019	2.0	Q2	1.4
Q3 2019	1.7	Q1	2.9
Q2 2019	2.7	Q4	0.5
Q1 2019	7.2	Q3	4.2
Q4 2018	-3.5	Q2	2.9
Q3 2018	0.1	Q1	0.0
Q2 2018	2.2	Q4	3.1
Q1 2018	0.2	Q3	-2.0
Q4 2017	4.4	Q2	-1.6
Q3 2017	0.4	Q1	6.6

Historic annual performance

Year	Return (%)	Year	Return (%)
2019	14.0	2009	16.2
2018	-0.7	2008	-15.9
2017	9.7	2007	1.5
2016	6.8	2006	12.9
2015	5.4	2005	12.0
2014	11.9	2004	10.7
2013	14.2	2003	13.8
2012	9.4	2002	-3.6
2011	0.5	2001	0.5
2010	10.4	2000	10.0

About the RBC Investor & Treasury Services All Plan Universe
For the past 30 years, RBC Investor & Treasury Services (RBC I&TS) has managed one of the industry's largest and most comprehensive universes of Canadian pension plans. The "All Plan Universe" currently tracks the performance and asset allocation of a cross-section of assets under management across Canadian defined benefit (DB) pension plans, and is a widely-recognized performance benchmark indicator. The RBC Investor & Treasury Services "All Plan Universe" is produced by RBC I&TS' Risk & Investment Analytics (R&IA) service. R&IA work in partnership with best-in-class technology to deliver independent and cost effective solutions designed to help institutional investor clients monitor investment decisions, optimize performance, reduce costs, mitigate risk and increase governance capability.

About RBC Investor & Treasury Services
RBC Investor & Treasury Services (RBC I&TS) is a specialist provider of asset services, custody, payments and treasury and market services for financial and other institutional investors worldwide, with over 4,500 employees in 17 countries across North America, Europe, Asia and Australia. We deliver services which safeguard client assets, underpinned by client-centric digital solutions which continue to be enhanced and evolved in line with our clients' changing needs. Trusted with CAD 4.3 trillion in client assets under administration, RBC I&TS is a financially strong partner with among the highest credit ratings globally.

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For more information, please contact:
Ylana Kurtz, +1 416 348 2330, ylana.kurtz@rbc.com

Hamilton

INFORMATION REPORT

TO:	Chair and Members HMRF / HWRF Pension Administration Sub-Committee
COMMITTEE DATE:	November 24, 2020
SUBJECT/REPORT NO:	Master Trust Pension Investment Performance Report as at June 30, 2020 (FCS20075) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Gerald T. Boychuk (905) 546-2424 Ext. 4321
SUBMITTED BY: **SIGNATURE:**	Brian McMullen Director, Financial Planning, Administration and Policy Corporate Services Department

Council Direction

Not Applicable.

Information

Attached as Appendix “A” to Report FCS20075 is Aon Hewitt’s investment performance report for the Hamilton Municipal Retirement Fund (HMRF), the Hamilton-Wentworth Retirement Fund (HWRF) and the Hamilton Street Railway (HSR), as of June 30, 2020. Together, the three pension funds make up the Master Trust, which is referred to as the “Plan” in Report FCS20075.

The Plan’s return for the one-year period ended June 30, 2020 of 1.3% underperformed its benchmark of 7.1% by 5.8%. The market value of the assets of the Plan totalled $318.8 M compared to June 30, 2019 of $336.4 M, a decrease of $17.6 M.

The funded ratio decreased to 73.0%. Currently, a funding ratio of 73.0% enables a range of 34% to 54% for the Liability Matching Component (LMC) and the fund is at 44.4% (Fixed Income). The ultimate target contemplates 80% fixed income as interest rates rise and value of assets increases relative to liability present values.

Table 1 shows the Plan’s one-year (ended June 30) returns, the value added, market value and funded status for the last five years.

Table 1
Plan's One-Year (ended June 30) Returns

	12 Months Ended Jun.30/20	12 Months Ended Jun.30/19	12 Months Ended Jun.30/18	12 Months Ended Jun.30/17	12 Months Ended Jun.30/16
Plan Return	1.3%	4.1%	7.3%	9.0%	3.2%
Benchmark	7.1%	6.4%	7.7%	7.5%	3.8%
Value Added	-5.8%	-2.3%	-0.4%	1.5%	-0.6%
Market Value ($ Millions)	$318.8	$336.4	$339.9	$334.3	$324.4
Funded Ratio	73.0%	76.2%	75.3%	70.3%	64.1%

The Plan's performance may be compared to the return earned in the broader pension market in Canada. Attached as Appendix "B" to Report FCS20075, RBC Investor & Treasury Service reports its universe of pension funds, which totals C$650 B and a median return of 9.6% in the quarter ended June 30, 2020. The Plan's quarterly return of 11.0% outperformed the universe's median quarterly return of 9.6% by 1.4%.

Asset Mix

Table 2 shows the percentage of Plan assets in each asset class as of June 30, 2020 compared to June 30, 2019.

Table 2
Percentage of Plan Assets in Each Asset Class

Asset Class	Jun.30/20	Jun.30/19	Change	Benchmark
Canadian Equity	27.8%	28.8%	-1.0%	28.0%
Global Equity	27.7%	22.8%	+4.9%	28.0%
Total Equity	55.5%	51.6%	+3.9%	
Canadian Fixed Income	44.4%	48.0%	-3.6%	48.0%
Cash	0.1%	0.5%	-0.4%	

Note: Anomalies due to rounding

Managers' Performance

Managers' investment performance relative to their benchmark is summarized in Table 3. One-year rates of return are all as of June 30, 2020.

Table 3
Managers' Performance
One-Year Period Ended Jun. 30/20

	Manager Return	Benchmark Return	Value Added (Manager Return less Benchmark Return)	Percentage Total Assets
Canadian Equity:				
Guardian	-6.5%	-2.2%	-4.3%	13.9%
Letko	-22.0%	-2.2%	-9.1%	13.9%
Global Equity				
Aberdeen(1)	7.2%	6.9%	+0.3%	5.9%
GMO(2)	8.2%	6.9%	+1.3%	21.8%
Fixed Income:				
TDAM Long Bonds(3)	12.1%	11.7%	+0.4%	25.2%
TDAM Real Return Bonds(3)	6.0%	5.5%	+0.5%	19.1%

Notes: *(1) Engaged in April 2010*
(2) Engaged in July 2010
(3) Toronto Dominion Asset Management (TDAM) engaged in March 2012

Pension Investment Transfer - Update

Discussions with OMERS have not presented a solution as costs for assumption were very high and given the current uncertainty not currently workable. Options may include migration to private sector management or to a not-for-profit public facility such as Investment Management Corporation (IMCO). The new entity created, called Investment Management Corporation Ontario, has recently been operational and may offer, in the future, a feasible option and potentially, an option to municipalities specifically under the Prudent Person delegation to municipalities.

Toronto was able to transfer most of their plans to OMERS, while Ottawa was left in the same situation as Hamilton in so far as not being able to come to an agreement. Ottawa is now looking at hiring an outside firm as the Outside Chief Investments Officer (OCIO) to take over their two legacy plans.

The Plan's Future

Staff has been looking to add a new global manager and have narrowed it to four good candidates at a cost of $15,000. However, given the recent economic problems with COVID-19 and tariffs, supply lines and markets have been restricted due to the uncertainty as to what the future brings. Staff proposes to do an asset mix study to determine the appropriate asset mix given economic conditions worldwide and the appropriate asset mix to match the more current liabilities in the plan. Also, staff would be updating the need to track exposure ranges to meet the goal of an expected wind-up at reasonable cost based on more recent liabilities and expected returns.

APPENDICES AND SCHEDULES ATTACHED

Appendix "A" to Report FCS20075 – City of Hamilton Master Trust Period Ending June 30, 2020 – AON Performance Review and Investment Manager Evaluation

Appendix "B" to Report FCS20075 – Canadian Defined Benefit Pension Plans Post Modest Gains in Q2 2020 – RBC Investor & Treasury Services Release

GB/dt

The City of Hamilton Master Trust Period Ending 30 June 2020

Performance Review and Investment Manager Evaluation

Visit the Aon Retirement and Investment Website *(https://retirement-investment-insights.aon.com/canada); sharing our best thinking.*

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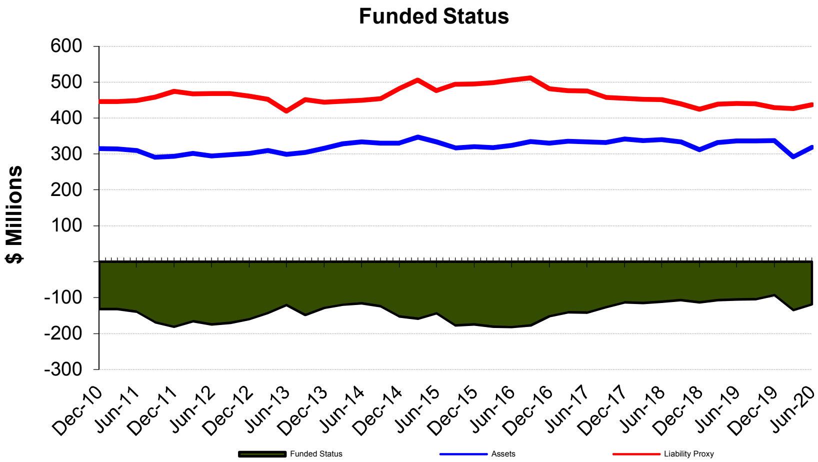
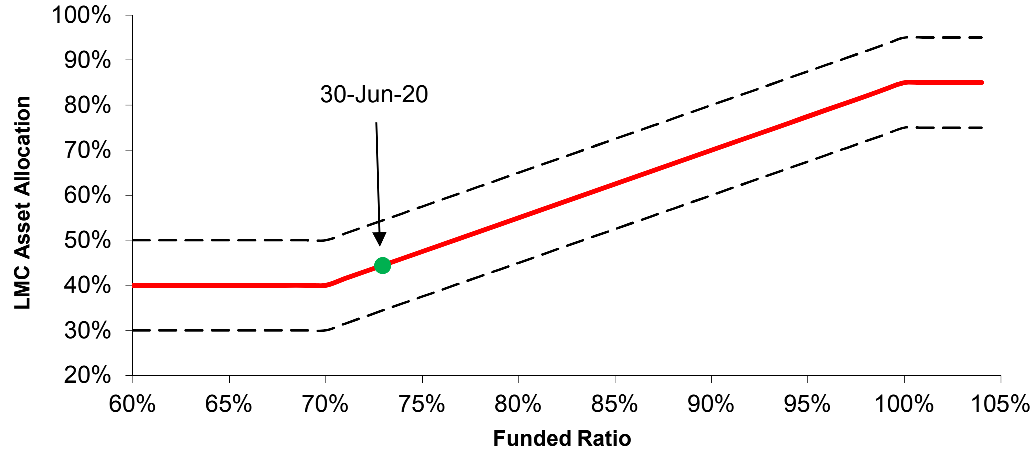
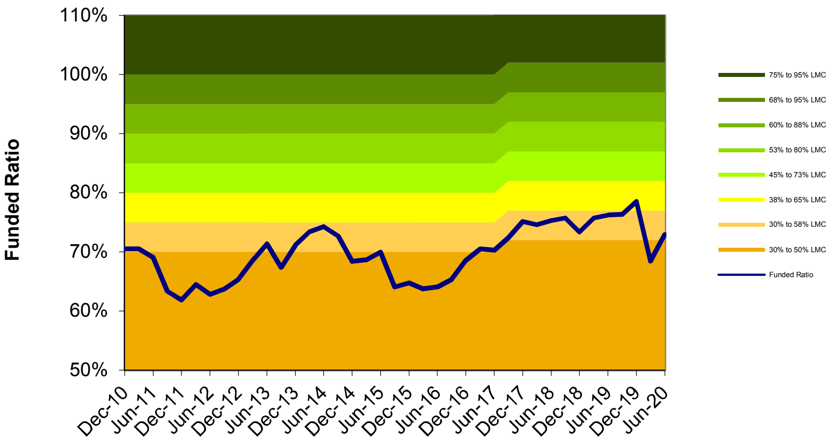
Executive Summary

Quarterly Performance Report for the City of Hamilton
Funded Status and Glide Path Information for June 30, 2020







Snapshot (Wind-Up)	30-Sep-19	31-Dec-19	31-Mar-20	30-Jun-20
Market value of assets ($ Millions)	$336.3	$337.5	$292.2	$318.8
Liability proxy ($ Millions)	$440.3	$429.6	$426.7	$437.0
Funded status ($ Millions)	($104.0)	($92.1)	($134.5)	($118.2)
Funded ratio	76.4%	78.6%	68.5%	73.0%
Current LMC Asset Allocation	48.9%	47.8%	54.0%	44.4%

Rebalancing

- The rebalancing strategy for this plan requires that assets be rebalanced to the target allocation (indicated by the red line) whenever the LMC Asset Allocation falls outside of the range deemed acceptable for a given funded ratio (indicated by the dashed lines).
- Because the LMC Asset Allocation as of June 30, 2020 is within the range determined acceptable for the current funded ratio (73.0%), the asset mix does not require rebalancing.

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Executive Summary

Trailing Period Performance

As of 30 June 2020

	Allocation		Performance (%)						
	Market Value ($000)	%	1 Quarter	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
Total Fund	318,755	100.0	11.0 (41)	1.3 (77)	2.7 (76)	4.2 (66)	5.4 (78)	4.9 (67)	7.4 (78)
Benchmark			13.2 (6)	7.1 (6)	6.7 (14)	7.1 (14)	7.3 (20)	6.6 (17)	8.1 (55)
Value Added			-2.2	-5.8	-4.0	-2.9	-1.9	-1.7	-0.7
Canadian Equity	88,674	27.8	14.0 (50)	-15.1 (93)	-8.4 (91)	-1.9 (85)	2.7 (80)	2.6 (76)	7.3 (54)
Guardian (including cash)	44,219	13.9	14.1 (49)	-6.5 (56)	-1.0 (51)	2.8 (40)	5.0 (42)	4.6 (37)	7.5 (50)
S&P/TSX Composite			17.0 (25)	-2.2 (32)	0.8 (26)	3.9 (23)	5.6 (32)	4.5 (42)	6.3 (73)
Value Added			-2.9	-4.3	-1.8	-1.1	-0.6	0.1	1.2
Letko (including cash)	44,455	13.9	13.9 (50)	-22.0 (100)	-14.0 (99)	-5.7 (98)	0.5 (89)	0.7 (91)	6.7 (63)
S&P/TSX Composite			17.0 (25)	-2.2 (32)	0.8 (26)	3.9 (23)	5.6 (32)	4.5 (42)	6.3 (73)
Value Added			-3.1	-19.8	-14.8	-9.6	-5.1	-3.8	0.4
Global Equities	88,426	27.7	12.4 (60)	7.5 (39)	5.1 (49)	6.2 (59)	9.3 (56)	6.7 (66)	10.4 (80)
Aberdeen	18,860	5.9	14.3 (45)	7.2 (40)	6.3 (41)	6.8 (52)	9.2 (56)	7.0 (63)	10.3 (82)
MSCI World (Net)			14.5 (43)	6.9 (40)	6.3 (40)	8.4 (39)	10.7 (42)	8.8 (42)	12.7 (49)
Value Added			-0.2	0.3	0.0	-1.6	-1.5	-1.8	-2.4
GMO	54,817	17.2	12.1 (62)	8.2 (35)	5.5 (46)	6.3 (57)	9.6 (53)	7.0 (64)	10.8 (77)
MSCI World (Net)			14.5 (43)	6.9 (40)	6.3 (40)	8.4 (39)	10.7 (42)	8.8 (42)	12.7 (49)
Value Added			-2.4	1.3	-0.8	-2.1	-1.1	-1.8	-1.9
GMO Asset Allocation **	14,750	4.6	-	-	-	-	-	-	-

*GMO returns are reported net-of-fees.
**GMO Asset Allocation fund was purchased due to a trading error. Funds were removed and trasnfered to GMO Global Equity Allocation fund as of August 11th 2020.
Parentheses contain percentile rankings.

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Executive Summary

Trailing Period Performance

As of 30 June 2020

	Allocation		Performance (%)						
	Market Value ($000)	%	1 Quarter	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
Canadan Fixed Income	141,456	44.4	9.3	9.2	8.7	6.7	4.7	5.3	5.3
TDAM Long Bonds	80,424	25.2	11.9	12.1	11.7	8.3	6.2	7.0	-
FTSE Canada Long Term Overall Bond			11.2	12.0	11.7	8.3	6.3	7.0	7.4
Value Added			0.7	0.1	0.0	0.0	-0.1	0.0	-
TDAM Real Return Bonds	60,961	19.1	6.7	6.0	5.5	5.1	3.0	3.5	-
FTSE Canada Real Return Bond			6.2	5.5	5.4	4.9	3.0	3.4	4.6
Value Added			0.5	0.5	0.1	0.2	0.0	0.1	-
TDAM Cash	71	0.0	1.2	-	-	-	-	-	-
Operating Account	200	0.1							

*GMO returns are reported net-of-fees.
**GMO Asset Allocation fund was purchased due to a trading error. Funds were removed and trasnfered to GMO Global Equity Allocation fund as of August 11th 2020.
Parentheses contain percentile rankings.

Executive Summary

Trailing Period Performance

As of 30 June 2020

	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total Fund	1.3 (77)	4.1 (74)	7.3 (52)	9.0 (67)	3.2 (40)	6.3 (86)	19.8 (31)	9.6 (72)	2.3 (22)	12.1 (85)	7.7 (50)
Benchmark	7.1 (6)	6.4 (28)	7.7 (34)	8.2 (79)	3.8 (30)	8.5 (59)	19.1 (42)	6.5 (96)	1.4 (38)	13.3 (66)	8.1 (46)
Value Added	-5.8	-2.3	-0.4	0.8	-0.6	-2.2	0.7	3.1	0.9	-1.2	-0.4
Canadian Equities	-15.1 (93)	-1.1 (80)	12.6 (17)	17.7 (3)	2.1 (50)	1.1 (45)	29.7 (52)	19.0 (14)	-5.9 (31)	21.4 (47)	11.0 (59)
Guardian (including cash)	-6.5 (56)	4.8 (29)	10.8 (40)	11.7 (54)	3.3 (31)	0.7 (49)	26.7 (78)	9.3 (82)	-3.1 (17)	21.6 (44)	4.6 (100)
S&P/TSX Composite	-2.2 (32)	3.9 (40)	10.4 (46)	11.0 (64)	-0.2 (64)	-1.2 (64)	28.7 (65)	7.9 (93)	-10.3 (64)	20.9 (56)	12.0 (55)
Value Added	-4.3	0.9	0.4	0.7	3.5	1.9	-2.0	1.4	7.2	0.7	-7.4
Letko (including cash)	-22.0 (100)	-5.2 (90)	13.4 (12)	21.5 (1)	1.5 (55)	1.4 (42)	31.1 (34)	24.2 (2)	-6.9 (34)	20.4 (64)	14.2 (32)
S&P/TSX Composite	-2.2 (32)	3.9 (40)	10.4 (46)	11.0 (64)	-0.2 (64)	-1.2 (64)	28.7 (65)	7.9 (93)	-10.3 (64)	20.9 (56)	12.0 (55)
Value Added	-19.8	-9.1	3.0	10.5	1.7	2.6	2.4	16.3	3.4	-0.5	2.2
Global Equities	7.5 (39)	2.8 (66)	8.3 (80)	19.4 (52)	-3.4 (77)	10.5 (91)	23.9 (65)	18.7 (85)	2.0 (40)	17.6 (68)	-0.1 (85)
Aberdeen	7.2 (40)	5.4 (43)	7.9 (82)	16.4 (71)	-1.0 (59)	7.6 (96)	22.0 (79)	17.2 (91)	4.3 (26)	18.3 (60)	-
MSCI World (Net)	6.9 (40)	5.7 (41)	12.5 (47)	17.8 (62)	1.4 (40)	18.9 (59)	25.2 (53)	22.7 (57)	0.4 (52)	18.7 (57)	0.7 (78)
Value Added	0.3	-0.3	-4.6	-1.4	-2.4	-11.3	-3.2	-5.5	3.9	-0.4	-
Brandes	-	0.7 (78)	9.3 (71)	22.2 (30)	-6.8 (91)	15.3 (78)	31.6 (7)	27.3 (24)	-1.5 (64)	17.2 (71)	-0.4 (87)
MSCI World (Net)	6.9 (40)	5.7 (41)	12.5 (47)	17.8 (62)	1.4 (40)	18.9 (59)	25.2 (53)	22.7 (57)	0.4 (52)	18.7 (57)	0.7 (78)
Value Added	-	-5.0	-3.2	4.4	-8.2	-3.6	6.4	4.6	-1.9	-1.5	-1.1
GMO	8.2 (35)	2.8 (66)	8.1 (81)	20.0 (46)	-2.8 (72)	11.9 (90)	23.8 (65)	19.0 (83)	2.9 (33)	16.8 (74)	-
MSCI World (Net)	6.9 (40)	5.7 (41)	12.5 (47)	17.8 (62)	1.4 (40)	18.9 (59)	25.2 (53)	22.7 (57)	0.4 (52)	18.7 (57)	0.7 (78)
Value Added	1.3	-2.9	-4.4	2.2	-4.2	-7.0	-1.4	-3.7	2.5	-1.9	-
Canadian Fixed Income	9.2	8.3	2.8	-1.2	7.8	7.5	8.1	-3.9	10.4	5.0	7.8
TDAM Long Bonds	12.1 (47)	11.4 (60)	1.8 (79)	0.3 (85)	10.2 (29)	9.0 (90)	8.0 (38)	-2.0 (27)	-	-	-
FTSE Canada Long Term Overall Bond	12.0 (60)	11.4 (37)	1.8 (72)	0.4 (75)	9.9 (51)	10.1 (37)	7.6 (72)	-2.9 (84)	18.8 (23)	7.0 (70)	10.9 (72)
Value Added	0.1	0.0	0.0	-0.1	0.3	-1.1	0.4	0.9	-	-	-
TDAM Real Return Bonds	6.0	5.1	4.2	-2.9	5.4	5.8	8.2	-8.5	-	-	-
FTSE Canada Real Return Bond	5.5	5.2	4.0	-2.7	5.3	5.6	8.1	-9.9	14.9	11.7	12.2
Value Added	0.5	-0.1	0.2	-0.2	0.1	0.2	0.1	1.4	-	-	-

Parentheses contain percentile rankings.

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Capital Markets Performance

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Capital Market Performance

Major Capital Markets' Returns

As of 30 June 2020

	1 Quarter	Year To Date	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
Equity								
S&P/TSX Composite	17.0	-7.5	-2.2	0.8	3.9	5.6	4.5	6.3
S&P 500	15.7	1.6	11.8	10.8	12.5	13.7	12.6	16.9
S&P 500 (USD)	20.5	-3.1	7.5	9.0	10.7	12.5	10.7	14.0
MSCI EAFE (Net)	10.2	-7.0	-1.3	-0.4	2.4	6.5	3.8	8.4
MSCI World (Net)	14.5	-1.2	6.9	6.3	8.4	10.7	8.8	12.7
MSCI ACWI (Net)	14.1	-1.5	6.4	5.7	7.8	10.5	8.3	11.9
MSCI Emerging Markets (Net)	13.0	-5.2	0.7	0.6	3.5	8.2	4.7	5.9
Real Estate								
MSCI/REALPAC Canada Annual Property	-1.6	-2.1	1.3	4.2	5.4	5.6	6.1	8.6
MSCI/REALPAC Canada Quarterly Property Fund	-3.0	-1.4	3.7	5.7	6.7	6.9	6.6	8.6
Fixed Income								
FTSE Canada Universe Bond	5.9	7.5	7.9	7.6	5.3	3.9	4.2	4.6
FTSE Canada Long Term Overall Bond	11.2	11.4	12.0	11.7	8.3	6.3	7.0	7.4
FTSE Canada 91 Day TBill	0.1	0.8	1.6	1.6	1.4	1.2	1.0	1.0
Consumer Price Index								
Canadian CPI, unadjusted	0.4	0.6	0.7	1.3	1.7	1.5	1.5	1.7

Canadian Equities

The S&P/TSX Composite Total Return Index returned +17.0% in the second quarter of 2020. Apart from Communication Services (-1.0%), all sectors showed positive returns. The best performing sectors were Information Technology (+68.3%), Materials (+42.0%) and Consumer Discretionary (+32.8%). Growth stocks outperformed value stocks (+22.3% vs. +7.2% respectively). For the 12 months ending June 30, 2020, growth stocks outperformed value stocks (+10.2% vs. -17.4% respectively). The S&P/TSX Composite Total Return Index returned -2.2% for the 12-month period ending June 30, 2020. Health Care (-54.5%) was the worst performing sector followed by Energy (-24.6%) and Real Estate (-15.3%). Information Technology (+85.6%) and Materials (+24.9%) were the best performing sectors.

U.S. Equities

The S&P 500 Total Return Index returned +15.3% in the second quarter of 2020 in Canadian dollar terms. Apart from Utilities (-1.7%), all sectors showed positive returns. The best performing sectors were Consumer Discretionary (+27.1%), Information Technology (+24.9%) and Energy (+24.9%). For the 12 months ending June 30, 2020, the Index returned +12.1% in Canadian dollar terms. The best performing sector was Information Technology (+41.6%) while Energy (-33.4%) was the worst performer.

Non-North American Equities

The MSCI EAFE Net Total Return Index returned +9.9% in the second quarter of 2020 in Canadian dollar terms. Apart from Energy (-4.3%), all sectors showed positive returns. The best performing sectors were Materials (+18.4%), Information Technology (+18.1%) and Consumer Discretionary (+12.7%). For the 12 months ending June 30, 2020, the Index returned -1.1% in Canadian dollar terms. The worst performing sectors were Energy (-35.5%) and Financials (-14.6%) while the best performers were Health Care (+24.9%) and Information Technology (+18.6%).

Fixed Income

The Canadian bond market, as measured by the FTSE Canada Universe Bond Index, returned +5.9% over the last quarter. Corporate bonds (+8.1%) outperformed Provincial bonds (+7.7%) and Federal bonds (+2.3%). From a term perspective, long duration bonds (+11.2%) outperformed medium duration bonds (+4.8%) and short duration bonds (+2.2%). Bond market performance over the 12 months to June 30, 2020 was led by Provincial bonds (+9.4%), outperforming Federal bonds (+7.2%) and Corporate bonds (+6.6%). Long duration (+12.0%) and medium duration bonds (+8.1%) outperformed short duration bonds (+4.5%) for the 12-month period ending June 30, 2020.

Returns for periods greater than one year are annualized. Sector returns are sourced from MSCI.

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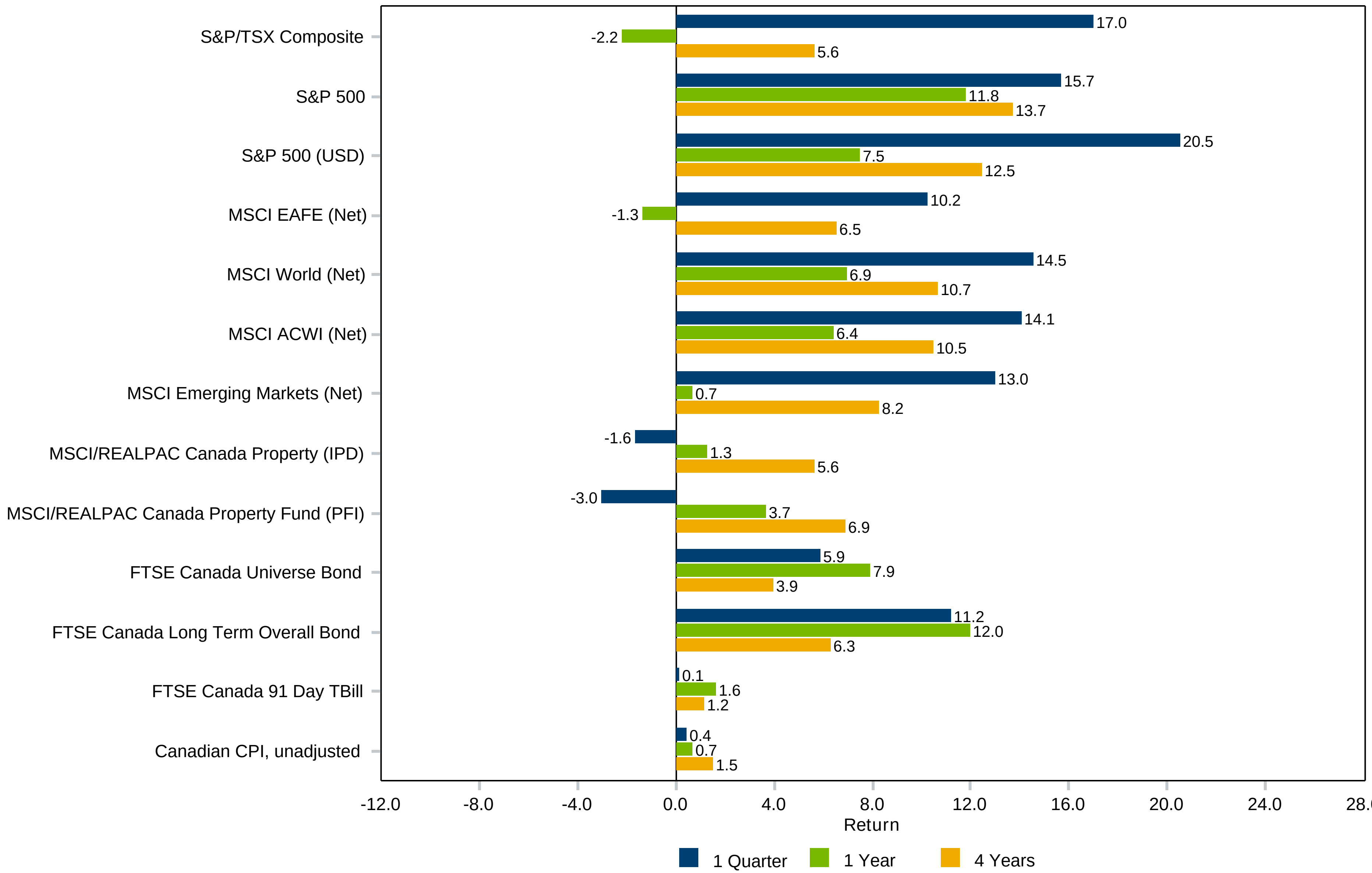
Comparative Performance

As of 30 June 2020



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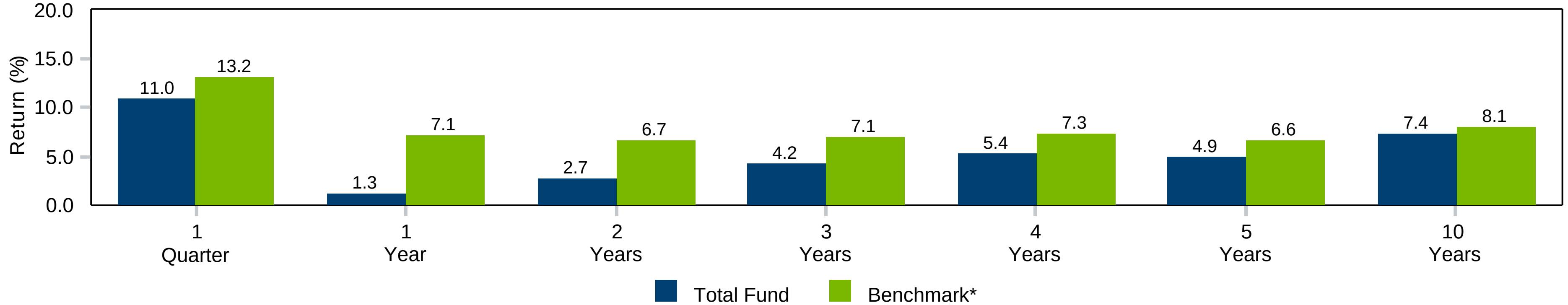
Total Fund Analysis

Total Fund

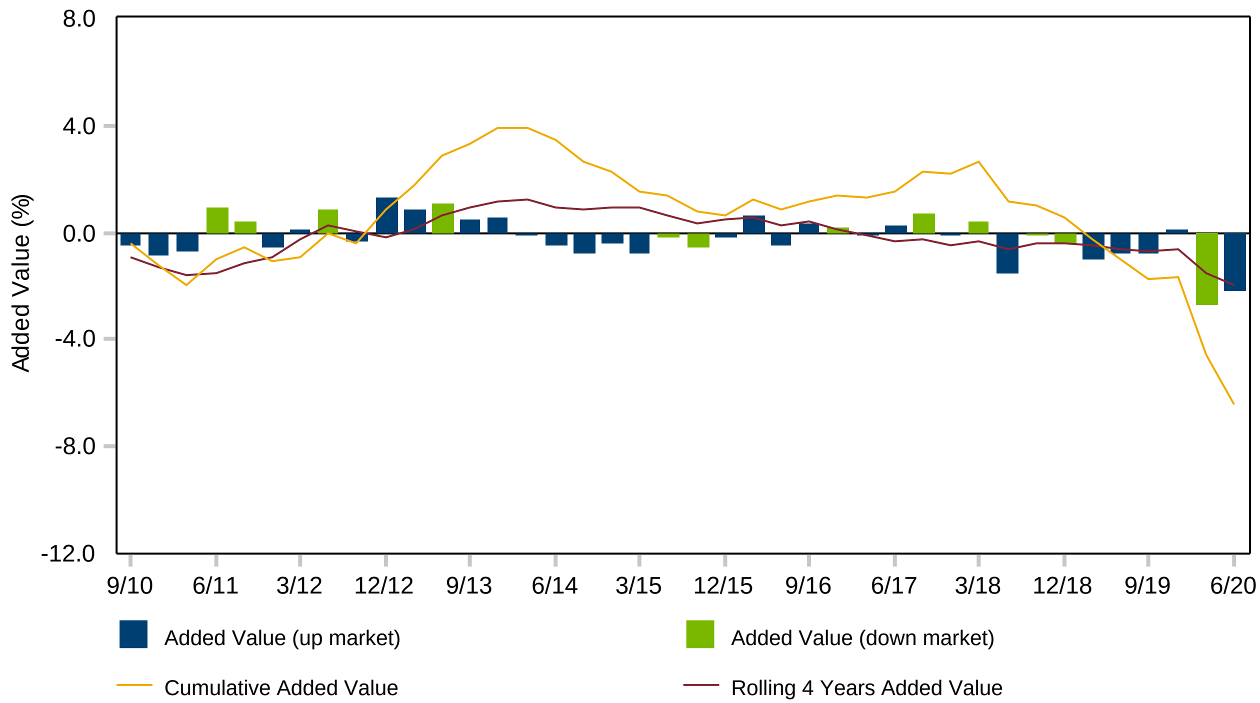
Total Fund Performance Summary

As of 30 June 2020

Return Summary



Added Value History (%)



Performance Statistics

	Quarters	%
Market Capture		
Up Markets	28	93.1
Down Markets	12	97.1
Batting Average		
Up Markets	28	32.1
Down Markets	12	58.3
Overall	40	40.0

* See Appendix A for benchmark components.

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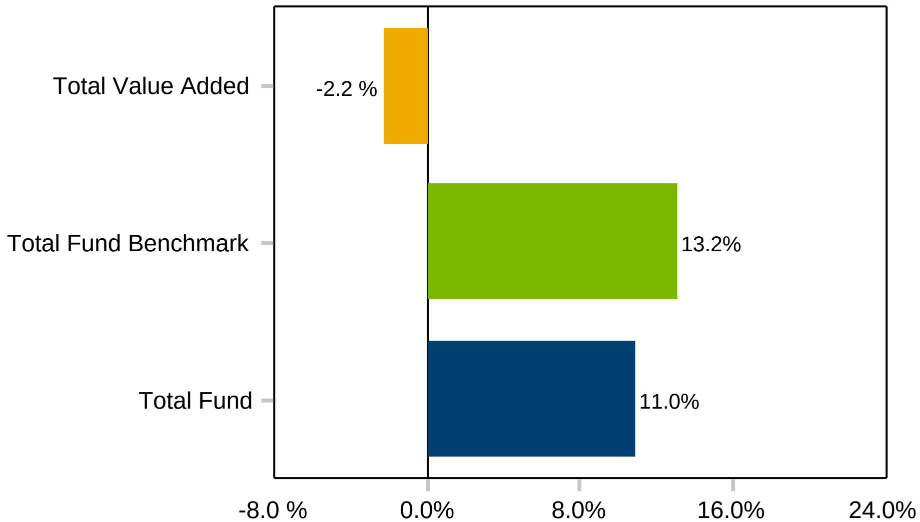
Total Fund

Total Fund Performance Attribution

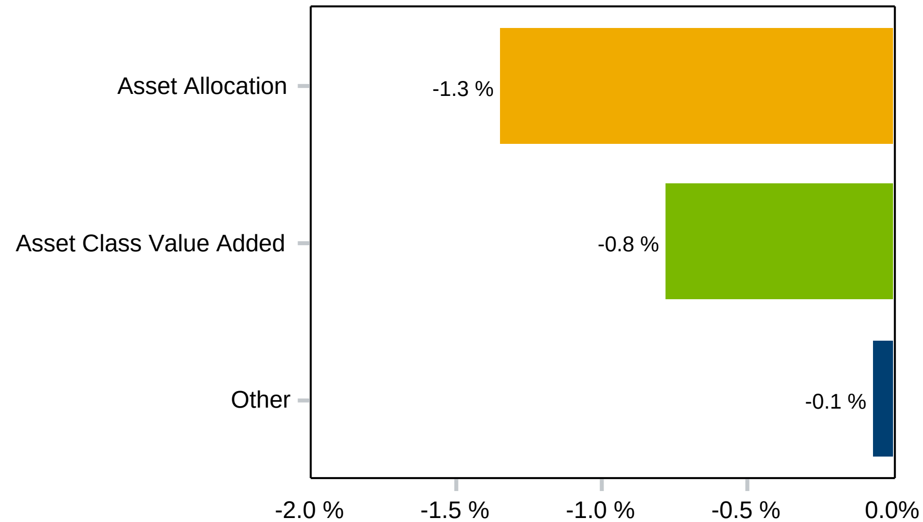
1 Quarter Ending 30 June 2020

Total Fund vs. Benchmark

Total Fund Performance



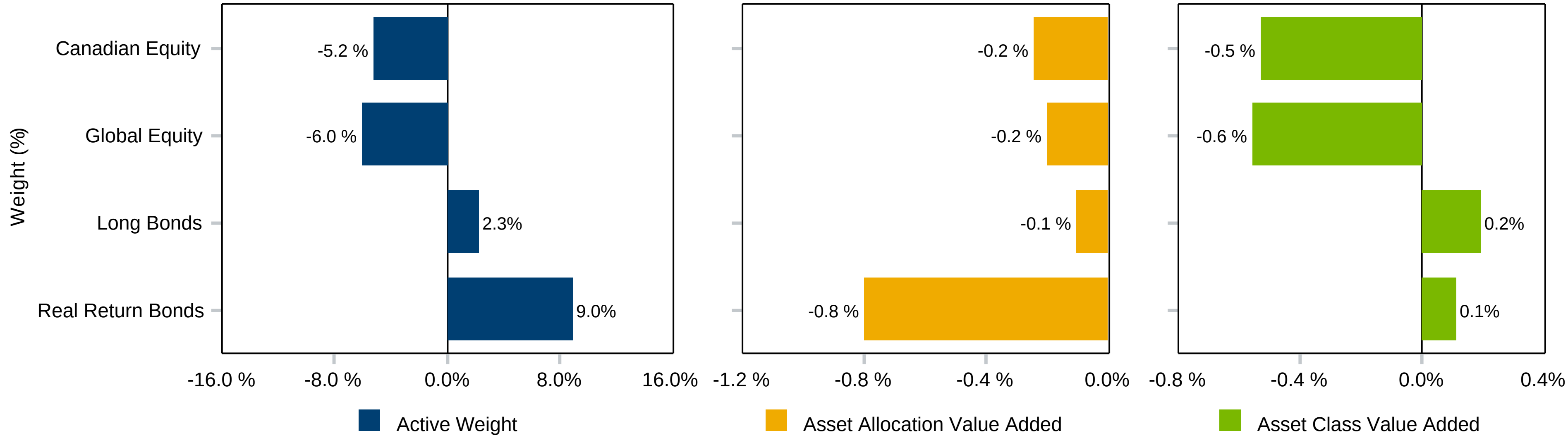
Total Value Added: -2.2 %



1 Quarter

Total Asset Allocation: -1.3 %

Total Asset Class Value Added: -0.8 %

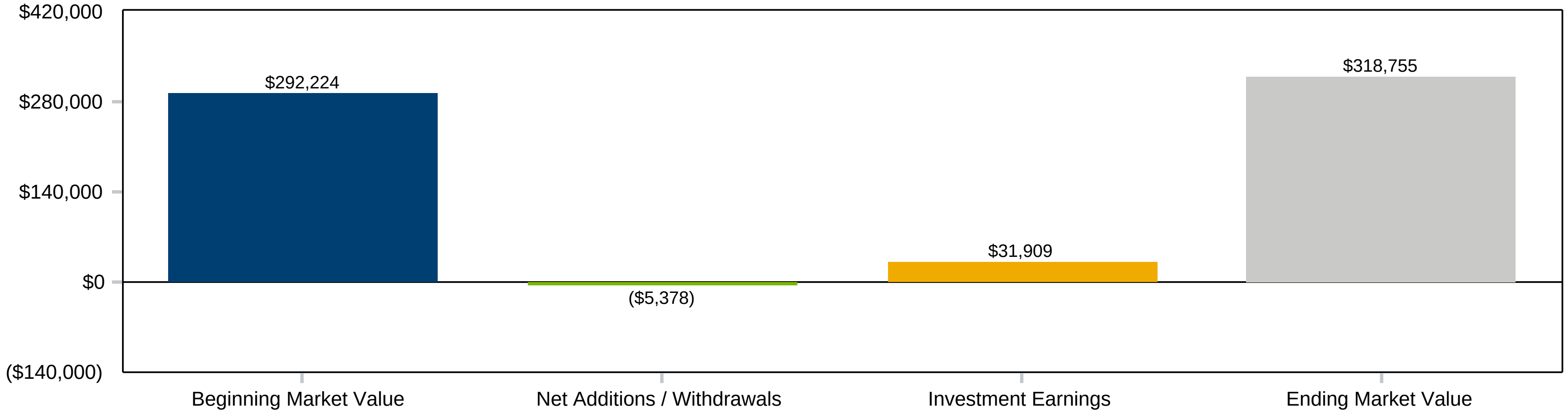


Total Fund

Total Fund Asset Summary

As of 30 June 2020

Change in Market Value ($000)
From 1 April 2020 to 30 June 2020



Summary of Cash Flows ($000)

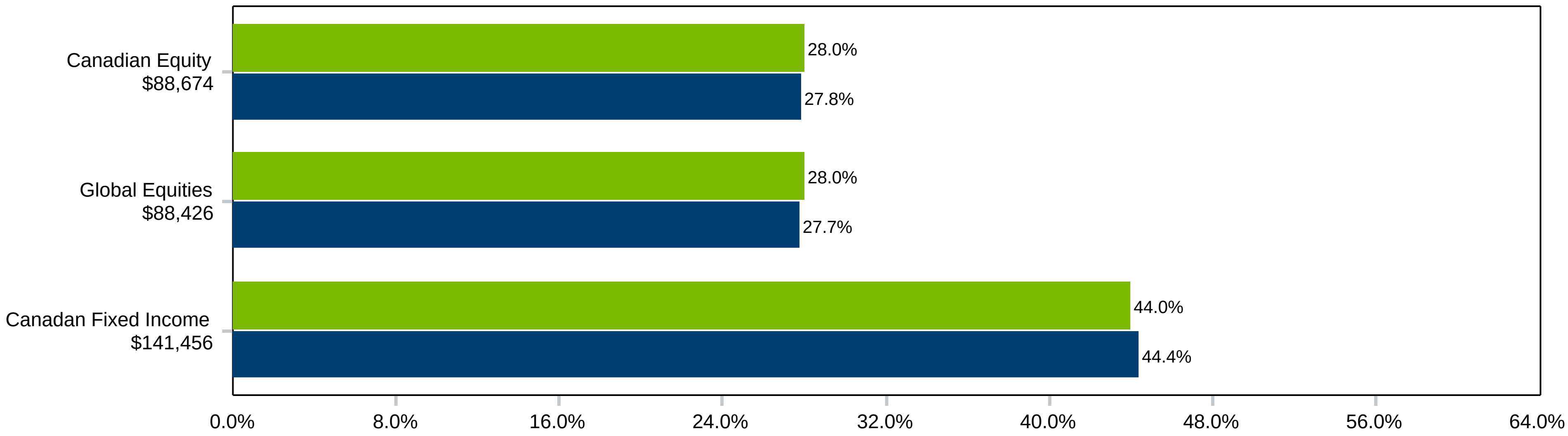
	1 Quarter	Year To Date	1 Year	4 Years
Total Fund				
Beginning Market Value	292,224	337,452	336,441	324,405
+/- Net Cash Flows	-5,378	-10,416	-6,249	-59,489
+/- Income	1,412	2,233	26,945	75,660
+/- Capital Gains / Losses	30,497	-10,514	-38,382	-21,821
= Ending Market Value	318,755	318,755	318,755	318,755

Empower Results®

Total Fund

Asset Allocation Compliance

As of 30 June 2020 ($000)



	Market Value ($000)	Market Value (%)	Target Allocation (%)	Differences (%)	Minimum Allocation (%)	Maximum Allocation (%)	Within Range
Total Fund	318,755	100.0	100.0	0.0			
Canadian Equity	88,674	27.8	28.0	-0.2	23.0	33.0	Yes
Global Equities	88,426	27.7	28.0	-0.3	23.0	33.0	Yes
Canadian Fixed Income	141,456	44.4	44.0	0.4	34.0	54.0	Yes

The Global Equity allocation for June 30, 2020 includes GMO Asset Allocation Fund, which is a balanced mandate with 65% allocation in Global Equities and 35% in Fixed Income. This fund was purchased due to a trading error and has been redeemed and the funds have been transfered to GMO Global Equity fund as of August 11th 2020.

Appendix A - Plan Information

Plan Information

Summary of Investment Objective

The investment policy contains specific performance objectives for the fund and the investment managers.
All investment rates of return are measured over moving four-year periods. Return objectives are net of fees and include realized and unrealized capital gains or losses plus income from all sources.

Returns will be calculated on a time-weighted basis and compared to the objectives described below.

The *objective* of the total fund is to outperform a benchmark portfolio that is comprised of the following weightings:

	1 July 2020 to 30 September 2020	1 April 2020 to 30 June 2020	1 January 2020 to 31 March 2020	1 April 2019 to 31 December 2019	1 January 2019 to 31 March 2019	1 October 2018 to 31 December 2018	1 April 2018 to 30 September 2018	1 January 2018 to 31 March 2018	1 October 2017 to 31 December 2017	1 July 2014 to 30 September 2017	1 April 2012 to 30 June 2014	1 July 2011 to 31 March 2012	1 January 2008 to 30 June 2011	1 July 2006 to 31 December 2007	Up to 30 June 2006
S&P/TSX Composite	28.00%	30.00%	24.00%	26.00%	27.00%	28.00%	27.00%	27.00%	27.00%	28.00%	30.00%	30.00%	30.00%	30.00%	25.00%
MSCI World (C$)	28.00%	30.00%	25.00%	25.00%	26.00%	28.00%	26.00%	27.00%	26.00%	28.00%	30.00%	30.00%	0.00%	0.00%	0.00%
MSCI World ex. Cda (C$)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.00%	15.00%	17.50%
S&P 500 - hedged to C$	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	7.50%	8.75%
MSCI EAFE - hedged to C$	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	7.50%	8.75%
FTSE Canada Universe Bond	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	45.00%	40.00%	40.00%
FTSE Canada Long Bond	23.00%	25.00%	21.00%	21.00%	22.00%	23.00%	22.00%	23.00%	22.00%	22.00%	25.00%	0.00%	0.00%	0.00%	0.00%
FTSE Canada Real Return Bond	21.00%	15.00%	31.00%	28.00%	25.00%	21.00%	25.00%	23.00%	25.00%	22.00%	15.00%	0.00%	0.00%	0.00%	0.00%
	100.00%	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Empower Results®

Appendix B - Manager Updates

Empower Results®

Manager Updates

As of 30 June 2020

Brandes Investment Partners

Q2 2020

Business

There were no significant events.

Staff

There were no significant events.

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Manager Updates

As of 30 June 2020

GMO

Q2 2020

Business

In April 2020, the firm launched a new GMO Cyclical Focus Strategy. The Strategy will be managed by the Focused Equity team and the Asset Allocation team has allocated an initial investment within certain multi-asset class portfolios, such as the GMO Benchmark-Free Allocation Strategy.

Effective June 30, 2020, the GMO Core Plus Bond has changed to the GMO Multi-Sector Fixed Income Strategy. This Strategy seeks to achieve total return in excess of that of its benchmark, the Bloomberg Barclays U.S. Aggregate Index, by extracting alpha opportunities without taking any secular bias in duration, maturity, rating, and overall aggregate composition.

Staff

In June, Mina Tomovska joined the Investment Oversight team as an Associate Portfolio Strategist. She was previously at GMO in the Investment Analysis team.

Romae Smith joined the Developed Rates & FX team. Previously at GMO, she was a quantitative intern on the Global Equity team.

Doug Moringiello, Research Analyst, previously a member of the trade and portfolio operations team, is now engaged in research for GMO's Structured Products team.

Lun Yang is engaged in research for GMO's Developed Rates & FX team. Previously at GMO, he was a member of the IT team.

Matt Gale, Quantitative Trading Strategist, and Paul Duchnowski, Quantitative Research Analyst, both left the firm in Q2 2020 to pursue other opportunities.

Guardian Capital

Q2 2020

Business

There were no significant events.

Staff

There were no significant events.

Letko, Brosseau & Associates Inc. ("Letko, Brosseau")

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Manager Updates

As of 30 June 2020

Q2 2020

Business
There were no significant events.

Staff
Matthieu Watson Santerre joined the Investment Services team in the Montreal office as Director, Communications, with the responsibility of overseeing communication material and publications.

Empower Results®

Manager Updates

As of 30 June 2020

TD Greystone Asset Management

Q2 2020

Business
The TD Greystone High Yield Fund and the TD Greystone Long Bond PLus Fund were terminated this quarter.

The TD Greystone Global Real Estate Fund (Canada Feeder) L.P. was launched in Q2 2020.

Staff
There were no significant events.

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Appendix C - Disclosure

Statement of Disclosure

As of 30 June 2020

Aon Hewitt Inc. reconciles the rates of return with each investment manager quarterly. Aon Hewitt Inc. calculates returns from the custodian/trustee statements while the managers use different data sources. Occasionally discrepancies occur because of differences in computational procedures, security prices, "trade date" versus "settlement date" accounting, etc. We monitor these discrepancies closely and find that they generally do not tend to persist over time. However, if a material discrepancy arises or persists, we will bring the matter to your attention after discussion with your money manager.

This report may contain slight discrepancies due to rounding in some of the calculations. All data presented is in Canadian dollars unless otherwise stated.

Best quarter on record for Canadian defined benefit pension plans:
RBC Investor & Treasury Services
Sharp rally in global equity markets and healthy gains in fixed income securities

TORONTO, July 29, 2020 – Canadian defined benefit pension plans experienced a pronounced upsurge in the second quarter, posting a median return of 9.6 per cent, according to the RBC Investor & Treasury Services All Plan Universe. This marked the highest single quarter return in the universe's history, reversing the steep Q1 losses and raising the median plan's return to 1.4 per cent on a year-to-date basis. The gains followed a series of aggressive fiscal and monetary support measures introduced in March to address the impact of the virtual shut down of the global economy due to COVID-19**.**

Global equity markets rallied off their March lows and recovered most of their losses from Q1. While there was a brief surge in cyclical stocks, growth stocks ultimately outperformed value. The median pension plan generated 13.9 per cent in its non-Canadian equity holdings, compared to 14.2 per cent for the MSCI World index. Strength in the Canadian dollar trimmed some local currency returns over the quarter for unhedged plans (MSCI World Index returned 18.5 per cent in local currency terms).

In Canada, the TSX Composite returned a healthy 17.0 per cent, as 10 out of the 11 economic sectors generated positive returns, with Information Technology (led by Shopify) taking the top spot (+68.3 per cent), followed by the Materials, Consumer Discretionary and Energy sectors. The median Canadian equities returned 13.0 per cent and trailed the benchmark by 4 per cent. On a year-to-date basis, Canadian equities returned -10.4 per cent.

Fixed income securities returned 8.7 per cent, compared to 5.9 per cent for the FTSE TMX Canada Universe Bond Index. Positive returns were generated by both the decline in longer term yields (FTSE TMX Canada Long Bond Index returned 11.2 per cent) and the tightening of credit spreads (FTSE TMX Canada Corporate Bond Index returned 8.1 per cent).

"The actions the Bank of Canada and Federal Government have taken over the past months to support the economy and financial system are unprecedented – not even seen following the 1929 stock market crash – and the markets have been quick to respond," remarked David Linds, Managing Director and Head of Asset Servicing, Canada. "In this environment where so many of us are at home, it continues to be somewhat of a winner-takes-all scenario, with the market being driven primarily by companies that have continued to exhibit growth and safe haven investments – such as precious metals. The long term implications of COVID-19 on the economy are unclear."

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Historic performance

Period	Return (%)	Period	Return (%)
Q2 2020	9.6	Q1 2018	0.2
Q1 2020	-7.1	Q4 2017	4.4
Q4 2019	2.0	Q3 2017	0.4
Q3 2019	1.7	Q2 2017	1.4
Q2 2019	2.7	Q1 2017	2.9
Q1 2019	7.2	Q4 2016	0.5
Q4 2018	-3.5	Q3 2016	4.2
Q3 2018	0.1	Q2 2016	2.9
Q2 2018	2.2	Q1 2016	0.0

About the RBC Investor & Treasury Services All Plan Universe
For the past 30 years, RBC Investor & Treasury Services (RBC I&TS) has managed one of the industry's largest and most comprehensive universes of Canadian pension plans. The "All Plan Universe" currently tracks the performance and asset allocation of a cross-section of assets under management across Canadian defined benefit (DB) pension plans, and is a widely-recognized performance benchmark indicator. The RBC Investor & Treasury Services "All Plan Universe" is produced by RBC I&TS' Risk & Investment Analytics (R&IA) service. R&IA work in partnership with best-in-class technology to deliver independent and cost effective solutions designed to help institutional investor clients monitor investment decisions, optimize performance, reduce costs, mitigate risk and increase governance capability.

About RBC Investor & Treasury Services
RBC Investor & Treasury Services (RBC I&TS) is a specialist provider of asset services, custody, payments and treasury and market services for financial and other institutional investors worldwide, with over 4,500 employees in 16 countries across North America, Europe and Asia. We deliver services which safeguard client assets, underpinned by client-centric digital solutions which continue to be enhanced and evolved in line with our clients' changing needs. Trusted with CAD 4 trillion in client assets under administration, RBC I&TS is a financially strong partner with among the highest credit ratings globally.

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For more information, please contact:
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