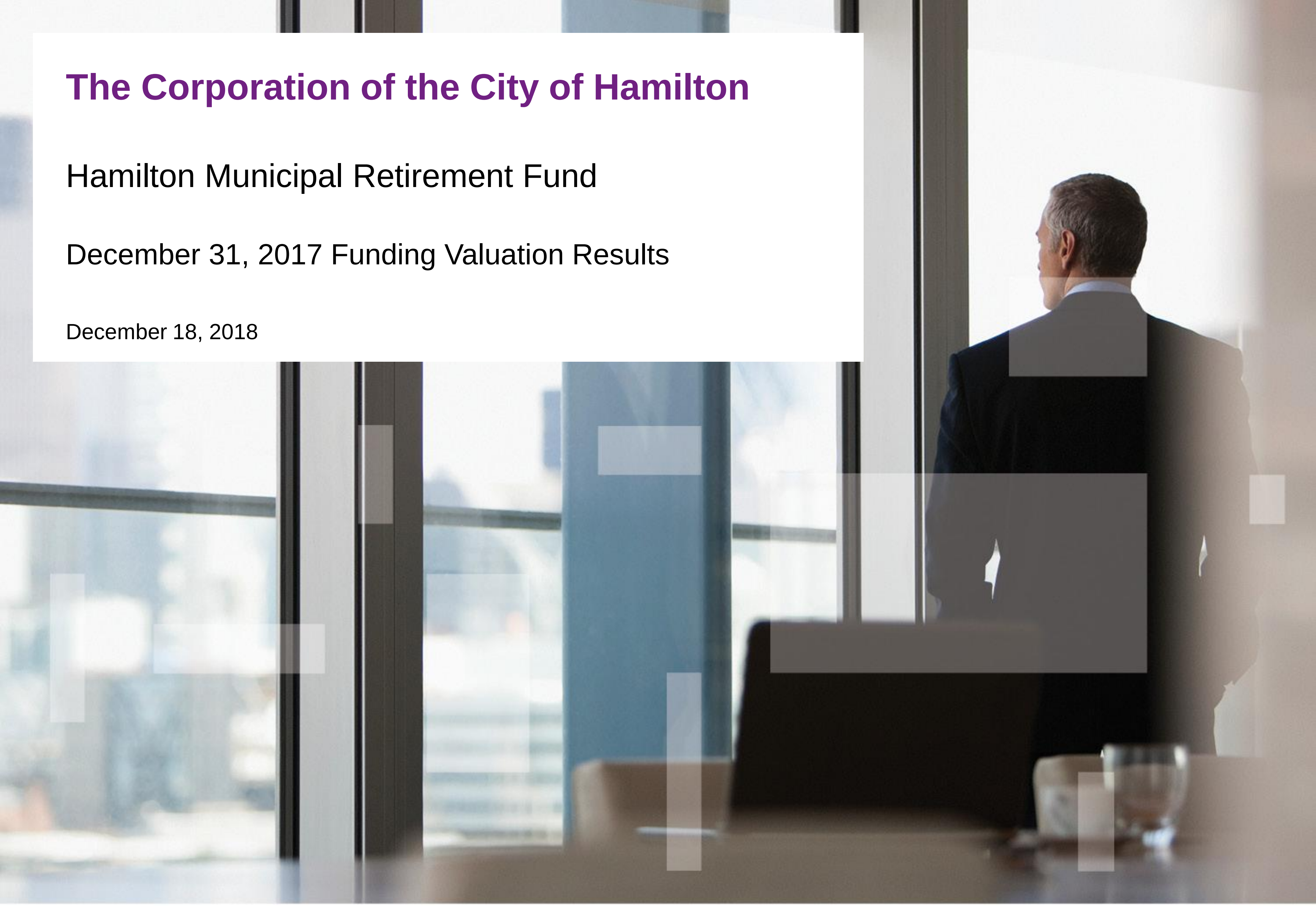
The Corporation of the City of Hamilton

Hamilton Municipal Retirement Fund

December 31, 2017 Funding Valuation Results

December 18, 2018



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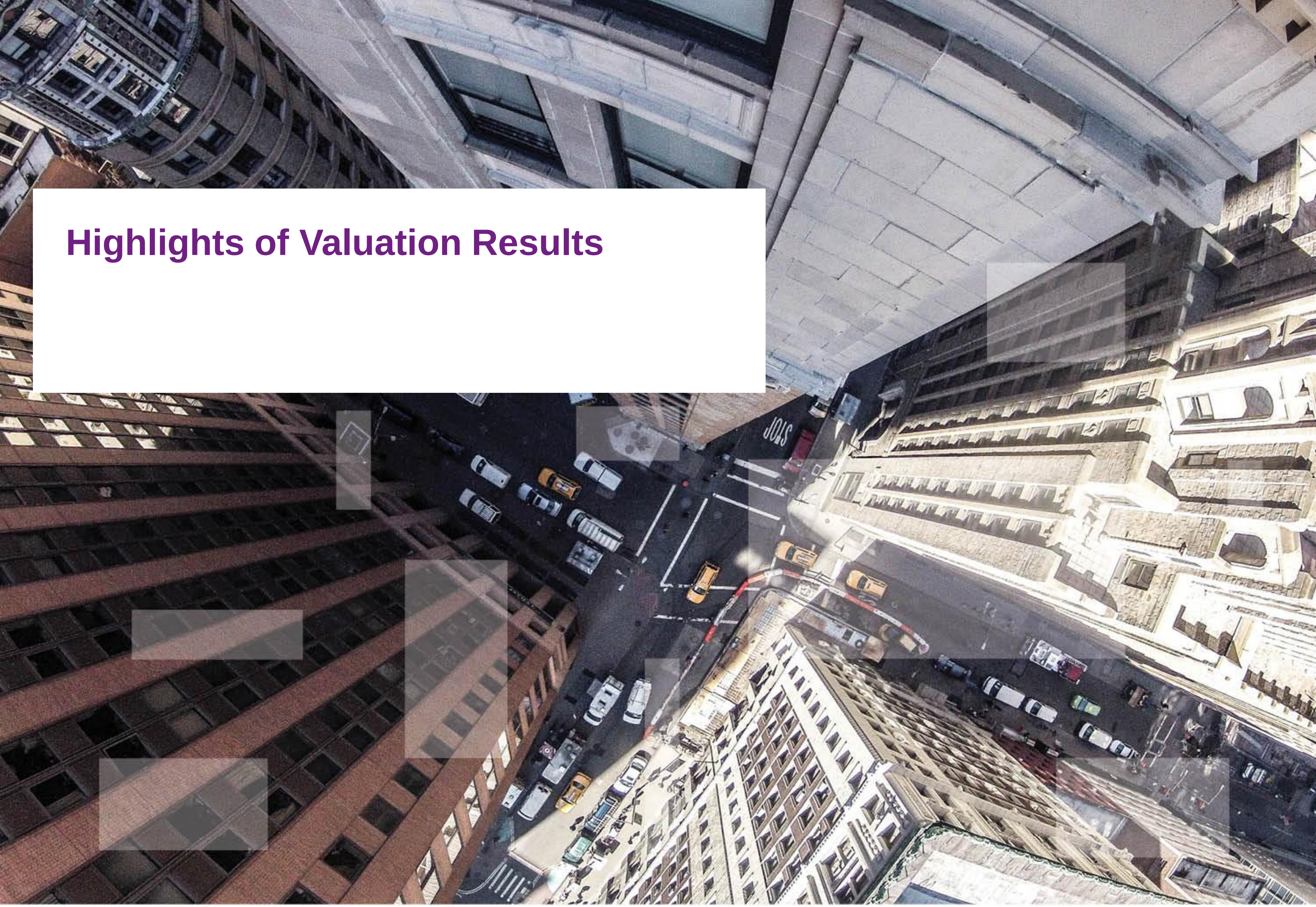
Agenda

- Highlights of the Valuation Results
- Additional Details on the Valuation
- Ontario Funding Reform
- Next Steps

Highlights of Valuation Results

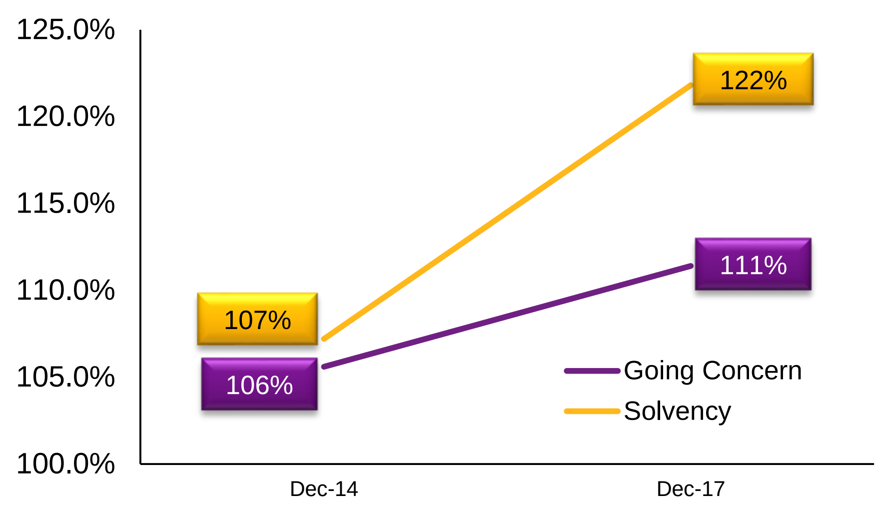


December 31, 2017 Valuation Highlights

Key Results

Solvency Funded Ratio	▲ 14.6%
December 31, 2017	121.8%
December 31, 2014	107.2%
Going Concern Funded Ratio	▲ 5.8%
December 31, 2017	111.4%
December 31, 2014	105.6%
Minimum Required Contributions	**No Change**
December 31, 2017	$ 0
December 31, 2014	$ 0

Funded Ratio



Commentary

- Better than expected asset returns and demographic experience gains have led to an improvement in the going concern and solvency funded status
- Transfer ratio also increased from 85.0% as at December 31, 2014 to 97.2% as at December 31, 2017.

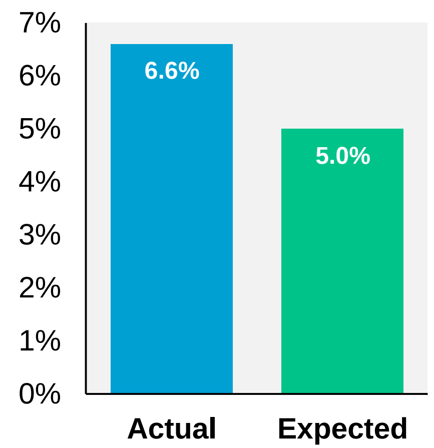
Assets

Reconciliation (Accrued basis)

(in 000's)	2015	2016	2017
As at beginning of year	$ 82,150	$77,226	$77,162
Company contributions	$ 0	$ 0	$ 0
Benefit payments	(6,842)	(6,541)	(6,254)
Investment income, net of all expenses	2,286	6,811	6,990
Expenses	(368)	(334)	(219)
As at end of year	$ 77,226	$77,162	$ 77,679
Rate of return, net of all expenses	**2.4%**	**8.8%**	**9.2%**

Annualized return Jan. 1, 2015 to Dec. 31, 2017

The actual return exceeded the expected return, resulting in an actuarial gain of $3.8 million.



Going concern valuation

Financial position

(in 000's)	December 31, 2017	December 31, 2014
Going concern value of assets		
▪ Market value of invested assets	$ 77,679	$ 82,150
Going concern actuarial liability		
▪ Active members	$ 0	$ 0
▪ Terminated vested members	126	122
▪ Retired members	41,881	50,067
▪ Beneficiaries	18,550	17,305
▪ Provision for future pension increases	9,144	10,327
▪ Total	$ 69,701	$ 77,821
Going concern surplus (deficit)	$ 7,978	$ 4,329
▪ Provision for Adverse Deviations (PfAD) –7.0%	$ 4,239	Not applicable
Going concern surplus (deficit) after PfAD	$ 3,739	Not applicable
Funded ratio	1.114	1.056

Going concern valuation

Reconciliation of financial position

(in 000's)	Plan Experience
Surplus (deficit) as at December 31, 2014	$ 4,329
Special payments towards deficits	0
Interest on deficit and special payments	682
Investment gains (losses), net of all expenses	3,757
Membership experience	
▪ Mortality gains (losses)	4,780
▪ Pension increase gains (losses)	1,095
▪ Other liability gains (losses)	(2)
Change in demographic assumptions	(547)
Change in assumed liability discount rate	(6,116)
Impact of PfAD	(4,239)
Surplus (deficit) as at December 31, 2017	$ 3,739

Solvency / Windup valuation

Financial position

(in 000's)	December 31, 2017	December 31, 2014
Solvency value of assets		
▪ Market value of invested assets	$ 77,679	$ 82,150
▪ Provision for windup expenses	(100)	(100)
▪ Total value of assets	$ 77,579	$ 82,050
Solvency liability		
▪ Active and disabled members	$ 0	$ 0
▪ Terminated vested members	126	122
▪ Retired members	43,973	57,065
▪ Beneficiaries	19,685	19,436
▪ Total	$ 63,784	$ 76,623
Solvency surplus (deficit)	**$ 13,795**	**$ 5,427**
Solvency ratio	1.218	1.072
▪ Provision for future pension increases	$ 16,176	$ 20,041
Transfer ratio	0.972	0.850

Funding requirements

- Minimum funding requirements
  - No contributions required until the next required funding valuation report is filed as at December 31, 2020
- Maximum funding allowed
  - $2,380,700 until the next required funding valuation report is filed as at December 31, 2020

Actuarial certification

The results presented in this presentation are based on the membership data and assumptions included in this presentation and based 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, 2017**. 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 Corporation 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.

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, FSC, FCIA

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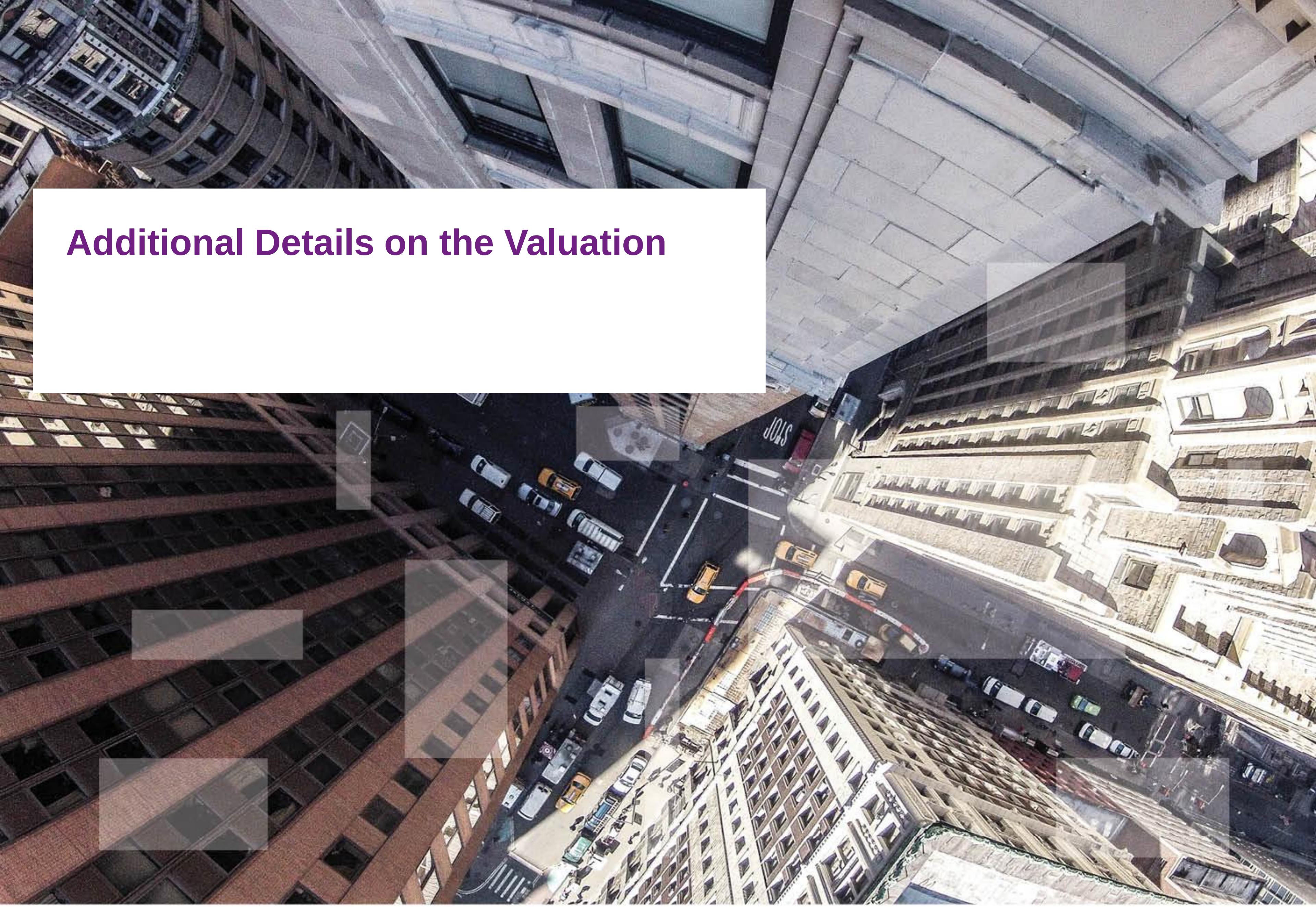
Additional Details on the Valuation



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, 2014
  - This valuation has been undertaken as of December 31, 2017
- 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

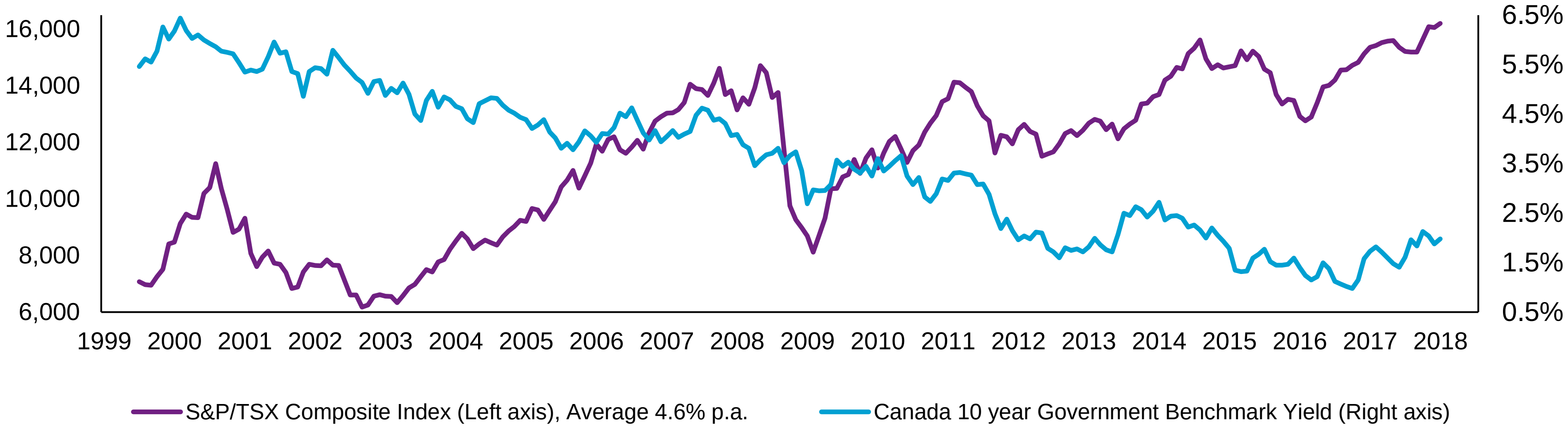
Types of Valuations

Two types of valuations are required for funding purposes:

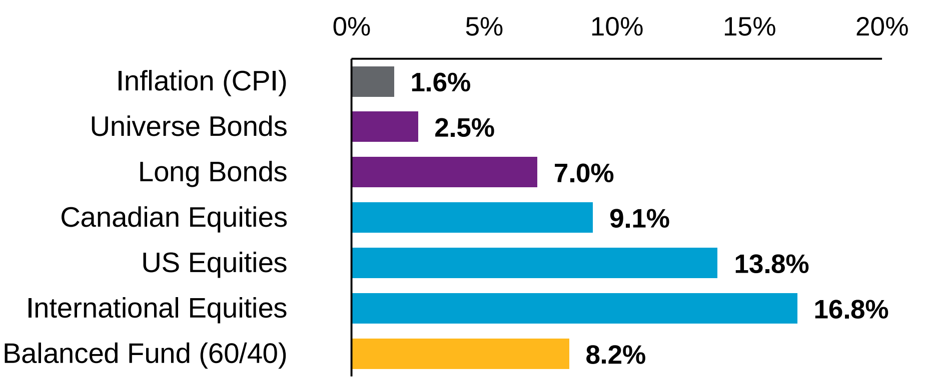
Type	Going Concern	Solvency
Scenario	Plan continues indefinitely	Plan winds up
Assumptions	Long term assumptions, selected by actuary	Largely prescribed, based on current market conditions
Timing for amortization of deficits	10 years	5 years

Financial markets backdrop

Prolonged period of declining interest rates and volatile equity markets



2017 Benchmark asset returns (in $CAD)



Solvency discount rates

80 bps

Annuity purchase rate - Solvency
- 2.2% at December 31, 2014
- 2.8% at December 31, 2017

50 bps

Annuity purchase rate - Windup
- (0.6)% at December 31, 2014
- (0.1)% at December 31, 2017

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

Going concern valuation

Key assumption changes

Discount Rate

- Going concern discount rate reflects the long-term expectation of investment returns (the new assumptions included no margin for conservatism)
- Interest rate decreased by 1.25% to 3.75% per annum to reflect new target asset mix, funded status of the plan and January 1, 2018 asset model

Mortality

- Going concern mortality assumption strengthened to reflect the new Canadian Institute of Actuaries (CIA) tables (liability increased by $0.5M due to this change):
  - Prior table: CPM2014 Public Sector Table projected generationally using Scale CPM-B
  - New table: CPM2014 Public Sector Table projected generationally using Scale MI-2017

Solvency valuation

Key assumption changes

Annuity Purchase Discount Rate

- Prior assumption:

  2.2% per year for solvency, (0.6)% per year for windup

- New assumption:

  2.8% per year for solvency, (0.1)% per year for windup

Mortality

- Solvency mortality assumption updated to reflect the new Canadian Institute of Actuaries (CIA) tables:
  - Prior table: 1994 Uninsured Pensioner Table projected generationally using Scale AA
  - New table: CPM2014 Table projected generationally using Scale CPM-B

Funding requirements

Minimum funding requirements

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

Normal Cost

- Cost of benefits that accrue during the year
- Administrative expenses

Amortization of Going Concern Deficits

- Going concern deficit amortized over 10 years
- Schedules re-established at each valuation date

Amortization of Solvency Deficits

- Solvency deficit under 85% of the solvency liability amortized over 5 years
- Net of going concern amortization payments

Membership data

Reconciliation

	Active Members	Terminated Vested Members	Retired Members	Beneficiaries
As at December 31, 2014	0	3	131	88
New Entrants				
Terminations				
▪ With lump sum settlement				
▪ Vested Termination				
Retirements				
Deaths				
▪ With Beneficiary			-15	
▪ Without Beneficiary			-12	-21
New beneficiaries				15
As at December 31, 2017	0	3	104	82

Ontario Funding Reform

Journey to Ontario Funding Reform

November 2015

Government announces intention to review solvency funding rules for DB pension plans.

July 2016

Release of consultation paper with 2 broad options: reduce solvency or eliminate solvency with enhanced Going Concern

May 2017

Framework for new funding rules announced

June 2017

Interim measures announced relating to 2017 valuations

January 2018

Detailed rules and transition measures

April 2018

Final funding reform regulations released, effective May 1, 2018

Valuations with an effective date on or after Dec. 31, 2017 * will be subject to new rules

* Current rules apply for any valuation filed before May 1, 2018, irrespective of the valuation date

Impact of Changes to Plan Funding

Change	Current Rules	Final Regulations (Effective May 2018)	Impact for the Plan
Solvency	▪ Solvency funding target of 100% ▪ Deficits amortized over 5 years	▪ Solvency funding target of 85% ▪ Deficits below 85% threshold are amortized over 5 years	▪ No immediate impact as the plan is fully funded on a going concern basis
Going Concern Funding	▪ Deficits are amortized over 15 years	▪ Deficits are amortized over 10 years ▪ Fresh start of going concern schedules every valuation, starting one year later ▪ Schedules continue until one year following effective date of subsequent valuation	▪ No immediate impact as the plan is fully funded on a going concern basis
Discount Rates	▪ Going Concern discount rate is best estimate based on asset mix (less margin required by FSCO); ▪ Solvency discount rates are prescribed	▪ Expected that FSCO will drop requirement for margin in Going Concern discount rate	▪ Going concern valuations had a 0.25% reduction in the discount rate as the margin for adverse deviations. Equates to a load of approximately 2.0% on liabilities. ▪ PfAD is 7.0%
Provision for Adverse Deviation (PfAD)	▪ None	▪ “Load” applied to going concern liability and normal cost; ▪ Reflects open/closed status of plan and asset mix	
Benefit Improvements	▪ Increase in the deficit must be funded according to solvency and going concern funding rules	▪ Solvency ratio and going concern ratio after the improvement must be at least 80% ▪ If the improvement brings the ratio below 80%, the plan must be brought back up to 80% with a one-time contribution, limited to the cost of the improvement ▪ Increase in the going concern liability must be funded over 8 years without consolidation option (including recognizing any one-time contribution made)	▪ No immediate impact.

Details regarding Provision for Adverse Deviation (PfAD)

“Non-Fixed Income”:
Equities and employer issued securities

“Fixed Income”:
Bonds, cash, treasury bills, GICs, annuities held as plan assets

“Alternatives” (Considered 50/50 Non-Fixed Income/Fixed Income):
Real estate, resource properties, infrastructure, mortgage loans

% Non-Fixed Income	Closed Plan	Open Plan
0	5%	4%
20	7%	5%
40	9%	6%
50	10%	7%
60	12%	8%
70	16%	10%
80	20%	12%
100	28%	16%

+

% that going concern discount rate exceeds “Benchmark Discount Rate”

Ontario – Funding Reform

Additional requirements for SIPP and Plan text

- Ontario's funding reform changes will require revisions to SIPP and to Plan text

Statement of Investment Policies and Procedures (SIPP)	▪ Include a target asset allocation for each of 16 classes identified in regulations (as used for % fixed income and non-fixed income in determination of PfAD)
Annual (active members) and Biennial Statements (deferred vested and retired members)	▪ Enhance funding disclosure for first valuation filed after December 31, 2017 (whether under new or old rules) ▪ Effective January 1, 2019, must include estimated transfer ratio as of the end of the statement reporting period
Plan text	▪ Plan text to include additional employer requirements regarding contributions in respect of PfAD, solvency contributions, benefit improvements, annuity discharge ▪ To be filed within 12 months of the date the first report is filed under the new rules

Other Important Changes

The Ministry of Finance released the final regulations on April 20, 2018.

Effective Date	▪ Valuations with effective date on or after December 31, 2017
One-Time Transition Measure	▪ In first valuation under new framework, any solvency excess can be used to reduce solvency payment amount or period
Phase-In of New Rules	▪ If total contributions under new rules (normal cost, special payments, PfAD) are greater than under old rules, increase may be phased in over the three years following first report under new framework
Member notification	▪ Members must be notified of new rules on first active and inactive statements after a valuation is filed
Still to Come	▪ Details regarding governance policies and funding policies

Next Steps

Next Steps

- Plan amendment may be required for various items
- Adjusting the asset allocation based on funded status of the plan and SIPP
- Continuing to Monitor Governance and funding policies – no further details yet