Attachment 2

TORONTO FIRE DEPARTMENT SUPERANNUATION AND BENEFIT FUND

Actuarial Valuation Report as of December 31, 2013

Registration #0351601

April 2014

A Xerox Company

buckconsultants

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1. Introduction

This report has been prepared for and at the request of the Benefit Fund Committee of the Toronto Fire Department Superannuation and Benefit Fund and presents the key results of the actuarial valuation of the Toronto Fire Department Superannuation and Benefit Fund (the "Fund" or the "Plan") as of December 31, 2013. The previous valuation of the Plan was prepared by Buck Consultants as of December 31, 2010.

1.1 Primary purpose

The primary purpose of this actuarial valuation report is to comply with regulatory filing requirements and more specifically:

- To determine the financial position of the Plan on a going concern basis using the unit credit actuarial cost method;
- To compare actual and expected experience on a going concern basis;
- To determine the financial position of the Plan on a solvency basis using the present value of accrued benefits;
- To determine the financial position of the Plan on a wind up basis using the present value of accrued benefits;
- To provide the range of permissible contributions; and
- To form part of the government filings, as required by the Financial Services Commission of Ontario ("FSCO") and Canada Revenue Agency ("CRA") for statutory and tax purposes.

These tasks are conducted in accordance with the Canadian Institute of Actuaries Standards of Practice for Pension Plans ("Standards of Practice") and all relevant regulations.

1.2 Highlights

The following summarizes the main changes in pension legislation and actuarial standards since the last actuarial valuation of the Plan as at December 31, 2010:

- Effective February 1, 2011, the Canadian Institute of Actuaries (the "CIA") amended Section 3500 of the Standards of Practice which govern the assumptions used to evaluate lump sum transfer values from registered pension plans. As of February 1, 2011, the mortality table to be used is the UP94 table projected generationally and the interest rate referenced is the month prior interest rate to the month of calculation.

- Effective July 1, 2012, regulations made under the Pension Benefits Act (Ontario) came into force to provide for immediate vesting and grow-in benefits for those Ontario members involuntarily terminated (without cause) who meet a rule of age plus years of service equal to at least 55 points (age and service).

- Effective February 2014, the Canadian Institute of Actuaries ("CIA") released their Final Report on Canadian Pensioner's Mortality. As the Final Report indicated significant variations in Canadian mortality rates and improvement scales from those previously used for Canadian pension plans, the CIA is recommending the adoption of these new rates and scales in future funding valuations. As a result, we have changed the going concern mortality assumption as shown herein.

The financial impact of these changes is shown in Section 3 of this report

1.3 Terms of engagement

The terms of engagement that are material are as follows:

- To consider all benefits of which we are aware, including contingent benefits, payable under the pension plan;

- To use a smoothed value of assets on a going concern basis to moderate the volatility of contribution rates;

- To use a smoothed value of assets on a solvency basis and a market value of assets on a wind up basis;

- To include considerations such as the security of benefits and related provisions for adverse deviations.

The terms of our engagement are in accordance with the Standards of Practice and all relevant regulations.

1.4 Limitations

It should be noted that the results of this valuation are presented at a single point in time. Both the going concern and solvency funded positions of the Plan can change with time and the reader should bear that in mind when using this report as a guide for the current funded positions, now or in the future.

The solvency valuation is for the most part based on prescribed assumptions, whereas the going concern valuation is based on assumptions made by the Plan actuary, subject to discussions with the Pension Committee. Those assumptions lie within a reasonable range of potential outcomes.

By necessity, we make a single estimate and this should not be taken to imply that it is the only possible outcome.

1.5 Third party disclaimer

This report is intended for the Benefit Fund Committee of the Toronto Fire Department Superannuation and Benefit Fund and the City of Toronto and it should not be shared with others (unless required by pension legislation) without our consent. Please note that we take no responsibility for any actions that may be taken by third parties based upon the contents of this report.

1.6 Subsequent events

Since the completion of this valuation, we are unaware of any other significant events (other than market volatility and the mortality table change) that would have a material impact on the results of this report.

1.7 Cost of living increases (Plan amendments)

Commencing 1986, City Council adopted a policy of providing ad hoc increases in pension to pensioners based on an excess interest indexing methodology. The policy provided for, subject to City Council approval, annual ad hoc increases subject to a minimum of 50% increase in the Consumer Price Index (the “CPI”), measured December to December, and a maximum increase equal to the lesser of the increase from “excess interest” and 100% CPI.

Commencing 1997, the Plan by-laws were amended to provide for future increases to pensioners including spouses of deceased retired members, based on the lesser of:

(a) the investment rate of return of Fund assets (using a 5-year smoothing technique) in excess of the rate of return required to maintain the actuarial solvency of the Benefit Fund as determined by the Actuary, and

(b) the increase in the year over year level of the average CPI, to the extent that actuarial surplus is available.

Based on the foregoing, there were no increases to pensioners and spouses that commenced prior to January 1, 2013 that we are aware of.

For information purposes only, the estimated cost at December 31, 2013 to provide anticipated future ad hoc pension increases to current pensioners based on 100% of the increase in the CPI is $33,581,000 based on the current valuation data and going concern valuation assumptions.

In respect of 2013, there is an excess investment return as outlined in (a) above, equal to 5.32%. The increase in the year over year level of the average CPI outlined in (b) above was 0.90%. However, an automatic cost of living adjustment is not allowed under current by-laws in respect of 2013 since the Plan does not have surplus all on all three actuarial bases: going concern, solvency, and wind up.

1.8 Confirmation

We confirm that this report complies with the Canadian Institute of Actuaries Standards of Practice, the Pension Benefits Act (Ontario), and the Income Tax Act (Canada).

2. Asset information

2.1 Source of information

The custodian of the Plan assets is CIBC Mellon. For the purposes of this valuation, we have relied on the draft pension fund financial statements for 2013 as provided by the City of Toronto.

2.2 Asset reconciliation (market value)

The table below reconciles the change in the market value of assets from the last valuation of the Plan to the market value of assets as of December 31, 2013.

Asset reconciliation	2013	2012	2011
Market value of assets at beginning of period	$ 239,773,877	$ 243,785,987	$ 271,473,569
Adjustment to prior year's draft statements	$ (1,226,556)	3,017,680	(121,036)
Employer contributions	-	-	-
Benefit payments	(24,747,049)	(24,365,516)	(26,335,218)
Investment earnings net of investment expenses	35,114,229	18,416,785	84,638
Fees and expenses	(1,040,115)	(1,081,059)	(1,315,966)
Market value at end of period	$ 247,874,386	$ 239,773,877	$ 243,785,987
less benefits and accounts payable	(1,031,906)	(1,241,260)	-
less investment transactions payable	(431,487)	9,222	-
less fees and expenses payable	(176,913)	-	-
Adjusted market value of assets at end of period	$ 246,234,080	$ 238,541,839	$ 243,785,987

2.3 Asset allocation (mix)

The asset mix of the Plan as of December 31, 2013 was allocated between the following major investment categories:

Asset class	Amount	Actual asset mix	Investment policy target
Canadian equities	$ 51,894,000	21%	20%
U.S equities	43,396,071	18%	15%
Foreign equities	46,064,977	19%	15%
Fixed income	94,763,323	38%	48%
Short-term and cash	11,756,015	4%	2%
Total invested assets as of December 31, 2013	$ 247,874,386	100%	100%

2.4 Value of assets

For going concern purposes, the smoothed value of assets is used and it is a four-year moving-average market value used to reduce contribution volatility. This method recognizes realized and unrealized investment gains and losses over a period of four years based on the expected investment return assumption. The smoothed value of assets does not take full account of recent investment gains and losses. Only a proportion of that experience will be recognized immediately, resulting in a smoothed investment return that differs from the actual return on a market value basis.

For solvency purposes, the smoothed value of assets is used.

There have been no changes in the asset valuation methods since the last actuarial valuation.

2.5 Performance of the fund

The annual net rates of return (investment income and capital appreciation, less investment and administrative expenses) earned on the market value of the assets in the past five years were as follows:

Year	Net return on market value	Return on smoothed value
2013	15.1%	7.3%
2012	7.4%	7.7%
2011	-0.5%	1.0%
2010	8.9%	1.0%
2009	14.4%	2.5%
Five-year average	8.9%	3.9%
Three-year average	7.1%	5.3%

The rate of return calculation assumes that all cash flow items are uniformly distributed throughout the year.

2.6 Development of smoothed value of assets

The following information shows the development of the smoothed value of assets

Market value experience	2013	2012	2011
Discount rates	5.75 %	5.75 %	5.75 %
Expected gross investment income	$ 13,055,979	$ 13,296,330	$ 14,825,869
Actual net investment income	33,887,673	21,434,465	(36,398)
Market value investment gain/(loss)	$ 20,831,694	$ 8,138,135	$ (14,862,267)

Year end	Investment gain/(loss) $	% of gain/(loss) deferred	Deferred gain/(loss) $
2013	$ 20,831,694	75%	$ 15,623,771
2012	8,138,135	50%	4,069,068
2011	(14,862,267)	25%	(3,715,567)
Smoothed value of assets adjustment			$ 15,977,272

Smoothed assets	December 31, 2013
Adjusted market value of assets	$ 246,234,080
Less: Smoothed value of assets adjustment	(15,977,272)
Smoothed value of assets	$ 230,256,808

2.7 Plan asset data tests

The tests performed in review of the plan asset data include the following:

- ✓ Comparison of the opening market value of assets disclosed in the financial statements with the ending values disclosed in the most recent actuarial valuation report;
- ✓ Comparison of pension payments made out of the fund with the total monthly pensions found in the retiree data, taking into account new retirees and deaths during the inter-valuation period; and
- ✓ Consideration of all important changes in the composition of the funds invested.

Any anomalies or discrepancies discovered through testing, if any, have been resolved. The asset data was reviewed for reasonableness and consistency and found to be sufficient and reliable for the purposes of the valuation.

3. Going concern valuation

The financial position of the Plan on a going concern basis is determined by comparing the smoothed value of assets to the going concern liabilities, in respect of accrued benefits, assuming the Plan will continue indefinitely.

To determine the value of liabilities, we build a model of all future expected cash flows to be paid from the Plan, adjusted for the likelihood of payment, and discounted to the valuation date in accordance with the assumptions made.

Details of the actuarial methods and assumptions are set out in Appendix A to this Report.

If the going concern liabilities exceed the smoothed value of assets, the shortfall, known as the going concern unfunded liability, must be amortized and paid for over no more than 15 years.

3.1 Financial position

The financial positions of the Plan on a going concern basis as of December 31, 2010 and December 31, 2013 are:

Financial Position	December 31, 2013	December 31, 2010
Smoothed value of assets	$ 230,257,000 (1)	$ 270,603,000
Going concern liabilities		
Pensioners	160,492,000	182,104,000
Beneficiaries	60,313,000	56,625,000
Total going concern liabilities	$ 220,805,000	$ 238,729,000
Going concern surplus/(unfunded liability)	$ 9,452,000	$ 31,874,000

(1) The smoothed value of assets is developed in Section 2.6.

3.2 Reconciliation of the going concern surplus/(unfunded liability)

The following table is a reconciliation of the going concern surplus/(unfunded liability) from the last valuation to this valuation. An explanation of the major items is provided in Section 3.3.

Reconciliation of financial position from previous valuation		
Going concern surplus/(unfunded liability) at beginning of period		$ 31,874,000
Interest on going concern surplus/(unfunded liability)		5,820,000
Amount of special payments plus interest		
Going concern special payments plus interest		0
Solvency special payments plus interest		0
Expected going concern surplus/(unfunded liability)		$ 37,694,000
Experience gains/(losses) due to:		
Investments	$ (3,737,000)	
Mortality	(3,480,000)	
Total experience gains/losses		$ (7,217,000)
Change in economic assumptions		(3,077,000)
Change in demographic assumptions		$ (17,948,000)
Going concern surplus/(unfunded liability) at end of period		$ 9,452,000

3.3 Explanation of reconciliation of going concern surplus/(unfunded liability) items

The following section briefly describes the major gain/loss items that occurred since the prior valuation.

a. Investment experience

The Plan's actual return on the smoothed value of assets of 5.3% was lower than the expected investment return assumption of 5.75% for the valuation period. This resulted in a loss of $3,737,000.

b. Mortality

A comparison of actual deaths versus expected deaths resulted in a loss of $(3,480,000).

c. Assumption changes

As a result of the change in mortality table from UP94 projected to 2005 using Scale AA to the Canadian Pensioner's Mortality Table for public sector employees with Scale CPM-B, there was a loss of $21,364,000.

As a result of the change in the assumption of 80% of members having a spouse to 70% having a spouse, there was a gain of $3,416,000.

d. Economic changes

As a result of lowering the discount rate from 5.75% to 5.50%, there was a loss of $3,077,000.

3.4 Normal cost

Since there are no longer any active members accruing service, there is no Normal Cost under the Plan.

3.5 Schedule of going concern special payments

As the Plan has a going concern surplus, there are no special payments required.

4. Solvency valuation

The Pension Benefits Act (Ontario) requires a measure of solvency based on assumptions, which are prescribed by the Act, to assess the financial status of the Plan in the event of Plan termination and wind up.

4.1 Financial position

The financial position of the Plan on a solvency basis is determined by comparing the solvency assets to the solvency liabilities (the actuarial present value of benefits, as determined by the Act, earned for service prior to the valuation date, calculated as if the pension plan were wound up on that date).

The financial positions of the Plan on a solvency basis as of December 31, 2010 and December 31, 2013 are:

Financial position	December 31, 2013	December 31, 2010
Solvency assets		
Adjusted market value of assets	$246,234,000	$271,474,000
Wind up expenses	(250,000)	(100,000)
Total solvency assets	$245,984,000	$271,374,000
Solvency liabilities		
Pensioners	$170,772,000	$206,386,000
Beneficiaries	64,213,000	63,207,000
Total solvency liabilities	$234,985,000	$269,593,000
Solvency surplus/(unfunded liability)	$ 10,999,000	$ 1,781,000

If the Plan were to be wound up on the valuation date, the wind up liabilities would be equal to the solvency liabilities and the wind up surplus would be $10,999,000. For the purpose of the solvency and wind up financial position, no potential post retirement ad hoc adjustments have been included in the liabilities.

4.2 Incremental cost

The Plan currently has no members accruing additional service for benefits or eligibility to early retirement subsidies and all liabilities are inactive. As a result, the incremental cost for the Plan on a solvency basis for the period until the next required valuation which is December 31, 2016 is nil.

4.3 Transfer ratio

The Plan's transfer ratio is determined by dividing the market value of assets by the solvency liabilities. As of December 31, 2013, the Plan's assets exceed its solvency liabilities; therefore the Plan has a solvency transfer ratio of 1.0.

Because this ratio is more than 0.85, the next required actuarial valuation to be filed with the authorities is a valuation dated not later than December 31, 2016.

4.4 Solvency excess/(deficiency)

The minimum funding requirements under the Regulation to the Pension Benefits Act (Ontario) are based on the solvency deficiency as of the valuation date. In calculating the solvency deficiency, various adjustments can be made to the solvency financial position, including:

- Recognition of the present value of existing special payments, including any going concern special payments established at the valuation date, due to be paid within the periods prescribed by the Regulation (in this case, five years);
- Smoothing of the asset value by use of an averaging technique;
- Adjustment to the solvency liability by use of an averaging technique in determining the discount rate used to value the liabilities; and
- Removal of any prepaid contributions from the asset value.

To the extent that there exists a solvency deficiency, after taking account of these adjustments, additional special payments must be made over a period of not more than five years. If there is no solvency deficiency, the solvency excess may be used to reduce the period of any existing solvency special payments or may be used to offset any solvency deficiency created by benefit improvements.

Solvency excess/(deficiency)	December 31, 2013	December 31, 2010
Surplus/(unfunded liability) [1]	$ 10,999,000	$ 1,781,000
Solvency adjustments:		
Present value of special payments	0	0
Solvency liability adjustment	0 [2]	3,576,000
Smoothed value of assets adjustment	(15,977,000) [3]	(871,000)
Total solvency adjustments	$ (15,977,000)	$ 2,705,000
Solvency excess/(deficiency)	$ (4,978,000)	$ 4,486,000

(1) The development of the solvency surplus/(unfunded liability) is shown in Section 4.1.

(2) At the valuation date, the four-year average solvency discount rate equals the calculated and unsmoothed annuity purchase rate. Consequently, the liability adjustment is nil.

(3) Developed in Section 2.6.

4.5 Schedule of solvency special payments

There are no solvency special payments required.

The solvency deficiency of $4,978,000 is a result of applying an asset smoothing method to artificially reduce the market value of assets under the Plan as at the valuation date. This is normally acceptable by Canada Revenue Agency and the Financial Services Commission of Ontario where the resulting contributions on a solvency basis are less than those required on a wind up basis. However, in this case under an unsmoothed approach (wind up basis), the Plan is in a surplus on a wind up basis and thus fully funded as at the valuation date and is in a deficit on a solvency basis. As a result, contributions on a solvency basis would exceed those contributions required on a windup basis and due to restrictions under the Income Tax Regulations, such contributions would not be permissible. Consequently, no contributions to the Plan are required until the next actuarial valuation of the Plan is completed.

4.6 Pension Benefits Guarantee Fund (PBGF) assessment

Under Section 47(1) of Regulation 909 of the Pension Benefits Act, R.S.O. 1990, the pension benefits provided by this Plan are not guaranteed by the Pension Benefits Guarantee Fund and this Plan is exempt from any Guarantee Fund assessment.

5. Employer contributions

In this section we set out the range of permissible employer contributions to the Plan for the next three years. The range of permissible employer contributions is based on the minimum that the employer must pay each year as prescribed by provincial pension regulations and the maximum permissible as prescribed by the Income Tax Act.

5.1 General

The permissible range of employer contributions is based on the following different measures:

- minimum going concern funding (normal cost plus going concern special payments);
- going concern maximum or "excess surplus"; and
- minimum solvency funding (solvency special payments).

If the Plan has a solvency funding requirement (i.e., a solvency funded position less than 100%), then the going concern maximum or "excess surplus" measure is not applicable. In addition, the calculation of any solvency special payments recognizes any going concern special payments that are required to be made.

5.2 Minimum and maximum employer contributions

The minimum and maximum employer contributions determined at the prior valuation and for the three years following the valuation date are nil.

The excess actuarial surplus, pursuant to Section 147.2(2) of the Income Tax Act (Canada), is $0.

6. Sensitivity analysis

It should be noted that the results of this valuation are presented at a single point in time. Both the going concern and solvency funded positions of the Plan can change with time and the potential for such variations must be borne in mind when using this report as a guide for the funded positions, now or in the future.

This section provides details on the sensitivity of the going concern and solvency valuation results to two key situations:

a. Investment Return (future long-term returns on the assets in the pension plan)

b. Market Correction (a one-time drop in assets in the pension plan)

6.1 Investment return

If the future long-term annual rate of return on pension plan assets is on average 1.0% (i.e., 100 basis points) below our current assumption of 5.50% per annum, the going concern surplus and employer normal cost for 2014 would decrease by $16,085,000 and nil, respectively. As a result, the total minimum employer contributions for 2014 would increase by $605,000 per year.

The minimum contribution determined for the year following the valuation date would be:

	Estimated employer normal cost	Going-concern special payments	Solvency special payments	Total minimum employer contribtutions
2014	$ -	$ 605,000	$ -	$ 605,000

If the prescribed solvency discount rate and the annuity purchase rate drop by 1.00% below current levels, the solvency deficit would decrease by $4,490,000. This would increase the solvency special payments for 2014 by nil.

The minimum contribution determined for the year following the valuation date would be nil due to restrictions under the Income Tax Regulations.

	Estimated employer normal cost	Going-concern special payments	Solvency special payments	Total minimum employer contribtutions
2014	$ -	$ -	-	-

6.2 Market adjustment

If the market value of assets experiences a one-time drop of 10% due to a market adjustment, the going concern surplus would decrease by $6,197,000, the solvency surplus would decrease by $6,197,000 as well and minimum employer contributions for 2014 would increase by $2,440,900. There would be no change in the normal cost under this scenario.

The minimum contribution determined for the year following the valuation date would be:

	Estimated employer normal cost	Going-concern special payments	Solvency special payments	Total minimum employer contribtutions
2014	$ -	$ -	$ 2,440,900	$ 2,440,900

7. Actuarial cost certificate and opinion

The Benefit Fund Committee of the Toronto Fire Department
Superannuation and Benefit Fund
Registration #0351601

In our opinion, for the purposes of this actuarial valuation report, the membership data on which the valuation is based are sufficient and reliable, the assumptions are appropriate and the methods employed in the valuation are appropriate.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada. This actuarial valuation report has been conducted in accordance with the funding and solvency standards prescribed by the Pension Benefits Act (Ontario) and Regulation, and in conformity with the requirements of the Income Tax Act (Canada) and Regulation. This actuarial opinion forms an integral part of the report.

Based on the results of this actuarial valuation report as of December 31, 2013, we certify that in our opinion:

1. The Plan does not have a prior year credit balance or prepaid contribution balance.

2. There is an actuarial surplus of $9,452,000 in the Plan on a going concern basis.

3. There is a solvency surplus of $10,999,000 under the Plan before application of solvency smoothing and a solvency deficiency of $4,978,000 after the application of solvency smoothing. Due to restrictions under the Income Tax Regulations, no solvency special payments are permitted under the Plan at this valuation date.

4. If the Plan had been wound up on the valuation date, the market value of Plan assets (net of wind up expenses) would have been $10,999,000 more than the wind up liabilities of the Plan.

5. The transfer ratio, as defined in the Regulation to the Pension Benefits Act (Ontario), is 1.0.

6. Under Section 47(1) of Regulation 909 of the Pension Benefits Act, R.S.O. 1990, the pension benefits provided by this Plan are not guaranteed by the Pension Benefits Guarantee Fund and this Plan is exempt from any Guarantee Fund assessment.

7. In accordance with the Regulation to the Pension Benefits Act (Ontario), the next actuarial valuation report should be prepared with a valuation date not later than December 31, 2016 should this report be filed.

8. We are unaware of any significant events since the valuation date that would have a material impact on the results of this report.

The undersigned is available to answer any questions with respect to this valuation report.

Faisal Siddiqi

Faisal Siddiqi
Fellow, Society of Actuaries
Fellow, Canadian Institute of Actuaries

April 7, 2014
Date

Appendix A Going concern assumptions and methods

The assumptions and methods used in the going concern valuation are described below. If actual Plan experience differs from the assumptions below, gains and losses will arise in future valuations.

A.1 Economic assumptions

Investment return[1]:	5.50% per annum, net of investment and administrative expenses.
Post-retirement indexation[2]:	No provision has been made for future post-retirement ad hoc adjustments in the liabilities based on the cost-of-living provisions of the Plan by-laws. Future post-retirement adjustments based on 100% CPI (Consumer Price Index) indexation were projected and valued to increase actuarial liabilities for the purpose of determining excess surplus and eligible contributions under Section 147.2(2) of the Income Tax Act. The increase in CPI is assumed to be 2.00% per annum.

(1) The investment return was 5.75% per annum at the prior valuation.
(2) The increase in CPI was assumed to be 2.25% per annum at the prior valuation date.

A.2 Non-economic assumptions

Mortality[1]:	CPM 2014 Public table with CPM-B projection with 1.0258 size of adjustment for males and 1.0065 size of adjustment for females.
Marital status[2]:	70% assumed to have a spouse at retirement based on recent Plan retiree experience.
Spouse's age:	Females three years younger than males.

(1) UP 1994 projected to 2005 using Scale AA at prior valuation date.
(2) 80% assumed to have a spouse at prior valuation date.

A3. Methods

Actuarial cost:	Unit Credit The accrued liability for pensioners and beneficiaries is the present value of their respective benefits.
Smoothed value of assets:	The smoothed value of assets is a 4-year moving-average market value. This method recognizes realized and unrealized investment gains and losses over a period of 4 years based on the expected investment return assumption.

Appendix B Rationale for going concern assumptions

The following rationale is provided to support the most significant going concern actuarial assumptions used in this report:

B.1 Investment return (discount rate)

The expected future benefit payments have been discounted using the expected investment return on the fund. The discount rate of 5.50% per annum was selected and the components of which are as follows:

Assumed Gross investment return	4.99%
Plus: Diversification of assets	0.40%
Plus: Additional return due to active management	0.50%
Less: Provision for investment and administration fees paid from the fund	(0.50%)
Less: Margins for adverse deviation	(0.10%)
Discount rate, before adjustment	5.29%
Discount rate, after adjustment	5.50%

The above items are supported as follows:

- The best estimate gross rate of return was developed by establishing expected returns for each major asset class in which the pension fund is invested and then using a building block approach based on the Plan's target asset allocation presented in Section 2.3. It is assumed that the Plan's long term asset allocation will not change over time. In determining a return on equity investments, we have assumed an equity risk premium (i.e. the difference between expected return on Canadian equities and Canadian bonds) of 4.45% per annum.
- Expenses represent the expected administration and investment expenses charged to the fund.
- To account for volatility in future investment returns given the Plan's investment mix, a margin for adverse deviation of 0.10% per annum was included.

B.2 Mortality

The Canadian Pensioner's Mortality Registered Pension Plan Public Table ("CPM2014 Publ") reflects the mortality experience as of 2014 from a public sector analysis of members in Canadian registered pension plans. In addition, future mortality experience is expected to follow Scale CPM-B.

This table is used since the mortality experience of the membership of a plan is insufficient to assess plan-specific experience and where there is no reason to expect the mortality experience of the plan to differ significantly from that of other pension plans. Both of these are true for this Plan and, therefore, the use of this mortality table is considered reasonable.

Appendix C Solvency assumptions and method

The assumptions and methods used in the solvency valuation are prescribed by regulation and are described below. Any changes to assumptions from the previous valuation are referenced by footnote.

C.1 Assumptions and method

Mortality[1]:	UP 1994 table with dynamic generational mortality projection using Scale AA.
Annuity purchase rate[2]:	3.58% per annum.
Smoothed annuity purchase rate[3]:	

Valuation dates	Rate
December 31, 2013	3.58%
December 31, 2012	2.96%
December 31, 2011	3.31%
December 31, 2010	4.48%
Average rate	3.58%

Election experience	100% of members assumed to have annuities purchased on their behalf.
Actuarial cost method:	Present value of accrued benefits. No benefits payable on plan wind up were excluded from the valuation.
Value of assets:	Smoothed value of assets for solvency and market value of assets for wind up.
Provision for wind up expenses[4]:	$250,000.
Marital status[5]:	70% assumed to have a spouse at retirement based on recent Plan retiree experience.
Spouse's age:	Females three years younger than males.

(1) UP94 projected to 2020 using Scale AA at the prior valuation date of December 31, 2010.

(2) 4.48% per annum at prior valuation date. Current rate based on CIA Recommendations using a plan duration of 6.80 years and an initial spread over CANSIM V39062 bond yield of 3.13% of 45 basis points.

(3) 4.66% per annum at prior valuation dates.

(4) $100,000 per annum at prior valuation date.

(5) 80% assumed to have a spouse at prior valuation date.

C.2 Provision for wind up expenses

Actuarial expense reasonably expected to wind up the plan have been included in the expense assumption. These expenses are assumed to be charged to the Plan. These wind up expenses do not include other expenses assumed to occur post valuation date up to the time of actual settlement. These additional expenses can include trustee, investment management, legal, administration and consulting expenses that may be incurred up until the time of final settlement. In addition any legal or actuarial expenses related to surplus ownership and or distribution, if any, are not included in these expense provisions.

Appendix D Summary of membership data

The membership data was provided and maintained by the City of Toronto. The membership data was compiled on December 31, 2013 and reviewed for reasonableness and consistency and found to be sufficient and reliable for the purposes of the valuation. These data tests are, by nature, high level and will not capture all possible deficiencies in the data. Therefore, reliance is also placed on the certification of the Benefit Fund Committee of the Toronto Fire Department Superannuation and Benefit Fund as to the quality of data.

D.1 Data tests

The tests done in review of the data include the following:

- ✓ High level review of the data to determine that an appropriate number of records was obtained, the appropriate data fields were provided and that the data fields contained valid information;
- ✓ A membership reconciliation was prepared to ensure the complete membership of the pension plan was accounted for;
- ✓ For terminated vested members, dates of birth and deferred pension amounts were reviewed against the prior valuation data for consistency;
- ✓ For retired members and beneficiaries, dates of birth and pension amounts were reviewed against the prior valuation data for consistency; and
- ✓ Aggregate pension payments in the data were compared to actual payments shown in the trust statement.

Since the form of pension and spouse date of birth for inactive vested and retired members are not readily available for valuation purposes, the assumptions shown in Appendix A2 have been adopted. The form of pension for members assumed to be married is life with 66-2/3% of the member's pension continuing to the spouse following the member's death with 120 payments guaranteed. The form of pension for members not assumed married is life with 120 months of payments guaranteed.

D.2 Summary of plan participants included in the valuation

	December 31, 2013	December 31, 2010
Pensioners		
Number	477	558
Average age (years)	78.0	75.6
Annual benefit	$17,050,085	$19,723,343
Average annual benefit	35,744	35,346
Beneficiaries		
Number	335	339
Average age (years)	79.9	78.2
Annual benefit	$7,207,973	$7,032,771
Average annual benefit	21,516	20,746

(1) Information suppressed for confidentiality purposes.

D.3 Data reconciliation

	Pensioners	Beneficiaries	Total
Number at December 31, 2010	558	339	897
Changes due to:			
New entrants	0	0	0
Vested termination	0	0	0
Non-vested termination	0	0	0
Paid out	0	0	0
Retirements	0	0	0
Deaths with survivor	(49)	49	0
Deaths without survivor	(32)	(55)	(87)
Data corrections	0	2	2
Total changes	(81)	(4)	(85)
Number at December 31, 2013	477	335	812

Appendix E Summary of plan provisions

The following summary describes the main features of the Plan which are of financial significance to the actuarial valuation and does not encompass all details required to properly administer the Plan. This summary is based on the most recent Plan document and Plan amendments. For a detailed description of the benefits, please refer to the Plan document.

Plan members:	All members of the Fire Department, except those who became members after May 8, 1961, at an age in excess of 26 years, or after July 1, 1968.

Normal retirement benefit

Eligibility:	The first of the month coincident with or next following attainment of age 65.
Amount:	On completion of 30 or more years of continuous service, an annual pension equal to 2% of the member's average annual earnings during the 60 consecutive months which produce the highest average, multiplied by his credited service up to 35 years; less a CPP offset equal to 0.7% of the lesser of such average earnings and the average of the YMPE at retirement and the 2 preceding years multiplied by his credited service after January 1, 1966. The CPP offset commences when the member attains age 65.
Creditable service limit:	Maximum of 35 years.
Minimum pension:	Member's annual pension shall not be less than $13,600.
Normal form of pension:	<u>No Spouse</u> Pension payable for life. <u>With a Spouse</u> Pension with a spousal lifetime pension of 66-2/3% of the initial amount following the later of the member's death.

Early retirement benefit

Eligibility:	Earlier of: a) Age 55 & 2 years of service, b) 30 years of service.
Amount:	Normal Retirement Benefit reduced as follows: a) 55 & 2 years of service – actuarial equivalent from earliest unreduced retirement age. b) Age 55 & 30 years of service – unreduced

Death benefits

Pre-retirement:	Lump sum amount equal to the actuarial equivalent of the pension earned on and after January 1, 1987.
Post-retirement:	If single at retirement - Beneficiary will receive greater of: a) the member's contributions with interest plus $100 for each year of service, and b) the commuted value of the member's benefit accrued after December 31, 1986 plus the member's contributions made prior to January 1, 1987 with interest. If a Spouse at retirement – Pension equal to 66-2/3% of the pension accrued to the date of the member's death payable for the life of Spouse.

Ad hoc post-retirement adjustments:

Commencing 1986, City Council adopted a policy of providing ad hoc increases in pensions to pensioners based upon an excess interest indexing methodology. Subject to City Council approval, each year, ad hoc increases in pension were provided, with a minimum increase of 50% of the increase in the Consumer Price Index (CPI) on a year over year basis, and a maximum increase of the lesser of the excess investment return on the Benefit Fund and 100% CPI.

Commencing 1997, the Plan by-laws were amended to provide for future increases to pensioners including spouses of deceased retired members, based on the lesser of:

(a) the investment rate of return of Fund assets (using a 5-year smoothing technique) in excess of the rate of return required to maintain the actuarial solvency of the Benefit Fund as determined by the Actuary, and

(b) the increase in the year over year level of the average CPI,

to the extent that actuarial surplus is available

Appendix F Certification

Toronto Fire Department Superannuation and Benefit Plan
Registration #0351601

I hereby certify on behalf of the Toronto Fire Department Superannuation Benefit Fund Committee, that to the best of my knowledge and belief:

1. The Plan Provisions summarized in Appendix E are accurate and up to date for the purpose of representing member benefit entitlements that significantly affect the financial condition of the Plan;
2. The membership data summarized in Appendix D is complete and accurate for all persons who are entitled or will become entitled to benefits under the Plan in respect of service up to the date of the valuation;
3. The asset information summarized in Sections 2.2 and 2.3 is complete and accurate; and
4. There have been no subsequent events that would materially change the Plan's financial position since the valuation date.
5. The actuary has been provided with the official plan text and all subsequent amendments pertaining to the Plan.

MC

Toronto Fire Department

Mike Wiseman
Name

Signature

Acting Director, Pension, Payroll & Employee Benefits
Title

April 25/2014
Date