

City of Woburn

Contributory Retirement System

Actuarial Valuation Report As of January 1, 2014

June 2015



TABLE OF CONTENTS

Report Summary

| | |
|----------------------------|---|
| Highlights | 1 |
| Introduction | 2 |
| Actuarial Experience | 3 |

Actuarial Costs and Liabilities

| | |
|--|---|
| Normal Costs | 4 |
| Present Value of Actuarial Accrued Liabilities | 5 |
| Present Value of Future Benefits | 6 |

Funded Status and Appropriations

| | |
|--|----|
| Market Value of Plan Assets | 7 |
| Actuarial Value of Plan Assets | 8 |
| Unfunded Actuarial Accrued Liabilities | 9 |
| Appropriations | 10 |
| Appropriation Forecast | 11 |
| GASB Statements No. 25 and No. 27 | 13 |
| PERAC Annual Statement | 14 |

Exhibits

| | |
|--|----|
| 1 Age/Service Distribution with Salary | 16 |
| 2 Retiree Distribution | 17 |
| 3 Disabled Retiree Distribution | 18 |
| 4 Distribution Forecast | 19 |
| 5 Summary of Plan Provisions | 20 |
| 6 Actuarial Methods and Assumptions | 26 |
| 7 Glossary of Terms | 29 |

| | |
|----------------------------|-----------|
| Certification | 30 |
|----------------------------|-----------|

Report Summary

| Highlights | January 1, 2012 | January 1, 2014 |
|---|--------------------|--------------------|
| Contributions | | |
| Funding Schedule FY 2015 | \$5,509,350 | \$5,509,350 |
| Funding Schedule FY 2016 | 5,685,539 | 6,000,000 |
| Funded Ratios | | |
| GASB No. 25 | 65.3% | 64.6% |
| Participants | | |
| Actives | 563 | 578 |
| Retirees and Beneficiaries | 362 | 369 |
| Inactives | 71 | 84 |
| Disabled | <u>35</u> | <u>31</u> |
| Total | 1,031 | 1,062 |
| Payroll | | |
| Payroll of Active Members | \$27,681,194 | \$28,945,300 |
| Average Payroll | 49,167 | 50,078 |
| Normal Cost | | |
| Employer | \$652,851 | \$828,863 |
| Employee | 2,319,917 | 2,472,416 |
| Administrative Expenses | <u>450,000</u> | <u>450,000</u> |
| Total | \$3,422,768 | \$3,751,279 |
| Actuarial Accrued Liabilities | | |
| Actives | \$82,398,320 | \$91,177,892 |
| Retirees, Beneficiaries, Disabilities and Inactives | <u>80,240,680</u> | <u>88,269,550</u> |
| Total | \$162,639,000 | \$179,447,442 |
| Actuarial Value of Assets | <u>106,181,870</u> | <u>115,874,621</u> |
| Unfunded Actuarial Accrued Liabilities | \$56,457,130 | \$63,572,821 |

Introduction

This report presents the findings of an actuarial valuation as of January 1, 2014, of Woburn Contributory Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L.", as of January 1, 2014.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the City of Woburn Contributory Retirement System
- Actuarial assumptions approved by the Retirement Board

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2014.

The valuation and forecast do not account for:

- Any subsequent changes in the law
- Chapter 32 of the M.G.L., Section 3(8)(c) transfers between systems
- State-mandated benefits
- Cost-of-living increases granted to retired members between 1982 and 1997. The cost of these benefits has been assumed by the State under Proposition Two and One-Half.

Actuarial Experience

In performing the actuarial valuation, various assumptions are made regarding such factors as mortality, retirement, disability, and withdrawal rates as well as both payroll, salary increases, and investment returns. A comparison of the current valuation and the prior valuation is made to determine how closely actual experience corresponded to anticipated occurrences. This analysis of the system provides insight into the overall quality of the actuarial assumptions and helps explain any change in the annual appropriation.

During the last two years, the total unfunded actuarial accrued liability increased by 12.6% to \$63,572,821. The increase is the result of net unfavorable actuarial experience during the preceding years, primarily less than expected growth in the actuarial value of assets due to the continuing recognition of investment losses in recent years, notably that experienced in 2008. In addition, the mortality assumption was updated to reflect an additional year of improvement. Finally, the rate of return assumption was changed from 8.25% to 8.00%. The sources of the (gain)/loss are as follows:

| | |
|---|----------------|
| Investment Experience | 1,449,097 |
| Interest Rate | 4,319,112 |
| Salary Loss | 145,335 |
| New Entrants | 352,213 |
| Active Decrements (Retirement) | (871,507) |
| Active Decrements (Termination) | 1,198,927 |
| Active Decrements (Death) | (67,469) |
| Active Decrements (Disability) | (584,675) |
| Inactive Mortality and data adjustments | 1,235,835 |
| Mortality Update | 532,913 |
| COLA experience | (1,484,357) |
| Other (Data corrections, Section 3(8)(c), buybacks, etc.) | <u>375,180</u> |
| Total (gain)/loss | 6,600,604 |

Benefit changes approved under Chapter 176 of the Acts of 2011 for members hired on or after April 2, 2012 were reflected in this valuation. Since these changes apply to new hires, there is little immediate impact on past service liability.

Actuarial Costs and Liabilities

Normal Costs

The normal cost is the sum of the individual normal costs determined for each member as if the assumptions underlying the cost determinations had been exactly realized. An individual normal cost represents that part of the cost of a member's future benefits which are assigned to the current year as if the costs are to remain level as a percentage of the member's pay. Benefits payable under all circumstances (i.e., retirement, death, disability and terminations) are included in this calculation. Anticipated employee contributions to be made during the year are subtracted from the total normal cost to determine employer normal cost. The total normal cost is divided by total payroll to determine the normal cost as a percent of pay. The normal cost is shown in Table I.

| Table I | January 1, 2012 | January 1, 2014 |
|-------------------------|-----------------|-----------------|
| Superannuation | \$2,129,479 | \$2,397,850 |
| Termination | 223,426 | 212,812 |
| Death | 98,476 | 109,646 |
| Disability | 521,387 | 580,971 |
| Administrative Expenses | <u>450,000</u> | <u>450,000</u> |
| Total Normal Cost | \$3,422,768 | \$3,751,279 |
| % of Pay | 12.4% | 13.0% |
| Employee Contributions | 2,319,917 | 2,472,416 |
| % of Pay | 8.4% | 8.5% |
| Employer Normal Cost | \$1,102,851 | \$1,278,863 |
| % of Pay | 4.0% | 4.4% |

Actuarial Costs and Liabilities

Present Value of Actuarial Accrued Liabilities

The actuarial accrued liabilities (AAL) represents today's value of all benefits based on the past service of the actives and inactive. The AAL can be compared to the assets to determine the funded status of the Plan. The value of these earned benefits is shown in Table II below.

| Table II | January 1, 2012 | January 1, 2014 |
|----------------------------|-------------------|------------------|
| Actives | | |
| Superannuation | \$75,033,518 | \$83,459,495 |
| Termination | 941,029 | 893,854 |
| Death | 1,248,468 | 1,375,365 |
| Disability | 5,175,305 | 5,449,178 |
| Retirees and Inactives | | |
| Retirees and Beneficiaries | \$69,011,236 | \$77,967,643 |
| Terminated (Refund) | 516,255 | 626,370 |
| Disabled | <u>10,713,189</u> | <u>9,675,537</u> |
| Total | \$162,639,000 | \$179,447,442 |

Actuarial Costs and Liabilities

Present Value of Future Benefits

The present value of future benefits represents today's value of all benefits earned by the inactive participants as well as all benefits earned and expected to be earned in the coming years by the active participants. The difference between the present value of future benefits and the present value of actuarial accrued liabilities is the value of benefits to be earned in the coming years. The value of the total expected benefits is shown in Table III.

| Table III | January 1, 2012 | January 1, 2014 |
|----------------------------|-------------------|------------------|
| Actives | | |
| Superannuation | \$91,081,402 | \$102,181,890 |
| Termination | 1,776,728 | 1,734,414 |
| Death | 1,956,890 | 2,187,229 |
| Disability | 9,539,733 | 10,533,997 |
| Retirees and Inactives | | |
| Retirees and Beneficiaries | \$69,011,236 | \$77,967,643 |
| Terminated (Refund) | 516,255 | 626,370 |
| Disabled | <u>10,713,189</u> | <u>9,675,537</u> |
| Total | \$184,595,433 | \$204,907,080 |

Funded Status and Appropriations

Market Value of Plan Assets

The trust fund composition on a market value basis is shown in Table IV.

| Table IV | January 1, 2012 | January 1, 2014 |
|-------------------------|-----------------|-----------------|
| Cash equivalents | \$4,463,191 | \$2,631,557 |
| Short term investments | 118,480 | 119,752 |
| Fixed income securities | 19,134,248 | 19,550,910 |
| Equities | 36,533,949 | 41,730,821 |
| International | 14,483,012 | 26,834,553 |
| Real Estate | 5,605,964 | 11,072,669 |
| Venture Capital | 0 | 0 |
| Other | 17,434,085 | 23,330,582 |
| Accounts receivable | 1,464,637 | 20,824 |
| Accounts payable | (183,160) | (104,245) |
| Accrued income | <u>96,563</u> | <u>88,150</u> |
| Total Market Value | \$99,150,970 | \$125,275,573 |
| Total Actuarial Value | \$106,181,870 | \$115,874,621 |

Funded Status and Appropriations

Actuarial Value of Assets

The actuarial value of assets is determined by projecting the market value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (8.00%) and accounting for deposits and disbursements with interest at the assumed rate of return. An adjustment is then applied to recognize the difference between the actual investment return and expected return over a five year period. This preliminary actuarial value is not allowed to differ from the market value of assets by more than 20%. The calculation of the actuarial value of assets as of January 1, 2014 is presented in Table V.

| Table V | January 1, 2014 |
|---|-----------------|
| (1) Market value at January 1, 2013 | \$108,709,248 |
| (2) 2013 Contributions | \$8,658,289 |
| (3) 2013 Payments | (\$12,095,594) |
| (4) Net interest adjustment at 8.00% on (1), (2) and (3) to December 31, 2013 | \$8,814,908 |
| (5) Expected market value on December 31, 2013 | \$114,086,851 |
| (1) + (2) + (3) + (4) | |
| (6) Actual market value on December 31, 2013 | \$125,275,573 |
| (7) 2013 (Gain) / Loss | (\$11,188,722) |
| (8) 80% of 2013 (Gain) / Loss | (\$8,950,978) |
| (9) 2012 (Gain) / Loss | (\$4,510,189) |
| (10) 60% of 2012 (Gain) / Loss | (\$2,706,113) |
| (11) 2011 (Gain) / Loss | \$8,241,957 |
| (12) 40% of 2011 (Gain) / Loss | \$3,296,783 |
| (13) 2010 (Gain) / Loss | (\$5,203,222) |
| (14) 20% of 2010 (Gain) / Loss | (\$1,040,644) |
| (15) Actuarial value on January 1, 2014, (6) + (8) + (10) + (12) + (14) but not less than 80% nor greater than 120% of (6) | \$115,874,621 |
| (16) Ratio of actuarial value to market value | 92.50% |
| (17) Actuarial Value Return for 2012 | 2.53% |
| (18) Actuarial Value Return for 2013 | 12.95% |
| (19) Market Value Return for 2012 | 12.86% |
| (20) Market Value Return for 2013 | 18.70% |

Funded Status and Appropriations

Unfunded Actuarial Accrued Liabilities

Under the Entry Age Normal Actuarial Cost Method, the Actuarial Accrued Liability represents what the accumulated assets would have been as of the valuation date if:

- current plan provisions and assumptions had always been in effect,
- experience conformed exactly to assumptions, and
- the normal cost had been contributed each year since inception.

The actuarial value of the Fund's assets as of the end of the prior year are subtracted from the Actuarial Accrued Liability (AAL) to determine the Unfunded Actuarial Accrued Liability (UAAL) as of the valuation date. Over time, annual pension contributions will accumulate Plan assets equal to the AAL, and the UAAL will be eliminated. Thereafter, annual contributions equal to the normal cost will keep the Plan's assets and liabilities in balance. The UAAL is developed in Table VI.

| Table VI | January 1, 2012 | January 1, 2014 |
|--------------------------------------|--------------------|--------------------|
| Actuarial Accrued Liability | \$162,639,000 | \$179,447,442 |
| Actuarial Assets | <u>106,181,870</u> | <u>115,874,621</u> |
| Unfunded Actuarial Accrued Liability | \$56,457,130 | \$63,572,821 |
| Funded Status | 65.3% | 64.6% |

Funded Status and Appropriations

Appropriations

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Sections 22D and 22F of Chapter 32 of the Massachusetts General Laws. These amounts were calculated to comply with the June 30, 2040, full funding mandate for all accrued liabilities. The pension appropriation is the sum of the:

- Employer normal cost
- Increasing amortization of the prior unfunded actuarial accrued liability by June 30, 2035
\$ 62,104,437 over 21 years with 4.0% increasing payments
- Level amortization of the 2002 Early Retirement Incentive by June 30, 2019
\$ 1,105,345 over 5 years
- Level amortization of the 2003 Early Retirement Incentive by June 30, 2020
\$ 363,039 over 6 years
- Interest adjustment for payments deposited each September 1

The pension appropriation is shown in Table VII.

| Table VII | January 1, 2012 | January 1, 2014 |
|---|-----------------|-----------------|
| Normal cost | \$1,102,851 | \$1,278,863 |
| Amortization payment of the prior accrued liability | 3,468,973 | 4,202,675 |
| Amortization payment of 2002 ERI liability | 257,429 | 256,334 |
| Amortization payment of 2003 ERI liability | <u>73,097</u> | <u>72,714</u> |
| Total cost | \$4,902,350 | \$5,810,586 |
| % of Pay | 17.7% | 20.1% |
| Fiscal 2015 cost | \$5,509,350 | \$5,509,350 |
| Fiscal 2016 cost | \$5,685,539 | \$6,000,000 |

Appropriation Forecast

The following exhibit forecasts employer and employee contributions over the next 32 years under the adopted funding schedule.

Note that the forecast is based upon an "open group" method. This method assumes that sufficient employees will be hired each year to keep the number constant. The total payroll of the system is expected to increase 4.0% per year. The employee contribution rate is expected to increase to 10.5% by 2038 as members contributing base percentages 5%, 7%, and 8% are replaced by new members, whose base contribution is 9%. Payments are assumed to be made at the beginning of the year.

The employer total cost is expected to increase during the next 21 years until the unfunded liabilities are completely paid off, at which time only the normal cost will remain. The total cost represents 19.0% of payroll, increasing to 20.3% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of 4.6% thereafter. The change in the cost as a percentage of payroll is a result of the increase in member deductions along with the change in the valuation interest rate from 8.25% to 8%.

Funded Status and Appropriations

Appropriation Forecast

| Fiscal Year Ending | Payroll* | Unfunded Accrued Liability** | Employee Contribution | Employer Normal Cost with Interest | Amortization Payments with Interest | Employer Total Cost with Interest | Employer Total Cost % of Payroll | Funded Ratio %*** |
|--------------------|--------------|------------------------------|-----------------------|------------------------------------|-------------------------------------|-----------------------------------|----------------------------------|-------------------|
| 2015 | \$28,945,300 | \$63,572,821 | \$2,472,416 | \$1,346,191 | \$4,163,159 | \$5,509,350 | 19.0% | 64.6% |
| 2016 | 30,103,112 | 63,764,386 | 2,572,589 | 1,398,695 | 4,601,305 | 6,000,000 | 19.9 | 65.7 |
| 2017 | 31,307,236 | 63,789,721 | 2,676,820 | 1,453,246 | 4,846,754 | 6,300,000 | 20.1 | 66.9 |
| 2018 | 32,559,526 | 63,628,265 | 2,785,273 | 1,509,922 | 5,105,078 | 6,615,000 | 20.3 | 68.1 |
| 2019 | 33,861,907 | 63,257,522 | 2,898,119 | 1,568,808 | 5,377,542 | 6,946,350 | 20.5 | 69.3 |
| 2020 | 35,216,383 | 62,652,894 | 3,015,537 | 1,629,989 | 5,633,026 | 7,263,015 | 20.6 | 70.5 |
| 2021 | 36,625,039 | 62,064,343 | 3,137,711 | 1,693,554 | 5,778,743 | 7,472,297 | 20.4 | 71.7 |
| 2022 | 38,090,040 | 61,286,348 | 3,264,834 | 1,759,597 | 6,009,893 | 7,769,490 | 20.4 | 72.8 |
| 2023 | 39,613,642 | 60,216,388 | 3,397,107 | 1,828,213 | 6,250,289 | 8,078,502 | 20.4 | 74.0 |
| 2024 | 41,198,187 | 58,821,917 | 3,534,737 | 1,899,503 | 6,500,300 | 8,399,803 | 20.4 | 75.2 |
| 2025 | 42,846,115 | 57,067,416 | 3,677,943 | 1,973,571 | 6,760,312 | 8,733,883 | 20.4 | 76.6 |
| 2026 | 44,559,959 | 54,914,145 | 3,826,950 | 2,050,525 | 7,030,725 | 9,081,250 | 20.4 | 78.0 |
| 2027 | 46,342,358 | 52,319,866 | 3,981,993 | 2,130,478 | 7,311,954 | 9,442,432 | 20.4 | 79.5 |
| 2028 | 48,196,052 | 49,238,548 | 4,143,315 | 2,213,547 | 7,604,432 | 9,817,979 | 20.4 | 81.1 |
| 2029 | 50,123,894 | 45,620,049 | 4,311,173 | 2,299,852 | 7,908,609 | 10,208,461 | 20.4 | 82.8 |
| 2030 | 52,128,850 | 41,409,766 | 4,485,830 | 2,389,520 | 8,224,954 | 10,614,474 | 20.4 | 84.7 |
| 2031 | 54,214,004 | 36,548,265 | 4,667,561 | 2,482,681 | 8,553,952 | 11,036,633 | 20.4 | 86.7 |
| 2032 | 56,382,564 | 30,970,873 | 4,856,654 | 2,579,472 | 8,896,110 | 11,475,582 | 20.4 | 88.9 |
| 2033 | 58,637,867 | 24,607,239 | 5,053,406 | 2,680,035 | 9,251,954 | 11,931,989 | 20.3 | 91.3 |
| 2034 | 60,983,381 | 17,380,863 | 5,258,127 | 2,784,515 | 9,622,032 | 12,406,547 | 20.3 | 93.9 |
| 2035 | 63,422,717 | 9,208,578 | 5,471,141 | 2,893,065 | 10,006,914 | 12,899,979 | 20.3 | 96.8 |
| 2036 | 65,959,625 | 0 | 5,692,783 | 3,005,844 | 0 | 3,005,844 | 4.6 | 100.0 |
| 2037 | 68,598,010 | 0 | 5,923,402 | 3,123,017 | 0 | 3,123,017 | 4.6 | 100.0 |
| 2038 | 71,341,931 | 0 | 6,163,363 | 3,244,754 | 0 | 3,244,754 | 4.5 | 100.0 |
| 2039 | 74,195,608 | 0 | 6,413,043 | 3,371,233 | 0 | 3,371,233 | 4.5 | 100.0 |
| 2040 | 77,163,432 | 0 | 6,672,836 | 3,502,639 | 0 | 3,502,639 | 4.5 | 100.0 |
| 2041 | 80,249,970 | 0 | 6,943,151 | 3,639,163 | 0 | 3,639,163 | 4.5 | 100.0 |
| 2042 | 83,459,968 | 0 | 7,224,415 | 3,781,006 | 0 | 3,781,006 | 4.5 | 100.0 |
| 2043 | 86,798,367 | 0 | 7,517,071 | 3,928,373 | 0 | 3,928,373 | 4.5 | 100.0 |
| 2044 | 90,270,302 | 0 | 7,821,581 | 4,081,479 | 0 | 4,081,479 | 4.5 | 100.0 |
| 2045 | 93,881,114 | 0 | 8,138,424 | 4,240,549 | 0 | 4,240,549 | 4.5 | 100.0 |
| 2046 | 97,636,359 | 0 | 8,468,100 | 4,405,814 | 0 | 4,405,814 | 4.5 | 100.0 |

* Calendar basis

** As of preceding January 1

*** Beginning of Fiscal Year

Funded Status and Appropriations

GASB Statements No. 25 and No. 27

Effective for periods beginning after June 15, 1997, the Governmental Accounting Standards Board (GASB) requires the disclosure of pension related liabilities for public employer financial statements in accordance with Statements 25 and 27. These statements, which replace GASB Statement No. 5, must be adhered to by any public employee retirement system that follows Generally Accepted Accounting Principles (GAAP). GASB 25 and 27 have been superseded for plan years and fiscal years beginning after June 15, 2013 and June 15, 2014, respectively. The information shown hereafter is for historical reasons. Information under the new standards will be presented in separate reports in the future.

These disclosures are intended to establish a reporting framework that distinguishes between:

- current financial information about plan assets and financial activities,
- actuarially determined information from a long-term perspective,
- the funded status of the plan, and
- progress being made in accumulating sufficient assets to pay benefits when due.

Footnote disclosures required by GASB Statement No. 25 and 27 include a description of the plan, a summary of significant accounting policies and information about contributions, legally required reserves and investment concentrations. As a result of the oversight of the Public Employees Retirement Administration Commission (PERAC) and the conversion of unpaid contributions to pension related debt, the Net Pension Obligation (NPO) as required by Statement No. 27 will effectively always be equal to \$0. The required disclosure information is shown in Table VIII.

| Table VIII | January 1, 2012 | January 1, 2014 |
|--|--------------------|--------------------|
| (1) Actuarial Accrued Liability | \$162,639,000 | \$179,447,442 |
| (2) Actuarial Value of Assets | <u>106,181,870</u> | <u>115,874,621</u> |
| (3) Unfunded Actuarial Accrued Liability | \$56,457,130 | \$63,572,821 |
| (4) Funded Ratio: (2) / (1) | 65.3% | 64.6% |
| (5) Covered Payroll | \$27,681,194 | \$28,945,300 |
| (6) UAAL as a Percentage of Payroll: (3) / (5) | 204.0% | 219.6% |
| (7) Annual Required Contribution (ARC) | \$5,089,320 | \$5,509,350 |
| (8) Net Pension Obligation | \$0 | \$0 |

PERAC Annual Statement

Appendix Page 3 Actuarial Valuation and Assumptions

The most recent actuarial valuation of the System was prepared by Buck Consultants as of January 1, 2014.

| | | |
|---|-------------|-------------|
| The normal cost for employees on that date was: | \$2,472,416 | 8.5% of pay |
| The normal cost for the employer was: | 1,278,863 | 4.4% of pay |

| | |
|---|---------------|
| The actuarial liability for active members was: | \$91,177,892 |
| The actuarial liability for retired and inactive members was: | 88,269,550 |
| Total actuarial accrued liability: | \$179,447,442 |
| System assets as of that date: | 115,874,621 |
| Unfunded actuarial accrued liability: | \$63,572,821 |

The ratio of system's assets to total actuarial liability was: 64.6%

The principal actuarial assumptions used in the valuation are as follows:

| | |
|--------------------------|--|
| Investment Return: | 8.00% |
| Rate of Salary Increase: | |
| Group 1 | 3.00% in years 2012 - 2014, 3.50% in years 2015 - 2016, 4.00% thereafter |
| Group 4 | 3.00% in years 2012 - 2014, 3.50% in years 2015 - 2016, 4.00% thereafter |

Schedule of Funding Progress

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (b) | Unfunded Actuarial Accrued Liability (b - a) | Funded Ratio (a / b) | Covered Payroll (c) | UAAL as a percent of Covered Payroll (b - a) / c |
|--------------------------|-------------------------------|---------------------------------|--|----------------------|---------------------|--|
| 01/01/2014 | \$115,874,621 | \$179,447,442 | \$63,572,821 | 64.6% | \$28,945,300 | 219.6% |
| 01/01/2012 | 106,181,870 | 162,639,000 | 56,457,130 | 65.3% | 27,681,194 | 204.0% |
| 01/01/2010 | 104,707,479 | 154,299,627 | 49,592,148 | 67.9% | 27,433,458 | 180.8% |
| 01/01/2009 | 110,478,130 | 141,758,527 | 31,280,397 | 77.9% | 24,431,654 | 128.0% |
| 01/01/2007 | 102,354,232 | 132,433,233 | 30,079,001 | 77.3% | 24,258,365 | 124.0% |
| 01/01/2005 | 87,818,592 | 120,595,047 | 32,776,455 | 72.8% | 22,623,505 | 144.9% |
| 01/01/2004 | 75,960,104 | 88,762,762 | 12,802,658 | 85.6% | 17,183,350 | 74.5% |

EXHIBITS

Participant Data

Age/Service Distribution with Salary as of January 1, 2014

| Attained Age | Average Salary | | | | | | | | | Total |
|--------------|----------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|--------------|---------------|
| | <5 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40+ | |
| < 20 | | | | | | | | | | |
| 20-24 | 7 15,482 | 1 22,686 | | | | | | | | 8 16,383 |
| 25-29 | 32 29,314 | 4 53,152 | 1 49,108 | | | | | | | 37 32,426 |
| 30-34 | 19 37,609 | 20 58,831 | 4 37,180 | | | | | | | 43 47,440 |
| 35-39 | 4 47,069 | 11 57,053 | 12 70,778 | 4 59,349 | | | | | | 31 61,374 |
| 40-44 | 9 32,303 | 16 51,672 | 16 67,525 | 6 71,750 | 5 63,287 | | | | | 52 56,631 |
| 45-49 | 13 19,660 | 27 35,180 | 18 55,480 | 14 66,653 | 6 71,656 | 8 89,675 | 1 73,481 | | | 87 50,092 |
| 50-54 | 17 35,033 | 14 23,698 | 44 39,058 | 12 49,763 | 10 77,844 | 24 77,720 | 7 98,036 | | | 128 51,352 |
| 55-59 | 4 36,945 | 15 34,062 | 30 35,614 | 13 35,582 | 7 65,909 | 16 76,260 | 5 77,907 | 10 88,922 | | 100 51,500 |
| 60-64 | 7 37,653 | 6 32,021 | 14 44,134 | 5 49,967 | 9 43,678 | 10 54,328 | 1 97,266 | 7 101,338 | 3 87,622 | 62 53,698 |
| 65-69 | 3 15,265 | 3 30,036 | 6 42,624 | 3 40,545 | | | 2 58,893 | 1 154,269 | 1 107,073 | 19 46,969 |
| 70+ | | 3 6,594 | 3 28,635 | | 1 63,356 | 2 62,045 | | 1 81,385 | 1 49,879 | 11 38,581 |
| Total | 115 | 120 | 148 | 57 | 38 | 60 | 16 | 19 | 5 | 578 |
| Avg. Salary | 30,855 | 41,340 | 46,437 | 53,197 | 64,280 | 74,504 | 85,270 | 96,539 | 83,964 | 50,078 |

Participant Data

Retiree Distribution as of January 1, 2014

| Attained Age | Number of Employees | | | Total Payments | | |
|-----------------------|---------------------|--------|-------|----------------|-----------|-----------|
| | Male | Female | Total | Male | Female | Total |
| < 20 | | | | | | |
| 20-24 | | | | | | |
| 25-29 | | | | | | |
| 30-34 | | | | | | |
| 35-39 | 1 | | 1 | 1,085 | | 1,085 |
| 40-44 | | | | | | |
| 45-49 | | 1 | 1 | | 27,325 | 27,325 |
| 50-54 | | 3 | 3 | | 51,566 | 51,566 |
| 55-59 | 12 | 11 | 23 | 508,089 | 230,705 | 738,794 |
| 60-64 | 26 | 17 | 43 | 1,130,597 | 400,377 | 1,530,974 |
| 65-69 | 36 | 29 | 65 | 1,695,182 | 454,209 | 2,149,391 |
| 70-74 | 20 | 21 | 41 | 567,106 | 390,298 | 957,404 |
| 75-79 | 31 | 36 | 67 | 768,179 | 426,054 | 1,194,234 |
| 80-84 | 25 | 30 | 55 | 559,514 | 390,116 | 949,630 |
| 85-89 | 10 | 37 | 47 | 172,992 | 351,454 | 524,446 |
| 90-94 | 8 | 14 | 22 | 120,459 | 98,611 | 219,071 |
| 95-99 | | 1 | 1 | | 8,227 | 8,227 |
| 100+ | | | | | | |
| Total | 169 | 200 | 369 | 5,523,204 | 2,828,943 | 8,352,147 |
| Average (Age/Payment) | 73.0 | 76.4 | 74.8 | 32,682 | 14,145 | 22,635 |
| Frequency Percent | 45.8 | 54.2 | 100.0 | 66.1 | 33.9 | 100.0 |

Participant Data

Disabled Retiree Distribution as of January 1, 2014

| Attained Age | Number of Employees | | | Total Payments | | |
|-----------------------|---------------------|--------|-------|----------------|--------|---------|
| | Male | Female | Total | Male | Female | Total |
| < 20 | | | | | | |
| 20-24 | | | | | | |
| 25-29 | | | | | | |
| 30-34 | | | | | | |
| 35-39 | | | | | | |
| 40-44 | 1 | | 1 | 44,763 | | 44,763 |
| 45-49 | 2 | | 2 | 34,867 | | 34,867 |
| 50-54 | 3 | 1 | 4 | 101,741 | 44,919 | 146,660 |
| 55-59 | 3 | | 3 | 147,266 | | 147,266 |
| 60-64 | 5 | | 5 | 213,270 | | 213,270 |
| 65-69 | 7 | | 7 | 217,246 | | 217,246 |
| 70-74 | 1 | | 1 | 21,765 | | 21,765 |
| 75-79 | 2 | | 2 | 71,100 | | 71,100 |
| 80-84 | 3 | | 3 | 48,795 | | 48,795 |
| 85-89 | 2 | 1 | 3 | 30,566 | 5,985 | 36,551 |
| 90-94 | | | | | | |
| 95-99 | | | | | | |
| Total | 29 | 2 | 31 | 931,378 | 50,904 | 982,282 |
| Average (Age/Payment) | 66.2 | 71.6 | 66.6 | 32,116 | 25,452 | 31,687 |
| Frequency Percent | 93.5 | 6.5 | 100.0 | 94.8 | 5.2 | 100.0 |

Cashflow Forecast

The following is a 30 year forecast of benefit payments net of state reimbursable COLA payments, Contribution Income and Investment Returns.

| Plan Year Ending | Benefit Payments | Employee Contributions | Employer Contributions | Investment Returns | Net Change in Plan Assets |
|------------------|------------------|------------------------|------------------------|--------------------|---------------------------|
| 2014 | \$11,094,968 | \$2,472,416 | \$5,509,350 | \$9,312,584 | \$6,199,382 |
| 2015 | 11,227,619 | 2,572,589 | 6,000,000 | 9,536,679 | 6,881,649 |
| 2016 | 12,031,000 | 2,676,820 | 6,300,000 | 9,988,601 | 6,934,421 |
| 2017 | 12,833,200 | 2,785,273 | 6,615,000 | 10,439,054 | 7,006,127 |
| 2018 | 13,580,583 | 2,898,119 | 6,946,350 | 10,890,675 | 7,154,561 |
| 2019 | 14,414,954 | 3,015,537 | 7,263,015 | 11,098,618 | 6,962,216 |
| 2020 | 15,188,953 | 3,137,711 | 7,472,297 | 11,609,647 | 7,030,702 |
| 2021 | 15,896,215 | 3,264,834 | 7,769,490 | 12,130,221 | 7,268,330 |
| 2022 | 16,636,411 | 3,397,107 | 8,078,502 | 12,667,951 | 7,507,149 |
| 2023 | 17,411,073 | 3,534,737 | 8,399,803 | 13,222,851 | 7,746,318 |
| 2024 | 18,221,806 | 3,677,943 | 8,733,883 | 13,794,861 | 7,984,881 |
| 2025 | 19,070,291 | 3,826,950 | 9,081,250 | 14,383,843 | 8,221,752 |
| 2026 | 19,958,285 | 3,981,993 | 9,442,432 | 14,989,568 | 8,455,708 |
| 2027 | 20,887,628 | 4,143,315 | 9,817,979 | 15,611,704 | 8,685,370 |
| 2028 | 21,860,244 | 4,311,173 | 10,208,461 | 16,249,806 | 8,909,196 |
| 2029 | 22,878,150 | 4,485,830 | 10,614,474 | 16,903,298 | 9,125,452 |
| 2030 | 23,943,454 | 4,667,561 | 11,036,633 | 17,571,465 | 9,332,205 |
| 2031 | 25,058,363 | 4,856,654 | 11,475,582 | 18,253,427 | 9,527,300 |
| 2032 | 26,225,187 | 5,053,406 | 11,931,989 | 18,948,130 | 9,708,338 |
| 2033 | 27,446,343 | 5,258,127 | 12,406,547 | 19,654,321 | 9,872,652 |
| 2034 | 28,724,362 | 5,471,141 | 12,899,979 | 20,370,529 | 10,017,287 |
| 2035 | 30,061,890 | 5,692,783 | 3,005,844 | 21,159,157 | (204,106) |
| 2036 | 31,461,700 | 5,923,402 | 3,123,017 | 21,065,108 | (1,350,173) |
| 2037 | 32,926,690 | 6,163,363 | 3,244,754 | 20,875,911 | (2,642,662) |
| 2038 | 34,459,897 | 6,413,043 | 3,371,233 | 20,579,697 | (4,095,924) |
| 2039 | 36,064,496 | 6,672,836 | 3,502,639 | 20,163,441 | (5,725,580) |
| 2040 | 37,743,813 | 6,943,151 | 3,639,163 | 19,612,864 | (7,548,635) |
| 2041 | 39,501,325 | 7,224,415 | 3,781,006 | 18,912,314 | (9,583,590) |
| 2042 | 41,340,675 | 7,517,071 | 3,928,373 | 18,044,657 | (11,850,574) |
| 2043 | 43,265,672 | 7,821,581 | 4,081,479 | 16,991,138 | (14,371,474) |

Exhibit 5 – Summary of Plan Provisions

This summary is prepared in accordance with Chapter 32 as of January 1, 2014, and does not take into account any subsequent changes.

Administration

Each of the 107 contributory retirement systems for public employees of the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts General Laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

Participation

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporary, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

- (i) Group 1: Most general employees in State and local government
- (ii) Group 2: Certain specified hazardous duty positions
- (iii) Group 3: State police officers and inspectors
- (iv) Group 4: Local police officers, firefighters, and designated employees of the municipal light department.

For members in more than one group, participation will be proportional.

Salary

Salary is defined as gross regular compensation. Salary does not include bonuses, overtime, severance pay, unused sick leave credit, or other similar compensation.

Member Contributions

Member contributions vary depending upon date hired as follows:

| Date of Hire | Member Contribution Rate |
|---------------------|--------------------------------------|
| Prior to 1975 | 5.0% of Salary |
| 1975 to 1983 | 7.0% of Salary |
| 1984 to 1996 | 8.0% of Salary |
| 1996 and Later plus | 9.0% of Salary |
| 1979 and Later | 2.0% of Salary in excess of \$30,000 |

The contribution rate for Group 1 participants hired on or after April 2, 2012 and who attain 30 years of service is reduced by three percentage points.

Exhibit 5 – Summary of Plan Provisions (continued)

Average Salary

Average salary is used to determine a participant's benefit. For those hired prior to April 2, 2012, it is defined as the average salary during the three consecutive-year period that produces the highest average. For those hired on or after April 2, 2012, it is defined as the average salary during the five consecutive-year period that produces the highest average. (Alternatively, if a greater amount results, it is the average rate of salary earned during the period or periods, whether or not consecutive, that constitutes the last three years, or five years if hired on or after April 2, 2012, preceding retirement.) For those hired on or after January 1, 2011, salary taken into account for benefit purposes is capped at 64% of the IRC Section 401(a)(17) limit (indexed).

Creditable Service

In general, creditable service is awarded during the period in which a member contributes to the retirement system.

Service Retirement

Eligibility

Group 1 members hired after April 1, 2012 are eligible for service retirement (also referred to as superannuation) upon attainment of age 60 and completion of ten years of creditable service.

For other members, one of the following conditions must be met:

- (i) completion of 20 years of service
- (ii) for an employee hired prior to January 1, 1978, attainment of age 55 as an active member
- (iii) for an employee hired on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service

Benefit Amount

The retirement allowance is determined as a product of the participant's Benefit Rate times Average Salary times Creditable Service, where Benefit Rate is determined from the following tables. The amount determined by the benefit formula cannot exceed 80% of the member's Average Salary. Any member who is a veteran also receives an additional annual retirement allowance of \$15 per year of creditable service, not exceeding \$300. This veteran allowance is paid in addition to the 80% maximum.

Exhibit 5 – Summary of Plan Provisions (continued)

For Actives Hired prior to April 2, 2012

| Age at Retirement | Fraction of Average Salary | | |
|-------------------|----------------------------|---------|---------|
| | Group 1 | Group 2 | Group 3 |
| 65 or Over | .025 | .025 | .025 |
| 64 | .024 | .025 | .025 |
| 63 | .023 | .025 | .025 |
| 62 | .022 | .025 | .025 |
| 61 | .021 | .025 | .025 |
| | | | |
| 60 | .020 | .025 | .025 |
| 59 | .019 | .024 | .025 |
| 58 | .018 | .023 | .025 |
| 57 | .017 | .022 | .025 |
| 56 | .016 | .021 | .025 |
| | | | |
| 55 | .015 | .020 | .025 |
| 57 | .014 | .014 | .024 |
| 53 | .013 | .013 | .023 |
| 52 | .012 | .012 | .022 |
| 51 | .011 | .011 | .021 |
| | | | |
| 50 | .010 | .010 | .020 |
| 49 | .009 | .009 | .019 |
| 48 | .008 | .008 | .018 |
| 47 | .007 | .007 | .017 |
| 46 | .006 | .006 | .016 |
| | | | |
| 45 | .005 | .005 | .015 |
| 44 | .004 | .004 | .004 |
| 43 | .003 | .003 | .003 |
| 42 | .002 | .002 | .002 |
| 41 | .001 | .001 | .001 |

For Actives Hired on or after April 2, 2012

| Age at Retirement | Group 1 | | Group 2 | | Group 4 | |
|-------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| | <30 Years of Creditable Service | 30+ Years of Creditable Service | <30 Years of Creditable Service | 30+ Years of Creditable Service | <30 Years of Creditable Service | 30+ Years of Creditable Service |
| 67 or over | .02500 | .02500 | .02500 | .02500 | .02500 | .02500 |
| 66 | .02350 | .02375 | .02500 | .02500 | .02500 | .02500 |
| 65 | .02200 | .02250 | .02500 | .02500 | .02500 | .02500 |
| 64 | .02050 | .02125 | .02500 | .02500 | .02500 | .02500 |
| 63 | .01900 | .02000 | .02500 | .02500 | .02500 | .02500 |
| 62 | .01750 | .01875 | .02500 | .02500 | .02500 | .02500 |
| 61 | .01600 | .01750 | .02350 | .02375 | .02500 | .02500 |
| 60 | .01450 | .01625 | .02200 | .02250 | .02500 | .02500 |
| 59 | N/A | N/A | .02050 | .02125 | .02500 | .02500 |
| 58 | N/A | N/A | .01900 | .02000 | .02500 | .02500 |
| 57 | N/A | N/A | .01750 | .01875 | .02500 | .02500 |
| 56 | N/A | N/A | .01600 | .01750 | .02350 | .02375 |
| 55 | N/A | N/A | .01450 | .01625 | .02200 | .02250 |

Deferred Vested Retirement

Eligibility

A participant who has completed ten or more years of creditable service is eligible for a deferred vested retirement benefit. If termination is involuntary, the participant is vested after six years. The benefit is payable upon attaining age 60 for Group 1 members hired after April 1, 2012 and age 55 for other members.

Benefit Amount

The participant's accrued benefit is payable commencing at age 55, or may be deferred until later at the employee's option.

Refund of Contributions

In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.

Exhibit 5 – Summary of Plan Provisions (continued)

Disability Retirement

Accidental Disability

Eligibility

Participants are eligible for an accidental disability benefit, regardless of service or age, if they become permanently and totally incapacitated for further duty as a result of personal injury sustained while in the performance of duties.

Benefit Amount

The accidental disability amount is 72% of annual salary plus \$648.48 per year for each child plus an additional annuity based upon accumulated Member Contributions with credited interest.

Ordinary Disability

Eligibility

An ordinary disability occurs when a member becomes permanently and totally disabled due to sickness or injury that is not job related. In order to be eligible for an ordinary disability benefit, a member must have ten years of service (and be less than age 55).

Benefit Amount

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55. If the member was a veteran, the benefit is 50% of the member's final rate of Salary during the preceding 12 months, plus an annuity based upon accumulated Member Contributions plus credited interest. If the participant is over age 55, he will receive not less than the superannuation allowance to which he is entitled.

Survivor Benefits

Occupational Death

The survivors of a member who dies due to an occupational injury will be entitled to a lump sum return of contributions plus a pension benefit equal to 72% of the participant's annual Salary.

Non-Occupational Death

Upon the death of a member other than due to an occupational injury, the designated beneficiary will be entitled to a retirement benefit as if Option C had been elected with a minimum of \$250 per month to the surviving spouse, plus \$120 for the first child, plus \$90 for each additional child. If no beneficiary is designated and if the employee worked two years, and is married at least one year, the spouse may elect benefits. If there is no designated beneficiary or surviving spouse, then member contributions are returned. If there are dependent children but no surviving spouse, they may elect minimum survivor benefits of \$250 per month plus \$120 for the first child and \$90 for each additional child.

Refund of Contributions

Upon the death of a member not entitled to survivor benefits, the beneficiary is entitled to a refund of all member contributions with interest.

Exhibit 5 – Summary of Plan Provisions (continued)

Cost-of-Living Increases

In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a cost-of-living adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees, and beneficiaries who have been receiving benefits payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$12,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the State and are not the liability of the Retirement System.

Postretirement Death Benefits

Any benefits following the death of a member after retirement are based upon the form of benefit the participant elected at the time of retirement. There are three available forms as follows:

(i) Option A

Life annuity

(ii) Option B

Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member

(iii) Option C

Life annuity with 66-2/3% of benefit continued after death of member to designated joint annuitant

Exhibit 6 – Actuarial Methods and Assumptions

The actuarial cost method, factors, and assumptions used in determining cost estimates are presented below.

Member Data

The member data used in the determination of cost estimates consist of pertinent information with respect to the active, inactive, retired, and disabled members of the employer as supplied by the employer to the actuary.

Valuation Date

January 1, 2014.

Actuarial Cost Method

The costs of the Plan have been determined in accordance with the individual entry age normal actuarial cost method.

Rate of Investment Return

It is assumed that the assets of the fund will accumulate at a compound annual rate of 8.00% per annum.

Salary Scale

The assumed annual rates for salary increases including longevity are illustrated by the following rates:

| Year | Rate |
|----------------|-------|
| 2014 | 3.00% |
| 2015 | 3.50% |
| 2016 | 3.50% |
| 2017 and later | 4.00% |

Cost-of-Living Increases

Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and \$12,000 per year.

Value of Investments

Assets held by the fund are valued at market value as reported by the Public Employees' Retirement Administration Commission (PERAC). The actuarial value of assets is determined using a five-year smoothing of asset returns greater than or less than the assumed rate of return, with a 20% corridor.

Annual Rate of Withdrawal Prior to Retirement

Based on an analysis of experience, the assumed annual rates of withdrawal may best be illustrated by the following rates at the following ages:

| Service | General Employees | Police and Fire Employees |
|---------|-------------------|---------------------------|
| 0 | 0.1500 | 0.0150 |
| 10 | 0.0540 | 0.0150 |
| 20 | 0.0200 | 0.0000 |
| 30 | 0.0000 | 0.0000 |

Exhibit 6 – Actuarial Methods and Assumptions (continued)

Annual Rate of Mortality

It is assumed that pre-retirement mortality is represented by the RP-2000 Mortality Table projected 15 years beyond the valuation date with Scale AA for males and females and post-retirement mortality is represented by the RP-2000 Mortality Table projected 7 years beyond the valuation using Scale AA for males and females. Mortality for disabled members is represented by the RP-2000 Mortality Table set forward two years for all disabled members. It is assumed that 80% of all deaths are ordinary (20% are service connected).

Service Retirement

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages:

| Age | Male | Female | Male and Female |
|-----|-------------------|-------------------|---------------------------|
| | General Employees | General Employees | Police and Fire Employees |
| 45 | 0.0000 | 0.0000 | 0.0100 |
| 46 | 0.0000 | 0.0000 | 0.0100 |
| 47 | 0.0000 | 0.0000 | 0.0100 |
| 48 | 0.0000 | 0.0000 | 0.0100 |
| 49 | 0.0000 | 0.0000 | 0.0100 |
| 50 | 0.0100 | 0.0150 | 0.0200 |
| 51 | 0.0100 | 0.0150 | 0.0200 |
| 52 | 0.0100 | 0.0200 | 0.0200 |
| 53 | 0.0100 | 0.0250 | 0.0500 |
| 54 | 0.0200 | 0.0250 | 0.0750 |
| 55 | 0.0200 | 0.0550 | 0.1500 |
| 56 | 0.0250 | 0.0650 | 0.1000 |
| 57 | 0.0250 | 0.0650 | 0.1000 |
| 58 | 0.0500 | 0.0650 | 0.1000 |
| 59 | 0.0650 | 0.0650 | 0.1500 |
| 60 | 0.1200 | 0.0500 | 0.2000 |
| 61 | 0.2000 | 0.1300 | 0.2000 |
| 62 | 0.3000 | 0.1500 | 0.2500 |
| 63 | 0.2500 | 0.1250 | 0.2500 |
| 64 | 0.2200 | 0.1800 | 0.3000 |
| 65 | 0.4000 | 0.1500 | 1.0000 |
| 66 | 0.2500 | 0.2000 | 1.0000 |
| 67 | 0.2500 | 0.2000 | 1.0000 |
| 68 | 0.3000 | 0.2500 | 1.0000 |
| 69 | 0.3000 | 0.2000 | 1.0000 |
| 70 | 1.0000 | 1.0000 | 1.0000 |

Note that these retirement rates are currently applied to all active members. Due to the implementation of the new provisions and retirement eligibilities under Chapter 176, it is possible that future experience may warrant a different set of assumptions for those members hired on or after April 2, 2012.

Exhibit 6 – Actuarial Methods and Assumptions (continued)

Annual Rate of Disability Prior to Retirement

Based on an analysis of experience, the assumed annual rates of disability may best be illustrated by the following probabilities at the following ages:

| Attained Age | General Employees | Police and Fire Employees |
|--------------|-------------------|---------------------------|
| 20 | 0.0001 | 0.0010 |
| 30 | 0.0003 | 0.0030 |
| 40 | 0.0010 | 0.0030 |
| 50 | 0.0019 | 0.0125 |

In addition, it is assumed for the general employees that 40% of all disabilities are ordinary (60% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected). A load was applied to the accidental disability liability to account for the additional benefit payable for each dependent child upon the member's disability. Loads of approximately 2% and 11.7% were developed for Group 1 and Group 4, respectively, taking into account the higher likelihood of Group 4 accidental disabilities at younger ages, thus the likelihood of Group 4 having more dependent children than Group 1 accidental disability retirees.

Family Composition

It is assumed that 80% of all members will be survived by a spouse and that females (males) are three years younger (older) than members.

Administrative Expenses

The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for fiscal year 2014 is \$450,000 and is anticipated to increase at 4.0% per year.

Exhibit 7 – Glossary of Terms

This glossary summarizes the technical terms contained in this report.

Actuarial Accrued Liability

That portion of the Actuarial Present Value of plan benefits that is not provided for by future employer Normal Costs or employee contributions.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting the Retirement System such as:

- Rates of investment returns
- Increases in a member's salary
- Inflation
- The probability of mortality, turnover, disablement
- Retirement at each age and other relevant items

Actuarial Cost Method

A procedure for allocating the Actuarial Present Value of pension plan benefits between Normal Cost and Actuarial Accrued Liability.

Actuarial Present Value

The single sum amount required at the valuation date that is required to provide for anticipated future events based upon the terms of the plan and the Actuarial Assumptions.

Forecast

A projection of future benefit payments or contribution requirements based upon the terms of the plan, the current asset amounts, the Actuarial Assumptions, and additional assumptions as to the replacement of terminating employees with new employees.

Normal Cost

That portion of the Actuarial Present Value of future benefits that is assigned to the current year.

Unfunded Actuarial Accrued Liability

That portion of the Actuarial Accrued Liability that is not provided for by current actuarial value of assets.

Valuation Method

The method used to divide the cost of future benefits among the Actuarial Accrued Liability, the current year's Normal Costs, and future years' Normal Costs. The resulting current funding requirement is then determined as the current year's Normal Cost plus the payment necessary to amortize the Unfunded Actuarial Liability.

Vested Liability

That portion of the Actuarial Present Value of Accrued Benefits that a member would be entitled to if the member terminated employment with the employer as of the valuation date.

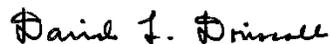
Certification

Use of this report for any other purpose may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. No one may make any representations or warranties based on any statements or conclusions contained in this report without the written consent of Buck Consultants.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions, applicable law or regulations. Because of limited scope, Buck performed no analysis of the potential range of such future differences.

This report fairly represents the actuarial position of the City of Woburn Retirement System as of January 1, 2014, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost are reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience. The valuation was performed by, and under the supervision of actuaries who have experience in performing valuations for public retirement systems. David Driscoll is a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. Hilja Viidemann is also a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. They both meet the Qualification Standards of the Academy to render the actuarial opinions contained herein. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions concerning it.

Buck Consultants, LLC



David L. Driscoll, FSA, EA, MAAA
Principal, Retirement



Hilja Viidemann, FSA, MAAA, EA
Senior Consultant and Consulting Actuary

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