January 1, 2014

# Actuarial Valuation Report

# Fitchburg Retirement Board

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October 17, 2014

Fitchburg Retirement Board
c/o City Hall
166 Boulder Drive
Fitchburg, MA 01420

Dear Fitchburg Retirement Board:

Stone Consulting, Inc. has performed a January 1, 2014 actuarial valuation of the Fitchburg Retirement System. This valuation and report was prepared using generally accepted actuarial principles and practices and meets the parameters set by the Governmental Accounting Standards Board Statement (GASB) No. 27. To the best of our knowledge, this report is complete and accurate, and the assumptions used represent our best estimate of anticipated experience of the system.

As part of performing the valuation, Stone Consulting, Inc. was furnished member data by the Fitchburg Retirement System's administrative staff. Although examined for general reasonableness, the data was not audited by the actuary. In addition, the administrative staff furnished financial statements that were not audited by the actuary or by the plan's auditors.

The funding objective of the plan is to fully fund the system while attempting to maintain a stable contribution amount for the upcoming fiscal year that is consistent with prior funding schedules or if employer finances allow it, to increase the contribution amount. This funding objective is being met.

We anticipate over time the contribution level to increase as a percentage of payroll. The contribution rate is determined by adding the normal cost plus an amortization of the unfunded actuarial accrued liability. The normal cost is expected to remain at a level percentage of payroll. The length of the funding schedule contained in this actuarial valuation report is seventeen years (fully funded by 2032). The contributions are structured to increase the total contribution by 6.00% each year.

The maximum length of the amortization is until Fiscal 2040. These limits are contained in Section 22F of Chapter 32 of the Massachusetts General Laws and related statutes.

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The contribution amount for Fiscal Year 2016 is $9,978,292 which is $196,773 more than the anticipated contribution amount from the prior funding schedule. PERAC and GASB guidelines indicate that actuarial valuations should be conducted at least every other year. The Fitchburg Retirement Board conducted their previous actuarial valuation effective January 1, 2012.

We are pleased to present the results of this valuation. If the Retirement Board has any questions on the content of this report, we would be glad to respond. Please note that this report is meant to be used in its entirety. Use of excerpts of this report may result in inaccurate or misleading understanding of the results.

I, Lawrence Stone, am a consultant for Stone Consulting, Inc. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
STONE CONSULTING, INC.
Actuaries for the Plan

Lawrence B. Stone
Member, American Academy of Actuaries

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## Introduction

This report presents the results of the actuarial valuation of the Fitchburg Retirement System. The valuation was performed at the request of the Retirement Board as of January 1, 2014 for the purpose of determining the contribution requirements for Fiscal Year 2016 and beyond. The contribution requirements are based on:

- The financial condition of the system as of December 31, 2013
- The benefit provisions of M.G.L. Chapter 32 and related statutes;
- The demographics of members in the system (i.e., active and inactive participants, retirees and beneficiaries as of January 1, 2014);
- Economic assumptions regarding salary increases and investment earnings; and
- Other actuarial assumptions (e.g., withdrawals, retirement, death, etc.)

### January 1, 2014 Valuation Summary

| | January 1, 2014 | January 1, 2012 | Change |
|---|---|---|---|
| Contribution Fiscal 2016 | $9,978,292 | $9,781,519 | $196,773 |
| Funding Schedule Length | 17 years | 20 years | -3 years |
| Amortization Increase | N/A | 4.50% | N/A |
| Funding Ratio | 42.5% | 42.0% | 0.5% |
| Interest Rate Assumption | 7.95% | 7.95% | 0.0% |
| Salary Increase Rate Assumption | 4.25% | 4.25% | 0.0% |

- The Fiscal Year 2016 contribution is $196,773 more than the planned 2016 contribution. Stone Consulting, with agreement from the Retirement Board, values assets using a three-year asset smoothing method. In this approach, asset gains and losses are recognized over a three-year period. The purpose of this approach is to avoid wide swings in asset value from one year to the next. This consistent with the method used in the prior valuation.

- The System, over the two-year period from January 1, 2012 through December 31, 2013, experienced a 13.4% annual return on the market value of assets versus our assumption of a 7.95% return which resulted in an $8,908,058 net actuarial gain. The annual rate of return on the actuarial value of assets (based on three-year asset smoothing) was 8.2%. The System's asset portfolio, effective December 31, 2013 is approximately 80% equities and 20% fixed income and short-term investments. The interest rate assumption was maintained at 7.95% to reflect anticipated market performance.

- The salary increase assumption of 4.25% has been maintained from the prior valuation. Total compensation changed by 2.0% over the prior valuation; however average annual compensation (compensation divided by number of active members) changed by 3.4%.

- The funding level of the Fitchburg Retirement System is 42.5% compared to 42.0% for the January 1, 2012 actuarial valuation. Chapter 68 requires a minimum funding ratio of 65% along with additional criteria in order to avoid being labeled an "under performing system". The funding level is estimated to be below the median of Massachusetts' Contributory Retirement Systems.

The schedule length is seventeen (17) years, requiring the use of Section 22F of the Massachusetts General Laws, Chapter 32. The maximum period permitted under Section 22F of Chapter 32 of the Massachusetts General Laws is 25 years (2040). The contributions have been set so that each will be 6.00% higher than the prior year's contribution, until 2032, when the contribution decreases.

- Non-economic assumptions were changed from the January 1, 2012 actuarial valuation. The mortality assumption is based upon Generational Mortality with scale BB. The previous assumption used the RP2000 Table projected 17 years. The net effect of this change increased the accrued liability by $8.2 million.

## January 1, 2014 Actuarial Valuation Results

| | January 1, 2014 | January 1, 2012 | Percentage Change |
|---|---|---|---|
| Funding | | | |
| Contribution for Fiscal 2016 | $9,978,292 | | |
| Contribution for Fiscal 2016 based on current schedule | | $9,781,519 | 2.0% |
| Members * | | | |
| ▪ Actives | | | |
| a. Number | 605 | 613 | -1.3% |
| b. Annual Compensation | $27,602,569 | $27,048,895 | 2.0% |
| c. Average Annual Compensation | $45,624 | $44,125 | 3.4% |
| d. Average Attained Age | 47.2 | 48.1 | -1.8% |
| e. Average Past Service | 12.6 | 12.7 | -0.5% |
| ▪ Retired, Disabled and Beneficiaries | | | |
| a. Number | 549 | 540 | 1.7% |
| b. Total Benefits* | $12,873,363 | $12,124,801 | 6.2% |
| c. Average Benefits* | $23,449 | $22,453 | 4.4% |
| d. Average Age | 72.7 | 72.6 | 0.1% |
| ▪ Inactives | | | |
| a. Number | 128 | 92 | 39.1% |
| Normal Cost | | | |
| a. Total Normal Cost as of January 1, 2014 | $3,526,949 | $3,311,694 | 6.5% |
| b. Less Expected Members' Contributions | 2,492,754 | 2,436,136 | 2.3% |
| c. Normal Cost to be funded by the Municipality | $1,034,195 | $875,558 | 18.1% |
| d. Adjustment to July 1, 2015 | 66,626 | 56,406 | 18.1% |
| e. Administrative Expense Assumption | 195,990 | 177,225 | 10.6% |
| f. Normal Cost Adjusted to July 1, 2015 | $1,296,811 | $1,109,189 | 16.9% |
| Actuarial Accrued Liability as of January 1, 2014 | | | |
| a. Active Members | $84,918,026 | $76,789,766 | 10.6% |
| b. Inactive Members | 1,063,071 | 960,046 | 10.7% |
| c. Retired Members and Beneficiaries | 126,616,195 | 116,015,096 | 9.1% |
| d. Total | $212,597,292 | $193,764,908 | 9.7% |
| Unfunded Actuarial Accrued Liability | | | |
| a. Actuarial Accrued Liability as of January 1, 2014 | $212,597,292 | $193,764,908 | 9.7% |
| b. Less Actuarial Value of Assets as of January 1, 2014 | 90,317,974 | 81,375,739 | 11.0% |
| c. Unfunded Actuarial Accrued Liability as of January 1, 2014 | $122,279,318 | $112,389,169 | 8.8% |
| d. Adjustment to July 1, 2015 | 6,625,344 | 6,451,122 | |
| e. Unfunded Actuarial Accrued Liability as of July 1, 2015 | $128,904,662 | $118,840,291 | |

*Excluding State reimbursed COLA

## Demographic Information

| Members | January 1, 2014 | Percentage Change |
|---|---|---|
| ▪ Actives | | |
| a. Number | 605 | -1.3% |
| b. Annual Compensation | $27,602,569 | 2.0% |
| c. Average Annual Compensation | $45,624 | 3.4% |
| d. Average Attained Age | 47.2 | -1.8% |
| e. Average Past Service | 12.6 | -0.5% |
| ▪ Retired, Disabled and Beneficiaries | | |
| a. Number | 549 | 1.7% |
| b. Total Annual Retirement Allowance excluding State-reimbursed COLA | $12,873,363 | 6.2% |
| ▪ Inactives | | |
| a. Number | 128 | 39.1% |

- The data was supplied by the Fitchburg Retirement Board. The data was checked under broad parameters for reasonableness. With the assistance of the staff of the Fitchburg Retirement Board, we were able to develop a database sufficient for valuation purposes.

## History of Active Participants

| Valuation Year | Number | Average Age | Average Past Service | Average Ann'l Compensation |
|---|---|---|---|---|
| 2014 | 605 | 47.2 | 12.6 | $45,624 |
| 2012 | 613 | 48.1 | 12.7 | $44,125 |
| 2010 | 589 | 49.2 | 13.8 | $44,398 |
| 2008 | 661 | 48.3 | 13.1 | $42,922 |
| 2006 | 713 | 47.0 | 11.8 | $39,949 |
| 2004 | 691 | 46.6 | 11.4 | $36,696 |
| 2002 | 802 | 45.1 | 10.4 | $33,065 |
| 2000 | 740 | 45.1 | 10.7 | $29,689 |

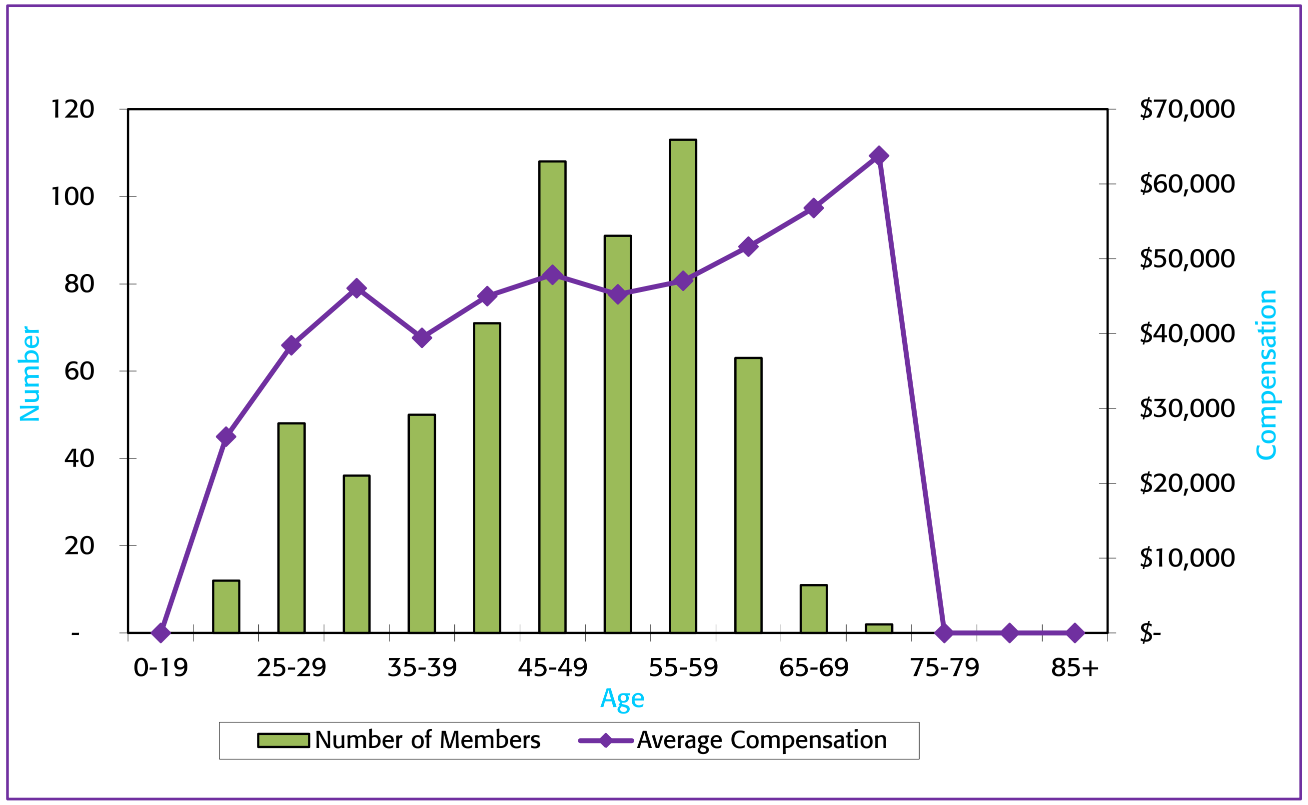
- Employee age has increased by 2.1 years and service has increased by 1.9 years over the course of the past fourteen years.  This is somewhat consistent with the trend in the Commonwealth towards an aging of the employee population. Over the past 4 years, there has been a significant reduction in average age and service in the active members. We have noticed that the aging trend has started to turn in some communities. We attribute this change to an increase in hiring. Average annual compensation has grown by 53.7% (3.1% annually) over the course of the past fourteen years.

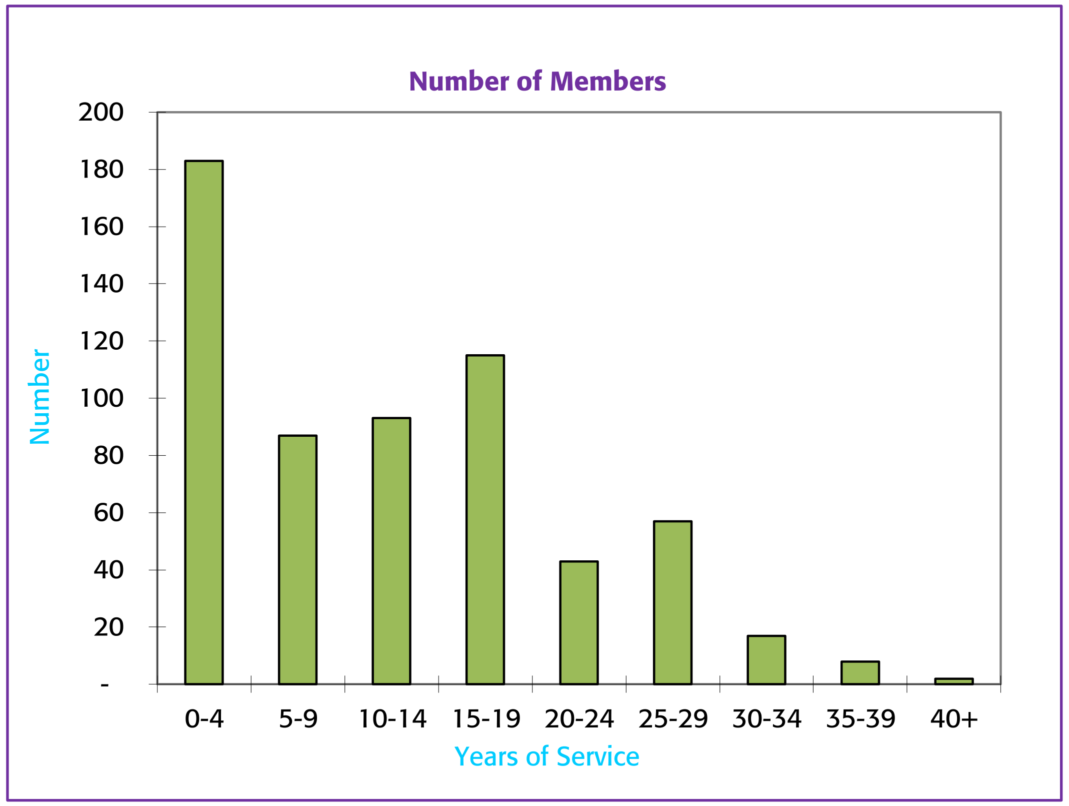
The charts on the following pages summarize demographic information regarding active and retiree members.

## Distribution of Plan Members as of January 1, 2014

Active Members

| AGE | 0-4 Years | 5-9 Years | 10-14 Years | 15-19 Years | 20-24 Years | 25-29 Years | 30-34 Years | 35-39 Years | 40 + Years | Total | Total Compensation | Average Compensation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-19 | - | - | - | - | - | - | - | - | - | - | $ - | $ - |
| 20-24 | 12 | - | - | - | - | - | - | - | - | 12 | 314,819 | 26,235 |
| 25-29 | 47 | 1 | - | - | - | - | - | - | - | 48 | 1,845,660 | 38,451 |
| 30-34 | 20 | 12 | 4 | - | - | - | - | - | - | 36 | 1,658,829 | 46,079 |
| 35-39 | 24 | 10 | 12 | 4 | - | - | - | - | - | 50 | 1,972,261 | 39,445 |
| 40-44 | 22 | 13 | 11 | 25 | - | - | - | - | - | 71 | 3,196,454 | 45,020 |
| 45-49 | 34 | 10 | 13 | 21 | 21 | 9 | - | - | - | 108 | 5,170,771 | 47,878 |
| 50-54 | 13 | 19 | 16 | 17 | 5 | 19 | 2 | - | - | 91 | 4,118,974 | 45,263 |
| 55-59 | 7 | 16 | 23 | 26 | 14 | 12 | 10 | 5 | - | 113 | 5,319,398 | 47,074 |
| 60-64 | 4 | 5 | 12 | 18 | 2 | 13 | 5 | 2 | 2 | 63 | 3,253,060 | 51,636 |
| 65-69 | - | 1 | 1 | 3 | 1 | 4 | - | 1 | - | 11 | 624,775 | 56,798 |
| 70-74 | - | - | 1 | 1 | - | - | - | - | - | 2 | 127,568 | 63,784 |
| 75-79 | - | - | - | - | - | - | - | - | - | - | - | - |
| 80-84 | - | - | - | - | - | - | - | - | - | - | - | - |
| 85+ | - | - | - | - | - | - | - | - | - | - | - | - |
| TOTAL | 183 | 87 | 93 | 115 | 43 | 57 | 17 | 8 | 2 | 605 | $ 27,602,569 | $ 45,624 |



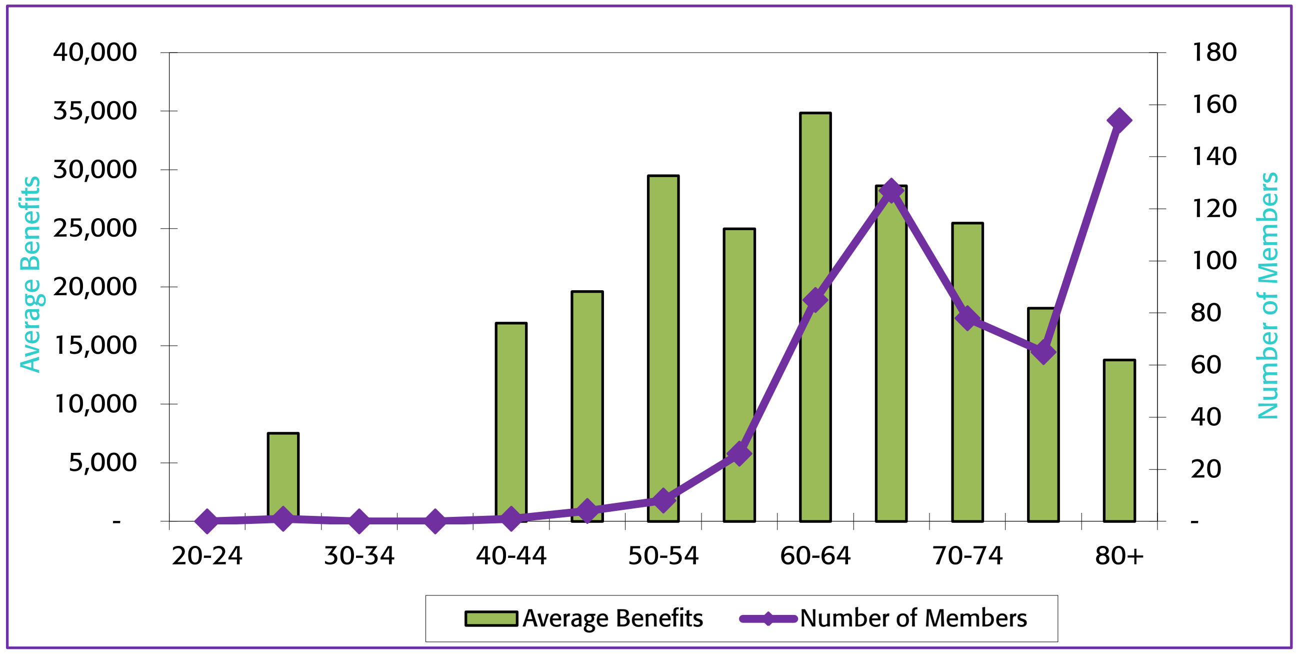
## Distribution of Plan Members as of January 1, 2014

Retired Members

| Retired Members and Beneficiaries | | | |
|---|---|---|---|
| Age | Number | Average Benefit | Total Benefit |
| 20-24 | - | - | - |
| 25-29 | 1 | 7,502 | 7,502 |
| 30-34 | - | - | - |
| 35-39 | - | - | - |
| 40-44 | 1 | 16,915 | 16,915 |
| 45-49 | 3 | 16,165 | 48,496 |
| 50-54 | 4 | 24,734 | 98,935 |
| 55-59 | 19 | 18,814 | 357,467 |
| 60-64 | 75 | 34,656 | 2,599,202 |
| 65-69 | 109 | 28,488 | 3,105,242 |
| 70-74 | 69 | 24,570 | 1,695,305 |
| 75-79 | 60 | 17,902 | 1,074,143 |
| 80+ | 149 | 13,867 | 2,066,211 |
| **TOTAL** | **490** | **$ 22,591** | **$ 11,069,416** |

| Disabled Members | | | |
|---|---|---|---|
| Age | Number | Average Benefit | Total Benefit |
| 20-24 | - | - | - |
| 25-29 | - | - | - |
| 30-34 | - | - | - |
| 35-39 | - | - | - |
| 40-44 | - | - | - |
| 45-49 | 1 | 29,936 | 29,936 |
| 50-54 | 4 | 34,238 | 136,952 |
| 55-59 | 7 | 41,678 | 291,746 |
| 60-64 | 10 | 36,266 | 362,660 |
| 65-69 | 18 | 29,440 | 529,922 |
| 70-74 | 9 | 32,117 | 289,052 |
| 75-79 | 5 | 21,748 | 108,741 |
| 80+ | 5 | 10,988 | 54,940 |
| **TOTAL** | **59** | **$ 30,575** | **$ 1,803,947** |

| Total | | | |
|---|---|---|---|
| Age | Number | Average Benefit | Total Benefit |
| 20-24 | - | - | - |
| 25-29 | 1 | 7,502 | 7,502 |
| 30-34 | - | - | - |
| 35-39 | - | - | - |
| 40-44 | 1 | 16,915 | 16,915 |
| 45-49 | 4 | 19,608 | 78,431 |
| 50-54 | 8 | 29,486 | 235,887 |
| 55-59 | 26 | 24,970 | 649,212 |
| 60-64 | 85 | 34,845 | 2,961,861 |
| 65-69 | 127 | 28,623 | 3,635,164 |
| 70-74 | 78 | 25,440 | 1,984,356 |
| 75-79 | 65 | 18,198 | 1,182,884 |
| 80+ | 154 | 13,774 | 2,121,151 |
| **TOTAL** | **549** | **$ 23,449** | **$ 12,873,363** |




Benefits shown are net of State reimbursed COLA.

## Valuation Methodology

Stone Consulting, Inc. used the Entry Age Normal actuarial funding method in this actuarial valuation. The use of the Entry Age Normal actuarial funding method is consistent with the requirements of Chapter 32 of the Massachusetts General Laws.

### NORMAL COST

| | January 1, 2014 | % of Payroll* |
|---|---|---|
| Gross Normal Cost (GNC) | $3,526,949 | 12.8% |
| Employees Contribution | $2,492,754 | 9.0% |
| Net Normal Cost (NNC) | $1,034,195 | 3.7% |
| Adjusted to Beginning of Fiscal Year 2016 | $66,626 | |
| Administrative Expense | $195,990 | 0.7% |
| Adjusted Net Normal Cost With Admin. Expense | $1,296,811 | |

*Payroll paid in 2013 for employees as of January 1, 2014 is $27,602,569. Payroll for new hires in 2013 was annualized.

- The gross normal cost (GNC) is the “price” of benefits accruing in the current year if the assumptions underlying the normal cost were realized.

- An individual normal cost represents that part of the cost of a member’s future benefits that 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 withdrawals) are included in this calculation.

- Anticipated employee contributions to be made during the year are subtracted from the GNC to determine employer normal cost, or net normal cost (NNC).

- Administrative expenses added to the NNC. The administrative expense does not include investment manager and custodial fees. These fees are considered part of the interest rate assumption that is net of fees.

### Actuarial Accrued Liability and Funded Status

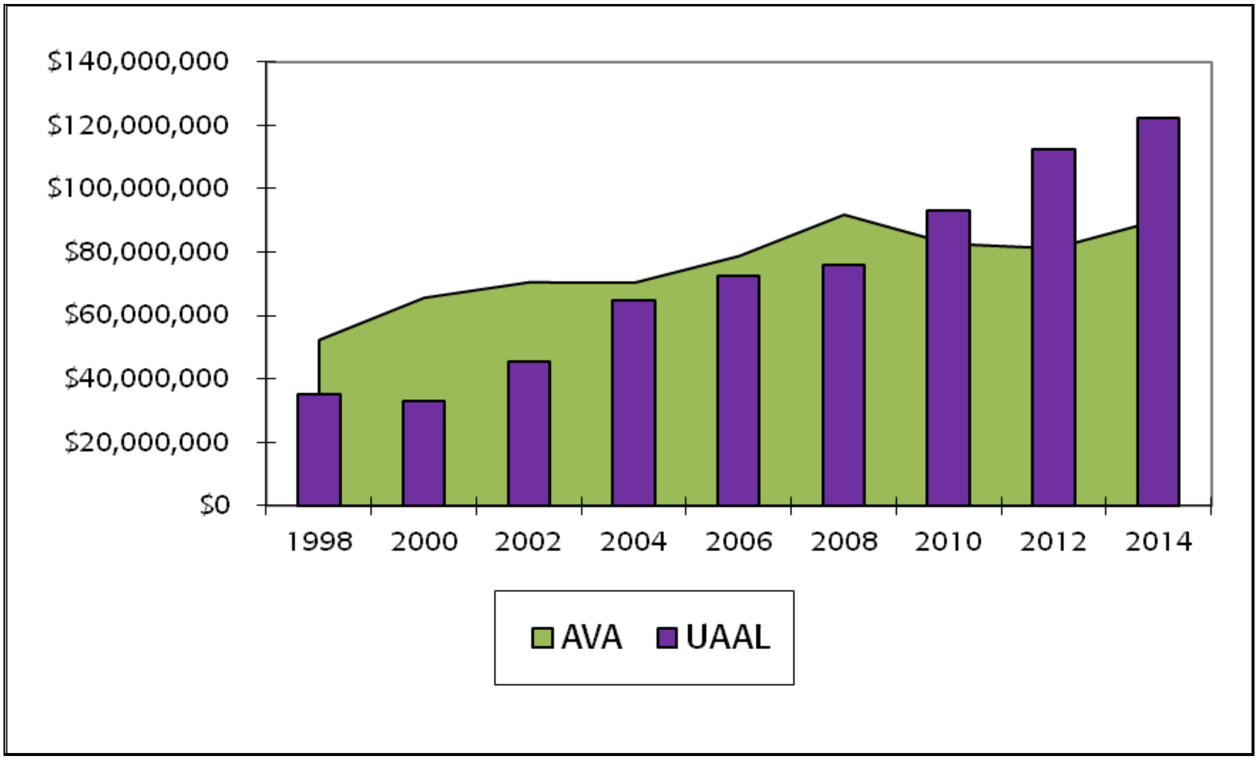
| | | | January 1, 2014 | Percentage Change |
|---|---|---|---|---|
| Active Actuarial Accrued Liability | | $ | 84,918,026 | 10.6% |
| Superannuation | $ 77,756,594 | | | |
| Death | $ 1,640,888 | | | |
| Disability | $ 4,995,306 | | | |
| Withdrawal | $ 525,238 | | | |
| | | | | |
| Retiree, Inactive, Survivor and Beneficiary Actuarial Accrued Liability | | $ | 127,679,266 | 9.2% |
| Retirees and Beneficiaries | $ 106,478,855 | | | |
| Disabled | $ 20,137,340 | | | |
| Inactive | $ 1,063,071 | | | |
| | | | | |
| Total Actuarial Accrued Liability (AAL) | | $ | 212,597,292 | 9.7% |
| | | | | |
| Actuarial Value of Assets (AVA) | | $ | 90,317,974 | 11.0% |
| | | | | |
| Unfunded Actuarial Accrued Liability | | $ | 122,279,318 | 8.8% |
| | | | | |
| Funded Ratio (AVA / AAL) | | | | |
| 2014 (7.95% interest rate): | 42.5% | | | |
| 2012 (7.95% interest rate): | 42.0% | | | |

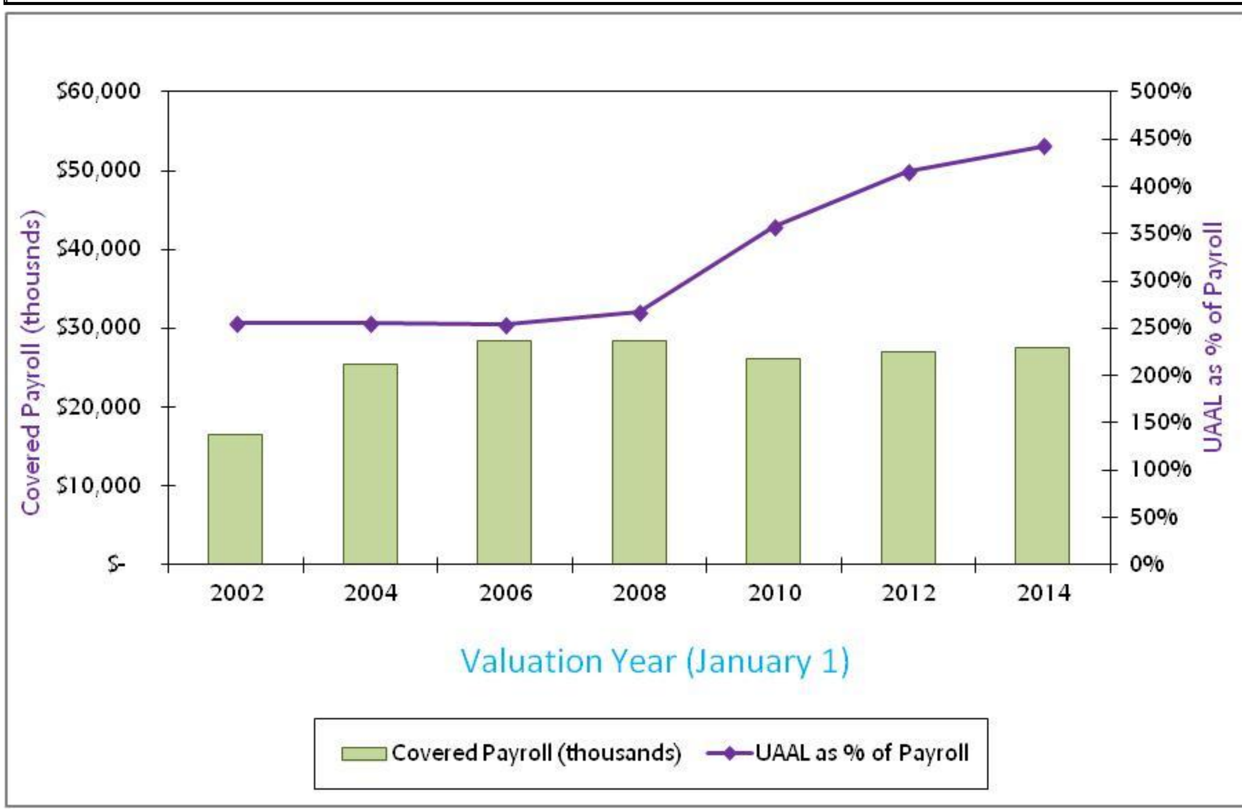
- Actuarial Accrued Liability (AAL) is the "price" of benefits attributable to benefits earned in past years, or in other words, represents today's value of all benefits earned by active and inactive members.

- The total AAL is $212,597,292. This along with an actuarial value of assets of $90,317,974 produces a funded status of 42.5%. This compares to a funded status of 42.0% for the 2012 valuation.

The chart on the following page is a history of the unfunded actuarial accrued liability (UAAL) and the valuation assets (AVA) over the course of the past nine actuarial valuations.

### History of Actuarial Valuation of Assets (AVA) and Unfunded Actuarial Accrued Liability (UAAL)



## Development of Funding Schedule

| | |
|---|---|
| Net Employer Normal Cost for Fiscal 2016 | $1,296,811 |
| Net 3(8)(c) Payments | $ 161,229 |
| Amortization | $8,520,252 |
| Total Appropriation required for Fiscal 2016 | $9,978,292 |

- The funding schedule is composed of the normal cost, the net 3(8)(c) payments and the amortization of the actuarial accrued unfunded liability and is adjusted by the administrative expense assumption. The contribution is assumed to be made at the beginning of the Fiscal Year. The 3(8)(c) payments are the amount that the Fitchburg Retirement System pays to or receives from other retirement boards for service that a retiree had with a different retirement system. The net 3(8)(c) payments is the difference between what the Fitchburg Retirement System paid out minus what was received by the System.

- The contribution amount for Fiscal 2016 is $9,978,292. The funding schedule is presented on page 11. The schedule's length is seventeen (17) years (for the fresh start base), using Section 22F of MGL Chapter 32.

- In developing the funding schedule, we used a fresh start approach in which the unfunded actuarial accrued liability (UAAL), other than the UAAL due to past early retirement incentives, is reamortized instead of maintaining the existing amortization amount and separately amortizing the actuarial gain or loss. The use of a fresh-start approach can result in a funding schedule in which the changes in contribution amounts from year to year are more consistent. The amortization is adjusted each year to maintain a constant increase in the total contribution. The contribution increases 6.00% a year from Fiscal 2016 through 2031. The contribution in FY 2032 decreases.

- Future contributions will be affected by the deferred net gains. At the time of the next valuation, as of January 1, 2016, there will be $4,681,669 of net gains recognized, decreasing the UAAL by that amount. This has been reflected in the funding schedule shown on the following page.

## FUNDING SCHEDULE

| Fiscal Year | Normal Cost | Unfunded Liability * | Funding Amortization of UAAL | Net 3(8)(c) Payments | Schedule Contribution ** |
|---|---|---|---|---|---|
| 2016 | 1,296,811 | 128,904,662 | 8,520,252 | 161,229 | 9,978,292 |
| 2017 | 1,351,925 | 129,954,971 | 9,063,836 | 161,229 | 10,576,990 |
| 2018 | 1,409,382 | 125,820,311 | 9,640,998 | 161,229 | 11,211,609 |
| 2019 | 1,469,281 | 125,415,569 | 10,253,796 | 161,229 | 11,884,306 |
| 2020 | 1,531,725 | 124,317,134 | 10,904,410 | 161,229 | 12,597,364 |
| 2021 | 1,596,824 | 122,429,036 | 11,595,153 | 161,229 | 13,353,206 |
| 2022 | 1,664,689 | 119,645,176 | 12,328,480 | 161,229 | 14,154,398 |
| 2023 | 1,735,438 | 115,848,374 | 13,106,995 | 161,229 | 15,003,662 |
| 2024 | 1,809,194 | 110,909,318 | 13,933,459 | 161,229 | 15,903,882 |
| 2025 | 1,886,085 | 104,685,440 | 14,810,801 | 161,229 | 16,858,115 |
| 2026 | 1,966,244 | 97,019,673 | 15,742,129 | 161,229 | 17,869,602 |
| 2027 | 2,049,809 | 87,739,109 | 16,730,740 | 161,229 | 18,941,778 |
| 2028 | 2,136,926 | 76,653,534 | 17,780,130 | 161,229 | 20,078,285 |
| 2029 | 2,227,745 | 63,553,839 | 18,894,008 | 161,229 | 21,282,982 |
| 2030 | 2,322,424 | 48,210,288 | 20,076,308 | 161,229 | 22,559,961 |
| 2031 | 2,421,127 | 30,370,632 | 21,331,203 | 161,229 | 23,913,559 |
| 2032 | 2,524,025 | 9,758,064 | 9,758,064 | 161,229 | 12,443,318 |
| 2033 | 2,631,296 | 0 | 0 | 161,229 | 2,792,525 |

### Amortization of Unfunded Liability as of July 1, 2015

| Year | Type | Original Amort. Amount | Percentage Increasing | Original # of Years | Current Amort. Amount | Years Remaining |
|---|---|---|---|---|---|---|
| 2006 | ERI2003 - City | 284,849 | 0.0% | 15 | 284,849 | 5 |
| 2016 | Fresh Start | N/A | N/A | 17 | N/A | 17 |

<u>Notes on Amortization of Unfunded Liability</u>

**Year is the year the amortization base was established.**
**Type is the reason for the creation of the base. Examples are Gain/(Loss) or Fresh Start.**
**Original Amortization Amount is the annual amortization amount when the base was established.**
**Percentage Increasing is the percentage that the Original Amortization Amount increases per year.**
**Original # of Years is the number of years over which the base is being amortized.**
**Current Amortization Amount is the amortization payment amount for this year.**
**Years Remaining is the number of years left to amortize the base.**

*** Includes unrecognized actuarial gains of $4,681,669 that will be recognized in Fiscal 2018**

**** Fresh Start amortization is set to be the amount needed to result in an adjusted payment which is 6% higher than the prior fiscal year for the next 16 years with a smaller payment in year 17.**

## Assumptions and Methodology Summary

The principal actuarial assumptions used in this valuation are the same as the assumptions used in the previous valuation, except where noted, and are summarized in the following table:

| | |
|---|---|
| Valuation Date | January 1, 2014 Valuation |
| Interest Rate | 7.95% (same as prior valuation). |
| Salary Increase | 4.25% (same as prior valuation). |
| COLA | 3% of $12,000 |
| COLA Frequency | Granted every year |
| Mortality | RP2000 table (sex-distinct) projected with generational mortality with scale BB. During employment healthy employee table is used. Post-employment the healthy annuitant table is used. For members retired under an Accidental Disability (job-related), 40% of deaths are assumed to be from the same cause as the disability. Disabled mortality table is RP2000 table (sex-distinct) for healthy annuitants, projected with generational mortality with scale BB, ages set forward 2 years. (Prior valuation used the same RP-2000 mortality tables projected 17 years with Scale AA.) |
| Overall Disability | Groups 1 and 2<br>45% ordinary disability<br>55% accidental disability<br><br>Group 4<br>10% ordinary disability<br>90% accidental disability |
| Retirement Rates | Groups 1 and 2<br>Ages 55 – 70<br><br>Group 4<br>Ages 50 – 65 |
| Administrative Expense | $195,990 budget estimated for FY 2016 provided by Fitchburg Retirement Board. |

## Assets

| | | | |
|---|---|---|---|
| a. | Cash | $ | 588,627.01 |
| b. | Pooled Real Estate Funds | | 1,709,237.00 |
| c. | PRIT Fund | | 92,704,320.06 |
| d. | Sub-Total: | $ | 95,002,184.07 |
| | | | |
| e. | Accounts Receivable | | 4,962.50 |
| f. | Accounts Payable | | (7,503.29) |
| g. | Interest Due and Accrued | | .00 |
| h. | Sub-Total: | $ | (2,540.79) |
| | | | |
| i. | Market Value of Assets [(d) + (h)] | $ | 94,999,643.28 |

- We were furnished with the System's annual report by the Board. The market value of assets as of December 31, 2013 (adjusted for payables and receivables) is $94,999,643.28.

- The asset allocation is approximately 20% fixed income, cash, receivables and payables and 80% equities. Historically, 10 to 11% has been the expected long-term rate of return for equities, and 6% to 7% has been the expected long-term rate of return for fixed income securities. Many economists and investment professionals are projecting lower returns of 6.25% to 9.00% for equities and 3.65% to 6.00% for fixed income securities. In light of these projections, as well as historical investment returns, the 7.95% interest rate assumption is within the reasonable assumption range. We encourage close monitoring for changes in investment performance against expectations.

- Actuarial value of assets (AVA) of $90,317,974 is based on a three-year smoothing method. Investment gains or losses above or below the expected rate of investment return are recognized over 3 years, 33% per year. The AVA must be no more than 115% of the market value of assets and no less than 85% of the market value of assets.

## Calculation of Valuation Assets as of January 1, 2014

### 3-YEAR PHASE-IN OF GAINS AND LOSSES

1. Market value of assets including receivable/payable as of 01/01/2014 — $94,999,643.28

2. Phase-in of asset gains and losses

| | Plan Year (1) | Original Amount (2) | Percent Unrecognized (3) | Amount Unrecognized (2) x (3) |
|---|---|---|---|---|
| a. | 2013 | $5,136,813 | 67% | $3,424,714 |
| b. | 2012 | $3,771,245 | 33% | $1,256,956 |
| c. | 2011 | ($6,450,751) | 0% | $0 |
| d. | 2010 | $2,168,159 | 0% | $0 |
| | | | | |
| e. | Total | | | $4,681,669 |

3. Valuation assets without corridor as of 01/01/2014 (1. - 2.e.) — $90,317,974

4. Corridor Check
   a. 85% of Market Value — $80,749,697
   b. 115% of Market Value — $109,249,590

5. Valuation assets with corridor as of 01/01/2014 — $90,317,974
   3. within Corridor

6. Calculation of return on valuation assets
   a. Valuation assets as of 01/01/2013 — $81,375,739
   b. ER contribs + EE contribs - Ben Pymts - Expenses — $(4,562,543)
   c. Actual return on valuation assets 5. - (6.a. + 6.b.) — $13,504,778
   d. Weighted value of valuation assets — $79,233,699
   e. Return on valuation assets 6.c. / 6.d. — 17.0%
   f. Annualized return on assets — 8.2%

## Disclosure Information Under GASB Statement 25

### SCHEDULES OF FUNDING PROGRESS
(Dollars In Thousands)

| Actuarial Valuation Date | Actuarial Value of Assets A | Actuarial Accrued Liability B | Unfunded AAL (UAAL) B-A | Funded Ratio A/B | Covered Payroll C | UAAL as a % of Covered Payroll (B-A)/C |
|---|---|---|---|---|---|---|
| 1/1/2014 | $90,318 | $212,597 | $122,279 | 42.5% | $27,603 | 443% |
| 1/1/2012 | $81,376 | $193,765 | $112,389 | 42.0% | $27,049 | 416% |
| 1/1/2010 | $82,821 | $176,105 | $93,284 | 47% | $26,151 | 357% |
| 1/1/2008 | $92,018 | $167,874 | $75,856 | 55% | $28,371 | 267% |
| 1/1/2006 | $78,944 | $151,248 | $72,303 | 52% | $28,483 | 254% |

### NOTES TO SCHEDULES

Additional information as of the latest actuarial valuation follows:

| | |
|---|---|
| Valuation Date | 1/1/2014 |
| Actuarial cost method | Entry Age Normal |
| Amortization method | Fresh Start, 6.00% Contribution Increases |
| Remaining amortization period | 17 years for the fresh start base |
| Asset valuation method | Market value adjusted by accounts payable and receivables adjusted to phase in over 3 years investment gains or losses above or below the expected rate of investment return. The actuarial value of assets must be no less than 85% of the adjusted market value nor more than 115% of the adjusted market value. Market value of assets is $94,999,643.28 |
| Actuarial assumptions: | |
| Investment Rate of Return | 7.95% per year |
| Projected Salary Increases | 4.25% per year |

## PERAC Information Disclosure

The most recent actuarial valuation of the System was prepared by Stone Consulting, Inc. as of January 1, 2014

| | | | |
|---|---|---|---|
| The normal cost for employees on that date was: | $2,492,754 | 9.0% | of payroll |
| The normal cost for the employer was: | $1,034,195 | 3.7% | of payroll |

| | |
|---|---|
| The actuarial liability for active members was: | $84,918,026 |
| The actuarial liability for retired members was (includes inactives): | $127,679,266 |
| Total actuarial accrued liability: | $212,597,292 |
| System assets as of that date (Market value of $94,999,643): | $90,317,974 |
| Unfunded actuarial accrued liability: | $122,279,318 |

| | |
|---|---|
| The ratio of system's assets to total actuarial liability was: | 42.5% |

| | |
|---|---|
| As of that date the total covered employee payroll was: | $27,602,569 |

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

| | |
|---|---|
| Investment Return: | 7.95% per annum |
| Rate of Salary Increase: | 4.25% |

SCHEDULE OF FUNDING PROGRESS (Dollars in $000's)

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded AAL (UAAL) (b-a) | Funded Ratio (a/b) | Covered Payroll (c) | UAAL as a % of Covered Payroll ((b-a)/c) |
|---|---|---|---|---|---|---|
| 1/1/2014 | $90,318 | $212,597 | $122,279 | 42.5% | $27,603 | 443% |
| 1/1/2012 | $81,376 | $193,765 | $112,389 | 42.0% | $27,049 | 416% |
| 1/1/2010 | $82,821 | $176,105 | $93,284 | 47% | $26,151 | 357% |
| 1/1/2008 | $92,018 | $167,874 | $75,856 | 55% | $28,371 | 267% |
| 1/1/2006 | $78,944 | $151,248 | $72,303 | 52% | $28,483 | 254% |

## Actuarial Methods and Assumptions

### ACTUARIAL METHODS

#### Actuarial Cost Method

The Entry Age Normal Actuarial Cost Method has been used in this valuation. Under this method, the normal cost is the amount calculated as the level percentage of compensation necessary to fully fund the prospective benefits from each member's entry age to retirement age.

The actuarial accrued liability represents the theoretical accumulation of all prior years' normal costs for the plan members as if the program had always been in effect. The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over plan assets.

#### Asset Valuation Method

Market value of assets (adjusted by payables and receivables) adjusted to phase in investment gains or losses above or below the expected rate of investment return over a three-year rolling period. The phase-in is 33% for year one, 67% for year two, and 100% for year three. The actuarial value of assets may be no less than 85%, or more than 115% of the market value of assets plus payables and receivables.

#### Fiscal Year Adjustment

The actuarial results are adjusted by the valuation interest rate and salary scale to the beginning of Fiscal Year 2016. The unfunded actuarial accrued liability is rolled forward with normal cost and further adjusted by anticipated contributions and interest.

### ACTUARIAL ASSUMPTIONS

#### Investment Return

7.95% per year net of investment expenses.

#### Regular Interest Rate Credited to Annuity Savings Account

2% per year.

#### Salary Increases

4.25% per year.

## Actuarial Methods and Assumptions
(Continued)

### Withdrawal Prior to Retirement

The rates shown at the following sample ages illustrate the withdrawal assumption. Withdrawal rates are set to zero if the retirement rate at that age is nonzero.

Rate of Withdrawal

| Service | Group 1 and 2 | Group 4 |
|---|---|---|
| 0 | 15% | 1.5% |
| 1 | 12% | 1.5% |
| 2 | 10% | 1.5% |
| 3 | 9% | 1.5% |
| 4 | 8% | 1.5% |
| 5 | 7.6% | 1.5% |
| 10 | 5.4% | 1.5% |
| 15 | 3.3% | 0.0% |
| 20 | 2.0% | 0.0% |
| 25 | 1.0% | 0.0% |
| 30+ | 0.0% | 0.0% |

### Disability Prior to Retirement

The rates shown at the following sample ages illustrate the assumption regarding the incidence of disability:

Rate of Disability

| Age | Group 1 and 2 | Group 4 |
|---|---|---|
| 20 | 0.01% | 0.10% |
| 25 | 0.02% | 0.20% |
| 30 | 0.03% | 0.30% |
| 35 | 0.06% | 0.30% |
| 40 | 0.10% | 0.30% |
| 45 | 0.15% | 1.00% |
| 50 | 0.19% | 1.25% |
| 55 | 0.24% | 1.20% |
| 60 | 0.28% | 0.85% |

Disability is assumed to be 45% ordinary and 55% accidental for Group 1 and 2 and 10% ordinary and 90% accidental for Group 4.

## Actuarial Methods and Assumptions
(Continued)

### Rates of Retirement

The rates shown at the following ages illustrate the assumption regarding the incidence of retirement, once the member has achieved 10 years of service:

| | | | | Hired after 4/1/2012 | | |
|---|---|---|---|---|---|---|
| Age | Group 1& 2 Male | Group 1 & 2 Female | Group 4 | Group 1& 2 Male | Group 1 & 2 Female | Group 4 |
| 50 | 1% | 1.5% | 2% | 0% | 0% | 1.5% |
| 51 | 1% | 1.5% | 2% | 0% | 0% | 1.5% |
| 52 | 1% | 2.0% | 2% | 0% | 0% | 1.5% |
| 53 | 1% | 2.5% | 2% | 0% | 0% | 1.5% |
| 54 | 2% | 2.5% | 7.5% | 0% | 0% | 5% |
| 55 | 2% | 5.5% | 15% | 0% | 0% | 10% |
| 56 | 2.5% | 6.5% | 10% | 0% | 0% | 7% |
| 57 | 2.5% | 6.5% | 10% | 0% | 0% | 20% |
| 58 | 5% | 6.5% | 10% | 0% | 0% | 10% |
| 59 | 6.5% | 6.5% | 15% | 0% | 0% | 15% |
| 60 | 12% | 5% | 20% | 25% | 30% | 20% |
| 61 | 20% | 13% | 20% | 20% | 13% | 20% |
| 62 | 30% | 15% | 25% | 30% | 15% | 25% |
| 63 | 25% | 12.5% | 25% | 25% | 12.5% | 25% |
| 64 | 22% | 18% | 30% | 22% | 18% | 30% |
| 65 | 40% | 15% | 100% | 40% | 15% | 100% |
| 66 | 25% | 20% | N/A | 25% | 20% | N/A |
| 67 | 25% | 20% | N/A | 25% | 20% | N/A |
| 68 | 30% | 25% | N/A | 30% | 25% | N/A |
| 69 | 30% | 20% | N/A | 30% | 20% | N/A |
| 70 | 100% | 100% | N/A | 100% | 100% | N/A |

### Mortality

RP2000 table (sex-distinct) projected with generational mortality (sex-distinct) and scale BB. (Prior valuation used RP-2000 mortality table with a 17 year projection). During employment the healthy employee mortality table is used. Post-employment the healthy annuitant table is used.

### Disabled Life Mortality

RP2000 table (sex-distinct) for healthy annuitants, projected with generational mortality and scale BB, ages set-forward by 2 years. Death is assumed to be due to the same cause as the disability 40% of the time. (Prior valuation used RP-2000 mortality table (sex-distinct) with a 17 year projection with ages set forward two years).

## Actuarial Methods and Assumptions
(Continued)

### Family Composition

Members assumed married with 2 dependent children – one male and one female both age 15; age difference between member and spouse assumed to be 3 years (the male being the older).

### Cost-of-Living Increases

A 3% COLA on the first $12,000 of a member's retirement allowance is assumed to be granted every year.

### Administrative Expenses

Estimated budgeted amount of $195,990 for the Fiscal Year 2016 excluding investment management fees and custodial fee is added to the Normal Cost.

### Credited Service

All service is assumed to be due to employment with the municipality.

### Contribution Timing

Contributions are assumed to be made in the beginning of the fiscal year (July 1).

### Total Payroll Increase

The total payroll is assumed to increase at 4.25% per year.

### Valuation Date

January 1, 2014.

## Summary of Principal Provisions

### 1. PARTICIPANT

Participation is mandatory for all full-time employees whose employment commences before age 65. There are three classes of members in the retirement system:

- Group 1: general employees
- Group 2: employees in specified hazardous occupations (e.g., electricians)
- Group 4: police and firefighters

### 2. MEMBER CONTRIBUTIONS

Member contributions vary depending upon date hired as follows:

| Date of Hire | Member Contribution Rate |
|---|---|
| Prior to 1975 | 5% of Pay |
| 1975 – 1983 | 7% of Pay |
| 1984 – June 30, 1996 | 8% of Pay |
| After June 30, 1996 | 9% of Pay |

Members hired after 1978 contribute an additional 2% of pay over $30,000.

### 3. PAY

#### a. Pay

Gross regular compensation excluding bonuses, overtime, severance pay, unused sick pay, and other similar compensation.

#### b. Average Pay

The average of pay during the three consecutive years that produce the highest average or, if greater, during the last three years (whether or not consecutive) preceding retirement. For members hired after April 1, 2012, five-year averages will be used.

### 4. CREDITED SERVICE

Period during which an employee contributes to the retirement system plus certain periods of military service and "purchased" service.

### 5. SERVICE RETIREMENT

#### a. Eligibility

1) For Group 1, 2 and 4 and hired pre-April 1, 2012: Completion of 20 years of credited service or attainment of age 55 and completion of 10 years of credited service. If a member of group 4, age 55 with no service requirement is also eligible for service retirement.

2) Hired after April 1, 2012: (Group 1 – Age 60, Group 2 – Age 55, Group 4 – Age 50) and completion of 10 years of service

## Summary of Principal Provisions
(Continued)

### b. Retirement Allowance

Determined as the product of the member's benefit percentage, average pay and credited service, where the benefit percentage is shown below (maximum allowance of 80% of average pay):

| Benefit Percentage | Group 1 | Group 2 | Group 4 |
|---|---|---|---|
| 2.5% | 65+ | 60+ | 55+ |
| 2.4 | 64 | 59 | 54 |
| 2.3 | 63 | 58 | 53 |
| 2.2 | 62 | 57 | 52 |
| 2.1 | 61 | 56 | 51 |
| 2.0 | 60 | 55 | 50 |
| 1.9 | 59 | N/A | 49 |
| 1.8 | 58 | N/A | 48 |
| 1.7 | 57 | N/A | 47 |
| 1.6 | 56 | N/A | 46 |
| 1.5 | 55 | N/A | 45 |
| | Hired after April 1, 2012* | | |
| 2.5% | 67+ | 62+ | 57+ |
| 2.35 | 66 | 61 | 56 |
| 2.20 | 65 | 60 | 55 |
| 2.05 | 64 | 59 | 54 |
| 1.90 | 63 | 58 | 53 |
| 1.75 | 62 | 57 | 52 |
| 1.60 | 61 | 56 | 51 |
| 1.45 | 60 | 55 | 50 |

*Reduction is .125% for each year early instead of .15% per year for employees with over 30 years of service.

In addition, veterans receive an additional $15 per year for each year of credited service up to 20 years.

## 6. DEFERRED VESTED RETIREMENT

### a. Eligibility

Completion of 10 years of credited service (for elected and appointed members, 6 years in the event of involuntary termination).

### b. Retirement Allowance

Determined in the same manner as "Service Retirement" section above with the member eligible to start collecting a benefit at age 55, (or age 57 for post-April 1, 2012 hires) or defer until later at his or her discretion. If a member chooses, his or her contributions with interest may be withdrawn. The amount of interest he or she will receive depends on length of service and whether or not the termination of employment was voluntary.

## Summary of Principal Provisions
(Continued)

### 7. ORDINARY DISABILITY RETIREMENT

#### a. Eligibility

Non-job related disability after completion of 10 years of credited service.

#### b. Retirement Allowance

Determined in the same manner as "Service Retirement" section and calculated as if the member had attained age 55 (or age 57 for those hired after April 1, 2012), if younger. Veterans receive 50% of pay (during final year) plus an annuity based on accumulated member contributions with interest.

### 8. ACCIDENTAL DISABILITY RETIREMENT

#### a. Eligibility

Disabled as a result of an accident in the performance of duties. No age or service requirement.

#### b. Retirement Allowance

72% of pay plus an annuity based on accumulated member contributions with interest. Also, a dependent's allowance per year for each child. Total allowance not to exceed 100% of pay (75% for members hired after 1987).

### 9. NON-OCCUPATIONAL DEATH

#### a. Eligibility

Dies while in active service, but not due to occupational injury. 2 years of service.

#### b. Retirement Allowance

Benefit as if Option C had been elected (see below) and member had attained age 55 (or age 57 for those hired after April 1, 2012) if younger. Minimum monthly benefits provided as follows:
spouse - $500, first child - $120, each additional child - $90

### 10. OCCUPATIONAL DEATH

#### a. Eligibility

Dies as a result of an occupational injury.

#### b. Benefit Amount

72% of pay plus refund of annuity savings fund balance. In the case of an accidental disability retiree who dies of the same cause, the beneficiary receives 72% of the last 12 months salary or the current pension amount, whichever is greater.

## Summary of Principal Provisions
(Continued)

### 11. COST-OF-LIVING INCREASES

An increase of up to 3% applied to the first $12,000 of annual benefit. Funded by the Municipality from Fiscal Year 1999. Percentage increase is voted on each year by the Retirement Board. Cost-of-living increases granted during Fiscal Year 1982 through Fiscal 1998 are reimbursed by the Commonwealth.

### 12. OPTIONAL FORMS OF PAYMENT

- Option A

Allowance payable monthly for the life of the member.

- Option B

Allowance payable monthly for the life of the member with a guarantee of remaining member contributions with interest.

- Option C

Allowance payable monthly for the life of the member with 66-2/3% continuing to the member's beneficiary upon the member's death. If the beneficiary predeceases the member, the allowance amount "pops up" to the non-reduced amount.

## Glossary of Terms

- Present Value of Benefits

  Represents the dollar value today of all benefits expected to be earned by current members if all actuarial assumptions are exactly realized.

- Actuarial Cost Method

  The procedure that is used to allocate the present value of benefits between the liability that is attributable to past service (Actuarial Accrued Liability) and that attributable to future service.

- Actuarial Assumptions

  Estimates are made as to the occurrence of certain events that determine the level of benefits to be paid and how long they will be provided. The more important actuarial assumptions include the investment return on assets, salary increases and the rates of turnover, disability, retirement and mortality.

- Actuarial Accrued Liability

  The portion of the Present Value of Benefits that is attributable to past service.

- Normal Cost

  The portion of the Present Value of Benefits that is attributable to benefits to be earned in the coming year.

- Actuarial Assets

  Market value of assets (adjusted by payables and receivables) adjusted to phase in investment gains or losses above or below the expected rate of investment return over a three-year rolling period. The phase-in is 33% for year one, 67% for year two, and 100% for year three. The actuarial value of assets may be no less than 85%, or more than 115% of the market value of assets plus payables and receivables.

- Unfunded Actuarial Accrued Liability

  That portion of the Actuarial Accrued Liability not covered by System Assets.

- PERAC

  Public Employee Retirement Administration Commission, a division of the State government which has regulatory authority over the administration of the retirement system.

- PRIT

  Pension Reserves Investment Trust Fund is the state controlled and administered fund for the investment of assets for members of the retirement system.

- GASB

  Government Accounting Standards Board (issues guidance for disclosure of retirement system liabilities).