January 1, 2014

Actuarial Valuation Report

Essex Regional Retirement Board

Lawrence B. Stone

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November 24, 2014

Essex Regional Retirement Board
491 Maple Street
Suite 202
Danvers, MA 01923

Dear Essex Regional Retirement Board:

Stone Consulting, Inc. has performed a January 1, 2014 actuarial valuation of the Essex Regional 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 Essex Regional 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 twenty years (fully funded in Fiscal 2035). The contribution is set to increase by 7.00% from the prior year for six years, 4.17% in year 7 and 4.00% thereafter.

The amortization payments are the amount left over after subtracting the normal cost and the 3(8)(c) payments from the contribution amount.

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The contribution amount for Fiscal Year 2016 is $28,419,207 which is equal to the anticipated contribution amount for Fiscal 2016 from the prior funding schedule. PERAC and GASB guidelines indicate that actuarial valuations should be conducted at least every other year. The Essex Regional Retirement Board conducted their previous actuarial valuation effective January 1, 2013.

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 Essex Regional 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, 2013	Change
Contribution Fiscal 2016	$28,419,207	$28,419,207	$0
Funding Schedule Length (as of Fiscal 2016)	20 years	20 years	0 years
Funding Ratio	48% (51% MVA Basis)	51%	-2%
Interest Rate Assumption	8.00%	8.00%	0.00%
Salary Increase Rate Assumption	Select and ultimate: 7.50% year one, 6.50% year two, 6.00% year three, 5.50% year four, 5.00% year five, 3.75% ultimate rate	Same	0.00%

- The Fiscal Year 2016 contribution is the same as the planned 2016 contribution. Stone Consulting, with agreement from the Retirement Board, values assets using a five-year asset smoothing method. In this approach, asset gains and losses are recognized over a five-year period. The purpose of this approach is to avoid wide swings in asset value from one year to the next.

The System experienced a 14.4% annual return on the market value of assets versus our assumption of an 8.00% return which resulted in a $19.0 million net actuarial gain. The System's asset portfolio, effective December 31, 2013 is approximately 80% equities, alternative investments, and real estate and 20% fixed income and short-term investments. The assets are mainly invested with the Pension Reserves Investment Trust (PRIT). The interest rate assumption was maintained at 8.00% to reflect anticipated market performance.

- The salary increase assumption is based on the same select and ultimate table as the prior valuation. Total compensation changed by 0.4% over the prior valuation; however average annual compensation (compensation divided by number of active members) changed by 4.1%. This assumption is based on expected future experience.

- The funding level of the Essex Regional Retirement System is 48% compared to 51% for the January 1, 2013 actuarial valuation. The decrease is due to the recognition of prior actuarial asset losses and the change in the mortality assumption. Using market value of assets the funding level is 51%.

  The schedule length is twenty (20) years (which is the same as the remaining schedule from the prior valuation). The maximum period permitted under Section 22F of Chapter 32 of the Massachusetts General Laws is 25 years (2040).

  The Fiscal 2016 contribution is 7.00% higher than the prior year contribution and increases annually at 7.00% for 5 years with a 4.17% increase in FY2022 and 4.00% increases thereafter. The prior schedule had two less years of 7.00% increases (Fiscal 2016 through 2019), with 4.00% increases beginning in Fiscal 2020.

- Non-economic assumptions were changed from the January 1, 2013 actuarial valuation. The mortality assumptions are based upon the RP2000 Table (sex-distinct) increased with generational mortality and Scale BB. The previous assumption used an 18 year projection with Scale AA. The net effect of this change increased the accrued liability by $26.2 million.

January 1, 2014 Actuarial Valuation Results

	January 1, 2014	January 1, 2013	Percentage Change
Funding			
Contribution for Fiscal 2016	$28,419,207		
Contribution for Fiscal 2016 based on current schedule		$28,419,207	0%
Members *			
▪ Actives			
a. Number	2,714	2,816	-3.6%
b. Annual Compensation	$119,733,698	$119,292,287	0.4%
c. Average Annual Compensation	$44,117	$42,362	4.1%
d. Average Attained Age	49.3	49.1	0.4%
e. Average Past Service	11.2	10.9	2.5%
▪ Retired, Disabled and Beneficiaries			
a. Number	1,725	1,670	3.3%
b. Total Benefits*	$35,797,918	33,498,993	6.9%
c. Average Benefits*	$ 20,752	$20,059	3.5%
d. Average Age	72.8	72.9	-0.1%
▪ Inactives			
a. Number	1,118	1,009	10.8%
Normal Cost			
a. Total Normal Cost	$14,994,053	$14,403,825	4.1%
b. Less Expected Members' Contributions	10,822,926	10,757,904	0.6%
c. Normal Cost to be funded by the Municipality	$4,171,127	$3,645,921	14.4%
d. Eighteen month adjustment	252,754	220,928	14.4%
e. Administrative Expense Assumption	1,111,000	945,000	17.6%
f. Adjusted Normal Cost and Expense	$5,534,881	$4,811,849	15.0%

*Excluding State reimbursed COLA

	January 1, 2014	January 1, 2013	Percentage Change
Actuarial Accrued Liability as of January 1, 2014			
a. Active Members	$314,583,476	$293,688,366	7.1%
b. Inactive Members	9,066,375	7,150,383	26.8%
c. Retired Members and Beneficiaries	352,824,351	318,500,331	10.8%
d. Total	$676,474,202	$619,339,080	9.2%
Unfunded Actuarial Accrued Liability			
a. Actuarial Accrued Liability	$676,474,202	$619,339,080	9.2%
b. Less Actuarial Value of Assets	327,727,973	314,565,925	4.2%
c. Unfunded Actuarial Accrued Liability	$348,746,229	$304,773,155	14.4%
d. Eighteen month adjustment	$22,508,504	$18,482,329	
e. Adjusted Unfunded Actuarial Accrued Liability	$371,254,733	$323,255,484	

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

- Payroll changed by 0.4% over the course of the past year. Average annual compensation changed by 4.1% over the same time period.

- The salary increase assumption includes general wage adjustments, step increases, and promotional increases.

History of Active Participants

Valuation Year	Number	Average Age	Average Past Service	Average Annual Compensation
2014	2,714	49.3	11.2	$44,117
2013	2,816	49.1	10.9	$42,362
2011	3,013	48.4	10.3	$37,838
2008	3,139	47.4	9.2	$33,976

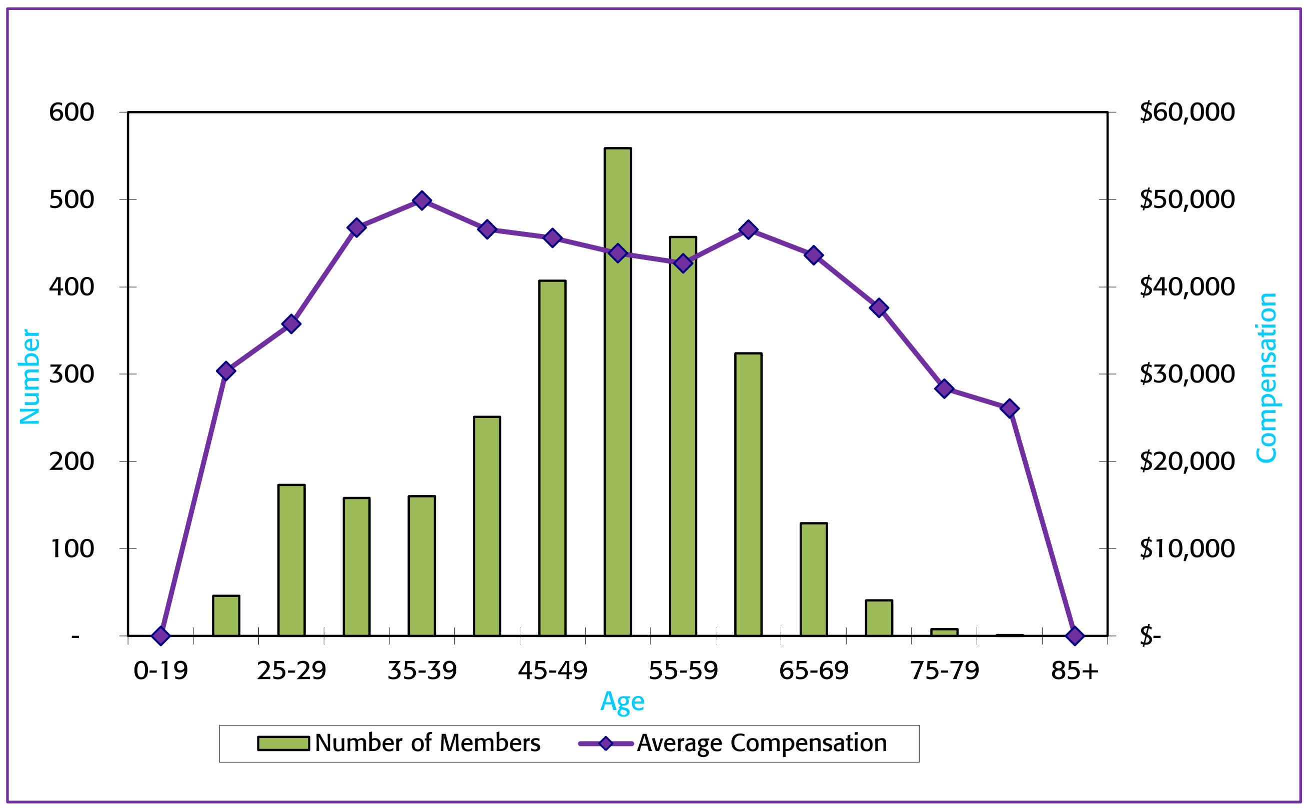
- Employee age has increased by 1.9 years and service has increased by 2.0 years over the past six years. This is consistent with the overall trend towards an aging of the employee population. We expect this trend to reverse itself in the near future. Average annual compensation has grown by 29.8% (4.4% annually) over the past six years. Some of the increase in average compensation may be caused by changes in the law which excluded employees who made less than $5,000 per year.

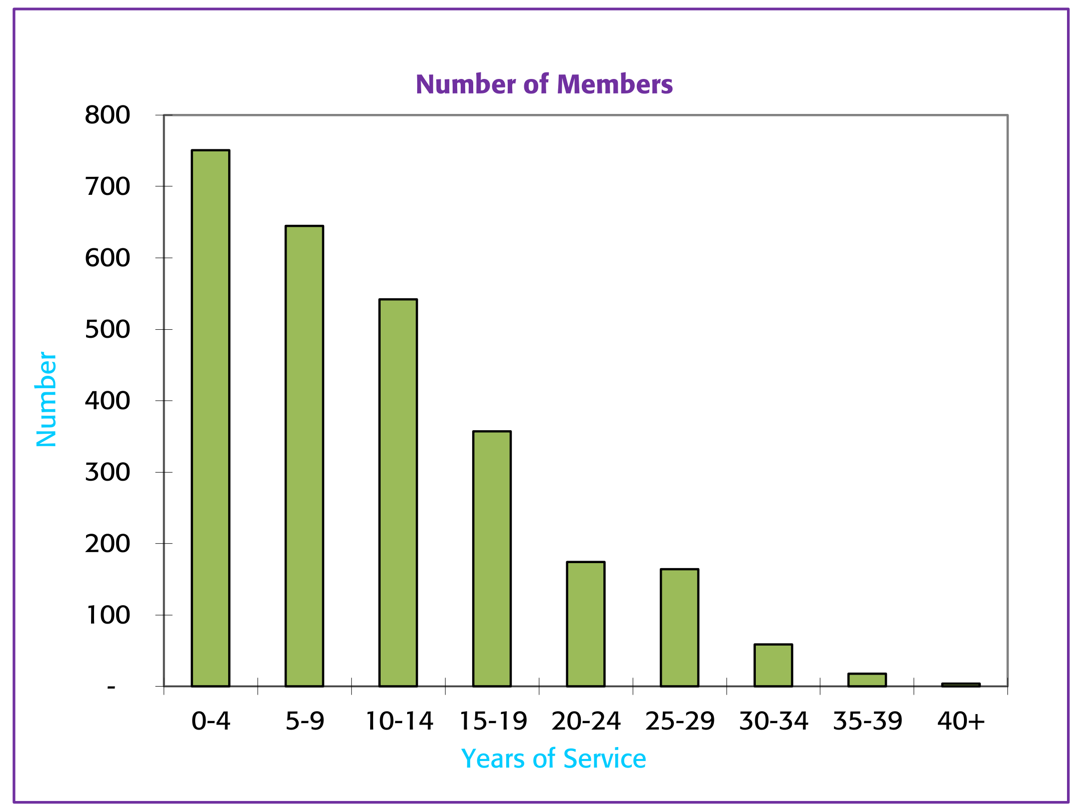
The charts on the following pages summarize demographic information regarding active and retiree members.

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	46	-	-	-	-	-	-	-	-	46	1,396,246	30,353
25-29	146	26	1	-	-	-	-	-	-	173	6,184,149	35,747
30-34	81	67	10	-	-	-	-	-	-	158	7,391,878	46,784
35-39	52	45	51	12	-	-	-	-	-	160	7,982,339	49,890
40-44	84	57	56	41	12	1	-	-	-	251	11,692,342	46,583
45-49	115	106	77	48	34	27	-	-	-	407	18,559,549	45,601
50-54	101	161	117	65	44	61	10	-	-	559	24,516,298	43,857
55-59	78	90	117	86	31	26	24	5	-	457	19,507,775	42,687
60-64	37	60	69	65	31	29	19	12	2	324	15,082,487	46,551
65-69	10	24	31	29	16	12	4	1	2	129	5,626,728	43,618
70-74	1	8	10	8	5	8	1	-	-	41	1,541,210	37,590
75-79	-	1	3	3	1	-	-	-	-	8	226,634	28,329
80-84	-	-	-	-	-	-	1	-	-	1	26,062	26,062
85+	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	751	645	542	357	174	164	59	18	4	2,714	$ 119,733,698	$ 44,117





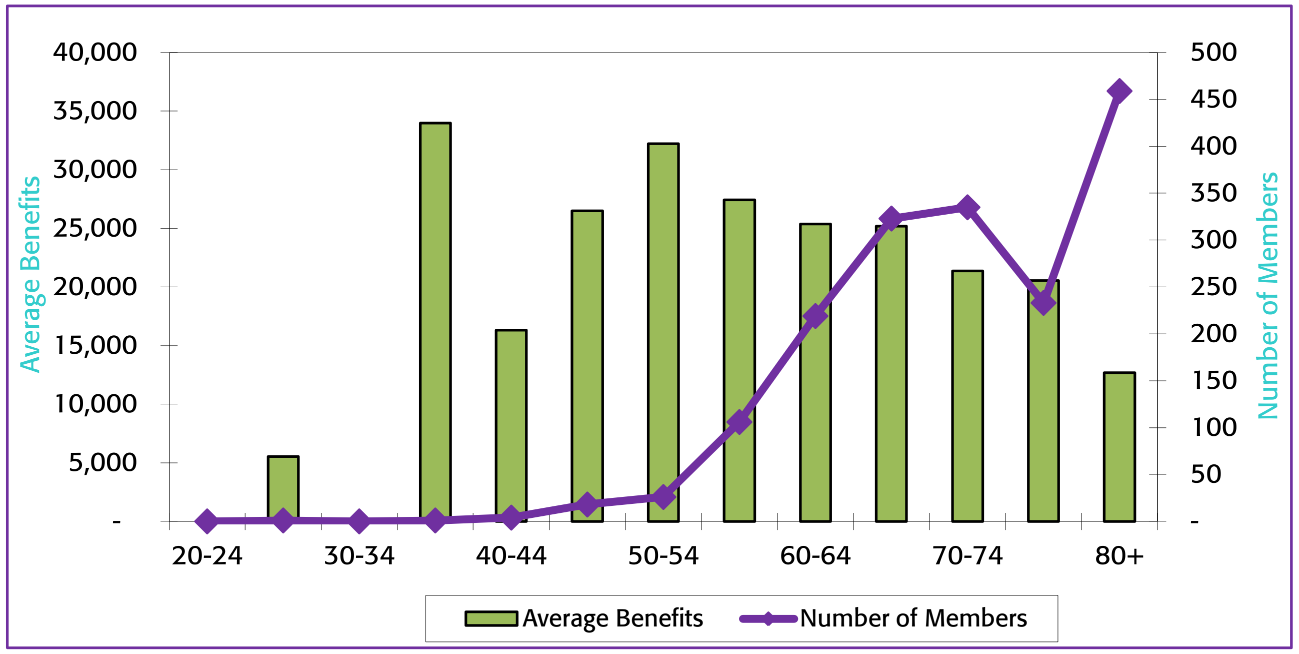
Distribution of Plan Members as of January 1, 2014

Retired Members

Retired Members and Beneficiaries			
Age	Number	Average Benefit	Total Benefit
20-24	-	-	-
25-29	1	5,535	5,535
30-34	-	-	-
35-39	1	33,972	33,972
40-44	1	6,956	6,956
45-49	8	22,368	178,944
50-54	16	29,812	476,995
55-59	87	25,953	2,257,882
60-64	193	24,188	4,668,265
65-69	301	25,122	7,561,656
70-74	319	21,098	6,730,241
75-79	219	20,627	4,517,279
80+	446	12,461	5,557,765
TOTAL	1,592	$ 20,098	$ 31,995,491

Disabled Members			
Age	Number	Average Benefit	Total Benefit
20-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	3	19,451	58,354
45-49	10	29,804	298,041
50-54	10	36,120	361,198
55-59	19	34,296	651,633
60-64	26	34,248	890,447
65-69	22	26,051	573,115
70-74	16	26,975	431,594
75-79	14	19,554	273,753
80+	13	20,330	264,293
TOTAL	133	$ 28,590	$ 3,802,427

Total			
Age	Number	Average Benefit	Total Benefit
20-24	-	-	-
25-29	1	5,535	5,535
30-34	-	-	-
35-39	1	33,972	33,972
40-44	4	16,327	65,309
45-49	18	26,499	476,986
50-54	26	32,238	838,193
55-59	106	27,448	2,909,516
60-64	219	25,382	5,558,712
65-69	323	25,185	8,134,770
70-74	335	21,379	7,161,836
75-79	233	20,562	4,791,032
80+	459	12,684	5,822,058
TOTAL	1,725	$ 20,752	$ 35,797,918



Benefits shown are net of State reimbursed COLA.

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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

Valuation Date	January 1, 2014	% of Payroll*
Gross Normal Cost (GNC)	$14,994,053	12.5%
Employees Contribution	$10,822,926	9.0%
Net Normal Cost (NNC)	$4,171,127	3.5%
Adjusted to Beginning of Fiscal Year 2016	$252,754	
Administrative Expense	$1,111,000	0.9%
Adjusted Net Normal Cost With Admin. Expense	$5,534,881	

*Payroll paid in 2013 for employees as of January 1, 2014 is $119,733,698. 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

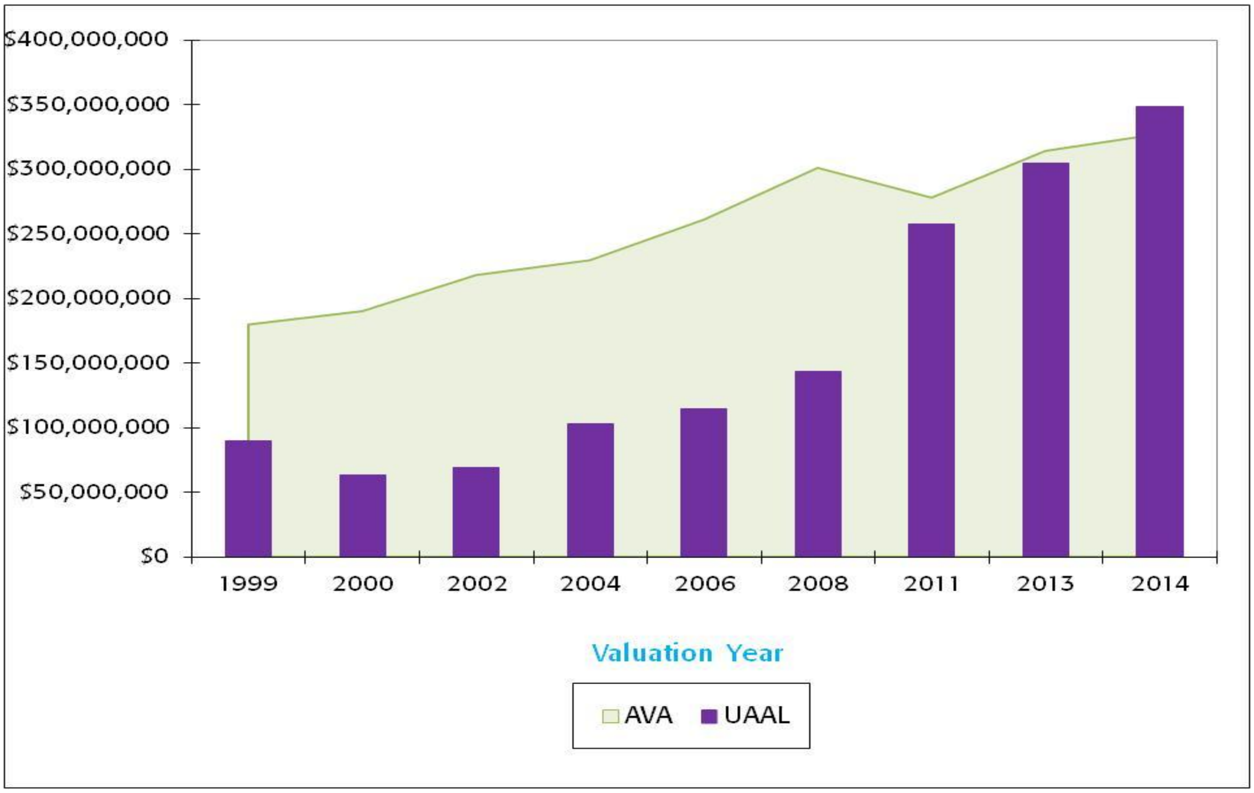
		January 1, 2014	Percentage Change
Active Actuarial Accrued Liability			
Superannuation	$288,996,081		
Death	6,542,852		
Disability	15,585,886		
Withdrawal	3,458,657		
Total		$314,583,476	7.1%
Retiree, Inactive, Survivor and Beneficiary Actuarial Accrued Liability			
Retirees and Beneficiaries	309,552,918		
Disabled	43,271,433		
Inactive	9,066,375		
Total		361,890,726	11.1%
Total Actuarial Accrued Liability (AAL)		$676,474,202	9.2%
Actuarial Value of Assets (AVA)		327,727,973	4.2%
Unfunded Actuarial Accrued Liability		$348,746,229	14.4%
Funded Ratio (AVA / AAL)			
2014 (8.00% interest rate):		48%	
2013 (8.00% interest rate):		51%	

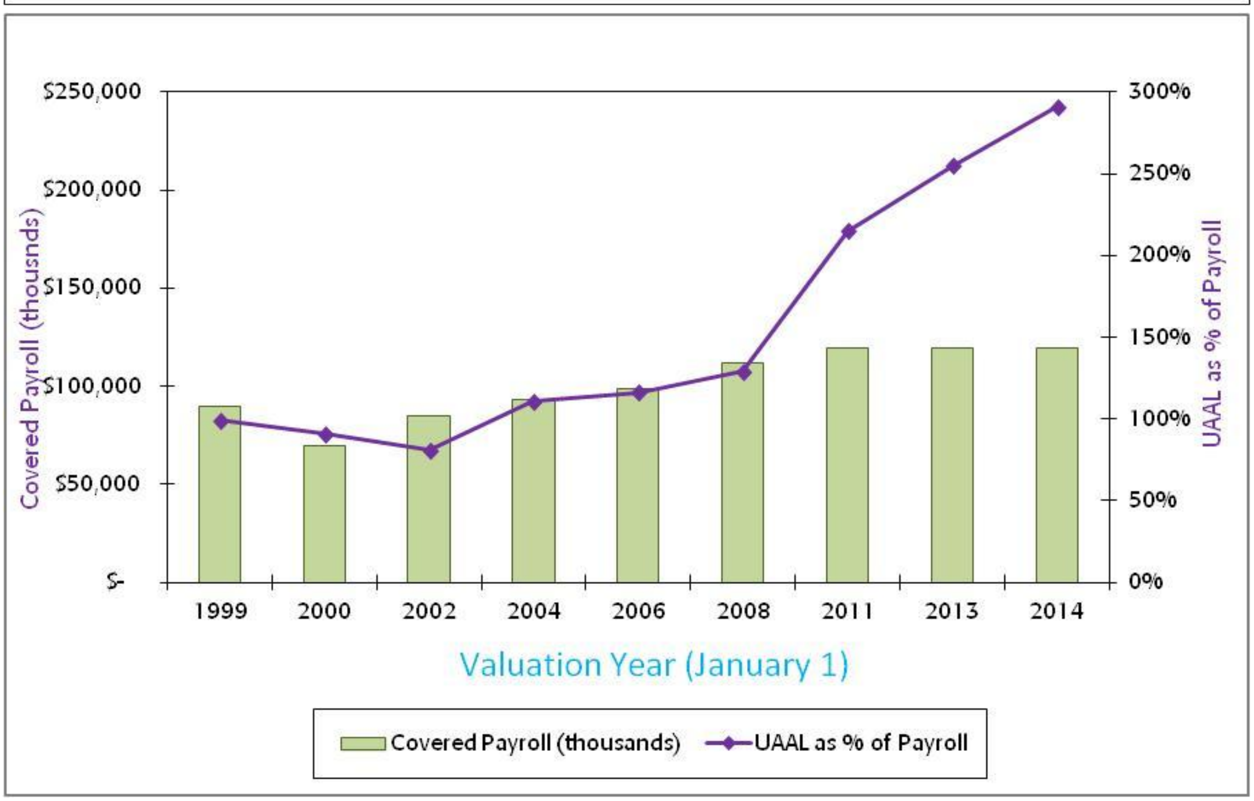
- Actuarial Accrued Liability (AAL) is the “price” of benefits attributable to benefits earned in past years, or in other words, represents today’s value of all benefits earned by active and inactive members.

- The total AAL is $676,474,202. This along with an actuarial value of assets of $327,727,973 produces a funded status of 48%. This compares to a funded status of 51% for the 2013 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	$5,534,881
Net 3(8)(c) payments	1,108,883
Amortization	21,239,038
Adjustment for semi-annual payments	536,406
Total Appropriation required for Fiscal 2016	$28,419,207

- 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 in semiannual payments.

- The 3(8)(c) payments is the net of payments made to or from different Chapter 32 Retirement Systems to reflect benefits paid due to service either with the Essex Regional Retirement System or other Chapter 32 Retirement Systems.

- The contribution amount for Fiscal 2016 is $28,419,207. The funding schedule is presented on page 11. The schedule's length is twenty (20) years (for the fresh start base) which is the same as the January 1, 2013 valuation remaining schedule's length. The maximum funding schedule length allowed by Section 22F of Chapter 32 of the Massachusetts General Laws is twenty-five years to Fiscal 2040.

- 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 amount for FY 2016 and beyond is a fixed amount based on increases of 7.00% for the first 6 years with a 4.17% increase in year 7 and 4.00% increases thereafter.

FUNDING SCHEDULE

Fiscal Year	Normal Cost	Unfunded Liability	Funding Amortization of UAAL	Net 3(8)(c) Payments	Schedule Contribution	Adjusted Payments
2016	5,534,881	371,254,733	21,239,038	1,108,883	27,882,801	28,419,207
2017	5,756,276	373,608,180	22,969,439	1,108,883	29,834,597	30,408,552
2018	5,986,527	376,011,075	24,827,609	1,108,883	31,923,019	32,537,151
2019	6,225,988	372,902,327	26,822,760	1,108,883	34,157,631	34,814,751
2020	6,475,028	369,965,509	28,964,754	1,108,883	36,548,665	37,251,784
2021	6,734,029	368,280,815	31,264,160	1,108,883	39,107,071	39,859,409
2022	7,003,390	363,977,988	32,627,227	1,108,883	40,739,500	41,523,242
2023	7,283,526	357,858,821	33,976,672	1,108,883	42,369,080	43,184,172
2024	7,574,867	349,792,722	35,380,094	1,108,883	44,063,843	44,911,538
2025	7,877,862	339,565,638	36,839,653	1,108,883	45,826,397	46,708,000
2026	8,192,976	326,944,065	38,357,594	1,108,883	47,659,453	48,576,320
2027	8,520,695	311,673,388	39,936,253	1,108,883	49,565,831	50,519,373
2028	8,861,523	293,476,106	41,578,059	1,108,883	51,548,464	52,540,148
2029	9,215,984	272,049,891	43,285,536	1,108,883	53,610,403	54,641,754
2030	9,584,623	247,065,503	45,061,313	1,108,883	55,754,819	56,827,424
2031	9,968,008	218,164,525	46,908,121	1,108,883	57,985,012	59,100,521
2032	10,366,728	184,956,916	48,828,801	1,108,883	60,304,412	61,464,541
2033	10,781,397	147,018,364	50,826,308	1,108,883	62,716,589	63,923,123
2034	11,212,653	103,887,420	52,903,716	1,108,883	65,225,252	66,480,048
2035	11,661,159	55,062,401	55,062,401	1,108,883	67,832,443	69,137,396
2036	12,127,606	-	-	1,108,883	13,236,489	13,491,131

Amortization of Unfunded Liability as of July 1, 2015

Year	Type	Original Amort. Amount	Percentage Increasing	Original # of Years	Current Amort. Amount	Years Remaining
2003	2002 ERI	4,357	4.50%	26	7,722	13
2003	2002 ERI	336,771	0.00%	17	336,771	4
2004	2003 ERI	4,229	4.50%	25	7,172	13
2004	2003 ERI	193,085	0.00%	17	193,085	5
2016	Fresh Start	N/A	N/A	20	N/A	20

* Includes recognition of asset/gains and losses in Fiscal 2017 through 2020:

2017: $4,408,771 ; 2018: $2,678,766 ; 2019: $6,375,816 ; 2020: $3,800,424

** Contribution is set to be the amount resulting from a 7% increase on last year's contribution, with 7% increases for another five years, a 4.17% increase in FY2022 and 4% increases thereafter.

Notes on Amortization of Unfunded Liability

Year is the year the amortization base was established. Type is the reason for the creation of the base.
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.

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	8.00%
Salary Increase	Select and ultimate: • 7.50% in year one • 6.50% in year two • 6.00% in year three • 5.50% in year four • 5.00% in year five • 3.75% thereafter
COLA	3% of $13,000
COLA Frequency	Granted every year
Mortality	RP-2000 table (sex distinct, healthy employees for actives and healthy annuitants for retirees) projected with scale BB and Generational Mortality. 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 is the healthy retiree table ages set forward 2 years. *(Prior valuation used RP2000 projected 18 years with scale AA.)*
Overall Disability	

	Ordinary	Accidental
Groups 1 and 2	45%	55%
Group 4	10%	90%

Retirement Rates	Groups 1 and 2: Ages 55 – 70, Group 4: Ages 50 – 65 Post April 1, 2012 Hires: Groups 1 and 2: Ages 60 – 70, Group 4: Ages 50 – 65
Administrative Expense	$1,111,000 budget estimated for FY 2016 provided by Essex Regional Retirement Board.

Assets

a.	Cash	$3,664,591.24
b.	Fixed Income	5,967.79
c.	Equities	1.72
d.	Pooled Alternative Investments	17,792,131.51
e.	Pooled Real Estate Funds	11,801,121.71
f.	PRIT Cash	1,000,233.34
g.	PRIT Fund	309,832,597.71
h.	Buildings	390,830.00
i.	Accumulated Depreciation - Buildings	(156,657.00)
j.	Sub-Total:	$344,330,818.02
k.	Interest Due and Accrued	$151.74
l.	Accounts Receivable	776,422.63
m.	Accounts Payable	(115,642.03)
n.	Sub-Total:	$660,932.34
o.	Market Value of Assets [(j) + (n)]	$344,991,750.36

- 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 $344,991,750.36.

- The asset allocation as of December 31, 2013 was approximately 20% cash, receivables, payables and fixed income and 80% equities, alternative investments and real estate.

- 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 7.00% to 8.50% for domestic equities, 8.25% to 8.50% for international equities, 9.50% for emerging markets, 8.00% for hedge funds, 10% for venture capital, 6.00% for real estate and 4.50% for core fixed income securities. In light of these projections, as well as historical investment returns, the 8.00% interest rate assumption is within the reasonable assumption range. We encourage close monitoring for changes in investment performance against expectations.

Calculation of Valuation Assets

1. Market value of assets including receivable/payable as of 01/01/2014 — $344,991,750

2. Phase-in of asset gains and losses

	Plan Year (1)	Original Amount (2)	Percent Unrecognized (3)	Amount Unrecognized (2) x (3)
a.	2013	$19,002,120	80%	$15,201,696
b.	2012	$12,876,959	60%	$7,726,175
c.	2011	($18,485,248)	40%	($7,394,099)
d.	2010	$8,650,025	20%	$1,730,005
e.	2009	$67,717,964	0%	$0
f.	Total			$17,263,778

3. Valuation assets without corridor as of 01/01/2014 — $327,727,973
   (1. - 2.f.)

4. Corridor Check
   a. 90% of Market Value — $310,492,575
   b. 110% of Market Value — $379,490,925

5. Valuation assets with corridor as of 01/01/2014 — $327,727,973
   3. within Corridor

6. Calculation of return on valuation assets
   a. Valuation assets as of 01/01/2013 — 314,565,925
   b. ER contribs + EE contribs - Ben Pymts - Expenses — (1,456,487)
   c. Actual return on valuation assets — $14,618,534
      5. - (6.a. + 6.b.)
   d. Weighted value of valuation assets — $307,790,109
   e. Return on valuation assets — 4.7%
      6.c. / 6.d.

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	$327,728	$676,474	$348,746	48%	$119,734	291%
1/1/2013	$314,566	$619,339	$304,773	51%	$119,292	255%
1/1/2011	$278,332	$536,116	$257,784	52%	$119,707	215%
1/1/2008	$301,421	$445,171	$143,751	68%	$111,727	129%
1/1/2006	$261,327	$376,035	$114,708	70%	$98,641	116%

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	Closed - Approximate level percent of payroll
Remaining amortization period	20 years for the fresh start base
Asset valuation method	Market value adjusted by accounts payable and receivables adjusted to phase in over 5 years investment gains or losses above or below the expected rate of investment return. The actuarial value of assets must be no less than 90% of the adjusted market value nor more than 110% of the adjusted market value. Market value of assets is $344,991,750.

Actuarial Assumptions

Investment rate of return	8.00% per year
Projected salary increases	Select and Ultimate 7.50% year one, 6.50% year two, 6.00% year three, 5.50% year four, 5.00% year five, 3.75% ultimate rate

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:	$10,822,926	9.0% of payroll
The normal cost for the employer was:	$4,171,127	3.5% of payroll

The actuarial liability for active members was:	$314,583,476
The actuarial liability for retired members was (includes inactives):	$361,890,726
Total actuarial accrued liability:	$676,474,202
System assets as of that date (market value: $344,991,750):	$327,727,973
Unfunded actuarial accrued liability:	$348,746,229

The ratio of system's assets to total actuarial liability was:	48%

As of that date the total covered employee payroll was:	$119,733,698

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

Investment Return:	8.00% per annum
Rate of Salary Increase:	Select and ultimate

SCHEDULE OF FUNDING PROGRESS (Dollars in $1,000'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	$327,728	$676,474	$348,746	48%	$119,734	291%
1/1/2013	$314,566	$619,339	$304,773	51%	$119,292	255%
1/1/2011	$278,332	$536,116	$257,784	52%	$119,707	215%
1/1/2008	$301,421	$445,171	$143,751	68%	$111,727	129%
1/1/2006	$261,327	$376,035	$114,708	70%	$98,641	116%

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 five-year rolling period. The phase-in is 20% for year one, 40% for year two, 60% for year three, 80% for year four and 100% for year five. The actuarial value of assets may be no less than 90%, or more than 110% 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

8.00% per year net of investment expenses.

Salary Increases

Select and Ultimate - 7.50% year one, 6.50% year two, 6.00% year three, 5.50% year four, 5.00% year five, 3.75% ultimate rate

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. A member would need to be eligible for the benefit to be assumed to retire. See Summary of Principal Provisions Number 5 for eligibility requirements.

				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

The RP-2000 mortality table (sex-distinct) projected with scale BB and Generational Mortality. (*Prior valuation used RP-2000 mortality table projected 18 years with scale AA.).* During employment the healthy employee mortality table is used. Post-employment the healthy annuitant table is used.

Disabled Life Mortality

The RP-2000 mortality table for healthy annuitants (sex-distinct) projected with scale BB and Generational Mortality 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 projected 18 years with scale AA).*

Actuarial Methods and Assumptions (Continued)

Regular Interest Rate Credited to Annuity Savings Account

2% per year.

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 $13,000 of a member's retirement allowance is assumed to be granted every year.

Administrative Expenses

Estimated budgeted amount of $1,111,000 for the Fiscal Year 2016 excluding investment management fees and custodial fee is added to the Normal Cost.

Step Increases

Step increases are assumed to be part of the salary increase assumption.

Credited Service

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

3(8)(c)

Net 3(8)(c) payments are added to the contribution amount, they have not been included in the Accrued Liability. They are assumed to remain constant.

Contribution Timing

Contributions are assumed to be made semi-annually.

Municipality

Refers to the various employers that comprise the Retirement System.

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

Completion of 20 years of credited service or attainment of age 55 and completion of 10 years of credited service. If hired prior to 1978 or a member of group 4, attainment of age 55.

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.

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.

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.

Summary of Principal Provisions
(Continued)

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.

11. COST-OF-LIVING INCREASES

An increase of up to 3% applied to the first $13,000 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.

Glossary (continued)

- 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 five-year rolling period. The phase-in is 20% for year one, 40% for year two, 60% for year three, 80% for year four and 100% for year five. The actuarial value of assets may be no less than 90%, or more than 110% 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).