January 1, 2015

Actuarial Valuation Report

Concord Retirement System

Lawrence B. Stone

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November 24, 2015

Concord Retirement Board
P.O. Box 535
22 Monument Square
Concord, MA 01742

Dear Concord Retirement Board:

Stone Consulting, Inc. has performed a January 1, 2015 actuarial valuation of the Concord Retirement System. This valuation and report was prepared using generally accepted actuarial principles and practices. It does not include GASB Statements Nos. 67 and 68 results as that will be presented in a separate report. 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 Concord 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 decrease 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 fourteen years (fully funded by 2030). The amortization is set to increase by 2.00% each year.

The contribution amount for Fiscal Year 2017 is $5,157,377 which is $502,193 greater 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. GASB Statements 67 and 68 require annual updates for asset experience and changes in cost allocation. The Concord Retirement Board conducted their previous actuarial valuation effective January 1, 2014.

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 Concord Retirement System. The valuation was performed at the request of the Retirement Board as of January 1, 2015 for the purpose of determining the contribution requirements for Fiscal Year 2017 and beyond. The contribution requirements are based on:

- The financial condition of the system as of December 31, 2014
- 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, 2015);
- Economic assumptions regarding salary increases and investment earnings; and
- Other actuarial assumptions (e.g., withdrawals, retirement, death, etc.)

January 1, 2015 Valuation Summary

	January 1, 2015	January 1, 2014	Change
Contribution Fiscal 2017	$5,157,377	$4,655,184	$502,193 greater than
Funding Schedule Length (as of Fiscal 2017)	14 years	14 years	0 years
Funding Ratio	81%	81%	0.0%
Interest Rate Assumption	7.25%	7.50%	-0.25%
Salary Increase Rate Assumption	Select and ultimate: 4.00% Ultimate rate, and 3.25% base rate while receiving the following steps: Group 1 and 2: 3% for 10 years Fire: 4.7% for 3 years Police: 5.2% in year 1, 5.6% in year 2, 7.3% in year 3, 5.0% in year 4, and 4.8% in year 5.	Select and ultimate: 4.00% Ultimate rate, and 3.50% base rate while receiving the following steps: Group 1 and 2: 4.3% for 7 years Fire: 4.7% for 3 years Police: 5.2% in year 1, 5.6% in year 2, 7.3% in year 3, 5.0% in year 4, and 4.8% in year 5.	

- The Fiscal Year 2017 contribution is equal to the planned 2017 contribution. Stone Consulting, with agreement from the Retirement Board, values assets using a four-year asset smoothing method. In this approach, asset gains and losses are recognized over a four-year period. The purpose of this approach is to avoid wide swings in asset value from one year to the next.

- The System, over the one-year period from January 1 to December 31, 2014, experienced an 8.9% annual return on the market value of assets versus our assumption of 7.50%. There was a $1,702,738 net actuarial gain in calendar year 2014. The System's asset portfolio, effective December 31, 2014 is approximately 69% equities and 31% fixed income and short-term investments. The interest rate assumption was changed to 7.25% to reflect anticipated future market performance. This change increased the actuarial accrued liability by $4.1 million.

- The salary increase assumption was changed from the prior valuation. For Group 1 and 2 the step increases were changed to 3% for 10 years (previously 4.3% for seven years) and the base rate while receiving steps was changed to 3.25% (previously 3.50%). This assumption is based on expected future experience as well as existing union contracts. This change increased the accrued liability by $.5 million and decreased the normal cost by $37,000. Total compensation changed by 6.4% over the prior valuation; however average annual compensation (compensation divided by number of active members) only changed by 4.1%.

- The funding level of the Concord Retirement System is 81% compared to 81% for the January 1, 2014 actuarial valuation. Using the market value of assets results in a funding level of 85%.

The schedule length is fourteen (14) years, a length consistent with the 14 years remaining from the 15 year schedule from the prior valuation. The maximum period permitted under Section 22F of Chapter 32 of the Massachusetts General Laws is twenty-four years (Fiscal 2040). Note that the maximum period under Section 22D of the MGL is 14 years.

- Non-economic assumptions are the same as the January 1, 2014 actuarial valuation.

- Assumptions have been set by the Retirement Board using recommendations by Stone Consulting, Inc. Experience different from the actuarial assumptions can result in contributions and funding levels different than shown in this report.

January 1, 2015 Actuarial Valuation Results

	January 1, 2015	January 1, 2014	Percentage Change
Funding			
Contribution for Fiscal 2017	$5,157,377		10.8%
Contribution for Fiscal 2017 based on current schedule		$4,655,184	
Members *			
Actives			
a. Number	513	502	2.2%
b. Annual Compensation	$29,283,408	$27,514,038	6.4%
c. Average Annual Compensation	$57,083	$54,809	4.1%
d. Average Attained Age	49.6	49.5	0.2%
e. Average Past Service	12.2	12.3	-0.8%
Retired, Disabled and Beneficiaries			
a. Number	274	270	1.5%
b. Total Benefits*	$6,463,837	$5,970,368	8.3%
c. Average Benefits*	$23,591	$22,112	6.7%
d. Average Age	73.7	73.6	0.1%
Inactives			
a. Number	120	108	11.1%
Normal Cost			
a. Total Normal Cost as of January 1, 2015	$4,331,620	$3,925,201	10.4%
b. Less Expected Members' Contributions	2,654,694	2,490,751	6.6%
c. Normal Cost to be funded by the Municipality	$1,676,926	$1,434,450	16.9%
d. Adjustment to July 1, 2016	108,032	92,411	16.9%
e. Administrative Expense Assumption	258,338	245,581	5.2%
f. Normal Cost Adjusted to July 1, 2016	$2,059,939	$1,772,442	16.2%
Actuarial Accrued Liability as of January 1, 2015			
a. Active Members	$89,439,219	$82,216,418	8.8%
b. Inactive Members	1,695,429	1,588,657	6.7%
c. Retired Members and Beneficiaries	65,417,483	58,599,569	11.6%
d. Total	$156,552,131	$142,404,644	9.9%
Unfunded Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of January 1, 2015	$156,552,131	$142,404,644	9.9%
b. Less Actuarial Value of Assets as of January 1, 2015	126,816,839	115,339,593	10.0%
c. Unfunded Actuarial Accrued Liability as of January 1, 2015	$29,735,292	$27,065,051	9.9%
d. Adjustment to July 1, 2016	$1,455,833	$1,377,365	
e. Unfunded Actuarial Accrued Liability as of July 1, 2016	$31,191,125	$28,442,416	

*Excluding State reimbursed COLA

- The data was supplied by the Concord Retirement Board. The data was checked under broad parameters for reasonableness. With the assistance of the staff of the Concord Retirement Board, we were able to develop a database sufficient for valuation purposes. The data was fairly complete. We assumed that the gender of spouses are the opposite of the member if it was missing.
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History of Active Participants

Valuation Year	Number	Average Age	Average Past Service	Average Ann'l Compensation
2015	513	49.6	12.2	$57,083
2014	502	49.5	12.3	$54,809
2012	493	49.3	12.0	$51,159
2010	488	48.7	11.7	$49,378
2008	461	48.2	11.3	$46,193
2006	451	47.8	11.1	$41,963
2004	438	47.1	10.5	$41,086
2002	444	46.2	10.0	$37,784
2000	434	45.6	9.7	$34,119

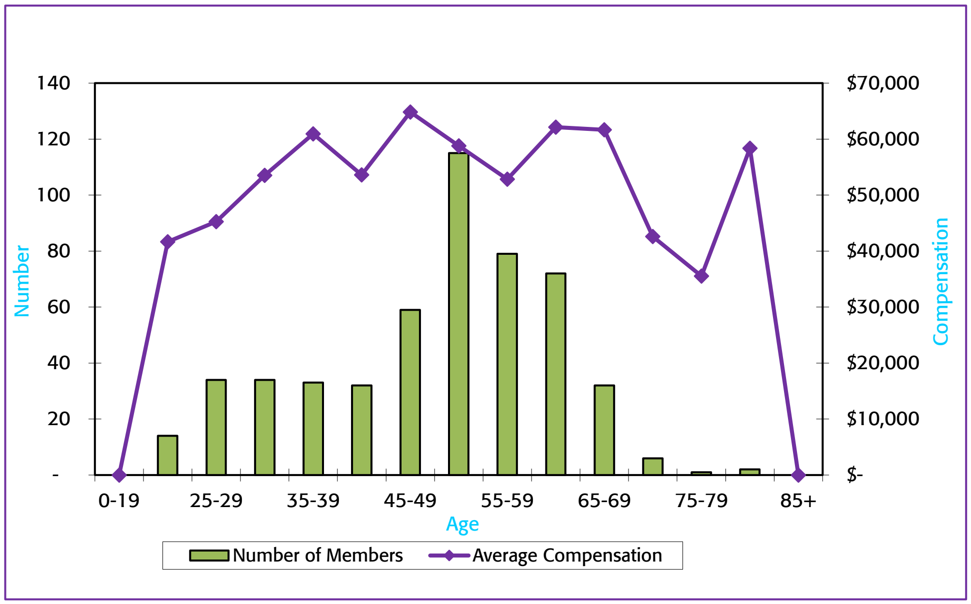
- Employee age has increased by 4.0 years and service has increased by 2.5 years over the course of the past fifteen years. This is consistent with the overall trend in the Commonwealth towards an aging of the employee population. Average annual compensation has grown by 67.3% (3.5% annually) over the same time period.

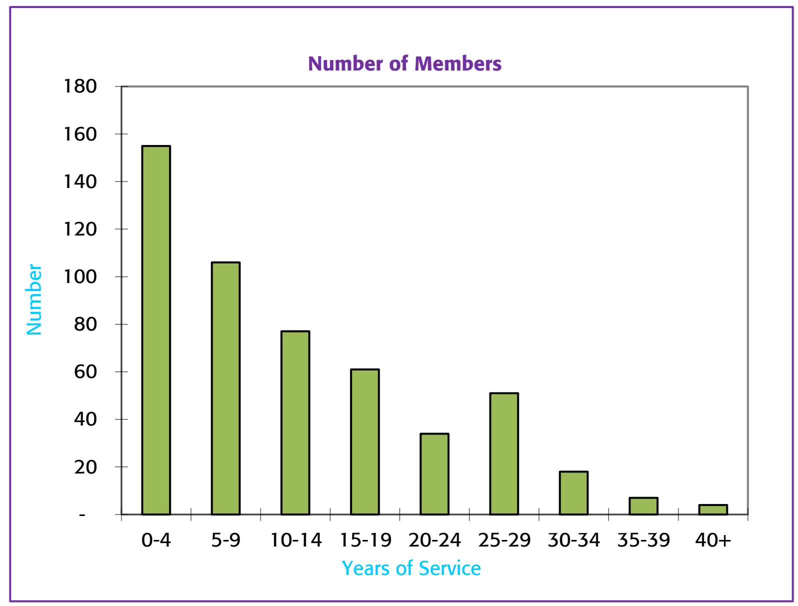
The charts on the following pages summarize demographic information regarding active and retiree members.

Distribution of Plan Members as of January 1, 2015

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	14	-	-	-	-	-	-	-	-	14	$ 583,482	$ 41,677
25-29	31	3	-	-	-	-	-	-	-	34	$ 1,537,958	$ 45,234
30-34	17	14	3	-	-	-	-	-	-	34	$ 1,819,562	$ 53,517
35-39	10	10	10	3	-	-	-	-	-	33	$ 2,010,116	$ 60,913
40-44	14	7	4	7	-	-	-	-	-	32	$ 1,715,723	$ 53,616
45-49	17	9	10	7	11	4	1	-	-	59	$ 3,825,097	$ 64,832
50-54	25	27	14	16	6	21	6	-	-	115	$ 6,761,901	$ 58,799
55-59	14	19	16	9	5	10	3	3	-	79	$ 4,174,713	$ 52,844
60-64	11	9	12	9	8	11	8	3	1	72	$ 4,474,294	$ 62,143
65-69	2	7	6	7	3	3	-	1	3	32	$ 1,972,803	$ 61,650
70-74	-	-	2	2	-	2	-	-	-	6	$ 255,497	$ 42,583
75-79	-	1	-	-	-	-	-	-	-	1	$ 35,534	$ 35,534
80-84	-	-	-	1	1	-	-	-	-	2	$ 116,728	$ 58,364
85+	-	-	-	-	-	-	-	-	-	-	$ -	$ -
TOTAL	**155**	**106**	**77**	**61**	**34**	**51**	**18**	**7**	**4**	**513**	**$ 29,283,408**	**$ 57,083**





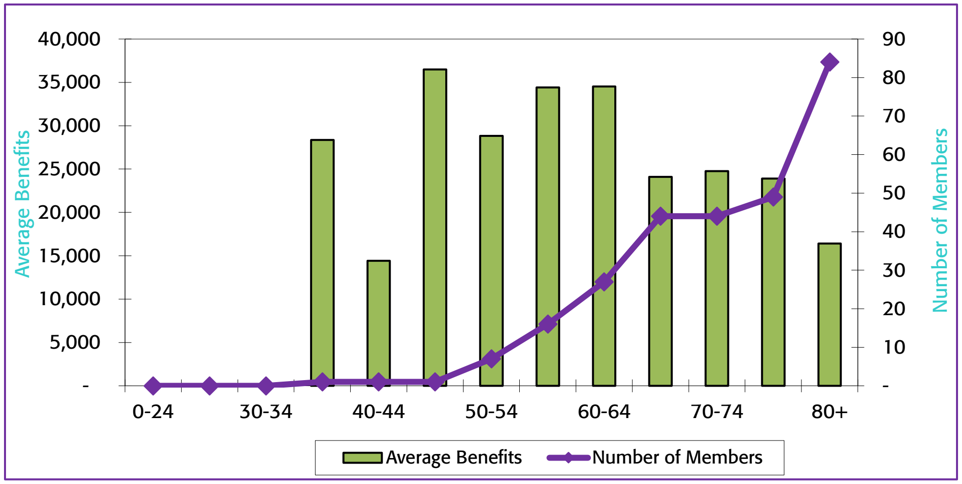
Distribution of Plan Members as of January 1, 2015

RETIRED MEMBERS

Retired Members and Beneficiaries			
Age	Number	Average Benefit	Total Benefit
0-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	1	14,432	14,432
45-49	1	36,501	36,501
50-54	5	25,802	129,008
55-59	10	41,226	412,260
60-64	24	35,356	848,549
65-69	40	23,211	928,434
70-74	41	24,601	1,008,645
75-79	48	23,862	1,145,370
80+	80	16,133	1,290,652
TOTAL	250	$ 23,255	$ 5,813,853

Disabled Members			
Age	Number	Average Benefit	Total Benefit
0-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	1	28,359	28,359
40-44	-	-	-
45-49	-	-	-
50-54	2	36,377	72,755
55-59	6	23,074	138,447
60-64	3	27,781	83,342
65-69	4	33,005	132,019
70-74	3	26,846	80,539
75-79	1	26,155	26,155
80+	4	22,092	88,370
TOTAL	24	$ 27,083	$ 649,985

Total			
Age	Number	Average Benefit	Total Benefit
0-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	1	28,359	28,359
40-44	1	14,432	14,432
45-49	1	36,501	36,501
50-54	7	28,823	201,763
55-59	16	34,419	550,707
60-64	27	34,514	931,891
65-69	44	24,101	1,060,453
70-74	44	24,754	1,089,184
75-79	49	23,909	1,171,525
80+	84	16,417	1,379,021
TOTAL	274	$ 23,591	$ 6,463,837



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

	January 1, 2015	% of Payroll*
Gross Normal Cost (GNC)	$4,331,620	14.8%
Employees Contribution	$2,654,694	9.1%
Net Normal Cost (NNC)	$1,676,926	5.7%
Adjusted to Beginning of Fiscal Year 2017	$108,032	
Administrative Expense	$258,338	0.9%
Adjusted Net Normal Cost With Admin. Expense	$2,059,939	

*Payroll paid in 2014 for employees as of January 1, 2015 is $29,283,408. Payroll for new hires in 2014 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, 2015	Percentage Change
Active Actuarial Accrued Liability			$	89,439,219	8.8%
Superannuation	$	83,180,365			
Death		1,798,545			
Disability		3,548,319			
Withdrawal		911,990			
Retiree, Inactive, Survivor and Beneficiary Actuarial Accrued Liability			$	67,112,912	11.5%
Retirees and Beneficiaries	$	57,931,512			
Disabled		7,485,971			
Inactive		1,695,429			
Total Actuarial Accrued Liability (AAL)			$	156,552,131	9.9%
Actuarial Value of Assets (AVA)			$	126,816,839	10.0%
Unfunded Actuarial Accrued Liability			$	29,735,292	9.9%
Funded Ratio (AVA / AAL)					
2015 (7.25% interest rate):	81%				
2014 (7.50% interest rate):	81%				

- 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.

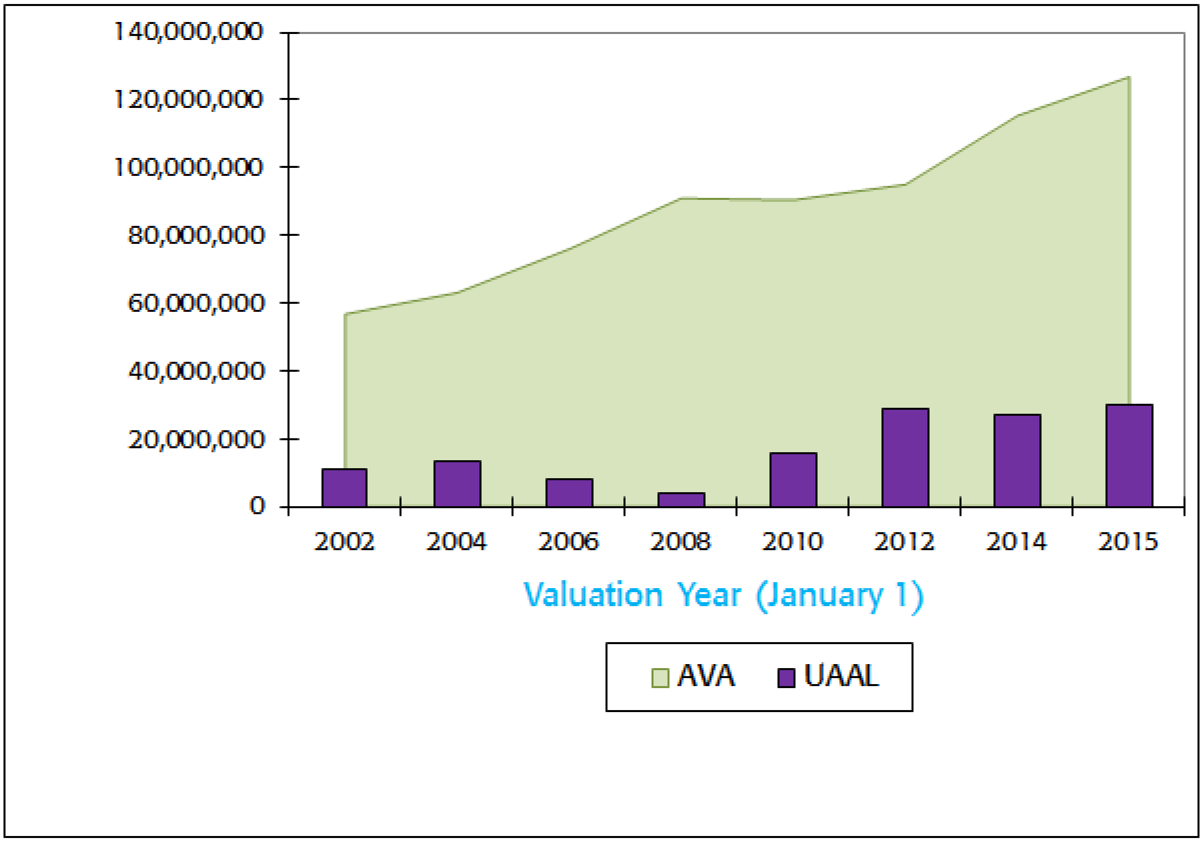
The total AAL is $156,552,131. This along with an actuarial value of assets of $126,816,839 produces a funded status of 81%. This compares to a funded status of 81% for the 2014 valuation. The unfunded actuarial accrued liability using market value of assets is $23,477,902.

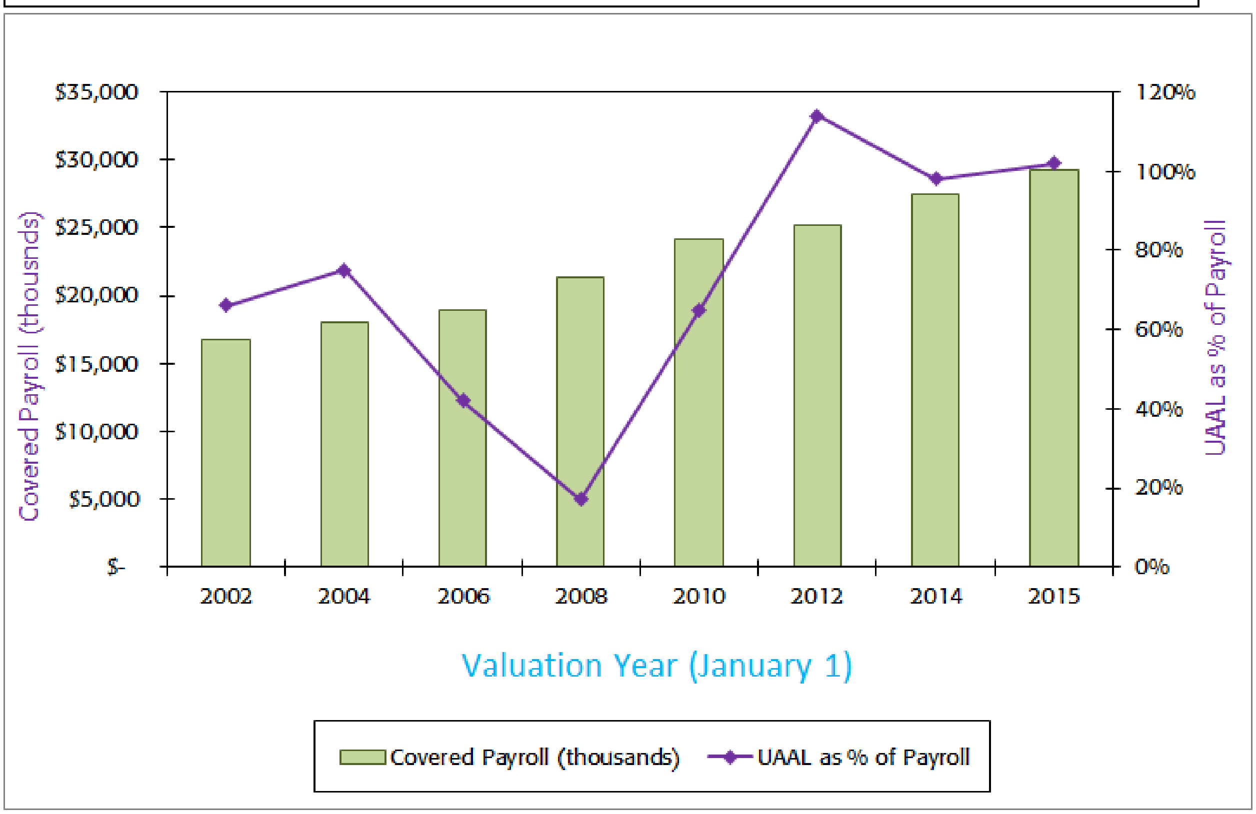
The funded status is not appropriate for assessing the sufficiency of plan assets for settlement as it includes projection of salaries as well as it includes smoothing methods inherent in the Entry Age Normal actuarial funding method.

The charts on the following page are:

- History of the unfunded actuarial accrued liability (UAAL) and the valuation assets (AVA) over the course of the past eight actuarial valuations
- History of the UAAL as a percentage of covered payroll and covered payroll amount over the same period

Charts of Selected Actuarial and Demographic Statistics





Development of Funding Schedule

Net Employer Normal Cost for Fiscal 2017 (including admin. expenses)	$2,059,939
Net 3(8)(c) Payments	$72,391
Amortization	3,025,047
Total Appropriation required for Fiscal 2017	$5,157,377

- 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 Concord 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 Concord Retirement System paid out minus what was received by the System.

- The contribution amount for Fiscal 2017 is $5,157,377. The funding schedule is presented on page 11. The schedule's length is fourteen (14) years (for the fresh start base) which is the remainder of the 15 year schedule from the January 1, 2014 valuation. The maximum funding schedule length allowed by Section 22F of Chapter 32 of the Massachusetts General Laws is twenty-four 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 of the UAAL increases by 2.00% each year.

- We expect that if the actuarial assumptions are realized, the system should become fully funded and future contributions should be reasonably related to the contributions shown in the funding schedule. The funding schedule assumes a static population where the future population has the same demographic makeup as the existing population. Shifts in the employee population and in the level of employee contribution percentages as well as the effect of pension reform have not been reflected. We expect these to result in lower contributions than shown in the funding schedule.

FUNDING SCHEDULE

Fiscal Year	Normal Cost	Unfunded Liability	Funding Amortization of UAAL	Net 3(8)(c) Payments	Schedule Contribution
2017	2,059,939	31,191,125	3,025,047	72,391	5,157,377
2018	2,147,486	30,208,119	3,085,548	72,391	5,305,425
2019	2,238,755	29,088,957	3,147,259	72,391	5,458,404
2020	2,333,902	27,822,471	3,210,204	72,391	5,616,497
2021	2,433,092	26,396,657	3,274,408	72,391	5,779,892
2022	2,536,499	24,798,611	3,339,896	72,391	5,948,786
2023	2,644,300	23,014,472	3,406,694	72,391	6,123,385
2024	2,756,683	21,029,342	3,474,828	72,391	6,303,902
2025	2,873,842	18,827,216	3,544,325	72,391	6,490,557
2026	2,995,980	16,390,901	3,615,211	72,391	6,683,582
2027	3,123,309	13,701,927	3,687,515	72,391	6,883,216
2028	3,256,050	10,740,456	3,761,266	72,391	7,089,707
2029	3,394,432	7,485,182	3,836,491	72,391	7,303,314
2030	3,538,695	3,913,221	3,913,221	72,391	7,524,307
2031	3,689,090	-	-	72,391	3,761,481

Amortization of Unfunded Liability as of July 1, 2016

Year	Type	Original Amort. Amount	Percentage Increasing	Original # of Years	Current Amort. Amount	Years Remaining
2017	Fresh Start	3,025,047	2.00%	14	3,025,047	14

<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. **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, 2015 Valuation
Interest Rate	7.25% *(7.50% prior valuation)*.
Salary Increase	Select and ultimate: 4.00% Ultimate rate, and 3.25% base rate while receiving the following steps: Group 1 and 2: 3.0% for 10 years of service Fire: 4.7% for 3 years of service Police: 5.2% in year 1, 5.6% in year 2, 7.3% in year 3, 5.0% in year 4, and 4.8% in year 5.
COLA	3% of $12,000
COLA Frequency	Granted every year
Mortality	Generational Mortality, Scale BB. 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 Generational Mortality, Scale BB, ages set forward 2 years.
Overall Disability	Groups 1 and 2 45% ordinary disability 55% accidental disability Group 4 10% ordinary disability 90% accidental disability
Retirement Rates	Groups 1 and 2: Hired prior to April 2, 2012 — Hired after April 1, 2012 Ages 55 – 70 — Ages 60 – 70 Group 4: Ages 50 – 65 — Ages 55 – 65
Administrative Expense	$258,338 budget estimated for FY 2017 provided by Concord Retirement Board.

Assets

	Cash	$	3,219,393.16
	Fixed Income Securities		28,043,395.65
	Pooled Domestic Equity Funds		40,502,310.63
	Pooled International Equity Funds		7,065,744.19
	Pooled Alternative Investments		2,061,814.56
	Pooled Real Estate Funds		6,164,129.94
	PRIT FUND		45,826,532.08
A	Sub-Total:	$	132,883,320.21
	Interest Due and Accrued		190,385.90
	Accounts Receivable		522.97
B	Sub-Total:	$	190,908.87
	Market Value of Assets [(A) + (B)]	$	133,074,229.08

- We were furnished with the System's annual report by the Board. The market value of assets as of December 31, 2014 (adjusted for payables and receivables) is $133,074,229.08.

- The asset allocation is approximately 31% fixed income, cash, receivables and payables and 69% 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 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 7.25% interest rate assumption is within the reasonable assumption range. We have used a building block method to develop the interest rate (which is the same as the assumed rate of investment return) assumption. We encourage close monitoring for changes in investment performance against expectations.

- Actuarial value of assets (AVA) of $126,816,839 is based on a four-year smoothing method. Investment gains or losses above or below the expected rate of investment return are recognized over 4 years, 25% per year. The AVA must be no more than 110% of the market value of assets and no less than 90% of the market value of assets.

- Future recognition of deferred asset gains/losses are not reflected in the funding schedule. Contribution requirements in future fiscal years will be impacted by the recognition of the deferrals.

Calculation of Valuation Assets as of January 1, 2015

FOUR-YEAR ASSET SMOOTHING

1. Market value of assets including receivable/payable as of 01/01/2015 — $133,074,229

2. Phase-in of asset gains and losses

	Plan Year (1)	Original Amount (2)	Percent Unrecognized (3)	Amount Unrecognized (2) x (3)
a.	2014	$1,702,738	75%	$1,277,053
b.	2013	$7,881,687	50%	$3,940,843
c.	2012	$4,157,975	25%	$1,039,494
d.	2011	($4,697,930)	0%	($0)
e.				$6,257,390

3. Valuation assets without corridor as of 01/01/2015 (1. - 2.e.) — $126,816,839

4. Corridor Check
   a. 90% of Market Value — $119,766,806
   b. 110% of Market Value — 146,381,652

5. Valuation assets with corridor as of 01/01/2015 (3. within Corridor) — $126,816,839

6. Calculation of return on valuation assets

   a. Valuation assets as of 01/01/2014 — $115,339,593

   b. ER contribs + EE contribs - Ben Pymts - Expenses — $52,507

   c. Actual return on valuation assets 5. - (6.a. + 6.b.) — $11,424,739

   d. Weighted value of valuation assets — $115,365,847

   e. Return on valuation assets (6.c. / 6.d.) — 9.9%

   f. Annualized return on assets — 9.9%

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
1/1/2015	$126,817	$156,552	$29,735	81%	$29,283	102%
1/1/2014	$115,340	$142,405	$27,065	81%	$27,514	98%
1/1/2012	$94,996	$123,798	$28,802	77%	$25,221	114%
1/1/2010	$90,445	$106,054	$15,609	85%	$24,097	65%
1/1/2008	$90,963	$94,681	$3,718	96%	$21,295	17%

NOTES TO SCHEDULES

Additional information as of the latest actuarial valuation follows:

Valuation Date	1/1/2015
Actuarial cost method	Entry Age Normal
Amortization method	Closed – Approximate level percent of payroll
Remaining amortization period	14 years for the fresh start base
Asset valuation method	Market value adjusted by accounts payable and receivables adjusted to phase in over 4 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 $133,074,229.08
<u>Actuarial assumptions:</u>	
Investment Rate of Return	7.25% per year
Projected Salary Increases	<u>Group 1 and 2</u>: 3.0% for 10 years of service <u>Fire</u>: 4.7% for 3 years of service <u>Police</u>: 5.2% in year 1, 5.6% in year 2, 7.3% in year 3, 5.0% in year 4, and 4.8% in year 5. <u>Ultimate Rate:</u> 4.00%

PERAC Information Disclosure

The most recent actuarial valuation of the System was prepared by Stone Consulting, Inc. as of January 1, 2015

The normal cost for employees on that date was:	$2,654,694	9.1% of payroll
The normal cost for the employer was:	$1,676,926	5.7% of payroll

The actuarial liability for active members was:	$89,439,219
The actuarial liability for retired members was (includes inactives):	$67,112,912
Total actuarial accrued liability:	$156,552,131
System assets as of that date ($133,074,229.08 Market Value):	$126,816,839
Unfunded actuarial accrued liability:	$29,735,292

The ratio of system's assets to total actuarial liability was:	81%

As of that date the total covered employee payroll was:	$29,283,408

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

Investment Return:	7.25% per annum
Rate of Salary Increase:	Select and ultimate rate (4.00% ultimate rate)

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)
1/1/2015	$126,817	$156,552	$29,735	81%	$29,283	102%
1/1/2014	$115,340	$142,405	$27,065	81%	$27,514	98%
1/1/2012	$94,996	$123,798	$28,802	77%	$25,221	114%
1/1/2010	$90,445	$106,054	$15,609	85%	$24,097	65%
1/1/2008	$90,963	$94,681	$3,718	96%	$21,295	17%

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 four-year rolling period. The phase-in is 25% for year one, 50% for year two, 75% for year three and finally 100% for year four. 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 2017. The unfunded actuarial accrued liability is rolled forward with normal cost and further adjusted by anticipated contributions and interest.

ACTUARIAL ASSUMPTIONS

Investment Return

7.25% per year net of investment expenses.

Regular Interest Rate Credited to Annuity Savings Account

2% per year.

Salary Increases

Select and ultimate, with 4.00% ultimate rate, and 3.25% base rate while receiving the following steps:

Group 1 and 2: 3.0% for 10 years of service

Fire: 4.7% for 3 years of service

Police: 5.2% in year 1, 5.6% in year 2, 7.3% in year 3, 5.0% in year 4, and 4.8% in year 5.

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%	0%
51	1%	1.5%	2%	0%	0%	0%
52	1%	2.0%	2%	0%	0%	0%
53	1%	2.5%	2%	0%	0%	0%
54	2%	2.5%	7.5%	0%	0%	0%
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

Generational Mortality, Scale BB (sex-distinct). During employment the healthy employee mortality table is used. Post-employment the healthy annuitant table is used. In-service death is assumed to be 55% accidental for group 1 and 2 and 90% accidental for group 4.

Disabled Life Mortality

Generational Mortality, Scale BB for healthy annuitants, set-forward by 2 years (sex-distinct). Death is assumed to be due to the same cause as the disability 40% of the time.

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 $258,338 for the Fiscal Year 2017 excluding investment management fees and custodial fee is added to the Normal Cost.

Net 3(8)(c)

Net 3(8)(c) payments are assumed to be the same level as the past calendar year for all future years.

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.

Contribution Timing

Contributions are assumed to be made at the beginning of the fiscal year.

Total Payroll Increase

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

Valuation Date

January 1, 2015.

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 (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

- Actuarial Accrued Liability

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

- 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 four-year rolling period. The phase-in is 25% for year one, 50% for year two, 75% for year three and finally 100% for year four. 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.

- 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 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.

- GASB

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

- Normal Cost

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

- PERAC

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

- 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.

- PRIT

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

- Unfunded Actuarial Accrued Liability

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

Concord Retirement System

Rollup of Unfunded Actuarial Liability to July 1, 2016

Valuation Date January 1, 2015

	Water	Sewer	Electric Light	Swim & Fitness	All Others	Total
Accrued Liability as of January 1, 2015	$3,567,670	$891,918	$14,007,481	$1,909,914	$136,175,148	$156,552,131
Gross Normal Cost as of January 1, 2015	86,328	21,582	347,509	121,621	3,754,580	4,331,620
Expected Employee Contributions during 2015	74,267	18,567	229,670	79,925	2,252,265	2,654,694
Expected Benefit Payouts excluding COLA during 2015[1]	75,886	18,972	633,206	8,063	5,727,710	6,463,837
Actuarial Value of Assets as of December 31, 2014	$2,890,032	$722,508	$11,346,920	$1,547,148	$110,310,231	$126,816,839
Unfunded Actuarial Accrued Liability as of July 1, 2016	$682,701	$170,676	$2,774,953	$336,958	$27,225,838	$31,191,127
Funding Ratio as of January 1, 2015	81%	81%	81%	81%	81%	81%

[1]State reimbursed COLA

stoneconsulting,inc

Town of Concord Retirement System

DEPARTMENT BREAKDOWN OF FISCAL 2017 CONTRIBUTION

	Water	Sewer	Electric Light	Swim & Fitness	All Others	Total
1. Amortization	$ 66,211	$ 16,553	$ 269,127	$32,680	$ 2,640,477	$ 3,025,047
2. Net Normal Cost Fiscal 2017 including Administrative Expense[1]	18,318	4,580	147,491	52,103	1,837,447	$ 2,059,939
3. Net 3(8)(c) payments[2]	1,650	412	6,477	883	62,969	72,391
4. Fiscal 2017 Appropriation (1+2+3)	$ 86,179	$ 21,545	$ 423,095	$ 85,666	$ 4,540,892	$ 5,157,377

[1] Net Normal Cost for Fiscal 2017 plus administrative expense. The administrative expense is allocated by gross normal cost.

[2] Net 3(8)(c) payments allocated by actuarial accrued liability