READING CONTRIBUTORY RETIREMENT SYSTEM

ACTUARIAL VALUATION
as of

January 1, 2017

Prepared by:

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October 27, 2017

Reading Contributory Retirement Board
16 Lowell Street
Reading, MA 01867

Dear Board Members:

We are pleased to present the enclosed report summarizing the results of our actuarial valuation of the Reading Contributory Retirement System as of January 1, 2017.

Our valuation was performed in accordance with the provisions contained in Chapter 32 of the Massachusetts General Laws, "M.G.L.", as of January 1, 2017. Disclosures under GASB Statement No. 67, Financial Reporting for Pension Plans (GASB 67) and GASB Statement No. 68, Accounting and Financial Reporting for Pensions (GASB 68) are provided in a separate report.

The principal results of our valuation are summarized in Section 2. The summary of Plan provisions and actuarial methods and assumptions are shown in Sections 5 and 6, respectively. Section 7 summarizes the demographic profile of active members, retired plan members and beneficiaries and disabled plan members. Asset information and actuarial liabilities are presented in Section 2. The development of the required appropriations pursuant to Chapter 32 of the M.G.L. is shown in Section 3. The summary of information for PERAC is presented in Section 4.

We also provide a 30-year forecast of the required appropriations and cash flows in Section 3.

Our actuarial valuation is based on an investment return rate of 7.65%, compounded annually. Our calculations were based on participant census and asset data and other information provided by the Reading Contributory Retirement System and the benefit provisions of Chapter 32 of the M.G.L. as of January 1, 2017.

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Our valuation follows generally accepted actuarial methods and we perform such tests as we consider necessary to assure the accuracy of the results. The amounts presented in this report have been appropriately determined according to the actuarial assumptions and methods stated herein.

We appreciate this opportunity to be of service to the Reading Contributory Retirement Board. We are available to answer any questions with respect to our valuation.

Respectfully submitted,

Linda L. Bournival, FSA
Member, American Academy of Actuaries

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ACTUARIAL CERTIFICATION

This report presents the results of the Actuarial Valuation of the Reading Contributory Retirement System as of January 1, 2017. The report presents the funding schedule contribution amounts for the fiscal years beginning 2019.

This valuation is based upon member data and asset information provided by the Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Reading Contributory Retirement System. Although we did not audit the data used in the valuation, we believe that the information is complete and reliable.

This report was completed in accordance with generally accepted actuarial standards and procedures, and conforms to the Code of Professional Conduct of the American Academy of Actuaries. The actuarial assumptions used in the determination of costs are reasonably related to the experience of the System and to reasonable expectations, and represent our best estimate of anticipated long-term experience under the System.

Future actuarial valuation results may differ significantly from the current results presented in this report. Examples of potential sources of volatility include plan experience differing from that anticipated by the economic or demographic assumptions, the effect of new entrants, changes in economic or demographic assumptions, the effect of law changes and the delayed effect of smoothing techniques.

This report is intended for the sole use of the Reading Contributory Retirement System and is intended to provide information to comply with the stated purpose of the report. It may not be appropriate for other purposes.

The undersigned credentialed actuaries are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinion contained herein. They are available to answer any questions with regard to this report.

Respectfully submitted,

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SECTION 1 - SUMMARY

Background

We have completed the Actuarial Valuation of the Reading Contributory Retirement System as of January 1, 2017. This valuation is based upon census data and asset information provided by the Retirement Board. Information for the prior valuation completed as of January 1, 2015 was obtained from the valuation report prepared by KMS Actuaries.

Massachusetts General Laws

The valuation was prepared in accordance with Chapter 32 of the Massachusetts General Laws ("M.G.L.").

The valuation does not take into consideration:

- Changes in the law after the valuation date,
- Transfers between retirement systems pursuant to Section 3(8)(c) of Chapter 32,
- State-mandated benefits and
- Cost-of-living increases granted to members in pay status between 1982 and 1997.

GASB Statement Numbers 67 and 68

The Governmental Accounting Standards Board (**GASB**) is responsible for establishing accounting standards for governmental entities. Calculations developed in accordance with GASB standards are required when providing financial statements.

In June 2012, the GASB approved two related Statements that significantly changed the way pension plans and governments account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, *Financial Reporting for Pension Plans* , replaces the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions* , replaces the requirements of Statement No. 27.

The required disclosures under the GASB Statements are presented in a separate report.

SECTION 1 - SUMMARY

Actuarial Valuation

During the 2 years since the last valuation, the total unfunded actuarial accrued liability of the System was expected to decrease from $42,961,539 as of January 1, 2015 to $39,917,596 as of January 1, 2017, for a total decrease of $3,043,943. The actual unfunded actuarial accrued liability, before any assumption or plan changes, was $46,995,150, resulting in an actuarial loss of $7,077,554. The actuarial loss was primarily made up of an asset loss of $2,052,080 and a demographic experience loss of $5,025,474. The details of the gain and loss analysis are provided in Exhibit 2.6.

Appropriations

The funding appropriation for each year is computed as the sum of the normal cost and an amortization payment to pay off the Unfunded Actuarial Liability, adjusted for semi-annual payments of the appropriation made August 1 and December 31 of each fiscal year. The appropriation calculated as of the January 1, 2017 valuation is $5,795,949, and is made up of a normal cost payment of $1,366,656 and an amortization payment of $4,429,293. The amortization method is an increasing amortization of the unfunded actuarial accrued liability at 4.50% over 12 years and is expected to fully pay the unfunded actuarial accrued liability by the year 2029. The development of the appropriation as of January 1, 2017 is presented in Exhibit 3.1.

For fiscal year 2018, we show the actual appropriation developed under the previous funding schedule and reported on the PERAC "Required Fiscal Year 2018 Appropriation" letter dated November 14, 2016 of $5,661,945. The Board has adopted a new funding schedule developed in this valuation based on certain assumption changes and changes to plan provisions, detailed below. Based on the results of this valuation, the unfunded actuarial accrued liability is expected to be fully paid by 2029. The current funding schedule is shown in Exhibit 3.2.

SECTION 1 - SUMMARY

A summary of principal valuation results from the current valuation and the prior valuation follows. Changes in actuarial assumptions and methods and Plan provisions are discussed below, as well as changes in census data and asset information.

Valuation Date	1/1/2017	1/1/2015	Increase/ (Decrease)
Summary of Member Data			
Active Members	341	333	2.4%
Average Age	48.3	48.7	(0.8%)
Average Service	14.1	15.0	(6.0%)
Salary	$24,883,071	$22,793,551	9.2%
Average Salary	$72,971	$68,449	6.6%
Retired Members and Beneficiaries	302	293	3.1%
Average Age	74.9	75.0	(0.1%)
Total Annual Pension	$8,884,683	$7,747,921	14.7%
Average Annual Pension	$29,419	$26,443	11.3%
Disabled Members	43	40	7.5%
Average Age	67.8	68.4	(0.9%)
Total Annual Pension	$1,461,098	$1,207,244	21.0%
Average Annual Pension	$33,979	$30,181	12.6%
Inactive Members	40	36	11.1%
Annuity Savings Fund	1,117,296	$1,255,953	(11.0%)
Actuarial Accrued Liability (AAL)	$173,147,741	$159,188,784	8.8%
Assets			
Market Value of Assets (MVA)	$123,992,243	$119,019,943	4.2%
Actuarial Value of Assets (AVA)	127,768,425	116,227,245	9.9%
Unfunded Accrued Liability	$45,379,316	$42,961,539	5.6%
Funded Status on AVA	73.8%	73.0%	1.1%
Funded Status on MVA	71.6%	74.8%	(4.3%)
Normal Cost			
Employer	$1,191,656	$1,192,291	(0.1%)
Employee	2,400,321	2,153,673	11.5%
Administrative Expenses	175,000	125,000	40.0%
Total Normal Cost	$3,766,977	$3,470,964	8.5%

SECTION 1 - SUMMARY

Valuation Date	1/1/2017	1/1/2015	Increase/ (Decrease)
Appropriations			
Fiscal Year 2018	$5,661,944	$5,661,945	0.0%
Fiscal Year 2019	$5,964,366	$5,916,733	0.8%
Fiscal Year 2020	$6,282,942	$6,182,986	1.6%

Actuarial Assumptions and Methods

Most of the Actuarial Assumptions and Methods used in this valuation are the same as those used in the prior valuation, except the assumed administrative expenses have increased from $125,000 to $175,000. The Actuarial Assumptions and Methods utilized in this valuation are detailed in Section 6, Actuarial Assumptions and Methods.

Plan Provisions

A COLA base of $14,000 was valued in the January 1, 2015 valuation. However, the Retirement Board did not approve the base increase, therefore the valuation incorporates a $12,000 COLA base. All other plan provisions are the same as those used in the previous valuation and are detailed in Section 5, Summary of Plan Provisions.

Census Data

As of January 1, 2017, there are 341 active members who may be eligible for benefits in the future, 302 retirees and beneficiaries, 40 inactives and 43 disabled retirees. Summaries of the active, retired and disabled employees are included in Section 7, Demographic Information.

Assets

This valuation is based upon asset information provided by the Reading Contributory Retirement Board. The market value of assets increased from $119,019,943 as of January 1, 2015 to $123,992,243 as of January 1, 2017. During the calendar years ended 2015 and 2016, the rates of return on the market value of assets were 0.75% and 7.40%, respectively.

The actuarial value of assets increased from $116,227,245 as of January 1, 2015 to $127,768,425 as of January 1, 2017. During the years ended December 31, 2015 and December 31, 2016, the rates of return on the actuarial value of assets were 6.76% and 6.87%, respectively.

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

Asset information is reported annually to the Public Employee Retirement Administration Commission by the Reading Contributory Retirement System. The Market Value of Assets for the two most recent calendar years are as follows:

Calendar Year Ended December 31	**2016**	**2015**
Trust Fund Composition at Year-End		
Cash	$213,826	$180,686
Short-Term Investments	0	0
Fixed Income Securities	0	0
Equities	0	0
Pooled Short Term Funds	0	0
Pooled Domestic Equity Funds	0	0
Pooled International Equity Funds	0	0
Pooled Global Equity Funds	0	0
Pooled Domestic Fixed Income Funds	0	0
Pooled International Fixed Income Funds	0	0
Pooled Global Fixed Income Funds	0	0
Pooled Alternative Investments	0	0
Pooled Real Estate Funds	0	0
Pooled Domestic Balanced Funds	0	0
Pooled International Balanced Funds	0	0
Hedge Funds	0	0
PRIT Cash	2,225,414	1,750,175
PRIT Fund	121,496,781	116,101,358
Interest Due & Accrued	0	0
Prepaid Expenses	8,400	9,012
Accounts Receivable	47,821	36,565
Land	0	0
Buildings	0	0
Accumulated Depreciation - Buildings	0	0
Accounts Payable	0	0
Total Market Value of Assets	$123,992,243	$118,077,797

Exhibit 2.1 - Plan Assets

Calendar Year Ended December 31	2016	2015
Funds		
Annuity Savings Fund	$25,386,544	$25,676,915
Annuity Reserve Fund	9,057,616	8,018,085
Military Service Fund	26,819	26,793
Pension Fund	9,960,187	12,916,549
Expense Fund	0	0
Pension Reserve Fund	79,561,076	71,439,455
Total Market Value of Assets	$123,992,243	$118,077,797
Asset Activity		
Market value as of January 1	$118,077,797	$119,019,943
Contributions and Receipts	8,357,205	8,158,518
Benefit Payments and Expenses	(11,083,350)	(9,983,089)
Investment Return	8,640,591	882,425
Market Value as of December 31	$123,992,243	$118,077,797
Estimated Rate of Return	7.40%	0.75%

PERAC Rates of Return

Returns and annualized past returns developed by PERAC are shown below. Information is obtained from the Annual Investment Reports published by PERAC for the years shown.

Year	1-Year Return	5-Year Return	Return (Since 1985)
2016	8.14%	9.29%	9.18%
2015	1.24%	7.63%	9.22%
2014	8.27%	10.14%	9.50%
2013	15.22%	12.02%	9.54%
2012	14.15%	1.57%	9.34%
2011	0.19%	1.21%	9.17%
2010	13.61%	4.37%	9.53%
2009	17.85%	4.21%	9.37%
2008	-29.42%	3.60%	9.03%
2007	12.17%	16.39%	11.11%
2006	16.84%	11.63%	11.06%
2005	12.75%	7.03%	10.79%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Exhibit 2.1 - Plan Assets

Valuation Date	1/1/2017	1/1/2016	1/1/2015 *
1. **Actuarial Value of Assets, prior year**	$122,194,974	$116,227,245	$109,602,111
a. Prior Year Contributions and Receipts	8,357,205	8,158,518	6,335,058
b. Prior Year Benefit Payments and Expenses	(11,083,350)	(9,983,089)	(4,671,298)
c. Average Actuarial Value of Assets	120,831,902	115,314,960	110,018,051
d. Expected Investment Return Rate	7.65%	7.65%	7.75%
e. Expected Investment Income	9,243,641	8,821,594	4,263,199
f. Preliminary Actuarial Value of Assets	128,712,470	123,224,268	115,529,070
g. Market Value of Assets as of end of year	123,992,243	118,077,797	119,019,943
h. Adjustment toward Market Value	(944,045)	(1,029,294)	698,175
i. Actuarial Value of Assets, before corridor	127,768,425	122,194,974	116,227,245

* The development of the actuarial value of assets for the period ending December 31, 2014 is based on asset activity for the period July 1, 2014 through December 31, 2014.

	1/1/2017	1/1/2016	1/1/2015
2. **Actuarial Value of Assets**			
a. Market Value of Assets Less Actuarial Value of Assets, before corridor	$127,768,425	$122,194,974	$116,227,245
b. 80% of Market Value of Assets	99,193,795	94,462,237	95,215,955
c. 120% of Market Value of Assets	148,790,692	141,693,356	142,823,932
d. Actuarial Value of Assets, a., but not less than b. and not greater than c.	$127,768,425	$122,194,974	$116,227,245
e. Ratio of Actuarial Value of Assets to Market Value of Assets	103.05%	103.49%	97.65%
3. **Rate of Return on Actuarial Value of Assets for Prior Year****	6.87%	6.76%	9.18%

** rate of return on January 1, 2015 actuarial value of assets was computed on 6-month period, then annualized.

SECTION 2 - PRINCIPAL VALUATION RESULTS

The **Actuarial Present Value of Future Benefits** is the present value of the cost to finance all benefits payable in the future, discounted to reflect the probability of payment and the time value of money. Below is the Actuarial Present Value of Future Benefits from the current valuation:

Exhibit 2.2 - Actuarial Present Value of Future Benefits

Valuation Date	1/1/2017	1/1/2015
Actives		
Superannuation	$86,700,474	$83,794,071
Termination	1,802,071	1,532,120
Death	3,952,854	3,834,986
Disability	12,402,988	11,839,186
Total Actives	$104,858,387	$101,000,363
Retired Members and Inactives		
Retired Members and Beneficiaries	$86,975,646	$77,012,989
Disabled Members	15,559,675	12,636,995
Inactive Members	1,117,296	1,255,953
Total Retired Members and Inactives	$103,652,617	$90,905,937
Total Present Value of Future Benefits	$208,511,004	$191,906,300

The **Actuarial Accrued Liability** is the portion of the Actuarial Present Value of Future Benefits which is allocated to all periods prior to a valuation year and therefore is not provided for by future Normal Costs. Below is the Actuarial Accrued Liability from the current valuation and the prior valuation:

Exhibit 2.3 - Actuarial Accrued Liability

Valuation Date	1/1/2017	1/1/2015
Actives		
Superannuation	$64,521,363	$61,939,913
Termination	(733,936)	668,890
Death	1,912,333	1,910,848
Disability	3,795,364	3,763,196
Total Actives	$69,495,124	$68,282,847
Retired Members and Inactives		
Retired Members and Beneficiaries	$86,975,646	$77,012,989
Disabled Members	15,559,675	12,636,995
Inactive Members	1,117,296	1,255,953
Total Retired Members and Inactives	$103,652,617	$90,905,937
Total Actuarial Accrued Liability	$173,147,741	$159,188,784

SECTION 2 - PRINCIPAL VALUATION RESULTS

The **Normal Cost** is the portion of the Actuarial Present Value of Future Benefits which is allocated to a valuation year. Only active employees who have not reached Normal Retirement Age incur a Normal Cost. Below is the Normal Cost from the current valuation and the prior valuation:

Exhibit 2.4 - Normal Cost

Valuation Date	1/1/2017	1/1/2015
Actives		
Superannuation	$2,297,534	$2,136,640
Termination	326,683	290,900
Death	215,970	205,294
Disability	751,790	713,130
Total Actives	$3,591,977	$3,345,964
Administrative Expenses	$175,000	$125,000
Total Normal Cost		
Normal Cost	$3,766,977	$3,470,964
As a Percentage of Salary	15.1%	15.2%
Employee Normal Cost		
Employee Contributions	$2,400,321	$2,153,673
As a Percentage of Salary	9.6%	9.4%
Employer Normal Cost		
Employer Normal Cost	$1,366,656	$1,317,291
As a Percentage of Salary	5.5%	5.8%

Exhibit 2.5 - Unfunded Actuarial Accrued Liability

Valuation Date		1/1/2017	1/1/2015
Unfunded Actuarial Accrued Liability			
a.	Actuarial Accrued Liability	$173,147,741	$159,188,784
b.	Actuarial Value of Assets	127,768,425	116,227,245
c.	Unfunded Actuarial Accrued Liability (a. - b.)	$45,379,316	$42,961,539
d.	Funded Ratio (b. divided by a.)	73.8%	73.0%

Exhibit 2.6 - Actuarial Experience

In performing the actuarial valuation, various assumptions are made regarding mortality, retirement, disability and withdrawal rates as well as salary increases and investment returns. A comparison of the results of the current valuation and the prior valuation is made to determine how closely actual experience relates to expected. During the 2-year period since the last valuation, the total unfunded actuarial accrued liability of the System was expected to decrease by $3,043,943. Below is the development of the Actuarial Gain or Loss for the period January 1, 2015 through December 31, 2016:

	Plan Year Ending	12/31/2016	12/31/2015
	Expected Unfunded Actuarial Accrued Liability		
a.	Unfunded Actuarial Accrued Liability, beginning of year	$41,514,008	$42,961,539
b.	Normal cost, beginning of year	$3,627,157	3,470,964
c.	Total contributions	(8,357,205)	(8,158,518)
d.	Interest (full year on a. and b., monthly on c.)	3,133,636	3,240,023
e.	Expected Unfunded Actuarial Accrued Liability	$39,917,596	$41,514,008
f.	Unfunded Actuarial Accrued Liability (before changes)	$46,995,150	
g.	(Gain)/Loss	$7,077,554	
	Asset (Gain)/Loss		
a.	Actuarial value of assets, beginning of year	$122,194,974	$116,227,245
b.	Contributions and Receipts	8,357,205	8,158,518
c.	Benefit Payments and Expenses	(11,083,350)	(9,983,089)
d.	Assumed rate of return	7.65%	7.65%
e.	Expected return	9,243,640	8,821,594
f.	Actuarial value of assets, end of year	127,768,425	122,194,974
g.	Actual return	8,299,596	7,792,300
h.	Actual rate of return	6.87%	6.76%
i.	Asset (gain)/loss	$944,044	$1,029,294
j.	Total (gain)/loss over the 2-year period	$2,052,080	
	Actual Unfunded Actuarial Accrued Liability		
a.	Changes due to:		
	i) Asset (gain)/loss	$2,052,080	
	ii) (Gain)/loss from demographic experience	5,025,474	
	iii) Total (Gain)/loss prior to changes	7,077,554	
	iv) Unfunded Actuarial Accrued Liability (before changes)	46,995,150	
	v) Assumption changes	-	
	vi) Plan changes	(1,615,834)	
b.	Unfunded Actuarial Accrued Liability, end of year	45,379,316	

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.1 - Annual Appropriations

The **Annual Appropriation** is determined in accordance with the requirements set forth in Sections 22D and 22F of Chapter 32 of the Massachusetts General Laws ("M.G.L."). The appropriation is comprised of the annual employer normal cost and amortization payments to pay the unfunded actuarial accrued liability. Below are the details of the annual appropriation for the current valuation.

Amortization Payment		**Outstanding Balance at 1/1/2017**	**Period (in years)**	**Payment Increase Rate**	**Annual Payment**
a.	Assumption Change	$0	12	4.50%	$0
b.	Plan Change	($1,615,834)	12	4.50%	($157,715)
c.	Unfunded Actuarial Accrued Liability	$46,995,150	12	4.50%	$4,587,008
d.	Total	$45,379,316			$4,429,293
Normal Cost					$1,366,656
Total Appropriation at Valuation Date					$5,795,949

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibits 3.2 and 3.3, are based on the assumptions below:

- Total Normal Cost is expected to increase 4.50% per year.
- Employee Contributions are expected to increase by 4.50% per year.
- Employer Normal Cost is the difference between Total Normal Cost and Employee Contributions.
- The Unfunded Actuarial Accrued Liability (""UAL"") is computed as of January 1 of each year assuming no future gains or losses.
- Total Employer Cost is the sum of the Employer Normal Cost and the Amortization of the UAL, both computed as of January 1 of each year and adjusted for semi-annual payments made on August 1 and December 31.
- For fiscal year 2018, we show the actual appropriation developed under the previous funding schedule of $5,661,945. The Board has adopted a new funding schedule developed in this valuation, providing annual appropriations that increase by 5.341% per year. Based on the results of this valuation, the unfunded actuarial accrued liability is expected to be fully paid by 2029.
- Expected benefit payments include payments expected to be made to retired members, beneficiaries, disabled members and active members expected to retire. In addition, expected benefit payments include distribution of the annuity savings fund attributed to inactive members.
- Benefit payments exclude cost-of-living increases granted to members in pay status between 1982 and 1997. In addition, benefit payments are as expected for the first ten years of the forecast, then increase by the greater of 4.50% per year thereafter or the expected future payments for the current population projected by our computer model.

Exhibit 3.2 - 30-Year Forecast of Annual Appropriations

Fiscal Year Ending	Total Normal Cost	Employee Contributions	Employer Normal Cost	Amortization Payment of UAL	Total Employer Cost	Increase over Prior Year	Unfunded Actuarial Accrued Liability
2018	$3,836,389	$2,444,551	$1,391,838	$4,270,106	$5,661,944		$45,379,316
2019	4,009,027	2,554,555	1,454,472	4,509,894	5,964,366	5.341%	44,337,235
2020	4,189,434	2,669,510	1,519,924	4,763,018	6,282,942	5.341%	42,961,974
2021	4,377,958	2,789,638	1,588,320	5,030,212	6,618,532	5.341%	41,213,948
2022	4,574,966	2,915,171	1,659,795	5,312,252	6,972,047	5.341%	39,049,767
2023	4,780,840	3,046,354	1,734,486	5,609,959	7,344,445	5.341%	36,421,904
2024	4,995,978	3,183,440	1,812,538	5,924,196	7,736,734	5.341%	33,278,327
2025	5,220,796	3,326,695	1,894,101	6,255,874	8,149,975	5.341%	29,562,110
2026	5,455,733	3,476,396	1,979,337	6,605,954	8,585,291	5.341%	25,211,011
2027	5,701,241	3,632,834	2,068,407	6,975,450	9,043,857	5.341%	20,157,010
2028	5,957,797	3,796,312	2,161,485	7,365,431	9,526,916	5.341%	14,325,813
2029	6,225,894	3,967,146	2,258,748	7,777,023	10,035,771	5.341%	7,636,311
2030	6,506,062	4,145,668	2,360,394	-	2,360,394	-76.480%	-
2031	6,798,835	4,332,223	2,466,612	-	2,466,612	4.500%	-
2032	7,104,783	4,527,173	2,577,610	-	2,577,610	4.500%	-
2033	7,424,498	4,730,896	2,693,602	-	2,693,602	4.500%	-
2034	7,758,600	4,943,786	2,814,814	-	2,814,814	4.500%	-
2035	8,107,738	5,166,256	2,941,482	-	2,941,482	4.500%	-
2036	8,472,586	5,398,738	3,073,848	-	3,073,848	4.500%	-
2037	8,853,852	5,641,681	3,212,171	-	3,212,171	4.500%	-
2038	9,252,276	5,895,557	3,356,719	-	3,356,719	4.500%	-
2039	9,668,628	6,160,857	3,507,771	-	3,507,771	4.500%	-
2040	10,103,716	6,438,095	3,665,621	-	3,665,621	4.500%	-
2041	10,558,384	6,727,809	3,830,575	-	3,830,575	4.500%	-
2042	11,033,511	7,030,561	4,002,950	-	4,002,950	4.500%	-
2043	11,530,020	7,346,936	4,183,084	-	4,183,084	4.500%	-
2044	12,048,871	7,677,548	4,371,323	-	4,371,323	4.500%	-
2045	12,591,070	8,023,038	4,568,032	-	4,568,032	4.500%	-
2046	13,157,668	8,384,074	4,773,594	-	4,773,594	4.500%	-
2047	13,749,763	8,761,358	4,988,405	-	4,988,405	4.500%	-

Exhibit 3.3 - 30-Year Forecast of Cash Flow

Calendar Year	Assets, BOY	Benefit Payments	Employee Contributions	Employer Contributions	Investment Return	Assets, EOY
2017	$123,992,243	$11,907,872	$2,400,321	$5,559,502	$9,638,857	$129,683,051
2018	129,683,051	11,232,829	2,508,335	5,856,451	10,131,004	136,946,012
2019	136,946,012	11,664,878	2,621,210	6,169,262	10,702,659	144,774,265
2020	144,774,265	12,125,789	2,739,164	6,498,781	11,318,123	153,204,544
2021	153,204,544	12,666,697	2,862,426	6,845,900	11,978,333	162,224,506
2022	162,224,506	13,094,082	2,991,235	7,211,560	12,689,840	172,023,059
2023	172,023,059	13,636,921	3,125,841	7,596,751	13,458,430	182,567,160
2024	182,567,160	14,086,487	3,266,504	8,002,516	14,289,660	194,039,353
2025	194,039,353	14,576,758	3,413,497	8,429,954	15,192,474	206,498,520
2026	206,498,520	15,061,870	3,567,104	8,880,223	16,173,241	220,057,218
2027	220,057,218	15,772,509	3,727,624	9,354,542	17,231,864	234,598,739
2028	234,598,739	16,482,272	3,895,367	9,854,194	18,368,198	250,234,226
2029	250,234,226	17,223,974	4,070,659	2,317,687	18,972,810	258,371,408
2030	258,371,408	17,999,053	4,253,839	2,421,983	19,587,649	266,635,826
2031	266,635,826	18,809,010	4,445,262	2,530,972	20,211,878	275,014,928
2032	275,014,928	19,655,415	4,645,299	2,644,866	20,844,520	283,494,198
2033	283,494,198	20,539,909	4,854,337	2,763,885	21,484,449	292,056,960
2034	292,056,960	21,464,205	5,072,782	2,888,260	22,130,371	300,684,168
2035	300,684,168	22,430,094	5,301,057	3,018,232	22,780,813	309,354,176
2036	309,354,176	23,439,448	5,539,605	3,154,052	23,434,100	318,042,485
2037	318,042,485	24,494,223	5,788,887	3,295,985	24,088,339	326,721,473
2038	326,721,473	25,596,463	6,049,387	3,444,304	24,741,395	335,360,096
2039	335,360,096	26,748,304	6,321,609	3,599,298	25,390,874	343,923,573
2040	343,923,573	27,951,978	6,606,081	3,761,267	26,034,092	352,373,035
2041	352,373,035	29,209,817	6,903,355	3,930,524	26,668,053	360,665,150
2042	360,665,150	30,524,259	7,214,006	4,107,398	27,289,418	368,751,713
2043	368,751,713	31,897,851	7,538,636	4,292,231	27,894,475	376,579,204
2044	376,579,204	33,333,254	7,877,875	4,485,381	28,479,101	384,088,307
2045	384,088,307	34,833,250	8,232,379	4,687,224	29,038,733	391,213,393
2046	391,213,393	36,400,746	8,602,836	4,898,149	29,568,321	397,881,953

SECTION 4 - REQUIRED DISCLOSURES

Exhibit 4.1 - GASB 67 and GASB 68 Disclosures

In June 2012, the GASB approved two related Statements that significantly changed the way pension plans and governments will account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, *Financial Reporting for Pension Plans*, replaced the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, replaced the requirements of Statement No. 27.

The new pension standards reflected changes from those previously in place regarding how governments calculate total pension liability and pension expense. Further, the new standards contain requirements for disclosing information in the notes to financial statements and presenting required supplementary information following the notes.

GASB 67 requires defined benefit pension plans, such as the Reading Contributory Retirement System, to present a statement of fiduciary net position (pension plan assets) and a statement of changes in fiduciary net position. Further, the statement requires that notes to financial statements include descriptive information such as the types of benefits provided, the classes of plan members covered and the composition of the pension plan's retirement board. Finally, GASB 67 requires pension plans to present in required supplementary information the sources of the changes in the net pension liability and information about the actuarially determined contributions compared with the actual contributions made to the plan and related ratios.

GASB 67 and GASB 68 require projected benefit payments be discounted to their actuarial present value using the single rate that reflects:

(1) a long-term expected rate of return on pension plan investments *to the extent that the pension plan's assets are sufficient to pay benefits and pension plan assets are expected to be invested using a strategy to achieve that return and*

(2) a tax-exempt, high-quality municipal bond rate *to the extent that the conditions for use of the long-term expected rate of return are not met.*

GASB 68 establishes standards for measuring and recognizing liabilities, deferred outflows of resources, deferred inflows of resources and pension expense by state and local governments.

The effective date for GASB 67 is for plan years beginning after June 15, 2013, which is fiscal year ending December 31, 2014 for the Reading Contributory Retirement System. The effective date for GASB 68 is for employers' fiscal years beginning after June 15, 2014. The GASB report, submitted under separate cover and prepared as of December 31, 2016 (the measurement date), presents information to assist the Reading Contributory Retirement System in providing the required information under GASB 68 to participating employers.

Exhibit 4.2 - PERAC Disclosure Information

The most recent actuarial valuation of the System was prepared by KMS Actuaries, LLC as of January 1, 2017.

The normal cost for employees on that date was:	$2,400,321	9.6% of payroll
The normal cost for the employer was:	$1,366,656	5.5% of payroll

The actuarial liability for active members was:	$69,495,124
The actuarial liability for retired and inactive members was:	103,652,617
Total actuarial liability:	$173,147,741
System assets as of that date:	$127,768,425
Unfunded actuarial accrued liability:	$45,379,316
The ratio of System assets to total actuarial accrued liability was:	73.8%

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

Investment Return:	7.65%
Rate of Salary Increase:	Based on years of service, ranging from 6% decreasing to 4.25% after 9 years of service for Group 1 employees, and ranging from 7% decreasing to 4.75% after 6 years for Group 4 employees.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Administration

There are 105 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws and other applicable statutes. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

Participation

Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the local retirement board, and approved by PERAC. Membership is optional for certain elected officials.

There are four classes of membership in the Retirement System:

Group 1:	General employees, including clerical, administrative, technical and all other employees not otherwise classified.
Group 2:	Certain specified hazardous duty positions.
Group 3:	State police officers and inspectors.
Group 4:	Local police officers, firefighters and other specified hazardous positions.

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

Member Contributions

Member contributions vary depending on the most recent date of membership:

Prior to 1975:	5% of Salary
1975 – 1983:	7% of Salary
1984 – June 30, 1996:	8% of Salary
July 1, 1996 – present:	9% of Salary
1979 – present:	An additional 2% of Salary in excess of $30,000.
Group 1 members hired on or after April 2, 2012:	6% with 30 or more years of creditable service.

Rate of Interest

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least ten financial institutions.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Retirement Age The mandatory retirement age for some Group 2 and Group 4 members is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for members in Group 1.

Salary Gross regular compensation. This does not include bonuses, overtime, severance pay, unused sick leave credit or other similar compensation.

Average Salary Membership before April 2, 2012: Average annual rate of regular compensation received during the three consecutive years that produce the highest average, or, if greater, during the last three years (whether or not consecutive) preceding retirement.

Membership on or after April 2, 2012: Average annual rate of regular compensation received during the five consecutive years that produce the highest average, or, if greater, during the last five years (whether or not consecutive) preceding retirement.

Creditable Service The period during which a member contributes to the retirement system plus certain periods of military service and "purchased" service.

Benefit Rate The benefit rate varies with the member's retirement age, Group, membership date and years of creditable service at retirement. Each year a member retires prior to the age at which the 2.5% maximum benefit rate applies, a reduction is applied to each year of age under the maximum age.

	Group 1	Group 2	Group 4
2.5% for Membership before April 2, 2012:			
Maximum age:	65	60	55
Reduction:	0.1%	0.1%	0.1%
2.5% for Membership on or after April 2, 2012, less than 30 years:			
Maximum age:	67	62	57
Reduction:	0.15%	0.15%	0.15%
2.5% for Membership on or after April 2, 2012, 30 or more years of service:			
Maximum age:	67	62	57
Reduction:	0.125%	0.125%	0.125%

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Superannuation Retirement

Eligibility if membership before April 2, 2012:

- completion of 20 years of Creditable Service, or
- attainment of age 55 if hired prior to 1978, or
- attainment of age 55 with 10 years of Creditable Service, if hired after 1978.

Eligibility if membership on or after April 2, 2012:

- attainment of age 60 with 10 years of Creditable Service if classified in Group 1
- attainment of age 55 with 10 years of Creditable Service if classified in Group 2
- attainment of age 55 if hired prior to 1978, or if classified in Group 4

Benefit Amount: Product of the member's Benefit Rate, Average Salary and Creditable Service.

Maximum Benefit: 80% of the member's Average Salary.

Veteran's Benefit: Additional benefit of $15 per year of Creditable Service, up to a maximum of $300.

Deferred Vested

Eligibility

- completion of ten or more years of Creditable Service.
- elected officials hired prior to 1978, completion of six years of Creditable Service.

Benefit Amount: Accrued benefit payable commencing at age 55, or the completion of 20 years of Creditable Service, or may be deferred until later at the participant's option.

Withdrawal of Contributions

Contributions may be withdrawn upon termination of employment.

- Members hired prior to 1984 receive contributions plus 100% of interest credited.
- Members hired after 1983 with less than five years of Creditable Service receive contributions only.
- Members hired after 1983 with more than five years of Creditable Service but less than ten years receive contributions plus 50% of interest credited.
- Members hired after 1983 with more than ten years of Creditable Service receive contributions plus 100% of interest credited.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Ordinary Disability Retirement	Eligibility	Non-job related disability after completion of ten years of Creditable Service.
	Benefit Amount for Group 1 membership before April 2, 2012 or Group 2 or Group 4	Superannuation benefit determined if the member is age 55, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest.
	Benefit Amount for Group 1 membership on or after April 2, 2012	Superannuation benefit determined if the member is age 60, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest.
Accidental Disability Retirement	Eligibility	Disabled as a result of an accident in the performance of duties. There is no minimum age or service requirement.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of $15 per year of Creditable Service, up to a maximum of $300.
	Supplemental Dependent Allowance	Additional allowance of $415 per year for each child.
Non-Occupational Death	Eligibility	For members with at least two years of creditable service who die while in active service, but not due to occupational injury.
	Benefit Amount	Benefit as if Option C had been elected. Minimum benefit of $250 per month for surviving spouse, $120 per month for first child and $90 per month for each additional child.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Accidental Death	Eligibility	For members who die as a result of an occupational injury.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of $15 per year of creditable service, up to a maximum of $300.
	Supplemental Dependent Allowance	Additional allowance of $708.60 per year for each child until age 18 (or age 22 if a full-time student).

Cost-of-Living Adjustment (COLA)

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

Optional Forms of Payment

A member may elect to receive his or her retirement allowance in one of three forms of payment:

- Option A – Total annual allowance commencing at retirement and terminating at member's death.

- Option B – A reduced annual allowance commencing at retirement with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member.

- Option C – A reduced annual allowance commencing at retirement with 66⅔% of benefit continued to designated beneficiary upon death of member. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Valuation Date: January 1, 2017. Prior valuation date, January 1, 2015.

Investment Return: 7.65% per year.

The investment return assumption is a long-term assumption based on capital market expectations by asset class, historical returns and professional judgment. We considered analysis prepared by PRIM's investment advisor using a building block approach and using the target asset allocation, expected returns by asset class and risk analysis to determine a long-term expected average annual rate of return.

Annuity Savings Fund Interest Rate: 3.00% per year

Amortization Method: *Unfunded Actuarial Accrued Liability (UAL):*

Increasing dollar amount at 4.50% to reduce the Unfunded Actuarial Accrued Liability to zero on or before June 30, 2029.

The increase in annual appropriation is limited to 5.341% increase over the prior year.

Salary Scale: The assumed annual rates for salary increases including longevity are illustrated by the following rates that vary by years of service:

Years of Service	General Employees	Police and Fire
0	6.00%	7.00%
1	5.50%	6.50%
2	5.50%	6.00%
3	5.25%	5.75%
4	5.25%	5.25%
5	4.75%	5.25%
6	4.75%	4.75%
7	4.50%	4.75%
8	4.50%	4.75%
9 and later	4.25%	4.75%

The salary scale assumption is a long-term estimate derived from historical data, current and recent market expectations and professional judgment.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Cost-of-Living Allowance: Cost-of-Living Allowances (COLA) are assumed to be 3% of the pension amount, capped at $360 per year.

Post-Retirement Mortality Rates: Post-retirement mortality rates are based on the RP-2014 Mortality Table, projected with fully generational mortality improvement using Scale MP-2014. For Disabled lives, RP-2014 Disabled Mortality Table. Previously, RP-2000 Mortality Table projected to 2012.

Pre-retirement mortality rates are based on the RP-2014 Mortality Table, projected with fully generational mortality improvement using Scale MP-2014. Previously, RP-2000 Mortality Table projected to 2012.

General Employees: 55% of deaths are job-related.
Police and Fire : 90% of deaths are job-related.

The underlying tables with generational mortality improvement reasonably reflect the mortality experience of the System as of the valuation date based on historical and current demographic data. Further, PERAC reviewed a sampling of a few larger local retirement systems and compared the results with the results found in performing the analsyis of the State Retirement System for years 2012 - 2014. For the State Retirement System analysis, the mortality assumptions reflect the recent experience study published in 2014.

Turnover Rates: Illustrative turnover rates are shown below:

Years of Service	General Employees	Police and Fire
0	15.0%	1.5%
1	12.0%	1.5%
2	10.0%	1.5%
3	9.0%	1.5%
4	8.0%	1.5%
5-9	7.6%	1.5%
10	5.4%	1.5%
11-14	5.4%	0.0%
15-19	3.3%	0.0%
20-24	2.0%	0.0%
25-29	1.0%	0.0%
30+	0.0%	0.0%

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Disability Rates: Illustrative disability rates are shown below:

Age	General Employees	Police and Fire
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%

General Employees: 55% of disabilities are accidental and 45% are ordinary.
Police and Fire : 90% of disabilities are accidental and 10% are ordinary.

Retirement Rates: Illustrative retirement rates are shown below:

	General Employees		
Age	Male	Female	Police and Fire
50	1.0%	1.5%	1.0%
51	1.0%	1.5%	1.0%
52	1.0%	2.0%	1.0%
53	1.0%	2.5%	1.0%
54	2.0%	2.5%	1.0%
55	2.0%	5.5%	2.0%
56	2.5%	6.5%	2.0%
57	2.5%	6.5%	2.0%
58	5.0%	6.5%	5.0%
59	6.5%	6.5%	7.5%
60	12.0%	5.0%	15.0%
61	20.0%	13.0%	10.0%
62	30.0%	15.0%	10.0%
63	25.0%	12.5%	10.0%
64	22.0%	18.0%	15.0%
65	40.0%	15.0%	20.0%
66	25.0%	20.0%	20.0%
67	25.0%	20.0%	25.0%
68	30.0%	25.0%	25.0%
69	30.0%	20.0%	30.0%
70	100.0%	100.0%	100.0%

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

The turnover, disability and retirement rates are based on PERAC's most recent experience analysis of local retirement systems which reviewed age, gender and job group. The assumptions reflect this analysis as well as professional judgment.

Actuarial Cost Method: Individual Entry Age Normal.

Actuarial Asset Method: The Actuarial Value of Assets is determined as follows:

a) A preliminary Actuarial Value of Assets is developed and equals the Actuarial Value of Assets from the prior year plus contributions and receipts minus benefit payments and expenses plus expected investment earnings.

b) An adjustment is added to a) that equals 20% of the excess of the Market Value at the end of the year over the preliminary Actuarial Value of Assets developed in a) above.

c) The Actuarial Value of Assets is further constrained to be not less than 80% or more than 120% of Market Value.

Census Data: Census data as of the valuation date were submitted by the Retirement Board.

Asset Data: Asset information is provided by the Board. Calendar year asset information is reported annually to the Public Employee Retirement Administration Commission by the Reading Contributory Retirement Board.

Dependents: 75% of all members will be survived by a spouse. Age assumption for spouses is that males are assumed to be three years older than females.

Administrative Expenses: For Fiscal Year 2018, the administrative expenses were assumed to be $175,000 and are anticipated to increase at 4.5% per year. Previously, $125,000 per year.

The administrative expense assumption is based on information relating to the System's administrative expenses provided by the Retirement System.

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.1 - Active Members Average Salary by Age and Years of Service

	Years of Service									
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	Total
Under 20	1	-	-	-	-	-	-	-	-	1
	56,768	-	-	-	-	-	-	-	-	56,768
20-24	3	-	-	-	-	-	-	-	-	3
	36,189	-	-	-	-	-	-	-	-	36,189
25 to 29	25	-	-	-	-	-	-	-	-	25
	55,290	-	-	-	-	-	-	-	-	55,290
30 to 34	14	12	6	-	-	-	-	-	-	32
	71,820	72,192	86,665	-	-	-	-	-	-	74,743
35 to 39	6	7	12	5	-	-	-	-	-	30
	64,770	75,462	82,985	73,181	-	-	-	-	-	75,953
40 to 44	5	5	13	10	5	-	-	-	-	38
	67,385	70,685	70,449	88,228	92,291	-	-	-	-	77,629
45 to 49	10	6	5	10	8	4	1	-	-	44
	63,434	74,213	81,582	77,798	85,402	68,508	107,472	-	-	75,687
50 to 54	11	4	6	6	6	10	4	1	-	48
	58,783	62,683	62,139	81,496	85,628	88,770	94,972	83,066	-	75,491
55 to 59	6	12	9	7	3	6	12	2	1	58
	57,133	64,223	81,989	95,437	114,769	98,922	99,207	121,629	84,151	85,779
60 to 64	4	3	5	12	5	3	5	3	2	42
	57,205	50,609	48,457	54,730	75,964	85,260	69,024	58,860	88,462	62,236
65 to 69	2	2	2	1	1	3	2	-	1	14
	38,984	44,550	51,657	82,789	63,871	61,099	69,062	-	77,027	58,249
70 & up	1	-	-	2	-	2	1	-	-	6
	52,482	-	-	61,613	-	67,592	45,933	-	-	59,471
Total	88	51	58	53	28	28	25	6	4	341
Average Salary	59,791	67,756	74,067	76,339	87,373	83,197	88,281	83,817	84,525	72,971

Average Age: 48.3 Average Service: 14.1

Exhibit 7.2 - Retired Plan Members and Beneficiaries Annual Pensions

	Male		Female		Total	
Attained Age	Count	Total Payments	Count	Total Payments	Count	Total Payments
<20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	1	9,835	1	9,835
40-44	0	0	0	0	0	0
45-49	0	0	0	0	0	0
50-54	1	8,600	0	0	1	8,600
55-59	14	752,861	4	80,266	18	833,126
60-64	20	1,061,655	8	215,864	28	1,277,518
65-69	37	1,738,479	27	654,384	64	2,392,862
70-74	27	1,067,405	20	341,191	47	1,408,596
75-79	27	955,639	21	323,305	48	1,278,943
80-84	18	515,543	22	344,800	40	860,343
85-89	12	246,650	15	178,223	27	424,873
90-94	11	188,467	10	107,443	21	295,910
95+	2	32,031	5	62,044	7	94,076
Total	169	6,567,329	133	2,317,354	302	8,884,683
Average Age	73.5		76.8		74.9	
Average Payment		38,860		17,424		29,419
	56.0%	73.9%	44.0%	26.1%	100.0%	100.0%

Exhibit 7.3 - Disabled Plan Members Annual Pensions

	Male		Female		Total	
Attained Age	Count	Total Payments	Count	Total Payments	Count	Total Payments
<20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	1	65,553	0	0	1	65,553
45-49	1	62,263	1	44,890	2	107,154
50-54	3	133,952	2	101,667	5	235,620
55-59	2	93,923	1	40,256	3	134,179
60-64	4	132,869	0	0	4	132,869
65-69	11	360,404	0	0	11	360,404
70-74	4	100,133	0	0	4	100,133
75-79	6	166,303	0	0	6	166,303
80-84	5	116,664	0	0	5	116,664
85-89	2	42,221	0	0	2	42,221
90-94	0	0	0	0	0	0
95+	0	0	0	0	0	0
Total	39	1,274,285	4	186,813	43	1,461,098
Average Age	69.4		52.0		67.8	
Average Payment		32,674		46,703		33,979
	90.7%	87.2%	9.3%	12.8%	100.0%	100.0%

SECTION 8 - GLOSSARY OF TERMS

Actuarial Accrued Liability – That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

Actuarial Assumptions – Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the commencement, amount and duration of pension benefits, such as: changes in compensation, mortality, withdrawal, disablement and retirement; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

Actuarial Cost Method (or Funding Method) – A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the current year (Normal Cost) and the past (Actuarial Accrued Liability).

Actuarial Gain or Loss (or Experience Gain or Loss) – A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between the valuation date and the most recent immediately preceding valuation date.

Actuarial Present Value – The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

Amortization Payment – That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

Annual Statement – The statement submitted by the local retirement board to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

Annuity Reserve Fund – The fund into which total accumulated Member Contributions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

Annuity Savings Fund – The fund in which Member Contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

Assets – The total value of the investments held by the Plan trust that are for the payment of promised benefits.

Cost of Benefits – The estimated payment from the pension system for benefits for the fiscal year.

Expense Fund – The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.

Funded Ratio – The Actuarial Value of Assets expressed as a percentage of the Actuarial Accrued Liability.

SECTION 8 - GLOSSARY OF TERMS

Funding Schedule – The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22D of M.G.L. Chapter 32.

GASB – Governmental Accounting Standards Board.

Normal Cost – Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits which is expected to accrue in the current fiscal year. The Employee Normal Cost is the amount of the expected Member Contributions for the current fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

Pension Fund – The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

Pension Reserve Fund – The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

Present Value of Future Benefits – The actuarial present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value of money and the probabilities of payment.

Special Fund for Military Service Credit – The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

Unfunded Actuarial Accrued Liability – The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

SECTION 9 - RESULTS BY DEPARTMENT

Department	Storm Water Enterprise	Housing	Municipal Light	School	Sewer	Water	Retirement	Town	Total
Summary of Member Data as of January 1, 2017									
Active Members	2	3	69	48	4	11	1	203	341
Average Age	53.8	60.7	49.6	52.3	38.2	43.6	45.5	47.2	48.3
Average Service	8.4	15.1	16.1	8.5	13.2	13.6	11.3	14.8	14.1
Salary	90,600	208,519	6,360,386	2,572,458	202,104	659,867	76,895	14,712,242	24,883,071
Average Salary	45,300	69,506	92,180	53,593	50,526	59,988	76,895	72,474	72,971
Retired Members and Survivors	0	4	69	94	2	9	0	124	302
Annual Pensions	0	63,036	2,921,697	1,256,490	42,658	340,314	0	4,260,488	8,884,683
Average Age	0.0	74.0	71.8	77.5	79.9	69.0	0.0	75.1	74.9
Disabled Members	0	0	7	2	1	2	0	31	43
Annual Pensions	0	0	295,653	42,895	28,788	71,994	0	1,021,768	1,461,098
Average Age	0.0	0.0	60.0	84.1	73.9	59.5	0.0	68.8	67.8
Inactive Members	0	0	5	11	1	0	1	22	40
Annuity Savings Fund	0	0	145,478	410,145	33,297	0	18,246	510,130	1,117,296
Normal Cost as of January 1, 2017									
1.1 Total Normal Cost	14,702	35,621	954,589	366,090	17,946	68,732	9,125	2,125,172	3,591,977
1.2 Administrative Expenses	716	1,735	46,507	17,836	874	3,349	445	103,538	175,000
1.3 Total Normal Cost = 1.1 + 1.2	15,418	37,356	1,001,096	383,926	18,820	72,081	9,570	2,228,710	3,766,977
1.4 Employee Normal Cost	8,766	20,309	610,812	243,366	19,212	63,776	7,858	1,426,222	2,400,321
1.5 Employer Normal Cost = 1.3 - 1.4	6,652	17,047	390,284	140,560	(392)	8,305	1,712	802,488	1,366,656
1.6 Adjusted for payment timing	6,775	17,361	397,475	143,150	(399)	8,458	1,743	817,275	1,391,838
Actuarial Accrued Liability as of January 1, 2017									
2.1 Active Employees	133,902	752,954	19,898,125	4,150,617	571,898	1,453,592	147,115	42,386,921	69,495,124
2.2 Retired Members and Survivors	0	679,429	30,410,167	11,424,791	490,805	3,632,442	0	40,338,012	86,975,646
2.3 Disabled Members	0	0	3,643,754	237,827	253,771	890,576	0	10,533,747	15,559,675
2.4 Inactive Members	0	0	145,478	410,145	33,297	0	18,246	510,130	1,117,296
2.5 Total = 2.1 + 2.2 + 2.3 + 2.4	133,902	1,432,383	54,097,524	16,223,380	1,349,771	5,976,610	165,361	93,768,810	173,147,741
Actuarial Value of Plan Assets as of January 1, 2017									
3.1 Actuarial Value of Assets	168,358	1,157,158	41,258,528	11,570,722	908,930	3,968,465	34,325	68,701,939	127,768,425
Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2017									
4.1 UAL = 2.5 - 3.1	(34,456)	275,225	12,838,996	4,652,658	440,841	2,008,145	131,036	25,066,871	45,379,316

SECTION 9 - RESULTS BY DEPARTMENT

Department	Storm Water Enterprise	Housing	Municipal Light	School	Sewer	Water	Retirement	Town	Total
Projected Payroll	90,600	208,519	6,360,386	2,572,458	202,104	659,867	76,895	14,712,242	24,883,071
FY2018 Appropriation									
5.1 Employer Normal Cost	6,775	17,361	397,475	143,150	(399)	8,458	1,743	817,275	1,391,838
5.2 Amortization Payment of UAL*	3,707	32,131	1,252,941	548,406	45,974	165,977	(1,743)	2,222,714	4,270,107
5.3 Total = 5.1 + 5.2	10,482	49,492	1,650,416	691,556	45,575	174,435	0	3,039,989	5,661,945
FY2019 Appropriation									
6.1 Employer Normal Cost	7,080	18,142	415,362	149,592	(417)	8,839	1,821	854,053	1,454,472
6.2 Amortization Payment of UAL**	(4,187)	26,669	1,271,050	450,258	43,319	202,095	14,567	2,506,123	4,509,894
6.3 Total = 6.1 + 6.2	2,893	44,811	1,686,412	599,850	42,902	210,934	16,388	3,360,176	5,964,366
6.4 Retirement Dept Appropriation***	8	123	4,646	1,653	118	581	(16,388)	9,259	0
6.5 Total = 6.3 + 6.4	**2,901**	**44,934**	**1,691,058**	**601,503**	**43,020**	**211,515**	**0**	**3,369,435**	**5,964,366**
Increase over prior year	-72.324%	-9.210%	2.463%	-13.022%	-5.606%	21.257%	0.000%	10.837%	5.341%
FY2020 Appropriation									
7.1 Employer Normal Cost	7,399	18,958	434,054	156,324	(436)	9,237	1,903	892,485	1,519,924
7.2 Amortization Payment of UAL	(4,422)	28,166	1,342,389	475,529	45,750	213,438	15,385	2,646,783	4,763,018
7.3 Total = 7.1 + 7.2	2,977	47,124	1,776,443	631,853	45,314	222,675	17,288	3,539,268	6,282,942
7.4 Retirement Dept Appropriation***	8	130	4,902	1,743	125	614	(17,288)	9,766	0
7.5 Total = 7.3 + 7.4	**2,985**	**47,254**	**1,781,345**	**633,596**	**45,439**	**223,289**	**0**	**3,549,034**	**6,282,942**
Increase over prior year	2.896%	5.163%	5.339%	5.335%	5.623%	5.567%	0.000%	5.330%	5.341%

Notes:

1. Actuarial Value of Plan Assets (3.1) is derived from allocation of assets as shown on separate attachment.

2. FY2019 and FY2020 Appropriation is based on Funding Schedule C-1.

3. 2018 Employer Normal Cost (5.1) is the Employer Normal Cost as of January 1, 2017, adjusted for payment timing (1.6). 2019 Employer Normal Cost (6.1) is based on 2018 Employer Normal Cost (5.1) increased by 4.5%.

*4. Amortization Payment of UAL (5.2) equals fiscal year 2018 budgeted appropriation (5.3) developed in the January 1, 2015 actuarial valuation less Employer Normal Cost (5.1).

**5. Amortization Payment of UAL (6.2) is the total Amortization Payment of UAL (6.2) allocated to each department in the proportion that the UAL (4.1) less 2018 Amortization Payment of UAL (5.2) bears to the total UAL (4.1) less total 2018 Amortization Payment of UAL (5.2).

***6. The appropriation developed for the Retirement department is allocated to each remaining department in the proportion that the department's fiscal year appropriation bears to the total fiscal year appropriation.