January 1, 2018

Actuarial Valuation Report

Stoneham Retirement System

Lawrence B. Stone

stoneconsulting,inc
5 West Mill Street, Suite 4
Medfield, Massachusetts 02052
T: 508.359.9600 F: 508.359.0190
Lstone@stoneconsult.com

September 11, 2018

Stoneham Contributory Retirement System
Town Hall
35 Central Street
Stoneham, MA 02180

Dear Stoneham Retirement Board:

Stone Consulting, Inc. has performed a January 1, 2018 actuarial valuation of the Stoneham Retirement System. This valuation and report was prepared using generally accepted actuarial principles and practices.

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 except where noted in the text.

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.

- The contribution amount for Fiscal Year 2020 is $6,805,992, which is $288,791 less than the anticipated contribution amount from the prior funding schedule.
- The length of the funding schedule contained in this actuarial valuation report is 5 years (fully funded in FY2024).
- The contribution is set to increase by 3.46% each year, except in the final year, when it increases by 3.34%. We anticipate over time the contribution level to decrease as a percentage of payroll.

PERAC and GASB guidelines indicate that actuarial valuations should be conducted at least every other year. The Stoneham Retirement Board conducted their previous actuarial valuation effective January 1, 2016.

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. The use of these results may not be appropriate for all circumstances.

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

Lawrence B. Stone
Member, American Academy of Actuaries

TABLE OF CONTENTS

Introduction

This report presents the results of the actuarial valuation of the Stoneham Retirement System. The valuation was performed at the request of the Retirement Board as of January 1, 2018 for the purpose of determining the contribution requirements for Fiscal Year 2020 and beyond. The contribution requirements are based on:

- The financial condition of the system as of December 31, 2017;
- 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, 2018);
- Economic assumptions regarding salary increases and investment earnings; and
- Other actuarial assumptions (e.g., withdrawals, retirement, death, etc.)

Valuation Summary

	January 1, 2018 Valuation	January 1, 2016 Valuation	Change
Contribution Fiscal 2020	$6,805,992	$7,139,052	$333,060 decrease
Funding Schedule Length (as of Fiscal 2020)	5 years	5 years	No change
Contribution Increase	3.46%	7.85%	-4.39%
Funding Ratio	75%	70%	4%
Interest Rate Assumption	7.25%	7.75%	-0.50%

Summary of Funding Schedule and Funding Progress

- The funding level of the Stoneham Retirement System is 75% compared to 70% for the January 1, 2016 actuarial valuation. The funding level is estimated to be near the median for Massachusetts' Contributory Retirement Systems.
- The schedule length is five (5) years, a length consistent with the 5 years remaining from the 7-year schedule from the January 1, 2016 valuation. The maximum period allowed under Section 22D is eleven years (Fiscal 2030).
- The contribution is set to increase by 3.46% annually, except in the final year, when it increases by 3.34%. The Fiscal Year 2020 contribution is $333,060 less than the planned 2020 contribution. The Fiscal 2020 contribution is higher than the Fiscal 2019 contribution by $186,565.

Summary of Changes to Assumptions, Methodology, and Plan Provisions

- The discount rate assumption is 7.25%
  - Previous valuation used 7.75%
  - Net effect of change in assumption increased the liability by $5.5 million (4.8%)
  - Reflects anticipated future market performance

- The salary increase assumption is select and ultimate
  - 4.25% ultimate rate
  - Group 4 receive 8.75% increases for first 5 years of service
  - Other employees receive 6.25% increases for the first 8 years of service
  - This assumption has been maintained from the prior valuation

- The mortality assumption is based upon the RP-2014 adjusted to 2006, projected generationally with MP-2016
  - The prior valuation used the RP-2000 table projected from 2000 using Generational Mortality, Scale BB
  - The net effect of the change decreased the liability by $421 thousand (0.4%)

Summary of Experience

- Average annual investment return in calendar 2016 and 2017 - 12.7% vs. a 7.75% assumption.
  - $7,944,765 net actuarial gain in Calendar Years 2016 and 2017

- The System's asset portfolio effective December 31, 2017 is approximately 70% equities and 30% fixed income and short-term investments.

- Total compensation changed by 6.4% over the prior valuation
  - average annual compensation (pay divided by number of active members) changed by 2.7%
  - Salary gain of $1.0 million (less liability than expected when compared to salary projected from the prior valuation data with the prior assumption)

January 1, 2018 Actuarial Valuation Results

	January 1, 2018	January 1, 2016	Percentage Change
Funding			
Contribution for Fiscal 2020	$6,805,992		-4.1%
Contribution for Fiscal 2020 based on current schedule		$7,094,783	
Members			
▪ Actives			
a. Number	284	274	3.6%
b. Annual Compensation	$14,642,891	$13,760,816	6.4%
c. Average Annual Compensation	$51,559	$50,222	2.7%
d. Average Attained Age	49.1	50.0	-1.8%
e. Average Past Service	12.6	13.2	-4.8%
▪ Retired, Disabled and Beneficiaries			
a. Number	281	282	-0.4%
b. Total Benefits*	$7,523,886	$6,983,714	7.7%
c. Average Benefits*	$26,775	$24,765	8.1%
d. Average Age	75.6	75.5	0.2%
▪ Inactives			
a. Number	91	74	23.0%
Normal Cost			
a. Total Normal Cost as of January 1, 2018	$2,285,114	$1,959,395	16.6%
b. Less Expected Members' Contributions	1,343,268	1,253,008	7.2%
c. Normal Cost to be funded by the Municipality	$941,846	$706,387	33.3%
d. Adjustment to July 1, 2019	64,285	48,214	33.3%
e. Administrative Expense Assumption	301,194	304,666	-1.1%
f. Normal Cost Adjusted to July 1, 2019	$1,307,325	$1,059,267	23.4%
Actuarial Accrued Liability as of January 1, 2018			
a. Active Members	$45,773,857	$42,880,121	6.7%
b. Inactive Members	1,100,927	658,031	67.3%
c. Retired Members and Beneficiaries	71,702,978	64,493,178	11.2%
d. Total	$118,577,762	$108,031,330	9.8%
Unfunded Actuarial Accrued Liability			
a. Actuarial Accrued Liability as of January 1, 2018	$118,577,762	$108,031,330	9.8%
b. Less Actuarial Value of Assets as of January 1, 2018	88,526,959	76,068,713	16.4%
c. Unfunded Actuarial Accrued Liability as of January 1, 2018	$30,050,804	$31,962,617	-6.0%
d. Adjustment to July 1, 2019	(1,831,632)	(837,357)	
e. Unfunded Actuarial Accrued Liability as of July 1, 2019	$28,219,172	$31,125,260	

*Excluding State reimbursed COLA

NOTE: for all tables in this report, totals may not sum due to rounding.

Development of Funding Schedule

The appropriation for Fiscal 2020 is as follows:

Net Employer Normal Cost for Fiscal 2020 (including admin. expenses)	$	1,307,325
Net 3(8)(c) Payments		98,264
Amortization		5,400,403
Total Appropriation required for Fiscal 2020	$	6,805,992

- The funding schedule is presented on the following page. The schedule's length is five (5) years which is equal to the remainder of the 7-year schedule from the January 1, 2016 valuation.
- The maximum funding schedule length allowed by Section 22D of Chapter 32 of the Massachusetts General Laws is eleven years to Fiscal 2030.
- The contribution increases each year by 3.46%, except in the final year, when it increases by 3.34%. The contribution is assumed to be made at the beginning of the fiscal year.

The funding contribution is composed of three components:

- Net Normal Cost, including administrative expense
- Amortization of the Unfunded Liability
- Net 3(8)(c) payments

These three components are discussed in greater detail in the pages following the funding schedule.

FUNDING SCHEDULE

Fiscal Year	Normal Cost	Unfunded Liability*	Funding Amortization of UAAL	Net 3(8)(c) Payments	Schedule Contribution**	% Change
2020	1,307,325	28,219,172	5,400,403	98,264	6,805,992	3.46%
2021	1,366,155	24,473,129	5,577,061	98,264	7,041,479	3.46%
2022	1,427,632	19,258,307	5,759,219	98,264	7,285,114	3.46%
2023	1,491,875	14,477,772	5,947,040	98,264	7,537,179	3.46%
2024	1,559,009	6,131,888	6,131,888	98,264	7,789,161	3.34%
2025	1,629,165	-	-	98,264	1,727,429	-77.82%

Amortization of Unfunded Liability as of July 1, 2019

Year	Type	Original Amort. Amount	Percentage Increasing	Original # of Years	Current Amort. Amount	Years Remaining
2003	2002 ERI	73,542	3.50%	18	131,984	1
2020	Fresh Start	N/A	N/A	5	N/A	5

<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.

* Includes recognition of the following asset gains/(losses) in Fiscal 2022 and 2024:

2022	1,007,727
2024	3,017,321

** Contribution is set to be the amount resulting from a 3.46% increase on the prior year's contribution, with 3.46% increases thereafter. The contribution in FY2024 increases by 3.34%.

Components of the Funding Schedule

The components of the funding contribution are developed from the results on page 6 as follows:

Net Normal Cost

	January 1, 2018	% of Payroll*
Gross Normal Cost (GNC)	$ 2,285,114	15.6%
Employees Contribution	1,343,268	9.2%
Net Normal Cost (NNC)	$ 941,846	6.4%
Adjusted to Beginning of Fiscal Year 2020	64,285	
Administrative Expense	301,194	2.1%
Adjusted Net Normal Cost With Admin. Expense	$ 1,307,325	

- The gross normal cost (GNC) is the "price" of benefits accruing in the current year if the valuation assumptions are realized. For an individual, this is the value in benefits which they are earning with their current year of service.

- The GNC only relates to current actives; retirees are done earning their benefit and inactives are not earning any credited service.

- The GNC for the whole system is split into two parts: the portion which is paid for by the employees (Employee Contributions), and the portion which must be paid for by the Retirement System (Net Normal Cost, or NNC).

- The NNC is adjusted from January 1, 2018 to Fiscal 2020 by rolling it forward with a salary increase factor of 4.50%.

- Finally, administrative expense is added to the adjusted NNC. This is the amount seen in the funding schedule.

*Payroll paid in 2017 for employees as of January 1, 2018 is $14,642,891. Payroll for new hires in 2017 was annualized.

Unfunded Actuarial Accrued Liability

				January 1, 2018	Percentage Change
Active Actuarial Accrued Liability			$	45,773,857	6.7%
Superannuation	$	41,853,400			
Death	$	874,872			
Disability	$	2,599,974			
Withdrawal	$	445,611			
Retiree, Inactive, Survivor and Beneficiary Actuarial Accrued Liability			$	72,803,905	11.7%
Retirees and Beneficiaries	$	63,232,658			
Disabled	$	8,470,320			
Inactive	$	1,100,927			
Total Actuarial Accrued Liability (AAL)			$	118,577,762	9.8%
Actuarial Value of Assets (AVA)			$	88,526,959	16.4%
Unfunded Actuarial Accrued Liability			$	30,050,804	-6.0%
Funded Ratio (AVA / AAL)					
2018 (7.25% interest rate):		75%			
2016 (7.75% interest rate):		70%			

- 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 $118,577,762. This along with an actuarial value of assets of $88,526,959 produces a funded status of 75%. This compares to a funded status of 70% for the 2016 valuation.

- The Unfunded AAL is the portion of the AAL which is not covered by the Plan assets. The UAAL for Stoneham as of January 1, 2018 is $30,050,804. This is adjusted to July 1, 2019 to produce the Unfunded Liability seen in Fiscal Year 2020 in the funding schedule.

- 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. This can result in a funding schedule in which the changes in contribution amounts from year to year are more consistent.

- Stoneham's funding schedule was developed by setting the contribution to increase by 3.46% each year. The remainder of each year's contribution apart from the Net Normal Cost and Net 3(8)(c)'s amortizes the unfunded liability.

Net 3(8)(c) Payments

- 3(8)(c) payments are benefits which the Stoneham 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 are the difference between what the Stoneham Retirement System paid out minus what was received by the System, calculated based on the December 31, 2017 PERAC annual statement.
- The amount of net 3(8)(c) payments is assumed to remain level in future years.

Assets

	Cash	$	50,864.16
	Pooled Domestic Equity Funds		22,919,825.11
	Pooled International Equity Funds		11,917,774.18
	Pooled Domestic Fixed Income Funds		11,424,362.80
	Pooled International Fixed Income Funds		3,663,900.17
	Pooled Alternative Investments		155,166.49
	Pooled Real Estate Funds		7,047,373.01
	Pooled Domestic Balanced Funds		6,224,567.44
	Hedge Funds		4,893,649.04
	PRIT FUND		24,021,650.82
A	Sub-Total:	$	92,319,133.22
	Interest Due and Accrued		158,403.14
	Accounts Receivable		81,550.41
	Accounts Payable		(7,080.00)
B	Sub-Total:	$	232,873.55
	Market Value of Assets [(A) + (B)]	$	92,552,006.77

- The asset allocation is approximately 30% fixed income, cash, receivables and payables and 70% equities, alternative investments, hedge funds and similar types of investments.

Five-Year Asset Smoothing

1. Market value of assets including receivable/payable as of 01/01/2018 — $92,552,007

2. Phase-in of asset gains and losses

	Plan Year (1)	Original Amount (2)	Percent Unrecognized (3)	Amount Unrecognized (2) x (3)
a.	2017	$7,141,840	80%	$5,713,472
b.	2016	$802,925	60%	$481,755
c.	2015	($5,335,254)	40%	($2,134,102)
d.	2014	($180,386)	20%	($36,077)
e.	2013	$4,015,308	0%	$0
f.	2012	$2,724,258	0%	$0
g.	Total	$6,444,433		$4,025,048

3. Valuation assets without corridor as of 01/01/2018 (1. - 2.g.) — $88,526,959

4. Corridor Check
   a. 85% of Market Value — $78,669,206
   b. 115% of Market Value — $106,434,808

5. Valuation assets with corridor as of 01/01/2018 (3. within Corridor) — $88,526,959

6. Calculation of return on valuation assets
   a. Valuation assets as of 01/01/2016 — $76,068,713
   b. ER contribs + EE contribs - Ben Pymts - Expenses — $(1,072,619)
   c. Actual return on valuation assets 5. - (6.a. + 6.b.) — $13,530,866
   d. Weighted value of valuation assets — $75,354,273
   e. Return on valuation assets (6.c. / 6.d.) — 18.0%
   f. Annualized return on assets — 8.6%

APPENDICES

Appendix A – 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.

Fiscal Year Adjustment

The actuarial results are adjusted by the valuation interest rate and salary scale to the beginning of Fiscal Year 2020. The unfunded actuarial accrued liability is rolled forward with normal cost and further adjusted by anticipated contributions and interest.

ACTUARIAL ASSUMPTIONS

Valuation Date

January 1, 2018.

Investment Return and Discount Rate

7.25% per year net of investment expenses (prior valuation used 7.75%).

Regular Interest Rate Credited to Annuity Savings Account

2% per year.

Cost-of-Living Increases

A 3% COLA on the first $13,000 of a member's retirement allowance is assumed to be granted every year.

Salary Increases

Select and Ultimate assumption.

- 4.25% ultimate rate
- Group 4 receive 8.75% increases for the first 5 years of service
- Other employees receive 6.25% increases for the first 8 years of service

Step increases are assumed to be part of the salary increase assumption. The total payroll is assumed to increase at 4.50% per year.

Credited Service

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

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).

Administrative Expenses

Estimated budgeted amount of $301,194 for the Fiscal Year 2020 is added to the Normal Cost. 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.

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.

Contribution Timing

Contributions are assumed to be made at the beginning of the fiscal year. The previous valuation assumed August 1 timing for contributions.

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%

In-Service Disability and Death

Both Disability and In-Service Death are assumed to be 55% ordinary and 45% 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

RP-2014 adjusted to 2006, projected generationally with MP-2016 (sex-distinct). (Prior valuation used RP-2000 mortality table projected from 2000 with Generational Mortality, Scale BB). During employment the healthy employee mortality table is used. Post-employment the healthy annuitant table is used.

Mortality for disabled retirees follows the same table as non-disabled retirees, set forward 2 years. Death is assumed to be due to the same cause as the disability 40% of the time.

Appendix B – 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.

Summary of Principal Provisions (Continued)

5. SERVICE RETIREMENT

a. Eligibility

<u>Hired prior to April 2, 2012:</u>

- Attainment of age 55 and completion of ten years of credited service,
- or at any age with completion of 20 years of service.
- If hired prior to 1978 or a member of Group 4, the completion of ten years of service is not required.

<u>Hired after April 1, 2012:</u>

- Group 1 – Age 60 and Completion of 10 years of credited service;
- Group 2 – Age 55 and completion of 10 years of service;
- Group 4 – Age 55.

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

Summary of Principal Provisions (Continued)

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.

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).

Summary of Principal Provisions(Continued)

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.

11. COST-OF-LIVING INCREASES

An increase of up to 3% applied to the first $13,000 of annual benefit. Funded by the Employer 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.

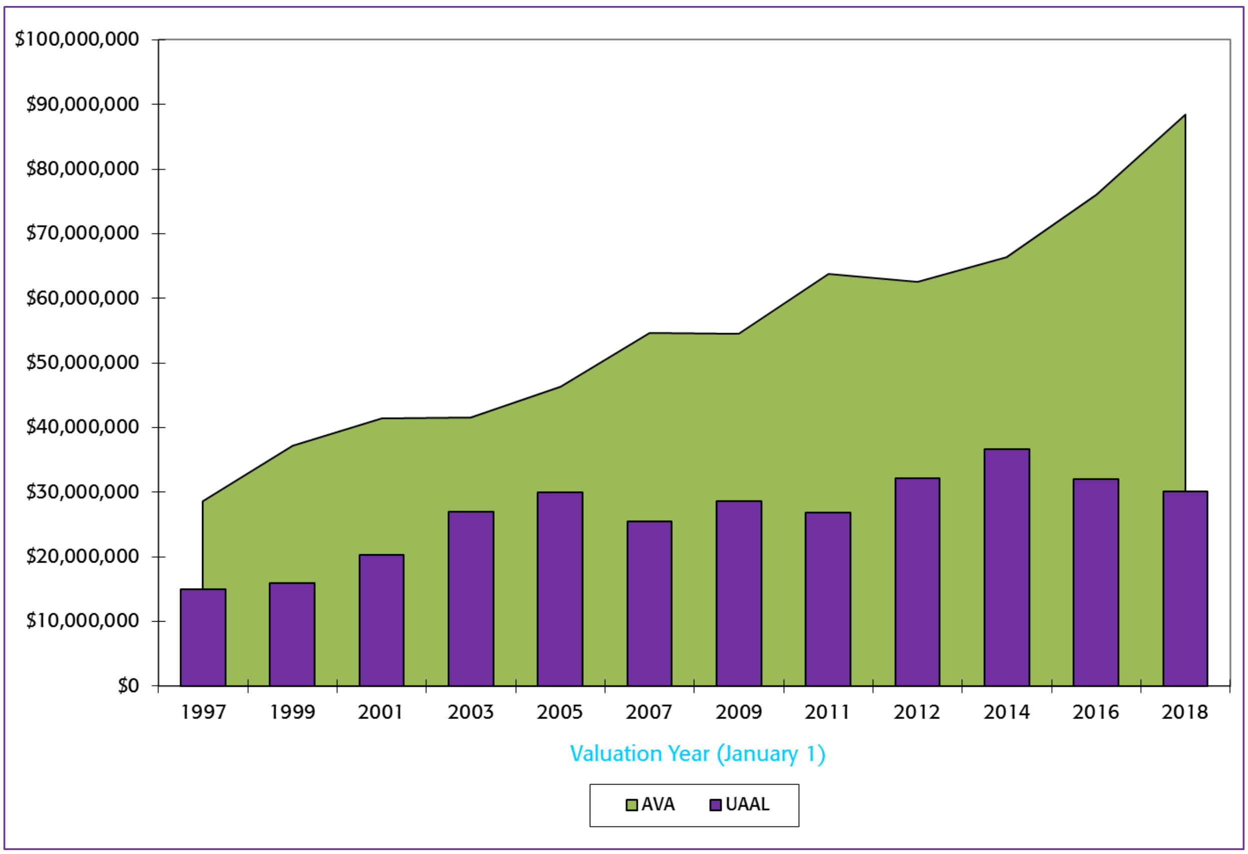
Appendix C – Charts of Selected Actuarial Statistics

History of Demographic Statistics

Valuation Year	Number	Average Age	Average Past Service	Average Ann'l Compensation
2018	284	49.1	12.6	$51,559
2016	274	50.0	13.2	$50,222
2014	273	49.9	12.9	$47,029
2012	256	49.2	13.0	$45,405
2011	268	N/A	N/A	$44,015

- Both employee age and service have begun to decrease in recent years, following years of increases. This pattern has appeared in the experience of several systems in the Commonwealth. Average annual compensation has grown by 17.1% (2.3% annually) over the past seven years.

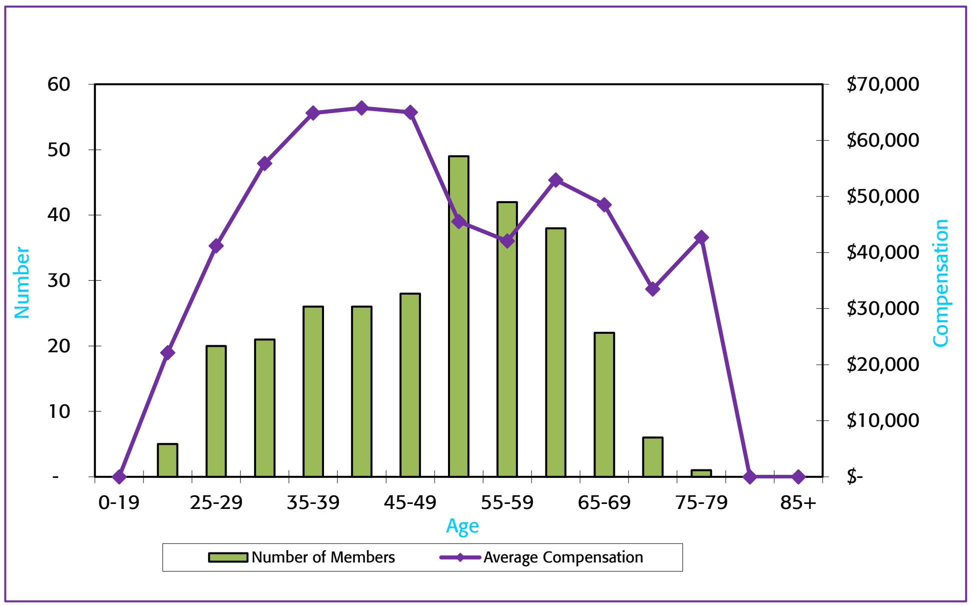
History of Assets and Unfunded Liability

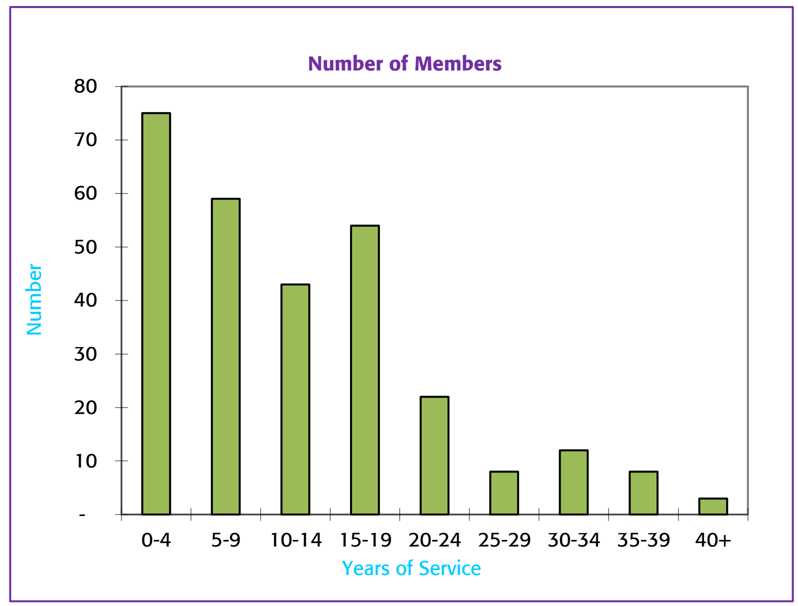


Distribution of Plan Members as of January 1, 2018

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	5	-	-	-	-	-	-	-	-	5	$ 110,660	$ 22,132
25-29	17	3	-	-	-	-	-	-	-	20	$ 823,396	$ 41,170
30-34	12	8	1	-	-	-	-	-	-	21	$ 1,173,416	$ 55,877
35-39	7	9	6	4	-	-	-	-	-	26	$ 1,687,101	$ 64,889
40-44	3	6	5	12	-	-	-	-	-	26	$ 1,710,179	$ 65,776
45-49	7	5	3	7	6	-	-	-	-	28	$ 1,820,190	$ 65,007
50-54	12	11	12	7	3	3	1	-	-	49	$ 2,229,952	$ 45,509
55-59	6	7	8	10	5	2	3	1	-	42	$ 1,766,642	$ 42,063
60-64	5	6	5	9	2	1	4	5	1	38	$ 2,010,300	$ 52,903
65-69	1	4	-	5	5	2	2	2	1	22	$ 1,067,562	$ 48,526
70-74	-	-	3	-	1	-	1	-	1	6	$ 200,814	$ 33,469
75-79	-	-	-	-	-	-	1	-	-	1	$ 42,680	$ 42,680
80-84	-	-	-	-	-	-	-	-	-	-	$ -	$ -
85+	-	-	-	-	-	-	-	-	-	-	$ -	$ -
TOTAL	75	59	43	54	22	8	12	8	3	284	$ 14,642,891	$ 51,559





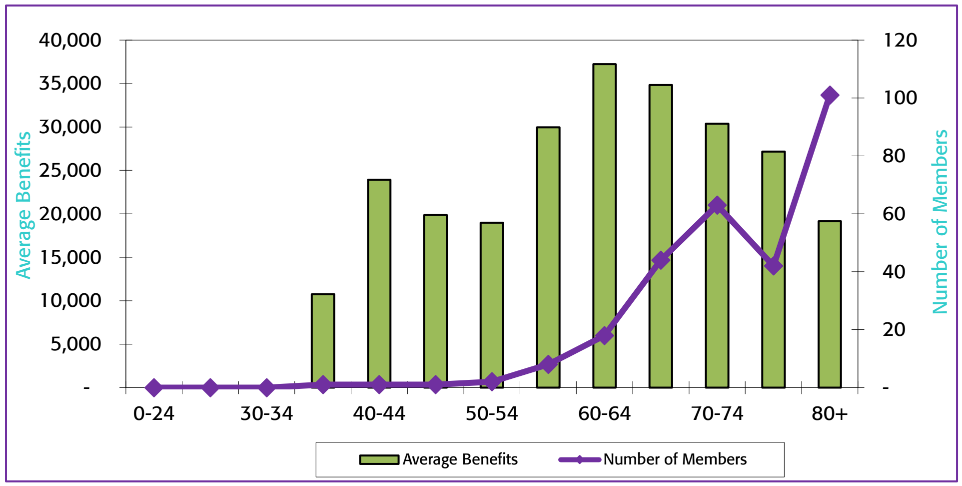
Distribution of Plan Members as of January 1, 2018

RETIRED MEMBERS

Retired Members and Beneficiaries			
Age	Number	Average Benefit	Total Benefit
0-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	1	10,753	10,753
40-44	1	23,943	23,943
45-49	1	19,859	19,859
50-54	2	18,989	37,978
55-59	7	29,803	208,623
60-64	15	35,733	536,002
65-69	38	33,765	1,283,055
70-74	57	29,297	1,669,949
75-79	40	27,027	1,081,072
80+	98	18,982	1,860,235
TOTAL	260	$ 25,890	$ 6,731,469

Disabled Members			
Age	Number	Average Benefit	Total Benefit
0-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	-	-	-
45-49	-	-	-
50-54	-	-	-
55-59	1	31,192	31,192
60-64	3	44,821	134,462
65-69	6	41,498	248,987
70-74	6	40,712	244,271
75-79	2	29,780	59,560
80+	3	24,648	73,945
TOTAL	21	$ 37,734	$ 792,417

Total			
Age	Number	Average Benefit	Total Benefit
0-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	1	10,753	10,753
40-44	1	23,943	23,943
45-49	1	19,859	19,859
50-54	2	18,989	37,978
55-59	8	29,977	239,815
60-64	18	37,248	670,464
65-69	44	34,819	1,532,042
70-74	63	30,384	1,914,220
75-79	42	27,158	1,140,631
80+	101	19,150	1,934,180
TOTAL	281	$ 26,775	$ 7,523,886



Benefits shown are net of State reimbursed COLA.

Appendix D – 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.

- **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.

- **Funding Ratio**
  This is the portion of the Actuarial Accrued Liability that is covered by the Actuarial Assets.

- **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.

Disclosures

- Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as:
  - plan experience differing from that anticipated by the economic or demographic assumptions,
  - changes in economic or demographic assumptions,
  - increases or decreases expected as part of natural operation of the methodology used for these measurements such as additional contribution requirements based on the plan's funded status,
  - changes in plan provisions or applicable law.

  As part of the valuation, we have not performed an analysis of the potential range of future measurements.

- Stone Consulting, Inc. was furnished member data by the Stoneham Retirement System's administrative staff. Although examined under broad parameters for 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. With the assistance of the staff of the Stoneham Retirement Board, we were able to develop a database sufficient for valuation purposes.

- The investment return assumption is a long-term assumption and is based on capital market expectations by asset class, historical returns, and professional judgement.

- Historically, 10% to 11% has been the expected long-term rate of return for equities, and 6% to 7% has been the expected long-term rate of return for fixed income securities. Many economists and investment professionals are projecting lower returns of 7% to 8% for equities and 4% to 6% 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 encourage close monitoring for changes in investment performance against expectations.

- The salary increase assumption reflects prior experience including PERAC's 2002 local experience study, current expectations, and professional judgement.

- All assumptions and methodologies were selected by the Stoneham Retirement Board in conjunction with guidance provided by Stone Consulting, Inc.

- 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.

- The UAAL and funded ratio are measures of the plan's funded status. These measures reflect the plan's position as of January 1, 2018. We believe these measures, by themselves, are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions. However, we believe these measures, in conjunction with the plan's funding schedule, are appropriate for assessing the amount of future contributions.

PERAC Information Disclosure

The most recent actuarial valuation of the System was prepared by Stone Consulting, Inc. as of January 1, 2018

The normal cost for employees on that date was:	$1,343,268	9.2%	of payroll
The normal cost for the employer was:	$941,846	6.4%	of payroll

The actuarial liability for active members was:	$45,773,857
The actuarial liability for retired members was (includes inactives):	$72,803,905
Total actuarial accrued liability:	$118,577,762
System assets as of that date ($92,552,006.77 Market Value):	$88,526,959
Unfunded actuarial accrued liability:	$30,050,804

The ratio of system's assets to total actuarial liability was:	75%

As of that date the total covered employee payroll was:	$14,642,891

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 (4.25% 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)
1/1/2018	$88,527	$118,578	$30,051	75%	$14,643	205%
1/1/2016	$76,069	$108,031	$31,963	70%	$13,761	232%
1/1/2014	$66,246	$102,977	$36,551	65%	$12,839	285%
1/1/2012	$62,496	$94,616	$32,120	66%	$11,624	276%
1/1/2011	$63,752	$90,520	$26,768	70%	$12,386	216%