

# **Town of Needham Contributory Retirement System**

**Actuarial Valuation and Review as of  
January 1, 2015**





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*October 15, 2015*

*Retirement Board*

*Town of Needham Contributory Retirement System*

*1471 Highland Avenue*

*Needham, MA 02492-2605*

*Dear Board Members:*

*We are pleased to submit this revised Actuarial Valuation and Review as of January 1, 2015, which replaces our report dated August 18, 2015 and reflects changes to Section 5 of the report due to audit adjustments. It summarizes the actuarial data used in the valuation, establishes the funding requirements for fiscal 2016 and later years and analyzes the preceding year's experience.*

*This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement System. The census information and financial information on which our calculations were based was prepared by the staff of the Town of Needham Contributory Retirement System. That assistance is gratefully acknowledged.*

*The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: 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 the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in plan provisions or applicable law.*

*An actuarial valuation is a measurement at a specific date – it is not a prediction of a plan's future financial condition. We have not been retained to perform an analysis of the potential range of financial measurements, except where otherwise noted.*

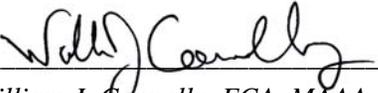
*The actuarial calculations were directed under the supervision of Kathleen A. Riley, FSA, MAAA, EA. She is a member of the American Academy of Actuaries and she meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of her knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in her opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Plan.*

*We look forward to reviewing this report at your next meeting and to answering any questions.*

*Sincerely,*

*Segal Consulting, a Member of The Segal Group, Inc.*

By:   
Kathleen A. Riley, FSA, MAAA, EA  
Senior Vice President and Actuary

  
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Consulting Actuary

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## SECTION 1: Valuation Summary for the Town of Needham Contributory Retirement System

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### Purpose

This report has been prepared by Segal Consulting to present a valuation of the Town of Needham Contributory Retirement System as of January 1, 2015. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. The contribution requirements presented in this report are based on:

- The benefit provisions of Massachusetts General Law Chapter 32;
- The characteristics of covered active participants, inactive vested participants, and retired participants and beneficiaries as of January 1, 2015;
- The assets of the Plan as of December 31, 2014;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

### Significant Issues in Valuation Year

The following key findings were the result of this actuarial valuation:

1. The actuarial valuation report as of January 1, 2015 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected.
2. During the 2014 plan year, the market value rate of return was 7.57%, compared to the assumed rate of return of 7.75%. Because the actuarial value of assets gradually recognizes market value fluctuations over a five-year period, the actuarial rate of return for the 2014 plan year was 9.54%. The actuarial value of assets as of December 31, 2014 was \$131.5 million, or 96.6% of the market value of assets of \$136.2 million reported in the Annual Statement. As of December 31, 2013, the actuarial value of assets was 94.9% of the market value.
3. As indicated in Section 2, the total unrecognized investment gain as of December 31, 2014 is \$4,671,863. This investment gain will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years, to the extent it is not offset by recognition of investment losses derived from future experience. This implies that earning the assumed rate of investment return on a market value basis will result in investment gains on the actuarial value of assets in the next few years. The deferred investment gains after December 31, 2015 are not reflected in the funding schedule in Section 2.

## SECTION 1: Valuation Summary for the Town of Needham Contributory Retirement System

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4. This valuation reflects the following changes in assumptions:
  - The administrative expense assumption was increased from \$200,000 for calendar 2014 to \$237,000 for calendar 2015.
  - The mortality assumption for healthy participants was changed from the RP-2000 Combined Healthy Mortality Table projected 22 years using Scale AA to the RP-2000 Combined Healthy Mortality Table projected generationally using Scale AA.
  - The mortality assumption for disabled participants was changed from the RP-2000 Combined Healthy Mortality Table set forward 2 years to the RP-2000 Combined Healthy Mortality Table set forward 2 years projected generationally using Scale AA.

Changing these assumptions resulted in a net increase in the unfunded liability of \$2,153,215 and a net increase in the employer normal cost of \$152,028.

5. As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Board has increased the Cost of Living Adjustment (COLA) base from \$12,000 to \$14,000 effective July 1, 2015. This change increased the unfunded liability by \$1,861,711 and the employer normal cost by \$44,349.
6. The unfunded liability was expected to increase from \$57.7 million as of January 1, 2014 to \$58.2 million as of January 1, 2015. The actual unfunded liability as of January 1, 2015 was \$60.1 million. The greater than expected increase was due to the change in the mortality assumption and the increase in the COLA base noted above, partially offset by a small experience gain.
7. The contribution for fiscal 2016 is equal to the previously budgeted amount of \$6,149,812. The results of this valuation will first be reflected in the fiscal 2017 appropriation. The increase in the appropriation is phased in over three years resulting in 9.06% increases each year through fiscal 2019. The amortization payments for fiscal 2020 and later are calculated to increase 4.5% per year and to fully fund the System by 2030.

Chart 16 in Section 2 shows the appropriation through fiscal 2030 based on this schedule. The fiscal 2017 appropriation is \$6,706,800 or 9.06% higher than the fiscal 2016 appropriation. The funding schedule reflects an investment gain on an actuarial basis in 2015 assuming a 2015 market return of 7.75%.

8. The funded ratio has increased from 67.89% as of January 1, 2014 to 68.63% as of January 1, 2015 on an actuarial value basis. On a market value basis, the funded ratio has decreased from 71.53% to 71.07%.
9. The Governmental Accounting Standards Board (GASB) approved two new Statements affecting the reporting of pension liabilities for accounting purposes. Statement 67 replaces Statement 25 and is for plan reporting. Statement 68

## SECTION 1: Valuation Summary for the Town of Needham Contributory Retirement System

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replaces Statement 27 and is for employer reporting. Statement 67 is effective with the fiscal year ending December 31, 2014 for Plan reporting and Statement 68 is effective with the fiscal year ending June 30, 2015 for employer reporting. Section 5 shows the disclosure information required by these statements.

- It is important to note that the new GASB rules only redefine pension liability and expense for financial reporting purposes, and do not apply to contribution amounts for pension funding purposes. Employers and plans can still develop and adopt funding policies under current practices.
- The Net Pension Liability (NPL) is equal to the difference between the Total Pension Liability (TPL) and the Plan's Fiduciary Net Position. The Plan's Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) on a market value basis. The NPL increased from \$51.2 million as of December 31, 2013 to \$55.4 million as of December 31, 2014 and the Plan's Fiduciary Net Position as a percent of the TPL decreased from 71.53% to 71.09%.
- The NPL was measured as of December 31, 2014 and 2013 and determined based upon the results of the actuarial valuations as of January 1, 2015 and January 1, 2014 respectively.
- The discount rate used to determine the TPL and NPL as of December 31, 2014 and 2013 was 7.75%.

**SECTION 1: Valuation Summary for the Town of Needham Contributory Retirement System**

**Summary of Key Valuation Results**

	<b>2015</b>	<b>2014</b>
<b>Contributions for fiscal year beginning July 1:</b>		
Recommended for fiscal 2016 and 2015	\$6,149,812	\$5,621,400
Recommended for fiscal 2017 and 2016	6,706,800	6,149,812
<b>Funding elements for plan year beginning January 1:</b>		
Normal cost, including administrative expenses	\$5,009,654	\$4,732,712
Market value of assets	136,213,050*	128,642,380
Actuarial value of assets	131,541,187	122,084,535
Actuarial accrued liability	191,665,860	179,834,295
Unfunded actuarial accrued liability	60,124,673	57,749,760
Funded ratio based on market value of assets	71.07%	71.53%
Funded ratio based on actuarial value of assets	68.63%	67.89%
<b>GASB 67/68</b>		
Measurement date	December 31, 2014	December 31, 2013
Total pension liability	\$191,665,860	\$179,834,295
Plan fiduciary net position	136,261,695	128,642,380
Net pension liability	55,404,185	51,191,915
Pension expense	7,953,604	N/A
<b>Demographic data for plan year beginning January 1:</b>		
Number of retired participants and beneficiaries	462	464
Number of inactive participants entitled to a return of their employee contributions	141	126
Number of inactive participants with a vested right to a deferred or immediate benefit	20	17
Number of active participants	647	631
Total payroll	\$32,213,389	\$31,406,062
Average payroll	49,789	49,772

\* For funding calculations, market value of assets as of December 31, 2014 as reported in the Annual Statement. For GASB 67/68 disclosures, market value of assets as of December 31, 2014 includes a contribution receivable of \$48,625.

## SECTION 1: Valuation Summary for the Town of Needham Contributory Retirement System

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### Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal Consulting (“Segal”) relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by the Town of Needham Contributory Retirement System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** The valuation is based on the market value of assets as of the valuation date, as provided by the Town of Needham Contributory Retirement System. Town of Needham Contributory Retirement System uses an “actuarial value of assets” that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

## SECTION 1: Valuation Summary for the Town of Needham Contributory Retirement System

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The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the Town of Needham Contributory Retirement System. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
- If the Town of Needham Contributory Retirement System is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Town of Needham Contributory Retirement System should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

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**A. PARTICIPANT DATA**

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive participants, retired participants and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in Section 3, Exhibits A and B.

*A historical perspective of how the participant population has changed over the past five valuations can be seen in this chart.*

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**CHART 1**  
**Participant Population: 2010 – 2014**

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<b>Year Ended December 31</b>	<b>Active Participants</b>	<b>Inactive Participants</b>	<b>Retired Participants and Beneficiaries</b>	<b>Ratio of Non-Actives to Actives</b>
2010	631	107	487	0.94
2011	644	127	473	0.93
2012	646	133	471	0.93
2013	631	143	464	0.96
2014	647	161	462	0.96

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**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

**Active Participants**

Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 647 active participants with an average age of 48.2, average years of service of 11.1 years and average payroll of \$49,789. The 631 active participants in the prior valuation had an average age of 48.7, average service of 11.6 years and average payroll of \$49,772.

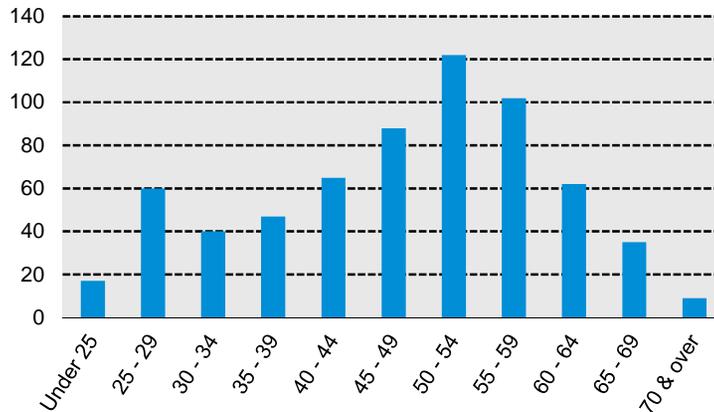
Among the active participants, there were no participants with unknown age and/or service information.

**Inactive Participants**

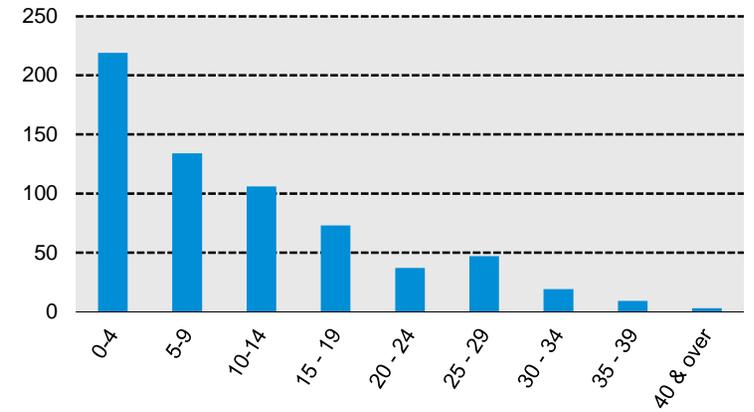
In this year's valuation, there were 20 participants with a vested right to a deferred or immediate vested benefit and 141 participants entitled to a return of their employee contributions.

*These graphs show a distribution of active participants by age and by years of service.*

**CHART 2**  
**Distribution of Active Participants by Age as of December 31, 2014**



**CHART 3**  
**Distribution of Active Participants by Years of Service as of December 31, 2014**



**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

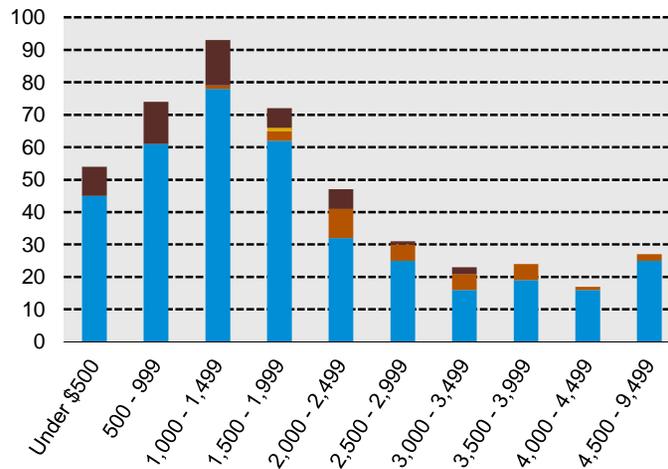
**Retired Participants and Beneficiaries**

As of December 31, 2014, 411 retired participants and 51 beneficiaries were receiving total monthly benefits of \$889,699, excluding COLAs reimbursed by the Commonwealth. For comparison, in the previous valuation, there were 410 retired participants and 54 beneficiaries receiving monthly benefits of \$837,251, excluding COLAs reimbursed by the Commonwealth.

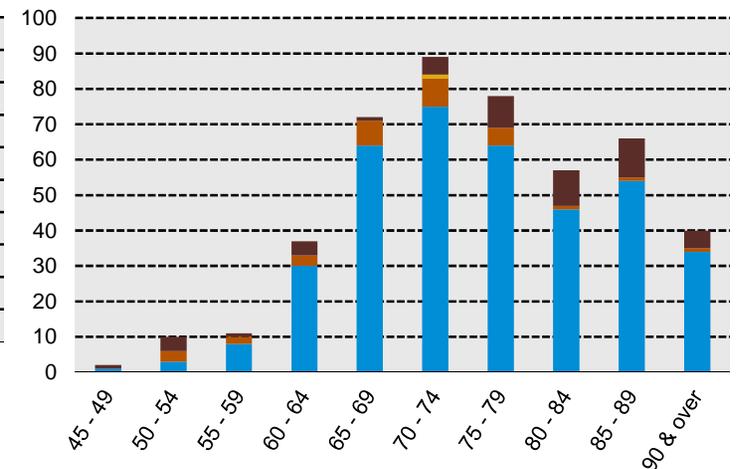
*These graphs show a distribution of the current retired participants and beneficiaries based on their monthly amount and age, by type of pension.*

- Beneficiaries
- Ordinary Disability
- Accidental Disability
- Superannuation

**CHART 4**  
**Distribution of Retired Participants and Beneficiaries by Type and by Monthly Amount as of December 31, 2014**



**CHART 5**  
**Distribution of Retired Participants and Beneficiaries by Type and by Age as of December 31, 2014**



**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

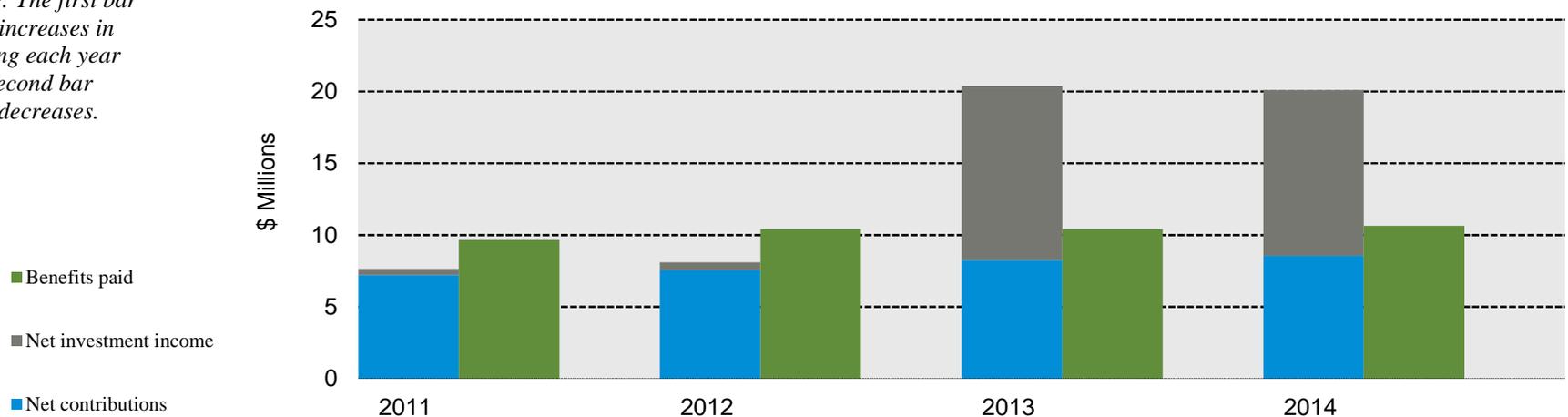
**B. FINANCIAL INFORMATION**

Retirement plan funding anticipates that, over the long term, both net contributions (less administrative expenses) and net investment earnings (less investment fees) will be needed to cover benefit payments.

Retirement plan assets change as a result of the net impact of these income and expense components. Additional financial information, including a summary of these transactions for the valuation year, is presented in Section 3, Exhibits C and D.

*The chart depicts the components of changes in the actuarial value of assets over the last four years. Note: The first bar represents increases in assets during each year while the second bar details the decreases.*

**CHART 6**  
**Comparison of Increases and Decreases in the Actuarial Value of Assets for Years Ended December 31, 2011 – 2014**



## SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable.

The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

*The chart shows the determination of the actuarial value of assets as of the valuation date.*

### CHART 7

#### Determination of Actuarial Value of Assets for Year Ended December 31, 2014

1. Market value of assets, December 31, 2014			\$136,213,050
2. Calculation of unrecognized return*	Original Amount	Unrecognized Return	
(a) Year ended December 31, 2014	-\$227,317	-\$181,854	
(b) Year ended December 31, 2013	7,470,006	4,482,004	
(c) Year ended December 31, 2012	5,330,652	2,132,261	
(d) Year ended December 31, 2011	-8,802,734	-1,760,547	
(e) Year ended December 31, 2010	4,522,713	<u>0</u>	
(f) Total unrecognized return			4,671,863
3. Preliminary actuarial value: (1) - (2f)			131,541,187
4. Adjustment to be within 20% corridor			0
5. Final actuarial value of assets as of December 31, 2014: (3) + (4)			<u>\$131,541,187</u>
6. Actuarial value as a percentage of market value: (5) ÷ (1)			96.6%
7. Amount deferred for future recognition: (1) - (5)			\$4,671,863

\* Unrecognized return is the difference between the total return and expected return on a market value basis and is recognized over a five-year period.

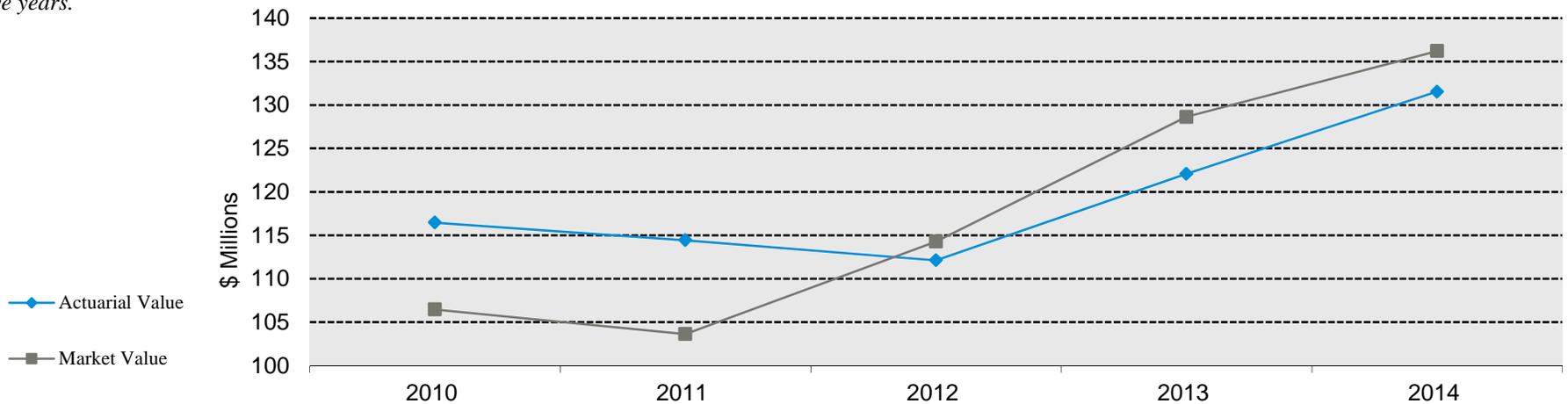
## SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System

Both the actuarial value and market value of assets are representations of the Town of Needham Contributory Retirement System's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Town of Needham Contributory Retirement System's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

*This chart shows the change in the actuarial value of assets versus the market value over the past five years.*

**CHART 8**

**Actuarial Value of Assets vs. Market Value of Assets as of December 31, 2010 – 2014**



## SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System

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### C. ACTUARIAL EXPERIENCE

To calculate the required contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the contribution requirement will decrease from the previous year. On the other hand, the contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term

development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The net experience for the year ending December 31, 2014 is \$2,057,923. A discussion of the major components of the actuarial experience is on the following pages.

*This chart provides a summary of the actuarial experience during the past year.*

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### CHART 9 Actuarial Experience for Year Ended December 31, 2014

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1. Net gain from investments*	\$2,166,897
2. Net loss from administrative expenses	-88,591
3. Net loss from other experience**	<u>-20,383</u>
4. Net experience gain: (1) + (2) + (3)	\$2,057,923

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\* Details in Chart 10

\*\* Details in Chart 13

**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

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**Investment Rate of Return**

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Town of Needham Contributory Retirement System’s investment policy. For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.75%. The actual rate of return on an actuarial basis for the 2014 plan year was 9.54%.

Since the actual return for the year was greater than the assumed return, the Town of Needham Contributory Retirement System experienced an actuarial gain during the year ended December 31, 2014 with regard to its investments.

*This chart shows the gain/(loss) due to investment experience.*

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**CHART 10**  
**Actuarial Value Investment Experience for Year Ended December 31, 2014**

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1. Actual return	\$11,547,431
2. Average value of assets	121,039,145
3. Actual rate of return: (1) ÷ (2)	9.54%
4. Assumed rate of return	7.75%
5. Expected return: (2) x (4)	\$9,380,534
6. Actuarial gain/(loss): (1) – (5)	<u>\$2,166,897</u>

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**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the market value investment return for the last five years, including a four-year average.

Based upon this experience and future expectations, we have maintained the assumed rate of return of 7.75%. We will continue to monitor the plan’s investment return assumption.

**CHART 11**

**Investment Return – Actuarial Value vs. Market Value: 2010 - 2014**

Year Ended December 31	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent
2010	--*	2.58%	--*	12.74%
2011	\$419,144	0.36	-\$399,618	-0.38
2012	541,125	0.48	13,507,074	13.22
2013	12,121,552	10.92	16,526,053	14.60
2014	<u>11,547,431</u>	9.54	<u>9,661,449</u>	7.57
Total	\$24,629,252		\$39,294,958	
	Four-year average return	5.34%		8.77%

\* Information not available.

## SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System

Subsection B described the actuarial asset valuation method that gradually takes into account fluctuations in the market value rate of return. The effect of this is to stabilize the actuarial rate of return, which contributes to leveling pension plan costs.

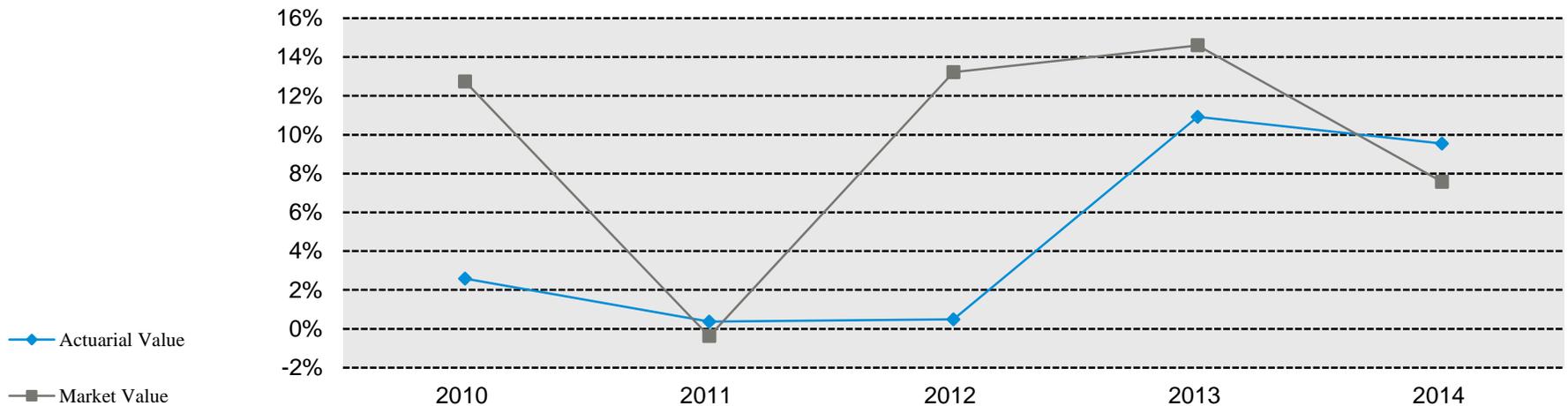
### Administrative Expenses

Administrative expenses for the year ended December 31, 2014 totaled \$293,796 compared to the assumption of \$200,000. This resulted in a loss of \$88,591 for the year. Based on budgeted expenses provided by the System, we have increased the assumption from \$200,000 to \$237,000 for the 2015 calendar year.

*This chart illustrates how this leveling effect has actually worked over the years 2010 - 2014.*

**CHART 12**

**Market and Actuarial Rates of Return for Years Ended December 31, 2010 - 2014**



**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

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**Other Experience**

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among the participants,
- retirement experience (earlier or later than expected),
- mortality (more or fewer deaths than expected),
- the number of disability retirements, and
- salary increases different than assumed.

The net loss from this other experience for the year ended December 31, 2014 amounted to \$20,383.

A brief summary of the demographic gain/(loss) experience of the Town of Needham Contributory Retirement System for the year ended December 31, 2014 is shown in the chart below.

This valuation reflects the following changes in actuarial assumptions and plan provisions:

- The administrative expense assumption was increased from \$200,000 for calendar 2014 to \$237,000 for

calendar 2015.

- The mortality assumption for healthy participants was changed from the RP-2000 Combined Healthy Mortality Table projected 22 years using Scale AA to the RP-2000 Combined Healthy Mortality Table projected generationally using Scale AA.
- The mortality assumption for disabled participants was changed from the RP-2000 Combined Healthy Mortality Table set forward 2 years to the RP-2000 Combined Healthy Mortality Table set forward 2 years projected generationally using Scale AA.

Changing these assumptions resulted in a net increase in the unfunded liability of \$2,153,215 and a net increase in the employer normal cost of \$152,028.

As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Board has increased the Cost of Living Adjustment (COLA) base from \$12,000 to \$14,000 effective July 1, 2015. This change increased the unfunded liability by \$1,861,711 and the employer normal cost by \$44,349.

*The chart shows elements of the experience gain/(loss) for the most recent year.*

**CHART 13**

**Experience Due to Changes in Demographics for Year Ended December 31, 2014**

1. Fewer deaths than expected amongst retired members and beneficiaries	-\$110,687
2. Salary increases for continuing actives less than expected	1,429,213
3. Miscellaneous experience loss, including data adjustments and transfers into the System	<u>-1,338,909</u>
4. Total	-\$20,383

**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

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The unfunded liability was expected to increase from \$57.7 million as of January 1, 2014 to \$58.2 million as of January 1, 2015. The actual unfunded liability as of January 1, 2015 of \$60.1 million is \$1,957,003 higher than expected as detailed in Chart 14 below.

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**CHART 14**

**Development of Unfunded Actuarial Accrued Liability for Year Ended December 31, 2014**

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1. Unfunded actuarial accrued liability at beginning of year		\$57,749,760
2. Normal cost at beginning of year		4,732,712
3. Total contributions		-8,847,169
4. Interest		
(a) For whole year on (1) + (2)	\$4,842,392	
(b) For half year on (3)	<u>-310,025</u>	
(c) Total interest		<u>4,532,367</u>
5. Expected unfunded actuarial accrued liability		\$58,167,670
6. Changes due to:		
(a) Net experience gain	-\$2,057,923	
(b) Assumption changes	2,153,215	
(c) Plan of benefits changes	<u>1,861,711</u>	
(d) Total changes		<u>1,957,003</u>
7. Unfunded actuarial accrued liability at end of year		<u>\$60,124,673</u>

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**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

**D. RECOMMENDED CONTRIBUTION**

The amount of annual contribution required to fund the Plan is comprised of an employer normal cost payment and a payment on the unfunded actuarial accrued liability.

The contribution for fiscal 2016 is equal to the previously budgeted amount of \$6,149,812. The results of this valuation will first be reflected in the fiscal 2017 appropriation. The increase in the appropriation is phased in over three years resulting in 9.06% increases each year through fiscal 2019. The amortization payments for fiscal 2020 and later are calculated to increase 4.5% per year and to fully fund the System by 2030.

Chart 16 shows the appropriation through fiscal 2030 based on this schedule. The fiscal 2017 appropriation is \$6,706,800 or 9.06% higher than the fiscal 2016 appropriation. The funding schedule reflects an investment gain on an actuarial basis in 2015 assuming a 2015 market return of 7.75%.

Because the total appropriation will increase faster than projected payroll, the appropriation as a percent of payroll is expected to increase. The unfunded actuarial accrued liability is projected to decrease each year, if all assumptions are met and there are no changes in assumptions or the plan of benefits.

*The chart compares this valuation's recommended contribution with the prior valuation.*

**CHART 15  
Recommended Contribution**

	Year Beginning January 1			
	2015		2014	
	Amount	% of Payroll	Amount	% of Payroll
1. Total normal cost	\$4,772,654	14.17%	\$4,532,712	13.90%
2. Administrative expenses	237,000	0.70%	200,000	0.61%
3. Expected employee contributions	<u>-3,196,783</u>	<u>-9.49%</u>	<u>-3,066,324</u>	<u>-9.40%</u>
4. Employer normal cost: (1) + (2) + (3)	\$1,812,871	5.38%	\$1,666,388	5.11%
5. Actuarial accrued liability	191,665,860		179,834,295	
6. Actuarial value of assets	<u>131,541,187</u>		<u>122,084,535</u>	
7. Unfunded actuarial accrued liability: (5) - (6)	\$60,124,673		\$57,749,760	
8. Employer normal cost projected to July 1, 2015 and 2014	1,844,323	5.38%	1,695,299	5.11%
9. Projected unfunded actuarial accrued liability	62,411,033		59,945,809	
10. Payment on projected unfunded actuarial accrued liability	4,305,489	12.56%	3,926,101	11.84%
11. Total recommended contribution: (8) + (10), adjusted for timing	<u>\$6,149,812</u>	<u>17.94%</u>	<u>\$5,621,400</u>	<u>16.95%</u>
12. Projected payroll	\$34,271,091		\$33,171,186	

*Notes: Recommended contributions are assumed to be paid on July 1.  
Recommended contributions are set equal to the budgeted amounts determined with the prior valuation.*

**SECTION 2: Valuation Results for the Town of Needham Contributory Retirement System**

**CHART 16**

**Funding Schedule – Fully Funded by 2030 with Three-Year Phase-In, Reflects Investment Gain on an Actuarial Basis in 2015 (Assuming 2015 Market Return of 7.75%)**

(1) Fiscal Year Ended June 30	(2) Employer Normal Cost	(3) Amortization of Unfunded Actuarial Accrued Liability	(4) Total Plan Cost: (2) + (3)	(5) Unfunded Actuarial Accrued Liability at Beginning of Fiscal Year	(6) Percent Increase in Total Cost
2016	\$1,844,323	\$4,305,489	\$6,149,812	\$62,411,033	--
2017	1,916,413	4,790,388	6,706,800	61,614,449	9.06%
2018	1,991,301	5,322,934	7,314,235	61,227,927	9.06%
2019	2,069,096	5,907,590	7,976,686	60,237,629	9.06%
2020	2,149,909	6,173,546	8,323,455	58,540,617	4.35%
2021	2,233,858	6,451,355	8,685,213	56,425,519	4.35%
2022	2,321,064	6,741,666	9,062,730	53,847,161	4.35%
2023	2,411,651	7,045,041	9,456,692	50,756,171	4.35%
2024	2,505,750	7,362,068	9,867,818	47,098,742	4.35%
2025	2,603,497	7,693,361	10,296,858	42,816,266	4.35%
2026	2,705,033	8,039,562	10,744,595	37,844,930	4.35%
2027	2,810,503	8,401,342	11,211,845	32,115,284	4.35%
2028	2,920,059	8,779,403	11,699,462	25,551,772	4.35%
2029	3,033,858	9,174,476	12,208,334	18,072,228	4.35%
2030	3,152,064	9,587,328	12,739,393	9,587,328	4.35%
2031	3,274,848	--	3,274,848	--	-74.29%

*Notes: Recommended contributions are assumed to paid on July 1.*

*Assumes contribution of budgeted amount for fiscal year 2016.*

*Item (2) increases at 3.5% per year, plus an additional 0.15% adjustment to total normal cost to reflect the effects of mortality improvement due to generational mortality assumption.*

*Assumes amortization payments of remaining liability increase at 4.50% per year.*

*Projected normal cost does not reflect the impact of pension reform for future hires.*

**SECTION 3: Supplemental Information for the Town of Needham Contributory Retirement System**

**EXHIBIT A**

**Table of Plan Coverage**

<b>Category</b>	<b>Year Ended December 31</b>		<b>Change From Prior Year</b>
	<b>2014</b>	<b>2013</b>	
<b>Active participants in valuation:</b>			
Number	647	631	2.5%
Average age	48.2	48.7	N/A
Average years of service	11.1	11.6	N/A
Total payroll	\$32,213,389	\$31,406,062	2.6
Average payroll	49,789	49,772	0.0%
Member contributions	28,788,775	28,453,176	1.2%
<b>Number of inactive participants entitled to a return of their employee contributions</b>			
	141	126	11.9%
<b>Number of inactive participants with a vested right to a deferred or immediate benefit</b>			
	20	17	17.6%
<b>Retired participants:</b>			
Number in pay status	379	379	0.0%
Average age	76.1	76.6	N/A
Average monthly benefit	\$1,935	\$1,809	7.0%
<b>Disabled participants:</b>			
Number in pay status	32	31	3.2%
Average age	69.2	68.3	N/A
Average monthly benefit	\$2,925	\$2,907	0.6%
<b>Beneficiaries in pay status:</b>			
Number in pay status	51	54	-5.6%
Average age	77.0	76.9	N/A
Average monthly benefit	\$1,227	\$1,142	7.4%

**SECTION 3: Supplemental Information for the Town of Needham Contributory Retirement System**

**EXHIBIT B**

**Participants in Active Service as of December 31, 2014  
By Age, Years of Service, and Average Payroll**

Age	Years of Service									
	Total	0-4	5-9	10-14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	17	17	--	--	--	--	--	--	--	--
	\$27,612	\$27,612	--	--	--	--	--	--	--	--
25 - 29	60	52	8	--	--	--	--	--	--	--
	\$36,066	\$34,566	\$45,818	--	--	--	--	--	--	--
30 - 34	40	21	16	3	--	--	--	--	--	--
	\$49,545	\$41,367	\$58,201	\$60,625	--	--	--	--	--	--
35 - 39	47	17	12	13	5	--	--	--	--	--
	\$55,135	\$42,651	\$58,159	\$71,204	\$48,543	--	--	--	--	--
40 - 44	65	18	14	18	11	4	--	--	--	--
	\$59,532	\$41,616	\$50,118	\$70,280	\$80,618	\$66,758	--	--	--	--
45 - 49	88	33	13	11	14	7	10	--	--	--
	\$49,887	\$31,969	\$44,564	\$50,882	\$65,336	\$81,375	\$71,175	--	--	--
50 - 54	122	27	37	17	13	9	17	2	--	--
	\$49,208	\$31,152	\$44,231	\$45,397	\$47,177	\$68,667	\$78,854	\$91,116	--	--
55 - 59	102	18	19	22	12	10	13	8	--	--
	\$51,917	\$41,729	\$37,175	\$40,427	\$57,900	\$65,026	\$72,986	\$81,847	--	--
60 - 64	62	13	7	12	10	3	3	5	7	2
	\$54,012	\$45,771	\$30,491	\$43,514	\$40,847	\$56,317	\$67,296	\$75,676	\$84,144	\$135,700
65 - 69	35	2	8	9	6	4	3	2	1	--
	\$45,692	\$23,156	\$47,147	\$39,940	\$44,214	\$37,170	\$49,348	\$84,046	\$86,184	--
70 & over	9	1	--	1	2	--	1	2	1	1
	\$55,591	\$28,023	--	\$121,096	\$42,474	--	\$23,233	\$47,088	\$37,750	\$111,097
Total	647	219	134	106	73	37	47	19	9	3
	\$49,789	\$36,193	\$46,344	\$52,794	\$56,315	\$65,475	\$71,792	\$77,771	\$79,216	\$127,499

**SECTION 3: Supplemental Information for the Town of Needham Contributory Retirement System**

**EXHIBIT C**

**Summary Statement of Income and Expenses on an Actuarial Value Basis**

	Year Ended December 31, 2014	Year Ended December 31, 2013
<b>Net assets at actuarial value at the beginning of the year</b>	\$122,084,535	\$112,131,508
<b>Contribution income:</b>		
Employer contributions	\$5,572,775	\$5,420,454
Employee contributions	3,274,394	2,962,759
Less administrative expenses	<u>-293,796</u>	<u>-137,378</u>
Net contribution income	8,553,373	8,245,835
<b>Net investment income</b>	<u>11,547,431</u>	<u>12,121,552</u>
<b>Total income available for benefits</b>	\$20,100,804	\$20,367,387
<b>Less benefit payments:</b>		
Pensions	-\$10,392,385	-\$9,878,148
Net 3(8)(c) reimbursements	-139,239	-207,513
Refunds, annuities, & Option B refunds	<u>-112,528</u>	<u>-328,699</u>
Net benefit payments	-\$10,644,152	-\$10,414,360
<b>Change in reserve for future benefits</b>	\$9,456,652	\$9,953,027
<b>Net assets at actuarial value at the end of the year</b>	\$131,541,187	\$122,084,535

**SECTION 3: Supplemental Information for the Town of Needham Contributory Retirement System**

**EXHIBIT D**

**Development of the Fund Through December 31, 2014**

<b>Year Ended December 31</b>	<b>Employer Contributions</b>	<b>Employee Contributions</b>	<b>Other Contributions</b>	<b>Net Investment Return*</b>	<b>Administrative Expenses</b>	<b>Benefit Payments</b>	<b>Actuarial Value of Assets at End of Year</b>
2011	\$4,722,775	\$2,683,104	\$11,468	\$419,144	\$196,963	\$9,659,869	\$114,445,376
2012	4,997,421	2,764,061	1,253	541,125	198,470	10,419,258	112,131,508
2013	5,420,454	2,962,759	0	12,121,552	137,378	10,414,360	122,084,535
2014	5,572,775	3,274,394	0	11,547,431	293,796	10,644,152	131,541,187

\* *Net of investment fees.*

### SECTION 3: Supplemental Information for the Town of Needham Contributory Retirement System

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#### EXHIBIT E

#### Definitions of Pension Terms

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The following list defines certain technical terms for the convenience of the reader:

**Assumptions or actuarial assumptions:**

The estimates on which the cost of the Plan is calculated including:

- (a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;
- (b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;
- (c) Retirement rates — the rate or probability of retirement at a given age;
- (d) Withdrawal rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

**Normal cost:**

The amount of contributions required to fund the benefit allocated to the current year of service.

**Actuarial accrued liability for actives:**

The value of all projected benefit payments for current members less the portion that will be paid by future normal costs.

**Actuarial accrued liability for pensioners:**

The single-sum value of lifetime benefits to existing pensioners. This sum takes account of life expectancies appropriate to the ages of the pensioners and the interest that the sum is expected to earn before it is entirely paid out in benefits.

**Unfunded actuarial accrued liability:**

The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There are many approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.

### SECTION 3: Supplemental Information for the Town of Needham Contributory Retirement System

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**Amortization of the unfunded actuarial accrued liability:**

Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.

**Investment return:**

The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.

## SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System

### EXHIBIT I

#### Summary of Actuarial Valuation Results

The valuation was made with respect to the following data supplied to us:

1. Retired participants as of the valuation date (including 51 beneficiaries in pay status)	462
2. Participants active during the year ended December 31, 2014 with total contributions of \$28,788,755 and total payroll of \$33,686,645	647
3. Inactive participants with a vested right to a deferred or immediate benefit as of December 31, 2014	20
4. Inactive participants with a right to a return of their employee contributions as of December 31, 2014	141

The actuarial factors as of the January 1, 2015 valuation date are as follows:

1. Normal cost		\$5,009,654
2. Expected employee contributions		<u>-3,196,783</u>
3. Employer normal cost: (1) + (2)		\$1,812,871
4. Actuarial accrued liability		191,665,860
	Retired participants and beneficiaries	\$96,999,044
	Active participants	90,650,423
	Inactive participants	4,016,393
5. Actuarial value of assets (\$136,213,050 at market value as reported in the Annual Statement)		131,541,187
6. Unfunded actuarial accrued liability: (4) – (5)		<u>60,124,673</u>

The actuarial factors projected to July 1, 2015 are as follows:

1. Employer normal cost, projected to July 1, 2015	\$1,844,323
2. Projected unfunded actuarial accrued liability	62,411,033
3. Payment on projected unfunded actuarial accrued liability	4,305,489
4. Recommended contribution: (1) + (3)	<u>\$6,149,812</u>
5. Projected payroll	\$34,271,091
6. Total budgeted contribution as a percentage of payroll: (4) ÷ (5)	17.94%

Notes: Recommended contributions are assumed to be paid July 1.

Recommended contributions are set equal to the budgeted amounts determined with the prior valuation.

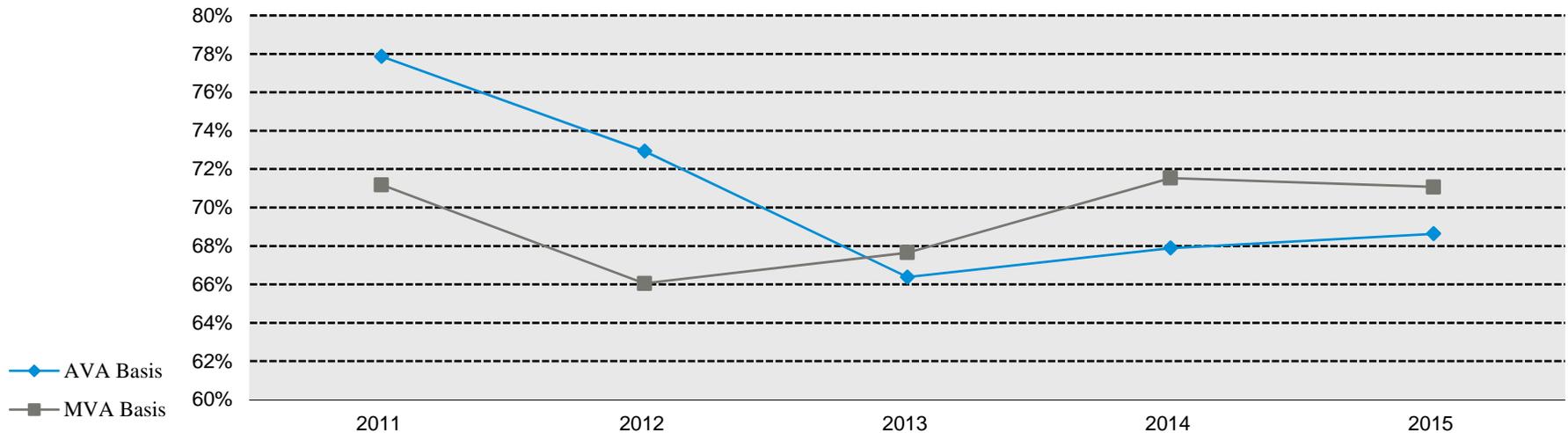
**SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

**EXHIBIT II  
Funded Ratio**

A critical piece of information regarding the Plan's financial status is the funded ratio. This ratio compares the actuarial value of assets to the actuarial accrued liabilities of the Plan as calculated. High ratios indicate a well-funded plan with assets sufficient to cover the plan's actuarial accrued liabilities. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other factors.

These measurements are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.

The chart below depicts a history of the funded ratios for this plan. On a market value basis, the funded ratio has decreased from 71.53% as of January 1, 2014 to 71.07% as of January 1, 2015. On an actuarial basis, the funded ratio has increased from 67.89% as of January 1, 2014 to 68.63% as of January 1, 2015.



## SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System

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### EXHIBIT III

#### Actuarial Assumptions and Actuarial Cost Method

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##### **Mortality Rates:**

Healthy: RP-2000 Combined Healthy Mortality Table projected generationally using Scale AA (previously, RP-2000 Combined Healthy Mortality Table projected 22 years using Scale AA)

Disabled: RP-2000 Combined Healthy Mortality Table set forward 2 years projected generationally using Scale AA (previously, RP-2000 Combined Healthy Mortality Table set forward 2 years)

The mortality tables reasonably reflect the projected mortality experience of the Plan as of the measurement date based on historical and current demographic data. As part of the analysis, a comparison was made between the actual number of retiree deaths and the projected number based on the prior years' assumption over the most recent two years. The mortality tables were then adjusted to future years using generational projection under Scale AA to reflect future mortality improvement.

**SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

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**Termination Rates before Retirement:**

**Groups 1 and 2 - Rate per year (%)**

Age	Mortality					Disability
	Current		Previously			
	Male	Female	Male	Female		
20	0.03	0.02	0.02	0.01	0.01	
25	0.04	0.02	0.03	0.02	0.02	
30	0.04	0.03	0.04	0.02	0.03	
35	0.08	0.05	0.07	0.04	0.06	
40	0.11	0.07	0.09	0.05	0.10	
45	0.15	0.11	0.11	0.08	0.15	
50	0.21	0.17	0.14	0.11	0.19	
55	0.36	0.27	0.24	0.23	0.24	
60	0.67	0.51	0.47	0.45	0.28	

*Notes: Mortality rates do not reflect generational projection.*

*55% of the disability rates shown represent accidental disability.*

*20% of the accidental disabilities will die from the same cause as the disability.*

*55% of the death rates shown represent accidental death.*

**SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

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<b>Group 4 - Rate per year (%)</b>					
<b>Mortality</b>					
<b>Age</b>	<b>Current</b>		<b>Previously</b>		<b>Disability</b>
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>	
20	0.03	0.02	0.02	0.01	0.10
25	0.04	0.02	0.03	0.02	0.20
30	0.04	0.03	0.04	0.02	0.30
35	0.08	0.05	0.07	0.04	0.30
40	0.11	0.07	0.09	0.05	0.30
45	0.15	0.11	0.11	0.08	1.00
50	0.21	0.17	0.14	0.11	1.25
55	0.36	0.27	0.25	0.23	1.20
60	0.67	0.51	0.47	0.45	0.85

*Notes: Mortality rates do not reflect generational projection.  
 90% of the disability rates shown represent accidental disability.  
 60% of the accidental disabilities will die from the same cause as the disability.  
 90% of the death rates shown represent accidental death.*

**SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

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Withdrawal Rates:	Years of Service	Rate per year (%)	
		Groups 1 and 2	Group 4
	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	7.6	1.5
	6	7.5	1.5
	7	6.7	1.5
	8	6.3	1.5
	9	5.9	1.5
	10	5.4	1.5
	11	5.0	0.0
	12	4.6	0.0
	13	4.1	0.0
	14	3.7	0.0
	15	3.3	0.0
	16 – 20	2.0	0.0
	21 – 29	1.0	0.0
	30+	0.0	0.0

The termination rates and disability rates were based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of terminations and disability retirements and the projected number based on the prior years' assumption over the most recent two years.

**SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

**Retirement Rates:**

Age	Rate per year (%)			
	Groups 1 and 2		Group 4	
	Male	Female	Age	Male and Female
50	1.0	1.5	45	1.0
51	1.0	1.5	46	1.0
52	1.0	2.0	47	1.0
53	1.0	2.5	48	1.0
54	2.0	2.5	49	1.0
55	2.0	5.5	50	2.0
56	2.5	6.5	51	2.0
57	2.5	6.5	52	2.0
58	5.0	6.5	53	5.0
59	6.5	6.5	54	7.5
60	12.0	5.0	55	15.0
61	20.0	13.0	56	10.0
62	30.0	15.0	57	10.0
63	25.0	12.5	58	10.0
64	22.0	18.0	59	15.0
65	40.0	15.0	60	20.0
66	25.0	20.0	61	20.0
67	25.0	20.0	62	25.0
68	30.0	25.0	63	25.0
69	30.0	20.0	64	30.0
70	100.0	100.0	65	100.0

The retirement rates were based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of retirements by age and the projected number based on the prior years' assumptions over the most recent two years.

## SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System

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<b>Retirement Age for Inactive Vested Participants:</b>	Age 65 for Group 1 and 2 employees and Age 55 for Group 4 employees The retirement age for inactive vested participants was based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment.
<b>Unknown Data for Participants:</b>	Same as those exhibited by participants with similar known characteristics.
<b>Family Composition:</b>	80% of participants are assumed to be married. None are assumed to have dependent children. Females are assumed to be three years younger than their spouses.
<b>Benefit Election:</b>	All participants are assumed to elect Option A.
<b>Net Investment Return:</b>	7.75%  The net investment return assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment. As part of the analysis, a building block approach was used that reflects inflation expectations and anticipated risk premiums for each of the portfolio's asset classes, as well as the Plan's target asset allocation.
<b>Salary Increases:</b>	4.75% for Group 1 and 2 employees and 5.25% for Group 4 employees The salary scale assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment.
<b>Interest on Employee Contributions:</b>	3.50%
<b>Administrative Expenses:</b>	\$237,000 for calendar 2015, increasing 3.50% per year (previously, \$200,000 for calendar 2014, increasing 3.50% per year) The administrative expense assumption is based on budgeted expenses provided by the System.
<b>2014 Salary:</b>	2014 salary equal to salaries provided in the data, except for new hires where salaries were annualized based on date of hire.
<b>Total Service:</b>	Total creditable service reported in the data.
<b>Net 3(8)(c) Liability:</b>	No liability is valued for benefits paid to or received from other municipal systems.

## SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System

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<b>Actuarial Value of Assets:</b>	<p>Market value of assets as reported in the System's Annual Statement less unrecognized return in each of the last five years. Unrecognized return is equal to the difference between the actual market value return and the expected market value return and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.</p> <p>For GASB 67/68 disclosures, market value of assets were increased by contributions receivable of \$48,625.</p>
<b>Actuarial Cost Method:</b>	<p>Entry Age Normal Actuarial Cost Method. Entry Age is the age of the participant less Total Service as defined above. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary. Normal Cost is determined using the plan of benefits applicable to each participant.</p>
<b>Changes in Assumptions:</b>	<p>Based on past experience and future expectations, the following actuarial assumptions were changed:</p> <ul style="list-style-type: none"><li>➤ The administrative expense assumption was increased from \$200,000 for calendar 2014 to \$237,000 for calendar 2015.</li><li>➤ The mortality assumption for healthy participants was changed from the RP-2000 Combined Healthy Mortality Table projected 22 years using Scale AA to the RP-2000 Combined Healthy Mortality Table projected generationally using Scale AA.</li><li>➤ The mortality assumption for disabled participants was changed from the RP-2000 Combined Healthy Mortality Table set forward 2 years to the RP-2000 Combined Healthy Mortality Table set forward 2 years projected generationally using Scale AA.</li></ul>

**SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

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**EXHIBIT IV**

**Summary of Plan Provisions**

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This exhibit summarizes the major provisions of Chapter 32 of the Laws of Massachusetts.

**Plan Year:** January 1 – December 31

**Retirement Benefits**

Employees covered by the Contributory Retirement Law are classified into one of four groups depending on job classification. Group 1 comprises most positions in state and local government. It is the general category of public employees. Group 4 comprises mainly police and firefighters. Group 2 is for other specified hazardous occupations. (Officers and inspectors of the State Police are classified as Group 3.)

For employees hired prior to April 2, 2012, the annual amount of the retirement allowance is based on the member’s final three-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following table based on the age of the member at retirement:

**Age Last Birthday at Date of Retirement**

<b>Percent</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 4</b>
2.5	65 or over	60 or over	55 or over
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	--	49
1.8	58	--	48
1.7	57	--	47
1.6	56	--	46
1.5	55	--	45

**SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

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A member’s final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement.

For employees hired on April 2, 2012 or later, the annual amount of the retirement allowance is based on the member’s final five-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following tables based on the age and years of creditable service of the member at retirement:

**For members with less than 30 years of creditable service:**

**Age Last Birthday at Date of Retirement**

<b>Percent</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 4</b>
2.50	67 or over	62 or over	57 or over
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

**For members with 30 years of creditable service or greater:**

**Age Last Birthday at Date of Retirement**

<b>Percent</b>	<b>Group 1</b>	<b>Group 2</b>	<b>Group 4</b>
2.500	67 or over	62 or over	57 or over
2.375	66	61	56
2.250	65	60	55
2.125	64	59	54
2.000	63	58	53
1.875	62	57	52
1.750	61	56	51
1.625	60	55	50

**SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

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A member’s final five-year average salary is defined as the greater of the highest consecutive five-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last five years of creditable service prior to retirement.

For employees who became members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit “spiking” of a member’s salary to increase the retirement benefit.

For all employees, the maximum annual amount of the retirement allowance is 80 percent of the member’s final average salary. Any member who is a veteran also receives an additional yearly retirement allowance of \$15 per year of creditable service, not exceeding \$300. The veteran allowance is paid in addition to the 80 percent maximum.

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**Employee Contributions**

<u>Date of Hire</u>	<u>Contribution Rate</u>
Prior to January 1, 1975	5%
January 1, 1975 – December 31, 1983	7%
January 1, 1984 – June 30, 1996	8%
July 1, 1996 onward	9%

In addition, employees hired after December 31, 1978 contribute an additional 2 percent of salary in excess of \$30,000.

Employees hired after 1983 who voluntarily withdraw their contributions with less than 10 ten years of credited service receive 3% interest on their contributions.

Employees in Group 1 hired on or after April 2, 2012 with 30 years of creditable service or greater will pay a base contribution rate of 6%.

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**Retirement Benefits (Superannuation)**

Members of Group 1, 2 or 4 hired prior to April 2, 2012 may retire upon the attainment of age 55. For retirement at ages below 55, twenty years of creditable service is required.

## **SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System**

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Members hired prior to April 2, 2012 who terminate before age 55 with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System).

Members of Group 1 hired April 2, 2012 or later may retire upon the attainment of age 60. Members of Group 2 or 4 hired April 2, 2012 or later may retire upon the attainment of age 55. Members of Group 4 may retire upon attainment of age 50 with ten years of creditable service.

Members hired April 2, 2012 or later who terminate before age 55 (60 for members of Group 1) with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (60 for members of Group 1) provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System.

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### **Ordinary Disability Benefits**

A member who is unable to perform his or her job due to a non-occupational disability will receive a retirement allowance if he or she has ten or more years of creditable service and has not reached age 55. The annual amount of such allowance shall be determined as if the member retired for superannuation at age 55 (age 60 for Group 1 members hired on or after April 2, 2012), based on the amount of creditable service at the date of disability. For veterans, there is a minimum benefit of 50 percent of the member's most recent year's pay plus an annuity based on his or her own contributions.

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### **Accidental Disability Benefit**

For a job-connected disability, the benefit is 72 percent of the member's most recent annual pay plus an annuity based on his or her own contributions, plus additional amounts for surviving children. Benefits are capped at 75 percent of annual rate of regular compensation for employees who become members after January 1, 1988.

## SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System

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### Death Benefits

In general, the beneficiary of an employee who dies in active service will receive a refund of the employee's own contributions. Alternatively, if the employee were eligible to retire on the date of death, a spouse's benefit will be paid equal to the amount the employee would have received under Option C. The surviving spouse of a member who dies with two or more years of credited service has the option of a refund of the employee's contributions or a monthly benefit regardless of eligibility to retire, if they were married for at least one year. There is also a minimum widow's pension of \$500 per month, and there are additional amounts for surviving children.

If an employee's death is job-connected, the spouse will receive 72 percent of the member's most recent annual pay, in addition to a refund of the member's accumulated deductions, plus additional amounts for surviving children. However, in accordance with Section 100 of Chapter 32, the surviving spouse of a police officer, firefighter or corrections officer is killed in the line of duty will be eligible to receive an annual benefit equal to the maximum salary held by the member at the time of death.

Upon the death of a job-connected disability retiree who retired prior to November 7, 1996 and could not elect an Option C benefit, a surviving spouse will receive an allowance of \$9,000 per year if the member dies for a reason unrelated to the cause of the disability.

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### "Heart And Lung Law" And Cancer Presumption

Any case of hypertension or heart disease resulting in total or partial disability or death to a uniformed fireman, permanent member of a police department, or certain employees of a county correctional facility is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. Any case of disease of the lungs or respiratory tract resulting in total disability or death to a uniformed fireman is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. There is an additional presumption for uniformed firemen that certain types of cancer are job-related if onset occurs while actively employed or within five years of retirement.

## SECTION 4: Reporting Information for the Town of Needham Contributory Retirement System

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### Options

Members may elect to receive a full retirement allowance payable for life under Option A. Under Option B a member may elect to receive a lower monthly allowance in exchange for a guarantee that at the time of death any contributions not expended for annuity payments will be refunded to the beneficiary. Option C allows the member to take a lesser retirement allowance in exchange for providing a survivor with two-thirds of the lesser amount. Option C pensioners will have benefits converted from a reduced to a full retirement if the beneficiary predeceases the retiree.

### Post-Retirement Benefits

The Board has adopted the provisions of Section 51 of Chapter 127 of the Acts of 1999, which provide that the Retirement Board may approve an annual COLA in excess of the Consumer Price Index but not to exceed a 3% COLA on the first \$14,000 (previously, \$12,000) of a retirement allowance. Cost-of-living increases granted prior to July 1, 1998 are reimbursed by the Commonwealth and not reflected in this report.

### Changes in Plan Provisions

As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Board has increased the Cost of Living Adjustment (COLA) base from \$12,000 to \$14,000 effective July 1, 2015.

## SECTION 5: GASB Information for the Town of Needham Contributory Retirement System

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### EXHIBIT 1

#### Net Pension Liability

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The components of the net pension liability of the Town of Needham Contributory Retirement System are as follows:

	<u>December 31, 2014</u>	<u>December 31, 2013</u>
Total pension liability	\$191,665,860	\$179,834,295
Plan fiduciary net position	136,261,675	128,673,500
System's net pension liability	55,404,185	51,160,795
Plan fiduciary net position as a percentage of the total pension liability	71.09%	71.55%

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*Actuarial assumptions.* The total pension liability as of December 31, 2014 was determined by an actuarial valuation as of December 31, 2014, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	3.5%
Salary increases	4.75% for Group 1 and 2 employees, 5.25% for Group 4 employees
Investment rate of return	7.75%, net of pension plan investment expense, including inflation
Cost of Living Adjustment	3% of first \$14,000
Healthy:	RP-2000 Combined Healthy Mortality Table projected generationally using Scale AA
Disabled:	RP-2000 Combined Healthy Mortality Table set forward 2 years projected generationally using Scale AA

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2014 are summarized in the following table:

**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

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<b>Asset Class</b>	<b>Long-Term Expected Real Rate of Return</b>
Domestic equity	6.40%
International developed markets equity	7.07%
International emerging markets equity	9.26%
Core fixed income	1.53%
High-yield fixed income	4.25%
Real estate	4.30%
Commodities	3.77%
Hedge fund, GTAA, Risk parity	3.44%
Private equity	11.26%

**Discount rate sensitivity**

*Discount rate:* The discount rate used to measure the total pension liability was 7.75%. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

*Sensitivity of the net pension liability to changes in the discount rate.* The following presents the net pension liability, calculated using the discount rate of 7.75%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.75%) or 1-percentage-point higher (8.75%) than the current rate:

	<b>1% Decrease (6.75%)</b>	<b>Current Discount (7.75%)</b>	<b>1% Increase (8.75%)</b>
Town of Needham Contributory Retirement System's net pension liability as of December 31, 2014	\$76,256,065	\$55,404,185	\$37,660,241

**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

**EXHIBIT 2**

**Schedule of Changes in the Net Pension Liability – Last Ten Years**

	Year End December 31,									
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
<b>Total pension liability</b>										
Service cost	\$4,532,712									
Interest	13,879,132									
Differences between expected and actual experience	-32,335									
Changes of assumptions	2,153,215									
Changes of benefit terms	1,861,711									
Benefit payments, including refunds of employee contributions	-10,562,870									
<b>Net change in total pension liability</b>	\$11,831,565									
<b>Total pension liability - beginning</b>	<u>179,834,295</u>									
<b>Total pension liability - ending (a)</b>	<u>\$191,665,860</u>									
<b>Plan fiduciary net position</b>										
Contributions - employer	\$5,621,400									
Contributions - employee	3,193,112									
Net investment income	9,630,329									
Benefit payments, including refunds of employee contributions	-10,562,870									
Administrative expenses	-293,796									
<b>Net change in fiduciary net position</b>	\$7,588,175									
<b>Plan fiduciary net position - beginning</b>	<u>128,673,500</u>									
<b>Plan fiduciary net position - ending (b)</b>	<u>\$136,261,675</u>									
<b>Net pension liability – ending: (a)-(b)</b>	\$55,404,185									
<b>Plan's fiduciary net position as a percentage of the total pension liability</b>	71.09%									
<b>Covered-employee payroll*</b>	TBD									
<b>Net pension liability as a percentage of covered-employee payroll</b>	TBD									

\* Total compensation paid to members for calendar year 2014 as reported by the Town.

**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

**EXHIBIT 3**

**Schedule of Contributions – Last Ten Years**

	Year End December 31,									
	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Actuarially determined contribution	\$5,621,400*									
Contributions in relation to the actuarially determined contribution	<u>5,621,400</u>									
Contribution deficiency (excess)	\$0									
Covered-employee payroll	TBD									
Contributions as a percentage of covered-employee payroll	TBD									

(Historical information prior to implementation of GASB 67/68 is not required)

\* Based on the results of the January 1, 2013 actuarial valuation (including assumptions and methods) which determined budgeted appropriation for fiscal 2015.

**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

**EXHIBIT 4**

**Pension Expense and Deferred Outflows/Inflows of Resources Related to Pensions**

**A. Pension expense for the year ended December 31, 2014**

	<b>Total</b>	<b>Town of Needham</b>	<b>Needham Housing Authority</b>
Service cost	\$4,532,712		
Interest on total pension liability	13,879,132		
Contributions – employee	-3,193,112		
Projected earnings on pension plan investments	-9,893,063		
Administrative expenses	293,796		
Recognized portion of current period plan between expected and actual experience	-6,467		
Recognized portion of current period plan between projected and actual earnings on pension plan investments	52,547		
Recognized portion of current year period assumption change	430,643		
Recognition of plan change	1,861,711		
Recognition of deferred outflows of resources	0		
Recognition of deferred inflows of resources	0		
Pension expense for fiscal year ended June 30, 2015	<u>\$7,957,899</u>	<u>\$7,820,228</u>	<u>\$137,671</u>
Fiscal Year 2015 allocation percentage	100.0%	98.270004%	1.729996%

**B. Deferred outflows/inflows of resources related to pensions**

	<b>Town of Needham</b>		<b>Needham Housing Authority</b>		<b>Total</b>	
	<b>Deferred Outflows of Resources</b>	<b>Deferred Inflows of Resources</b>	<b>Deferred Outflows of Resources</b>	<b>Deferred Inflows of Resources</b>	<b>Deferred Outflows of Resources</b>	<b>Deferred Inflows of Resources</b>
Differences between expected and actual experience	\$0	\$25,420	\$0	\$448	\$0	\$25,868
Changes of assumptions	1,692,772	0	29,800	0	1,722,572	0
Net difference between projected and actual earnings on pension plan investments	<u>206,551</u>	<u>0</u>	<u>3,636</u>	<u>0</u>	<u>210,187</u>	<u>0</u>
Total	\$1,899,323	25,420	\$33,436	\$448	\$1,932,759	25,868

**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

**C. Projected recognition of deferred outflows/(inflows)**

Employer Name	Deferred Inflows/(Outflows) Recognized In Future Pension Expense (Year Ended June 30):				
	2016	2017	2018	2019	Thereafter
Town of Needham	\$468,476	\$468,476	\$468,476	\$468,475	\$0
Needham Housing Authority	<u>8,247</u>	<u>8,247</u>	<u>8,247</u>	<u>8,247</u>	<u>0</u>
<b>Grand Totals:</b>	\$476,723	\$476,723	\$476,723	\$476,722	\$0

**D. Discount rate sensitivity**

*Discount rate:* The discount rate used to measure the total pension liability was 7.75%. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that contributions will be made at rates equal to the actuarially determined contribution rates. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

*Sensitivity of the net pension liability to changes in the discount rate.* The following presents the net pension liability, calculated using the discount rate of 7.75%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.75%) or 1-percentage-point higher (8.75%) than the current rate:

	<u>1% Decrease (6.75%)</u>	<u>Current Discount (7.75%)</u>	<u>1% Increase (8.75%)</u>
Town of Needham's net pension liability as of December 31, 2014	\$74,936,838	\$54,445,695	\$37,008,720
Needham Housing Authority's net pension liability as of December 31, 2014	<u>1,319,227</u>	<u>958,490</u>	<u>651,521</u>
Town of Needham Contributory Retirement System's net pension liability as of December 31, 2014	\$76,256,065	\$55,404,185	\$37,660,241

**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

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**E. Determination of Proportionate Share**

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<b>Employer Name</b>	<b>FY 2015 Total Appropriation</b>	<b>Percent of Total Appropriation</b>
Town of Needham	\$5,524,150	98.270004%
Needham Housing Authority	97,250	1.729996%
<b>Grand Totals:</b>	<b>\$5,621,400</b>	<b>100%</b>

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**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

**EXHIBIT 5**

**Schedule of Pension Amounts by Employer as of December 31, 2014**

Employer Name	Deferred Outflows of Resources						Deferred Inflows of Resources					Pension Expense		
	Net Pension Liability	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Inflows of Resources	Proportionate Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Employer Pension Expense
Town of Needham	\$54,445,695	\$0	\$206,551	\$1,692,772	\$ -	\$1,899,323	\$25,420	\$ -	\$ -	\$ -	\$25,420	\$7,820,228	\$ -	\$7,820,228
Needham Housing Authority	<u>958,490</u>	<u>0</u>	<u>3,636</u>	<u>29,800</u>	<u>--</u>	<u>33,436</u>	<u>448</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>448</u>	<u>137,671</u>	<u>--</u>	<u>137,671</u>
<b>Grand Totals:</b>	\$55,404,185	\$0	\$210,187	\$1,722,572	\$ -	\$1,932,759	\$25,868	\$ -	\$ -	\$ -	\$25,868	\$7,957,899	\$ -	\$7,957,899

**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

**EXHIBIT 6**

**Schedule of Contributions – Last Ten Years – Department Breakdown**

	Year End December 31,									
	2014*	2013	2012	2011	2010	2009	2008	2007	2006	2005
<b>Town of Needham</b>										
Actuarially determined contribution	\$5,524,150									
Contributions in relation to the actuarially determined contribution	<u>5,524,150</u>									
Contribution deficiency (excess)	0									
Covered-employee payroll	TBD									
Contributions as a percentage of covered-employee payroll	TBD									(Historical information prior to implementation of GASB 67/68 is not required)
<b>Needham Housing Authority</b>										
Actuarially determined contribution	\$97,250									
Contributions in relation to the actuarially determined contribution	<u>97,250</u>									
Contribution deficiency (excess)	0									
Covered-employee payroll	TBD									
Contributions as a percentage of covered-employee payroll	TBD									(Historical information prior to implementation of GASB 67/68 is not required)
<b>Grand Total</b>										
Actuarially determined contribution	\$5,621,400									
Contributions in relation to the actuarially determined contribution	<u>5,261,400</u>									
Contribution deficiency (excess)	0									
Covered-employee payroll	TBD									
Contributions as a percentage of covered-employee payroll	TBD									(Historical information prior to implementation of GASB 67/68 is not required)

\* Based on the results of the January 1, 2013 actuarial valuation (including assumptions and methods) which determined budgeted appropriation for fiscal 2015.

**SECTION 5: GASB Information for the Town of Needham Contributory Retirement System**

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**EXHIBIT 7**

**Notes to Required Supplementary Information**

<b>Valuation date</b>	Actuarial determined contributions for fiscal 2017 and later are determined with the January 1, 2015 actuarial valuation.
<b>Actuarial cost method</b>	Entry Age Normal Cost Method
<b>Amortization method</b>	Increase in appropriation is phased in over three years resulting in 9.06% increases each year through fiscal 2019. Thereafter, amortization payments increase 4.5% per year.
<b>Remaining amortization period</b>	15 years from July 1, 2015
<b>Asset valuation method</b>	Market value of assets as reported in the System's Annual Statement less unrecognized return in each of the last five years. Unrecognized return is equal to the difference between the actual market value return and the expected market value return and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.  For GASB 67/68 disclosures, market value of assets were increased by contributions receivable of \$48,625.
<b>Actuarial assumptions:</b>	
Investment rate of return	7.75%
Discount rate	7.75%
Inflation rate	3.5%
Projected salary increases	4.75% for Group 1 and 2 employees, 5.25% for Group 4 employees
Cost of living adjustments	3% of first \$14,000
<b>Plan membership:</b>	
Retired participants and beneficiaries receiving benefits	462
Inactive participants entitled to a return of their employee contributions	141
Inactive participants with a vested right to a deferred or immediate benefit	20
Active participants	<u>647</u>
Total	1,270

## SECTION 5: GASB Information for the Town of Needham Contributory Retirement System

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### Changes in Assumptions:

Effective January 1, 2014:

- The investment return assumption was lowered from 8.00% to 7.75%.

Effective January 1, 2015:

- The administrative expense assumption was increased from \$200,000 for calendar 2014 to \$237,000 for calendar 2015.
- The mortality assumption for healthy participants was changed from the RP-2000 Combined Healthy Mortality Table projected 22 years using Scale AA to the RP-2000 Combined Healthy Mortality Table projected generationally using Scale AA.
- The mortality assumption for disabled participants was changed from the RP-2000 Combined Healthy Mortality Table set forward 2 years to the RP-2000 Combined Healthy Mortality Table set forward 2 years projected generationally using Scale AA.

### Changes in Plan Provisions:

As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Board has increased the Cost of Living Adjustment (COLA) base from \$12,000 to \$14,000 effective July 1, 2015.