

Middlesex County Retirement System

Governmental Accounting Standards Board (GASB)
Statements No. 67 and 68 Accounting Valuation Report
as of December 31, 2014

The logo for Segal Consulting is a large, solid blue chevron pointing to the right. Inside the chevron, the company name "Segal Consulting" is written in white, preceded by a white star icon.

★ Segal Consulting



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September 28, 2015

Retirement Board

Middlesex County Retirement System

25 Linnell Circle

Billerica, MA 01865

Dear Board Members:

We are pleased to submit this revised Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 Accounting Valuation as of December 31, 2014 for the Middlesex County Retirement System, a cost-sharing multiple-employer defined benefit pension plan. It contains the actuarial information that will need to be disclosed in order to comply with GASB 67 and 68.

This report replaces the report dated August 20, 2015. In this revised report, no NPL has been assigned to the Middlesex County Retirement Board, Middlesex County or the Middlesex Hospital because the obligation to fund these units is a shared responsibility of the other units in the System. The NPL of these three units has been allocated amongst the other units.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist the Board and the member units in preparing their financial reports. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board and may only be provided to other parties in its entirety. The census and financial information on which our calculations were based was provided by the Middlesex County 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; 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 my supervision. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in my 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 with you 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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SECTION 1: Valuation Summary for the Middlesex County Retirement System

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future uncertain obligations of a pension plan. As such, it will never forecast the precise future contribution requirements or the precise future stream of benefit payments. In any event, it is an estimated forecast – the actual cost of the plan will be determined by the benefits and expenses paid, not by the budgeting cost from the actuarial valuation.

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. It is important for the Board to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our funding valuation 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 plan. 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. For most plans, it is not possible or desirable to take a snapshot of the actual work force on the valuation date. In any event, the actuarial valuation is based on a future work force that is presumed to be the same as the active population included in the valuation, but in fact, employment varies from year to year, sometimes quite considerably. It is not necessary to have perfect data for an actuarial valuation: the valuation is an estimated forecast, not a prediction. The uncertainties in other factors are such that even perfect data does not produce a “perfect” result. Notwithstanding the above, it is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
- **Assets** Part of the cost of a plan will be paid from existing assets – the balance will need to come from future contributions and investment income. The valuation is based on the asset values as of the valuation date, typically reported by the auditor. Some plans include assets, such as private equity holdings, real estate, or hedge funds, that are not subject to valuation by reference to transactions in the marketplace.
- **Actuarial assumptions** In preparing an actuarial valuation, Segal starts by developing a forecast of the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year, as well as forecasts of the plan’s benefits for each of those events. The forecasted benefits are then discounted to a present value, typically based on an estimate of the rate of return that will be achieved on the plan’s assets. All of these factors are uncertain and unknowable. Thus, there will be a range of reasonable assumptions, and the results may vary materially based on which assumptions the actuary selects within that range. That is, there is no right answer (except with hindsight). It is important for any user of an actuarial valuation to understand and accept this constraint. The actuarial model may use approximations and estimates that will have an immaterial impact on our results and will have no impact on the actual cost

SECTION 1: Valuation Summary for the Middlesex County Retirement System

of the plan. In addition, the actuarial assumptions may change over time, and while this can have a significant impact on the reported results, it does not mean that the previous assumptions or results were unreasonable or wrong.

Given the above, the user of Segal's actuarial valuation (or other actuarial calculations) needs to keep the following in mind:

- The actuarial valuation is prepared at the request of the Board to assist the sponsors of the Fund in preparing their financial report for the pension plan. It includes information for compliance with federal filing requirements and for the plan's auditor. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement at a specific date — it is not a prediction of a plan's future financial condition. Accordingly, Segal did not perform an analysis of the potential range of financial measurements, except where otherwise noted.
- Sections of this report include actuarial results that are not rounded, but that does not imply precision.
- Critical events for a plan include, but are not limited to, decisions about changes in benefits and contributions. The basis for such decisions needs to consider many factors such as the risk of changes in employment levels and investment losses, not just the current valuation results.
- 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 Board should look to their other advisors for expertise in these areas.
- While Segal maintains extensive quality assurance procedures, an actuarial valuation involves complex computer models and numerous inputs. In the event that an inaccuracy is discovered after presentation of Segal's valuation, Segal may revise that valuation or make an appropriate adjustment in the next valuation.
- Segal's report shall be deemed to be final and accepted by the Board upon delivery and review. The Board should notify Segal immediately of any questions or concerns about the final content.

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

SECTION 1: Valuation Summary for the Middlesex County Retirement System

Purpose

This report has been prepared by Segal Consulting to present certain disclosure information required by Governmental Accounting Standards Board Statements No. 67 and 68 as of December 31, 2014. This report is based on financial information as of December 31, 2014 and the Middlesex County Retirement System Actuarial Valuation and Review as of January 1, 2014, dated February 26, 2015, which reflects:

- The benefit provisions of Massachusetts General Laws Chapter 32;
- The characteristics of covered active participants, inactive participants, and retired participants and beneficiaries as of January 1, 2014;
- The assets of the Plan as of December 31, 2013;
- 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:

- 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 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.
- 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 \$1.18 billion as of December 31, 2013 to \$1.20 billion as of December 31, 2014 and the Plan's Fiduciary Net Position as a percent of the TPL increased from 46.18% to 47.65%.

SECTION 1: Valuation Summary for the Middlesex County Retirement System

- The NPL was measured as of December 31, 2014 and 2013 and determined based upon the results of the actuarial valuation as of January 1, 2014.
- The discount rate used to determine the TPL and NPL as of December 31, 2014 and 2013 was 7.875%.

SECTION 2: Accounting Information for the Middlesex County Retirement System

EXHIBIT 1

Net Pension Liability

The components of the net pension liability of the Middlesex County Retirement System are as follows:

	December 31, 2014	December 31, 2013
Total pension liability	\$2,294,876,389	\$2,195,732,452
Plan fiduciary net position	1,093,560,674	1,014,013,415
System's net pension liability	1,201,315,715	1,181,719,037
Plan fiduciary net position as a percentage of the total pension liability*	47.65%	46.18%

* These funded percentages 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.

Actuarial assumptions. The total pension liability as of December 31, 2014 and December 31, 2013 was determined by an actuarial valuation as of December 31, 2013, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation 4.00%

Salary increases

Years of Service	Group 1	Group 2	Group 4
0	6.00%	6.00%	7.00%
1	5.50%	5.50%	6.50%
2	5.50%	5.50%	6.00%
3	5.25%	5.25%	5.75%
4	5.25%	5.25%	5.25%
5	4.75%	4.75%	5.25%
6	4.75%	4.75%	4.75%
7	4.50%	4.50%	4.75%
8	4.50%	4.50%	4.75%
9+	4.25%	4.50%	4.75%

Investment rate of return 7.875%, net of pension plan investment expense, including inflation

Cost of Living Adjustments 3% of first \$14,000

SECTION 2: Accounting Information for the Middlesex County Retirement System

Healthy:

Pre-Retirement

RP-2000 Employee Mortality Table projected 22 years with Scale AA

Post-Retirement

RP-2000 Healthy Annuitant Mortality Table projected 17 years with Scale AA

Disabled:

RP-2000 Healthy Annuitant Mortality Table set forward three years projected 17 years with 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, 2013 are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return
Domestic equity	6.60%
International developed markets equity	7.10%
International emerging markets equity	9.40%
Core fixed income	2.20%
High yield fixed income	4.70%
Real estate	4.40%
Commodities	4.40%
Short-term government money market	1.80%
Hedge fund, GTAA, Risk parity	3.90%
Private equity	11.70%

Discount rate: The discount rate used to measure the total pension liability was 7.875%. 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 the Middlesex County Retirement System 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.

SECTION 2: Accounting Information for the Middlesex County Retirement System

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability of the Middlesex County Retirement System, calculated using the discount rate of 7.875%, as well as what the Middlesex County Retirement System's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.875%) or 1-percentage-point higher (8.875%) than the current rate:

	1% Decrease (6.875%)	Current Discount (7.875%)	1% Increase (8.875%)
Middlesex County Retirement System's net pension liability as of December 31, 2014	\$1,452,645,252	\$1,201,315,715	\$987,337,404

SECTION 2: Accounting Information for the Middlesex County 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
Total pension liability										
Service cost	\$52,132,389									
Interest	172,094,226									
Differences between expected and actual experience	0									
Changes of assumptions	0									
Changes of benefit terms	0									
Benefit payments, including refunds of employee contributions	<u>-125,082,678</u>									
Net change in total pension liability	\$99,143,937									
Total pension liability - beginning	<u>2,195,732,452</u>									
Total pension liability - ending (a)	<u>\$2,294,876,389</u>									
Plan fiduciary net position										
Contributions - employer	\$93,400,946									
Contributions - employee	39,806,980									
Net investment income	74,962,895									
Benefit payments, including refunds of employee contributions	-125,082,678									
Administrative expenses	<u>-3,540,884</u>									
Net change in fiduciary net position	\$79,547,259									
Plan fiduciary net position - beginning	<u>1,014,013,415</u>									
Plan fiduciary net position - ending (b)	<u>\$1,093,560,674</u>									
Net pension liability – ending: (a)-(b)	\$1,201,315,715									
Plan's fiduciary net position as a percentage of the total pension liability	47.65%									
Covered-employee payroll	\$415,752,810									
Net pension liability as a percentage of covered-employee payroll	288.95%									

*Covered-employee payroll for 2014 as estimated in the January 1, 2014 funding valuation report.

SECTION 2: Accounting Information for the Middlesex County 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*	\$92,826,743									
Contributions in relation to the actuarially determined contribution	<u>93,400,946</u>									
Contribution deficiency (excess)	<u>-\$574,203</u>									
Covered-employee payroll	\$415,752,810									
Contributions as a percentage of covered-employee payroll	22.47%									

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

* Based on the results of the January 1, 2012 actuarial valuation (including assumptions and methods) which determined budgeted appropriation for fiscal 2015, adjusted to reflect actual timing of payments.

SECTION 2: Accounting Information for the Middlesex County Retirement System

EXHIBIT 4

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

A. Pension expense for the year ended June 30, 2015

Service cost	\$52,132,389
Interest	172,094,226
Contributions – employee	-39,806,980
Projected earnings on pension plan investments	-80,034,066
Administrative expenses	3,540,884
Recognized portion of current-period difference between expected and actual experience	0
Recognized portion of current-period difference between projected and actual earnings on pension plan investments	1,014,234
Recognized portion of current year period assumption change	0
Recognized portion of current year period plan change	0
Recognition of deferred outflows of resources	0
Recognition of deferred inflows of resources	0
Pension expense for fiscal year ended June 30, 2015	<u>\$108,940,687</u>

B. Deferred outflows/inflows of resources related to pensions

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$0	\$0
Changes of assumptions	0	0
Net difference between projected and actual earnings on pension plan investments	<u>4,056,937</u>	<u>0</u>
Total	\$4,056,937	\$0

C. Projected recognition of deferred outflows/(inflows)

	Year Ended June 30,	Recognition
	2016	\$1,014,234
	2017	1,014,234
	2018	1,014,234
	2019	1,014,235
	Thereafter	0

SECTION 2: Accounting Information for the Middlesex County Retirement System

EXHIBIT 5

Determination of Proportionate Share

Employer Name	NPL Prior to Reallocation	NPL Excluding Retirement Board, County and Hospital	Percent of NPL Excluding Retirement Board, County and Hospital	Reallocated NPL
Middlesex County Retirement Board	\$4,097,867	\$- -	--	\$- -
Middlesex County	19,077,316	--	--	--
Middlesex Hospital	9,886,470	--	--	--
Town of Acton	39,920,583	39,920,583	3.417115%	41,050,336
Town of Ashby	1,388,510	1,388,510	0.118853%	1,427,805
Town of Ashland	23,880,206	23,880,206	2.044094%	24,556,017
Town of Ayer	15,339,767	15,339,767	1.313051%	15,773,883
Town of Bedford	42,730,592	42,730,592	3.657645%	43,939,870
Town of Billerica	116,588,095	116,588,095	9.979687%	119,887,544
Town of Boxborough	7,137,627	7,137,627	0.610965%	7,339,622
Town of Burlington	95,354,662	95,354,662	8.162151%	98,053,205
Town of Carlisle	7,764,771	7,764,771	0.664648%	7,984,515
Town of Chelmsford	85,674,865	85,674,865	7.333582%	88,099,468
Town of Dracut	47,361,537	47,361,537	4.054044%	48,701,871
Town of Dunstable	2,130,019	2,130,019	0.182325%	2,190,299
Town of Groton	18,959,321	18,959,321	1.622876%	19,495,870
Town of Holliston	20,641,336	20,641,336	1.766853%	21,225,487
Town of Hopkinton	16,365,707	16,365,707	1.400869%	16,828,857
Town of Hudson	51,303,407	51,303,407	4.391460%	52,755,296
Town of Lincoln	21,141,100	21,141,100	1.809632%	21,739,395
Town of Littleton	18,498,098	18,498,098	1.583397%	19,021,595
Town of North Reading	40,257,709	40,257,709	3.445972%	41,397,005
Town of Pepperell	11,261,474	11,261,474	0.963958%	11,580,175
Town of Sherborn	9,203,793	9,203,793	0.787825%	9,464,261
Town of Shirley	8,314,304	8,314,304	0.711686%	8,549,600

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	NPL Prior to Reallocation	NPL Excluding Retirement Board, County and Hospital	Percent of NPL Excluding Retirement Board, County and Hospital	Reallocated NPL
Town of Stow	8,284,779	8,284,779	0.709159%	8,519,238
Town of Sudbury	47,297,331	47,297,331	4.048548%	48,635,848
Town of Tewksbury	78,833,443	78,833,443	6.747971%	81,064,434
Town of Townsend	6,557,238	6,557,238	0.561285%	6,742,808
Town of Tyngsborough	15,894,091	15,894,091	1.360500%	16,343,894
Town of Wayland	47,983,377	47,983,377	4.107272%	49,341,309
Town of Westford	41,814,219	41,814,219	3.579206%	42,997,563
Town of Weston	53,427,028	53,427,028	4.573237%	54,939,016
Town of Wilmington	67,877,975	67,877,975	5.810207%	69,798,925
Acton-Boxborough RSD	21,182,449	21,182,449	1.813171%	21,781,913
Acton Water Supply	2,491,568	2,491,568	0.213273%	2,562,079
Bedford Housing Authority	236,942	236,942	0.020282%	243,648
Billerica Housing Authority	984,504	984,504	0.084271%	1,012,365
Chelmsford Housing Authority	974,492	974,492	0.083414%	1,002,070
Chelmsford Water District	2,048,356	2,048,356	0.175335%	2,106,325
Dracut Housing Authority	1,666,094	1,666,094	0.142614%	1,713,245
Dracut Water Supply	2,228,012	2,228,012	0.190713%	2,291,065
E. Chelmsford Water	243,602	243,602	0.020852%	250,496
E. Middlesex Mosq Control	392,923	392,923	0.033633%	404,042
Greater Lowell RVTSD	13,571,461	13,571,461	1.161687%	13,955,534
Groton-Dunstable RSD	7,384,704	7,384,704	0.632115%	7,593,692
Hudson Housing Authority	1,293,315	1,293,315	0.110705%	1,329,916
Lincoln Sudbury	7,223,273	7,223,273	0.618296%	7,427,692
Nashoba Vally THSD	2,975,709	2,975,709	0.254714%	3,059,922
N. Chelmsford Water	608,104	608,104	0.052052%	625,314
North Middlesex RSD	9,828,821	9,828,821	0.841326%	10,106,977
Shawsheen Valley RVS	6,749,279	6,749,279	0.577724%	6,940,284
South Middlesex RVTs	5,869,073	5,869,073	0.502380%	6,035,168
Sudbury Water District	1,295,451	1,295,451	0.110888%	1,332,112

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	NPL Prior to Reallocation	NPL Excluding Retirement Board, County and Hospital	Percent of NPL Excluding Retirement Board, County and Hospital	Reallocated NPL
Tewksbury Housing Authority	1,137,981	1,137,981	0.097409%	1,170,186
Wayland Housing Authority	377,587	377,587	0.032321%	388,273
Hopkinton Housing Authority	380,094	380,094	0.032535%	390,851
Sudbury Housing Authority	221,921	221,921	0.018996%	228,202
Wilmington Housing Authority	247,001	247,001	0.021143%	253,992
Acton Housing Authority	732,601	732,601	0.062709%	753,333
Burlington Housing Authority	56,334	56,334	0.004822%	57,928
Ayer Housing Authority	383,377	383,377	0.032816%	394,227
Holliston Housing Authority	181,845	181,845	0.015566%	186,991
Littleton Housing Authority	344,446	344,446	0.029484%	354,194
Westford Housing Authority	377,554	377,554	0.032318%	388,239
Shirley Water District	308,947	308,947	0.026445%	317,690
Tyngsboro Housing Authority	376,733	376,733	0.032247%	387,394
Pepperell Housing Authority	87,876	87,876	0.007522%	90,362
Groton Housing Authority	7,789	7,789	0.000667%	8,010
Tyngsboro Water District	317,419	317,419	0.027170%	326,402
North Reading Housing Authority	74,177	74,177	0.006349%	76,277
West Groton Water	10,234	10,234	0.000876%	10,524
Ayer-Shirley RSD	4,195,050	4,195,050	0.359087%	4,313,770
Grand Totals:	\$1,201,315,715	\$1,168,254,062	100%	\$1,201,315,715

Note: Net Pension Liability for each employer was determined on an individual basis by rolling forward the Total Pension Liability from December 31, 2013 to December 31, 2014 for each employer and allocating the market value of assets as of December 31, 2014 to each employer based on detailed cash flow information provided by the Retirement System.

The NPL for the Middlesex County Retirement Board, Middlesex County and the Middlesex Hospital has been allocated amongst the other units in the System because the obligation to fund these units is a shared responsibility of these other units.

SECTION 2: Accounting Information for the Middlesex County Retirement System

EXHIBIT 6

Determination of Pension Amounts by Employer as of June 30, 2015

Employer Name	Employer's Proportionate Share Allocation (1)	Net Pension Liability (2)	Covered Employee Payroll (3)	Discount Rate Sensitivity		
				1% Decrease (6.875%) (4)	Current Discount Rate (7.875%) (5)	1% Increase (8.875%) (6)
Middlesex County Retirement Board	--	\$-	\$1,409,549	\$-	\$-	\$-
Middlesex County	--	--	--	--	--	--
Middlesex Hospital	--	--	--	--	--	--
Town of Acton	3.417115%	41,050,336	12,546,476	49,638,562	41,050,336	33,738,450
Town of Ashby	0.118853%	1,427,805	890,708	1,726,512	1,427,805	1,173,480
Town of Ashland	2.044094%	24,556,017	11,227,098	29,693,434	24,556,017	20,182,105
Town of Ayer	1.313051%	15,773,883	5,183,887	19,073,973	15,773,883	12,964,244
Town of Bedford	3.657645%	43,939,870	16,210,255	53,132,606	43,939,870	36,113,297
Town of Billerica	9.979687%	119,887,544	30,175,213	144,969,449	119,887,544	98,533,183
Town of Boxborough	0.610965%	7,339,622	2,782,496	8,875,154	7,339,622	6,032,286
Town of Burlington	8.162151%	98,053,205	29,210,227	118,567,099	98,053,205	80,587,970
Town of Carlisle	0.664648%	7,984,515	4,542,103	9,654,978	7,984,515	6,562,318
Town of Chelmsford	7.333582%	88,099,468	23,136,579	106,530,931	88,099,468	72,407,198
Town of Dracut	4.054044%	48,701,871	14,022,321	58,890,878	48,701,871	40,027,093
Town of Dunstable	0.182325%	2,190,299	1,061,161	2,648,535	2,190,299	1,800,163
Town of Groton	1.622876%	19,495,870	6,626,697	23,574,631	19,495,870	16,023,262
Town of Holliston	1.766853%	\$21,225,487	9,798,713	25,666,106	21,225,487	17,444,801
Town of Hopkinton	1.400869%	16,828,857	12,044,656	20,349,657	16,828,857	13,831,304
Town of Hudson	4.391460%	52,755,296	20,202,237	63,792,335	52,755,296	43,358,527
Town of Lincoln	1.809632%	21,739,395	9,225,968	26,287,533	21,739,395	17,867,174
Town of Littleton	1.583397%	19,021,595	10,367,883	23,001,141	19,021,595	15,633,471
Town of North Reading	3.445972%	41,397,005	12,101,624	50,057,749	41,397,005	34,023,370
Town of Pepperell	0.963958%	11,580,175	4,287,483	14,002,890	11,580,175	9,517,518
Town of Sherborn	0.787825%	9,464,261	3,785,488	11,444,302	9,464,261	7,778,491

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Employer's Proportionate Share Allocation (1)	Net Pension Liability (2)	Covered Employee Payroll (3)	Discount Rate Sensitivity		
				1% Decrease (6.875%) (4)	Current Discount Rate (7.875%) (5)	1% Increase (8.875%) (6)
Town of Shirley	0.711686%	8,549,600	1,939,960	10,338,273	8,549,600	7,026,742
Town of Stow	0.709159%	8,519,238	3,075,468	10,301,565	8,519,238	7,001,792
Town of Sudbury	4.048548%	48,635,848	14,294,094	58,811,040	48,635,848	39,972,829
Town of Tewksbury	6.747971%	81,064,434	18,938,690	98,024,080	81,064,434	66,625,242
Town of Townsend	0.561285%	6,742,808	2,883,402	8,153,480	6,742,808	5,541,777
Town of Tyngsborough	1.360500%	16,343,894	7,154,125	19,763,239	16,343,894	13,432,725
Town of Wayland	4.107272%	49,341,309	17,400,877	59,664,092	49,341,309	40,552,633
Town of Westford	3.579206%	42,997,563	21,791,477	51,993,166	42,997,563	35,338,840
Town of Weston	4.573237%	54,939,016	18,621,858	66,432,910	54,939,016	45,153,279
Town of Wilmington	5.810207%	69,798,925	20,291,188	84,401,696	69,798,925	57,366,347
Acton-Boxborough RSD	1.813171%	21,781,913	12,401,710	26,338,942	21,781,913	17,902,115
Acton Water Supply	0.213273%	2,562,079	974,755	3,098,100	2,562,079	2,105,724
Bedford Housing Authority	0.020282%	243,648	129,557	294,626	243,648	200,252
Billerica Housing Authority	0.084271%	1,012,365	296,957	1,224,159	1,012,365	832,039
Chelmsford Housing Authority	0.083414%	1,002,070	1,316,791	1,211,710	1,002,070	823,578
Chelmsford Water District	0.175335%	2,106,325	1,175,508	2,546,996	2,106,325	1,731,148
Dracut Housing Authority	0.142614%	1,713,245	350,319	2,071,675	1,713,245	1,408,081
Dracut Water Supply	0.190713%	2,291,065	606,983	2,770,383	2,291,065	1,882,981
E. Chelmsford Water	0.020852%	250,496	183,717	302,906	250,496	205,880
E. Middlesex Mosq Control	0.033633%	404,042	353,375	488,568	404,042	332,071
Greater Lowell RVTSD	1.161687%	13,955,534	4,910,870	16,875,191	13,955,534	11,469,770
Groton-Dunstable RSD	0.632115%	7,593,692	4,506,491	9,182,389	7,593,692	6,241,108
Hudson Housing Authority	0.110705%	1,329,916	272,389	1,608,151	1,329,916	1,093,032
Lincoln Sudbury	0.618296%	7,427,692	2,721,134	8,981,647	7,427,692	6,104,668
Nashoba Vally THSD	0.254714%	3,059,922	784,836	3,700,091	3,059,922	2,514,887
N. Chelmsford Water	0.052052%	625,314	482,919	756,131	625,314	513,929
North Middlesex RSD	0.841326%	10,106,977	4,798,208	12,221,482	10,106,977	8,306,726

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Employer's Proportionate Share Allocation (1)	Net Pension Liability (2)	Covered Employee Payroll (3)	Discount Rate Sensitivity		
				1% Decrease (6.875%) (4)	Current Discount Rate (7.875%) (5)	1% Increase (8.875%) (6)
Shawsheen Valley RVS	0.577724%	6,940,284	2,606,516	8,392,280	6,940,284	5,704,085
South Middlesex RVTS	0.502380%	6,035,168	2,235,967	7,297,799	6,035,168	4,960,186
Sudbury Water District	0.110888%	1,332,112	774,283	1,610,809	1,332,112	1,094,839
Tewksbury Housing Authority	0.097409%	1,170,186	342,718	1,415,007	1,170,186	961,755
Wayland Housing Authority	0.032321%	388,273	250,959	469,509	388,273	319,117
Hopkinton Housing Authority	0.032535%	390,851	171,221	472,618	390,851	321,230
Sudbury Housing Authority	0.018996%	228,202	94,127	275,944	228,202	187,555
Wilmington Housing Authority	0.021143%	253,992	116,036	307,133	253,992	208,753
Acton Housing Authority	0.062709%	753,333	331,278	910,939	753,333	619,149
Burlington Housing Authority	0.004822%	57,928	249,747	70,047	57,928	47,609
Ayer Housing Authority	0.032816%	394,227	161,812	476,700	394,227	324,005
Holliston Housing Authority	0.015566%	186,991	134,701	226,119	186,991	153,689
Littleton Housing Authority	0.029484%	354,194	36,089	428,298	354,194	291,107
Westford Housing Authority	0.032318%	388,239	192,960	469,466	388,239	319,088
Shirley Water District	0.026445%	317,690	191,365	384,152	317,690	261,101
Tyngsboro Housing Authority	0.032247%	387,394	132,588	468,435	387,394	318,387
Pepperell Housing Authority	0.007522%	90,362	71,176	109,268	90,362	74,268
Groton Housing Authority	0.000667%	8,010	25,933	9,689	8,010	6,586
Tyngsboro Water District	0.027170%	326,402	178,260	394,684	326,402	268,260
North Reading Housing Authority	0.006349%	76,277	80,892	92,228	76,277	62,686
West Groton Water	0.000876%	10,524	174,460	12,725	10,524	8,649
Ayer-Shirley RSD	0.359087%	4,313,770	3,703,242	5,216,260	4,313,770	3,545,400
Grand Totals:	100%	\$1,201,315,715	\$415,752,810	\$1,452,645,252	\$1,201,315,715	\$987,337,404

SECTION 2: Accounting Information for the Middlesex County Retirement System

EXHIBIT 6 (Continued)

Determination of Pension Amounts by Employer as of June 30, 2015

Employer Name	Schedule of Contributions				Pension Expense		
	Statutory Required Contribution (7)	Contributions In Relation to the Statutory Required Contribution (8)	Contribution Deficiency/ (Excess) (9)	Contributions as a Percentage of Covered Employee Payroll (10)	Proportionate Share of Plan Pension Expense (11)	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (12)	Total Employer Pension Expense (13)
Middlesex County Retirement Board	\$307,873	\$(307,873)	\$- -	21.84%	\$307,873	\$- -	\$307,873
Middlesex County	--	--	--	N/A	--	--	--
Middlesex Hospital	--	--	--	N/A	--	--	--
Town of Acton	2,512,579	(2,512,579)	--	20.03%	3,712,110	--	3,712,110
Town of Ashby	150,378	(150,378)	--	16.88%	129,114	--	129,114
Town of Ashland	2,206,657	(2,233,252)	(26,595)	19.89%	2,220,556	--	2,220,556
Town of Ayer	1,344,155	(1,344,155)	--	25.93%	1,426,404	--	1,426,404
Town of Bedford	3,372,935	(3,372,935)	--	20.81%	3,973,403	--	3,973,403
Town of Billerica	8,541,268	(8,541,268)	--	28.31%	10,841,214	--	10,841,214
Town of Boxborough	545,780	(545,780)	--	19.61%	663,709	--	663,709
Town of Burlington	7,511,305	(7,511,305)	--	25.71%	8,866,774	--	8,866,774
Town of Carlisle	726,609	(726,609)	--	16.00%	722,025	--	722,025
Town of Chelmsford	6,483,706	(6,483,706)	--	28.02%	7,966,676	--	7,966,676
Town of Dracut	3,864,705	(3,864,705)	--	27.56%	4,404,022	--	4,404,022
Town of Dunstable	198,716	(198,716)	--	18.73%	198,065	--	198,065
Town of Groton	1,560,704	(1,560,704)	--	23.55%	1,762,976	--	1,762,976
Town of Holliston	1,909,829	(1,946,930)	(37,101)	19.87%	1,919,383	--	1,919,383
Town of Hopkinton	1,812,062	(1,812,062)	--	15.04%	1,521,803	--	1,521,803
Town of Hudson	4,153,464	(4,153,464)	--	20.56%	4,770,566	--	4,770,566
Town of Lincoln	1,622,193	(1,622,193)	--	17.58%	1,965,854	--	1,965,854
Town of Littleton	1,711,410	(1,711,410)	--	16.51%	1,720,089	--	1,720,089
Town of North Reading	3,126,208	(3,126,208)	--	25.83%	3,743,456	--	3,743,456
Town of Pepperell	967,605	(967,605)	--	22.57%	1,047,174	--	1,047,174

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Schedule of Contributions				Pension Expense		
	Statutory Required Contribution (7)	Contributions In Relation to the Statutory Required Contribution (8)	Contribution Deficiency/ (Excess) (9)	Contributions as a Percentage of Covered Employee Payroll (10)	Proportionate Share of Plan Pension Expense (11)	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (12)	Total Employer Pension Expense (13)
Town of Sherborn	700,612	(706,278)	(5,666)	18.66%	855,836	--	855,836
Town of Shirley	649,803	(649,803)	--	33.50%	773,125	--	773,125
Town of Stow	685,927	(685,927)	--	22.30%	770,379	--	770,379
Town of Sudbury	3,458,181	(3,458,181)	--	24.19%	4,398,052	--	4,398,052
Town of Tewksbury	6,304,010	(6,304,010)	--	33.29%	7,330,511	--	7,330,511
Town of Townsend	673,724	(673,724)	--	23.37%	609,740	--	609,740
Town of Tyngsborough	1,399,358	(1,399,358)	--	19.56%	1,477,949	--	1,477,949
Town of Wayland	3,740,468	(3,740,468)	--	21.50%	4,461,846	--	4,461,846
Town of Westford	3,808,963	(3,808,963)	--	17.48%	3,888,192	--	3,888,192
Town of Weston	4,139,155	(4,139,155)	--	22.23%	4,968,036	--	4,968,036
Town of Wilmington	4,952,939	(4,952,939)	--	24.41%	6,311,791	--	6,311,791
Acton-Boxborough RSD	1,756,208	(1,756,208)	--	14.16%	1,969,699	--	1,969,699
Acton Water Supply	133,367	(133,367)	--	13.68%	231,684	--	231,684
Bedford Housing Authority	23,693	(23,693)	--	18.29%	22,033	--	22,033
Billerica Housing Authority	86,316	(86,316)	--	29.07%	91,546	--	91,546
Chelmsford Housing Authority	81,762	(81,762)	--	6.21%	90,615	--	90,615
Chelmsford Water District	243,247	(743,247)	(500,000)	63.23%	190,471	--	190,471
Dracut Housing Authority	99,462	(99,462)	--	28.39%	154,926	--	154,926
Dracut Water Supply	128,920	(128,920)	--	21.24%	207,177	--	207,177
E. Chelmsford Water	19,234	(19,234)	--	10.47%	22,652	--	22,652
E. Middlesex Mosq Control	39,179	(39,179)	--	11.09%	36,537	--	36,537
Greater Lowell RVTSD	1,067,953	(1,067,953)	--	21.75%	1,261,974	--	1,261,974
Groton-Dunstable RSD	684,179	(684,179)	--	15.18%	686,684	--	686,684
Hudson Housing Authority	65,711	(65,711)	--	24.12%	120,262	--	120,262
Lincoln Sudbury	523,265	(523,265)	--	19.23%	671,673	--	671,673
Nashoba Vally THSD	183,580	(183,580)	--	23.39%	276,703	--	276,703
N. Chelmsford Water	37,663	(37,663)	--	7.80%	56,546	--	56,546

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Schedule of Contributions				Pension Expense		
	Statutory Required Contribution (7)	Contributions In Relation to the Statutory Required Contribution (8)	Contribution Deficiency/ (Excess) (9)	Contributions as a Percentage of Covered Employee Payroll (10)	Proportionate Share of Plan Pension Expense (11)	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (12)	Total Employer Pension Expense (13)
North Middlesex RSD	759,662	(759,662)	--	15.83%	913,956	--	913,956
Shawsheen Valley RVS	448,563	(448,563)	--	17.21%	627,597	--	627,597
South Middlesex RVTS	458,947	(458,947)	--	20.53%	545,749	--	545,749
Sudbury Water District	85,316	(85,316)	--	11.02%	120,461	--	120,461
Tewksbury Housing Authority	80,757	(80,757)	--	23.56%	105,818	--	105,818
Wayland Housing Authority	34,540	(34,540)	--	13.76%	35,111	--	35,111
Hopkinton Housing Authority	25,627	(25,627)	--	14.97%	35,344	--	35,344
Sudbury Housing Authority	28,129	(28,129)	--	29.88%	20,636	--	20,636
Wilmington Housing Authority	21,919	(21,919)	--	18.89%	22,968	--	22,968
Acton Housing Authority	60,393	(60,393)	--	18.23%	68,123	--	68,123
Burlington Housing Authority	21,640	(21,640)	--	8.66%	5,238	--	5,238
Ayer Housing Authority	33,261	(33,261)	--	20.56%	35,649	--	35,649
Holliston Housing Authority	15,433	(15,433)	--	11.46%	16,909	--	16,909
Littleton Housing Authority	25,490	(25,490)	--	70.63%	32,029	--	32,029
Westford Housing Authority	31,870	(31,870)	--	16.52%	35,108	--	35,108
Shirley Water District	17,261	(17,261)	--	9.02%	28,728	--	28,728
Tyngsboro Housing Authority	25,001	(25,001)	--	18.86%	35,031	--	35,031
Pepperell Housing Authority	7,350	(7,350)	--	10.33%	8,171	--	8,171
Groton Housing Authority	2,770	(2,770)	--	10.68%	724	--	724
Tyngsboro Water District	19,809	(19,809)	--	11.11%	29,516	--	29,516
North Reading Housing Authority	9,611	(14,453)	(4,842)	17.87%	6,898	--	6,898
West Groton Water	6,883	(6,883)	--	3.95%	952	--	952
Ayer-Shirley RSD	289,491	(289,491)	--	7.82%	390,086	--	390,086
Grand Totals:	\$92,826,743	\$(93,400,946)	\$(574,203)	22.47%	\$108,940,687	--	\$108,940,687

SECTION 2: Accounting Information for the Middlesex County Retirement System

EXHIBIT 6 (Continued)

Determination of Pension Amounts by Employer as of June 30, 2015

Employer Name	Deferred Outflows of Resources					Deferred Inflows of Resources				
	Differences Between Expected and Actual Experience (14)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (15)	Changes of Assumptions (16)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (17)	Total Deferred Outflows of Resources (18)	Differences Between Expected and Actual Experience (19)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (20)	Changes of Assumptions (21)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (22)	Total Deferred Inflows of Resources (23)
Middlesex County Retirement Board	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Middlesex County	--	--	--	--	--	--	--	--	--	--
Middlesex Hospital	--	--	--	--	--	--	--	--	--	--
Town of Acton	--	138,629	--	--	138,629	--	--	--	--	--
Town of Ashby	--	4,822	--	--	4,822	--	--	--	--	--
Town of Ashland	--	82,928	--	--	82,928	--	--	--	--	--
Town of Ayer	--	53,270	--	--	53,270	--	--	--	--	--
Town of Bedford	--	148,388	--	--	148,388	--	--	--	--	--
Town of Billerica	--	404,870	--	--	404,870	--	--	--	--	--
Town of Boxborough	--	24,786	--	--	24,786	--	--	--	--	--
Town of Burlington	--	331,133	--	--	331,133	--	--	--	--	--
Town of Carlisle	--	26,964	--	--	26,964	--	--	--	--	--
Town of Chelmsford	--	297,519	--	--	297,519	--	--	--	--	--
Town of Dracut	--	164,470	--	--	164,470	--	--	--	--	--
Town of Dunstable	--	7,397	--	--	7,397	--	--	--	--	--
Town of Groton	--	65,839	--	--	65,839	--	--	--	--	--
Town of Holliston	--	71,680	--	--	71,680	--	--	--	--	--
Town of Hopkinton	--	56,832	--	--	56,832	--	--	--	--	--
Town of Hudson	--	178,159	--	--	178,159	--	--	--	--	--
Town of Lincoln	--	73,416	--	--	73,416	--	--	--	--	--

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Deferred Outflows of Resources					Deferred Inflows of Resources				
	Differences Between Expected and Actual Experience (14)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (15)	Changes of Assumptions (16)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (17)	Total Deferred Outflows of Resources (18)	Differences Between Expected and Actual Experience (19)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (20)	Changes of Assumptions (21)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (22)	Total Deferred Inflows of Resources (23)
Town of Littleton	--	64,237	--	--	64,237	--	--	--	--	--
Town of North Reading	--	139,801	--	--	139,801	--	--	--	--	--
Town of Pepperell	--	39,107	--	--	39,107	--	--	--	--	--
Town of Sherborn	--	31,962	--	--	31,962	--	--	--	--	--
Town of Shirley	--	28,873	--	--	28,873	--	--	--	--	--
Town of Stow	--	28,770	--	--	28,770	--	--	--	--	--
Town of Sudbury	--	164,247	--	--	164,247	--	--	--	--	--
Town of Tewksbury	--	273,761	--	--	273,761	--	--	--	--	--
Town of Townsend	--	22,771	--	--	22,771	--	--	--	--	--
Town of Tyngsborough	--	55,195	--	--	55,195	--	--	--	--	--
Town of Wayland	--	166,629	--	--	166,629	--	--	--	--	--
Town of Westford	--	145,206	--	--	145,206	--	--	--	--	--
Town of Weston	--	185,533	--	--	185,533	--	--	--	--	--
Town of Wilmington	--	235,716	--	--	235,716	--	--	--	--	--
Acton-Boxborough RSD	--	73,559	--	--	73,559	--	--	--	--	--
Acton Water Supply	--	8,652	--	--	8,652	--	--	--	--	--
Bedford Housing Authority	--	823	--	--	823	--	--	--	--	--
Billerica Housing Authority	--	3,419	--	--	3,419	--	--	--	--	--
Chelmsford Housing Authority	--	3,384	--	--	3,384	--	--	--	--	--
Chelmsford Water District	--	7,113	--	--	7,113	--	--	--	--	--
Dracut Housing Authority	--	5,786	--	--	5,786	--	--	--	--	--
Dracut Water Supply	--	7,737	--	--	7,737	--	--	--	--	--
E. Chelmsford Water	--	846	--	--	846	--	--	--	--	--
E. Middlesex Mosq Control	--	1,364	--	--	1,364	--	--	--	--	--
Greater Lowell RVTSD	--	47,129	--	--	47,129	--	--	--	--	--
Groton-Dunstable RSD	--	25,645	--	--	25,645	--	--	--	--	--

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Deferred Outflows of Resources					Deferred Inflows of Resources				
	Differences Between Expected and Actual Experience (14)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (15)	Changes of Assumptions (16)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (17)	Total Deferred Outflows of Resources (18)	Differences Between Expected and Actual Experience (19)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (20)	Changes of Assumptions (21)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (22)	Total Deferred Inflows of Resources (23)
Hudson Housing Authority	--	4,491	--	--	4,491	--	--	--	--	--
Lincoln Sudbury	--	25,084	--	--	25,084	--	--	--	--	--
Nashoba Vally THSD	--	10,334	--	--	10,334	--	--	--	--	--
N. Chelmsford Water	--	2,112	--	--	2,112	--	--	--	--	--
North Middlesex RSD	--	34,132	--	--	34,132	--	--	--	--	--
Shawsheen Valley RVS	--	23,438	--	--	23,438	--	--	--	--	--
South Middlesex RVTS	--	20,381	--	--	20,381	--	--	--	--	--
Sudbury Water District	--	4,499	--	--	4,499	--	--	--	--	--
Tewksbury Housing Authority	--	3,952	--	--	3,952	--	--	--	--	--
Wayland Housing Authority	--	1,311	--	--	1,311	--	--	--	--	--
Hopkinton Housing Authority	--	1,320	--	--	1,320	--	--	--	--	--
Sudbury Housing Authority	--	771	--	--	771	--	--	--	--	--
Wilmington Housing Authority	--	858	--	--	858	--	--	--	--	--
Acton Housing Authority	--	2,544	--	--	2,544	--	--	--	--	--
Burlington Housing Authority	--	196	--	--	196	--	--	--	--	--
Ayer Housing Authority	--	1,331	--	--	1,331	--	--	--	--	--
Holliston Housing Authority	--	632	--	--	632	--	--	--	--	--
Littleton Housing Authority	--	1,196	--	--	1,196	--	--	--	--	--
Westford Housing Authority	--	1,311	--	--	1,311	--	--	--	--	--
Shirley Water District	--	1,073	--	--	1,073	--	--	--	--	--
Tyngsboro Housing Authority	--	1,308	--	--	1,308	--	--	--	--	--
Pepperell Housing Authority	--	305	--	--	305	--	--	--	--	--
Groton Housing Authority	--	27	--	--	27	--	--	--	--	--
Tyngsboro Water District	--	1,102	--	--	1,102	--	--	--	--	--

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Deferred Outflows of Resources					Deferred Inflows of Resources				
	Differences Between Expected and Actual Experience (14)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (15)	Changes of Assumptions (16)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (17)	Total Deferred Outflows of Resources (18)	Differences Between Expected and Actual Experience (19)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (20)	Changes of Assumptions (21)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (22)	Total Deferred Inflows of Resources (23)
North Reading Housing Authority	--	258	--	--	258	--	--	--	--	--
West Groton Water	--	36	--	--	36	--	--	--	--	--
Ayer-Shirley RSD	--	14,568	--	--	14,568	--	--	--	--	--
Grand Totals:	--	\$4,056,937	--	--	\$4,056,937	--	--	--	--	--

SECTION 2: Accounting Information for the Middlesex County Retirement System

EXHIBIT 6 (Continued)

Determination of Pension Amounts by Employer as of June 30, 2015

Employer Name	Deferred Inflows/(Outflows) Recognized In Future Pension Expense (Year Ended June 30):					
	2016 (24)	2017 (25)	2018 (26)	2019 (27)	2020 (28)	Thereafter (29)
Middlesex County Retirement Board	\$- -	\$- -	\$- -	\$- -	\$- -	\$- -
Middlesex County	--	--	--	--	--	--
Middlesex Hospital	--	--	--	--	--	--
Town of Acton	34,658	34,658	34,658	34,655	--	--
Town of Ashby	1,206	1,206	1,206	1,204	--	--
Town of Ashland	20,732	20,732	20,732	20,732	--	--
Town of Ayer	13,318	13,318	13,318	13,316	--	--
Town of Bedford	37,097	37,097	37,097	37,097	--	--
Town of Billerica	101,217	101,217	101,217	101,219	--	--
Town of Boxborough	6,197	6,197	6,197	6,195	--	--
Town of Burlington	82,783	82,783	82,783	82,784	--	--
Town of Carlisle	6,741	6,741	6,741	6,741	--	--
Town of Chelmsford	74,380	74,380	74,380	74,379	--	--
Town of Dracut	41,117	41,117	41,117	41,119	--	--
Town of Dunstable	1,849	1,849	1,849	1,850	--	--
Town of Groton	16,460	16,460	16,460	16,459	--	--
Town of Holliston	17,920	17,920	17,920	17,920	--	--
Town of Hopkinton	14,208	14,208	14,208	14,208	--	--
Town of Hudson	44,540	44,540	44,540	44,539	--	--
Town of Lincoln	18,354	18,354	18,354	18,354	--	--
Town of Littleton	16,059	16,059	16,059	16,060	--	--
Town of North Reading	34,950	34,950	34,950	34,951	--	--
Town of Pepperell	9,777	9,777	9,777	9,776	--	--
Town of Sherborn	7,990	7,990	7,990	7,992	--	--

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Deferred Inflows/(Outflows) Recognized In Future Pension Expense (Year Ended June 30):					
	2016 (24)	2017 (25)	2018 (26)	2019 (27)	2020 (28)	Thereafter (29)
Town of Shirley	7,218	7,218	7,218	7,219	--	--
Town of Stow	7,193	7,193	7,193	7,191	--	--
Town of Sudbury	41,062	41,062	41,062	41,061	--	--
Town of Tewksbury	68,440	68,440	68,440	68,441	--	--
Town of Townsend	5,693	5,693	5,693	5,692	--	--
Town of Tyngsborough	13,799	13,799	13,799	13,798	--	--
Town of Wayland	41,657	41,657	41,657	41,658	--	--
Town of Westford	36,302	36,302	36,302	36,300	--	--
Town of Weston	46,383	46,383	46,383	46,384	--	--
Town of Wilmington	58,929	58,929	58,929	58,929	--	--
Acton-Boxborough RSD	18,390	18,390	18,390	18,389	--	--
Acton Water Supply	2,163	2,163	2,163	2,163	--	--
Bedford Housing Authority	206	206	206	205	--	--
Billerica Housing Authority	855	855	855	854	--	--
Chelmsford Housing Authority	846	846	846	846	--	--
Chelmsford Water District	1,778	1,778	1,778	1,779	--	--
Dracut Housing Authority	1,446	1,446	1,446	1,448	--	--
Dracut Water Supply	1,934	1,934	1,934	1,935	--	--
E. Chelmsford Water	211	211	211	213	--	--
E. Middlesex Mosq Control	341	341	341	341	--	--
Greater Lowell RVTSD	11,782	11,782	11,782	11,783	--	--
Groton-Dunstable RSD	6,411	6,411	6,411	6,412	--	--
Hudson Housing Authority	1,123	1,123	1,123	1,122	--	--
Lincoln Sudbury	6,271	6,271	6,271	6,271	--	--
Nashoba Vally THSD	2,583	2,583	2,583	2,585	--	--
N. Chelmsford Water	528	528	528	528	--	--
North Middlesex RSD	8,533	8,533	8,533	8,533	--	--
Shawsheen Valley RVS	5,859	5,859	5,859	5,861	--	--

SECTION 2: Accounting Information for the Middlesex County Retirement System

Employer Name	Deferred Inflows/(Outflows) Recognized In Future Pension Expense (Year Ended June 30):					
	2016 (24)	2017 (25)	2018 (26)	2019 (27)	2020 (28)	Thereafter (29)
South Middlesex RVTS	5,095	5,095	5,095	5,096	--	--
Sudbury Water District	1,125	1,125	1,125	1,124	--	--
Tewksbury Housing Authority	988	988	988	988	--	--
Wayland Housing Authority	328	328	328	327	--	--
Hopkinton Housing Authority	330	330	330	330	--	--
Sudbury Housing Authority	193	193	193	192	--	--
Wilmington Housing Authority	214	214	214	216	--	--
Acton Housing Authority	636	636	636	636	--	--
Burlington Housing Authority	49	49	49	49	--	--
Ayer Housing Authority	333	333	333	332	--	--
Holliston Housing Authority	158	158	158	158	--	--
Littleton Housing Authority	299	299	299	299	--	--
Westford Housing Authority	328	328	328	327	--	--
Shirley Water District	268	268	268	269	--	--
Tyngsboro Housing Authority	327	327	327	327	--	--
Pepperell Housing Authority	76	76	76	77	--	--
Groton Housing Authority	7	7	7	6	--	--
Tyngsboro Water District	276	276	276	274	--	--
North Reading Housing Authority	64	64	64	66	--	--
West Groton Water	9	9	9	9	--	--
Ayer-Shirley RSD	3,642	3,642	3,642	3,642	--	--
Grand Totals:	\$1,014,234	\$1,014,234	\$1,014,234	\$1,014,235	--	--

SECTION 2: Accounting Information for the Middlesex County Retirement System

EXHIBIT 7

Notes to Required Supplementary Information

Valuation date	Actuarial determined contributions for fiscal 2016 and 2017 are determined with the January 1, 2014 actuarial valuation.
Actuarial cost method	Entry Age Normal Cost Method
Amortization method	Prior year's total contribution increased by 6.5% for fiscal 2014 through fiscal 2020, and thereafter the remaining unfunded liability will be amortized on a 4.0% annual increasing basis; ERI liability amortized in level payments
Remaining amortization period	As of July 1, 2012, 7 years remaining for 2002 ERI liability, 8 years remaining for 2003 ERI liability, 10 years remaining for 2010 ERI liability and 23 years for remaining unfunded liability.
Asset valuation method	The difference between the expected return and the actual investment return on a market value basis is recognized over a five-year period. Asset value is adjusted as necessary to be within 20% of the market value.

Actuarial assumptions:	
Investment rate of return	7.875%
Discount rate	7.875%
Inflation rate	4.00%
Projected salary increases	Varies by length of service with ultimate rates of 4.25% for Group 1, 4.50% for Group 2, and 4.75% for Group 4
Cost of living adjustments	3.00% of first \$14,000 of retirement income

Plan membership:	
Retired participants and beneficiaries in pay status or with suspended benefits	5,077
Inactive participants entitled to a return of their employee contributions	2,632
Inactive participants with a vested right to a deferred or immediate benefit	384
Active participants	<u>9,082</u>
Total	17,175

SECTION 2: Accounting Information for the Middlesex County Retirement System

Changes in Assumptions:

The following changes were effective January 1, 2014

- The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012.
- The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected 22 years with Scale AA.
- The mortality assumption for non-disabled retirees was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected 17 years with Scale AA.
- The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years to the RP-2000 Healthy Annuitant Mortality Table set forward three years projected 17 years with Scale AA.
- The investment return assumption was lowered from 8.00% to 7.875%.
- The salary increase assumption was changed from level rates of 4.75% per year for Group 1 and Group 2 members and 5.25% per year for Group 4 members, including an allowance for inflation of 4.5% per year, to rates based on years of service with ultimate rates of 4.25% per year for Group 1 members, 4.5% per year for Group 2 members and 4.75% per year for Group 4 members, including an allowance for inflation of 4.0% per year.
- The assumed retirement age for inactive vested participants was changed from age 65 to age 60 for Group 1 and 2 members and remained the same at age 55 for Group 4 members hired prior to April 2, 2012. For participants hired April 2, 2012 or later, the assumption is 60 for Group 1 members, 55 for Group 2 members, and 50 for Group 4 members.
- The administrative expense assumption was increased from \$3,100,000 for calendar 2012 to \$3,400,000 for calendar 2014.

Changes in Plan Provisions:

Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.

SECTION 3: Supplemental Information for the Middlesex County Retirement System

EXHIBIT I

Actuarial Assumptions and Actuarial Cost Method*

Mortality Rates:

Pre-Retirement:

RP-2000 Employee Mortality Table projected 22 years with Scale AA (Previously, projected 12 years with Scale AA)

Healthy Retiree:

RP-2000 Healthy Annuitant Mortality Table projected 17 years with Scale AA (Previously, projected 12 years with Scale AA)

Disabled Retiree:

RP-2000 Healthy Annuitant Mortality Table set forward 3 years projected 17 years with Scale AA (Previously, set forward 2 years and projected 0 years)

The RP-2000 Employee Mortality Table projected 22 years with Scale AA and the RP-2000 Healthy Annuitant Mortality Table projected 17 years with Scale AA were determined to contain provisions appropriate to reasonably reflect future mortality improvement, based on a review of the mortality experience of the plan.

* Used in January 1, 2014 Actuarial Valuation and Review.

SECTION 3: Supplemental Information for the Middlesex County Retirement System

Termination Rates before Retirement:

Groups 1 and 2 - Rate (%)					
Age	Mortality				Disability
	Current		Previously		
	Male	Female	Male	Female	
20	0.02	0.01	0.03	0.02	0.02
25	0.03	0.02	0.03	0.02	0.02
30	0.04	0.02	0.04	0.02	0.03
35	0.07	0.04	0.07	0.04	0.06
40	0.09	0.05	0.10	0.06	0.10
45	0.11	0.08	0.13	0.09	0.15
50	0.14	0.11	0.17	0.14	0.19
55	0.20	0.21	0.24	0.23	0.24
60	0.34	0.35	0.40	0.37	0.28

Notes: 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 3: Supplemental Information for the Middlesex County Retirement System

Termination Rates before Retirement (continued):

inued):

Group 4 – Rate (%)					
Mortality					Disability
Age	Current		Previously		
	Male	Female	Male	Female	
20	0.02	0.01	0.03	0.02	0.20
25	0.03	0.02	0.03	0.02	0.20
30	0.04	0.02	0.04	0.02	0.30
35	0.07	0.04	0.07	0.04	0.30
40	0.09	0.05	0.10	0.06	0.30
45	0.11	0.08	0.13	0.09	1.00
50	0.14	0.11	0.17	0.14	1.25
55	0.20	0.21	0.24	0.23	1.20
60	0.34	0.35	0.40	0.37	0.85

Notes: 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.

Withdrawal Rates:

Years of Service	Rate per year (%)		Years of Service	Group 4
	Groups 1 and 2			
0	15.0		0	1.5
1	12.0		1	1.5
2	10.0		2	1.5
3	9.0		3	1.5
4	8.0		4	1.5
5 – 9	7.6		5	1.5
10 – 14	5.4		6	1.5
15 – 19	3.3		7	1.5
20 – 24	2.0		8	1.5
25 - 29	1.0		9	1.5
30+	0.0		10	1.5
			11+	0.0

SECTION 3: Supplemental Information for the Middlesex County Retirement System

Retirement Rates:

Age	Rate per year (%)		
	Male	Female	Group 4
Groups 1 and 2			
45 – 49	--	--	1.0
50 – 54	--	--	2.0
55 – 59	2.0	5.5	15.0
60 – 61	12.0	5.0	20.0
62 – 64	30.0	15.0	25.0
65 – 68	40.0	15.0	100.0
69	50.0	20.0	--
70	100.0	100.0	--

**Retirement Age for Inactive
Vested Participants:**

Age 60 (previously, age 65) for Group 1 and Group 2 members and age 55 for Group 4 members hired prior to April 2, 2012. For members hired April 2, 2012 or later, age 60 for Group 1 members, age 55 for Group 2 members and age 50 for Group 4 members.

Unknown Data for Participants:

Same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.

Family Composition:

75% 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.

Benefit Election:

All participants are assumed to elect Option A.

SECTION 3: Supplemental Information for the Middlesex County Retirement System

Net Investment Return: 7.875% (previously, 8.00%)

Interest on Employee Contributions: 3.5%

Salary Increases:

Years of Service	Group 1	Group 2	Group 4
0	6.00%	6.00%	7.00%
1	5.50%	5.50%	6.50%
2	5.50%	5.50%	6.00%
3	5.25%	5.25%	5.75%
4	5.25%	5.25%	5.25%
5	4.75%	4.75%	5.25%
6	4.75%	4.75%	4.75%
7	4.50%	4.50%	4.75%
8	4.50%	4.50%	4.75%
9+	4.25%	4.50%	4.75%

Includes an allowance for inflation of 4.0% per year.

(Previously, 4.75% for Group 1 and 2 members and 5.25% for Group 4 members, including allowance for inflation of 4.5% per year.)

Administrative Expenses: \$3,400,000 for calendar year 2014, increasing 4.0% per year (previously, \$3,100,000 for calendar year 2012, increasing 4.5% per year)

2013 Salary: 2013 salaries are equal to salaries provided in the data, except for actives missing salary and employees with less than one year of service, where salaries are calculated from annualized contributions divided by the contribution rates provided.

Total Service: Total creditable service reported in the data.

Net 3(8)(c) Liability: No liability is valued for benefits paid to or received from other municipal systems.

SECTION 3: Supplemental Information for the Middlesex County Retirement System

Actuarial Value of Assets:	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 at 20% per year over a five-year period, further adjusted, if necessary, to be within 20% of the market value.
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method. Entry Age is the age of the participant less total creditable service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary. Normal Cost is determined by using the plan of benefits applicable to each participant. (Previously, Normal Cost determined as if the current plan of benefits had always been in effect.)
Changes in Assumptions:	This valuation reflects the following: ➤ The actuarial cost method was changed to better reflect the impact of the plan changes effective for employees hired on or after April 2, 2012. ➤ The pre-retirement mortality assumption was changed from the RP-2000 Employee Mortality Table projected 12 years with Scale AA to the RP-2000 Employee Mortality Table projected 22 years with Scale AA. ➤ The mortality assumption for non-disabled retirees was changed from the RP-2000 Healthy Annuitant Mortality Table projected 12 years with Scale AA to the RP-2000 Healthy Annuitant Mortality Table projected 17 years with Scale AA. ➤ The mortality assumption for disabled participants was changed from the RP-2000 Healthy Annuitant Mortality Table set forward two years to the RP-2000 Healthy Annuitant Mortality Table set forward three years projected 17 years with Scale AA. ➤ The investment return assumption was lowered from 8.00% to 7.875%. ➤ The salary increase assumption was changed from level rates of 4.75% per year for Group 1 and Group 2 members and 5.25% per year for Group 4 members, including an allowance for inflation of 4.5% per year, to rates based on years of service with ultimate rates of 4.25% per year for Group 1 members, 4.5% per year for Group 2 members and 4.75% per year for Group 4 members, including an allowance for inflation of 4.0% per year.

SECTION 3: Supplemental Information for the Middlesex County Retirement System

- The assumed retirement age for inactive vested participants was changed from age 65 to age 60 for Group 1 and 2 members and remained the same at age 55 for Group 4 members hired prior to April 2, 2012. For participants hired April 2, 2012 or later, the assumption is 60 for Group 1 members, 55 for Group 2 members, and 50 for Group 4 members.
- The administrative expense assumption was increased from \$3,100,000 for calendar 2012 to \$3,400,000 for calendar 2014.

SECTION 3: Supplemental Information for the Middlesex County Retirement System

EXHIBIT II

Summary of Plan Provisions

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

Percent	Group 1	Group 2	Group 4
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 3: Supplemental Information for the Middlesex County Retirement System

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

Percent	Group 1	Group 2	Group 4
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

Percent	Group 1	Group 2	Group 4
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 3: Supplemental Information for the Middlesex County Retirement System

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.

Employee Contributions

Date of Hire	Contribution Rate
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%.

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 3: Supplemental Information for the Middlesex County Retirement System

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.

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.

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.

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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 cause of disability.

"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.

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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 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

Members hired on or after April 2, 2012 are covered by the provisions of Chapter 32 as amended by of Chapter 176 of the Acts of 2011 and Chapter 139 of the Acts of 2012.

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Appendix A

Glossary

Definitions of certain terms *as they are used in Statement 68*; the terms may have different meanings in other contexts.

Active employees:	Individuals employed at the end of the reporting or measurement period, as applicable.
Actual contributions:	Cash contributions recognized as additions to a pension plan's fiduciary net position.
Actuarial present value of projected benefit payments:	Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial valuation:	The determination, as of a point in time (the actuarial valuation date), of the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial valuation date:	The date as of which an actuarial valuation is performed.
Actuarially determined contribution:	A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.
Ad hoc cost-of-living adjustments (ad hoc COLAs):	Cost-of-living adjustments that require a decision to grant by the authority responsible for making such decisions.
Ad hoc postemployment benefit changes:	Postemployment benefit changes that require a decision to grant by the authority responsible for making such decisions.
Agent employer:	An employer whose employees are provided with pensions through an agent multiple-employer defined benefit pension plan.

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Agent multiple-employer defined benefit pension plan (agent pension plan):

A multiple-employer defined benefit pension plan in which pension plan assets are pooled for investment purposes but separate accounts are maintained for each individual employer so that each employer's share of the pooled assets is legally available to pay the benefits of only its employees.

Allocated insurance contract:

A contract with an insurance company under which related payments to the insurance company are currently used to purchase immediate or deferred annuities for individual employees. Also may be referred to as an annuity contract.

Automatic cost-of-living adjustments (automatic COLAs):

Cost-of-living adjustments that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Automatic postemployment benefit changes:

Postemployment benefit changes that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Closed period:

A specific number of years that is counted from one date and declines to zero with the passage of time. For example, if the recognition period initially is five years on a closed basis, four years remain after the first year, three years after the second year, and so forth.

Collective deferred outflows of resources and deferred inflows of resources related to pensions:

Deferred outflows of resources and deferred inflows of resources related to pensions arising from certain changes in the collective net pension liability.

Collective net pension liability:

The net pension liability for benefits provided through (1) a cost-sharing pension plan or (2) a single-employer or agent pension plan in circumstances in which there is a special funding situation.

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Collective pension expense:	Pension expense arising from certain changes in the collective net pension liability.
Contributions:	Additions to a pension plan's fiduciary net position for amounts from employers, nonemployer contributing entities (for example, state government contributions to a local government pension plan), or employees. Contributions can result from cash receipts by the pension plan or from recognition by the pension plan of a receivable from one of these sources.
Cost-of-living adjustments:	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-sharing employer:	An employer whose employees are provided with pensions through a cost-sharing multiple-employer defined benefit pension plan.
Cost-sharing multiple-employer defined benefit pension plan (cost-sharing pension plan):	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
Covered-employee payroll:	The payroll of employees that are provided with pensions through the pension plan.
Deferred retirement option program (DROP):	A program that permits an employee to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The employee continues to provide service to the employer and is paid for that service by the employer after the DROP entry date; however, the pensions that would have been paid to the employee (if the employee had retired and not entered the DROP) are credited to an individual employee account within the defined benefit pension plan until the end of the DROP period.
Defined benefit pension plans:	Pension plans that are used to provide defined benefit pensions.

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Defined benefit pensions:	Pensions for which the income or other benefits that the employee will receive at or after separation from employment are defined by the benefit terms. The pensions may be stated as a specified dollar amount or as an amount that is calculated based on one or more factors such as age, years of service, and compensation. (A pension that does not meet the criteria of a defined contribution pension is classified as a defined benefit pension for purposes of Statement 68.)
Defined contribution pension plans:	Pension plans that are used to provide defined contribution pensions.
Defined contribution pensions:	Pensions having terms that (1) provide an individual account for each employee; (2) define the contributions that an employer is required to make (or the credits that it is required to provide) to an active employee's account for periods in which that employee renders service; and (3) provide that the pensions an employee will receive will depend only on the contributions (or credits) to the employee's account, actual earnings on investments of those contributions (or credits), and the effects of forfeitures of contributions (or credits) made for other employees, as well as pension plan administrative costs, that are allocated to the employee's account.
Discount rate:	The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following: 1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension plan's fiduciary net position is projected (under the requirements of Statement 68) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments. 2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.

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Entry age actuarial cost method:	A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the <i>normal cost</i> . The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the <i>actuarial accrued liability</i> .
Inactive employees:	Terminated individuals that have accumulated benefits but are not yet receiving them, and retirees or their beneficiaries currently receiving benefits.
Measurement period:	The period between the prior and the current measurement dates.
Multiple-employer defined benefit pension plan:	A defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Net pension liability:	The liability of employers and nonemployer contributing entities to employees for benefits provided through a defined benefit pension plan.
Nonemployer contributing entities:	Entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of Statement 68, employees are not considered nonemployer contributing entities.
Other postemployment benefits:	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits, regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits. ⁴
Pension plans:	Arrangements through which pensions are determined, assets dedicated for pensions are accumulated and managed, and benefits are paid as they come due.
Pensions:	Retirement income and, if provided through a pension plan, postemployment benefits other than retirement income (such as death benefits, life insurance, and disability benefits). Pensions do not include postemployment healthcare benefits and termination benefits.

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Plan members:	Individuals that are covered under the terms of a pension plan. Plan members generally include (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members).
Postemployment:	The period after employment.
Postemployment benefit changes:	Adjustments to the pension of an inactive employee.
Postemployment healthcare benefits:	Medical, dental, vision, and other health-related benefits paid subsequent to the termination of employment.
Projected benefit payments:	All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and their expected future service.
Public employee retirement system:	A special-purpose government that administers one or more pension plans; also may administer other types of employee benefit plans, including postemployment healthcare plans and deferred compensation plans.
Real rate of return:	The rate of return on an investment after adjustment to eliminate inflation.
Service costs:	The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.
Single employer:	An employer whose employees are provided with pensions through a single-employer defined benefit pension plan.
Single-employer defined benefit pension plan (single-employer pension plan):	A defined benefit pension plan that is used to provide pensions to employees of only one employer.
Special funding situations:	Circumstances in which a nonemployer entity is legally responsible for making contributions directly to a pension plan that is used to provide pensions to the employees of another entity or entities and either of the following conditions exists: The amount of contributions for which the nonemployer entity legally is responsible is <i>not</i> dependent upon one or more events or circumstances unrelated to the pensions. The nonemployer entity is the only entity with a legal obligation to make contributions directly to a pension plan.

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Termination benefits:

Inducements offered by employers to active employees to hasten the termination of services, or payments made in consequence of the early termination of services. Termination benefits include early-retirement incentives, severance benefits, and other termination-related benefits.

Total pension liability:

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of Statement.

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